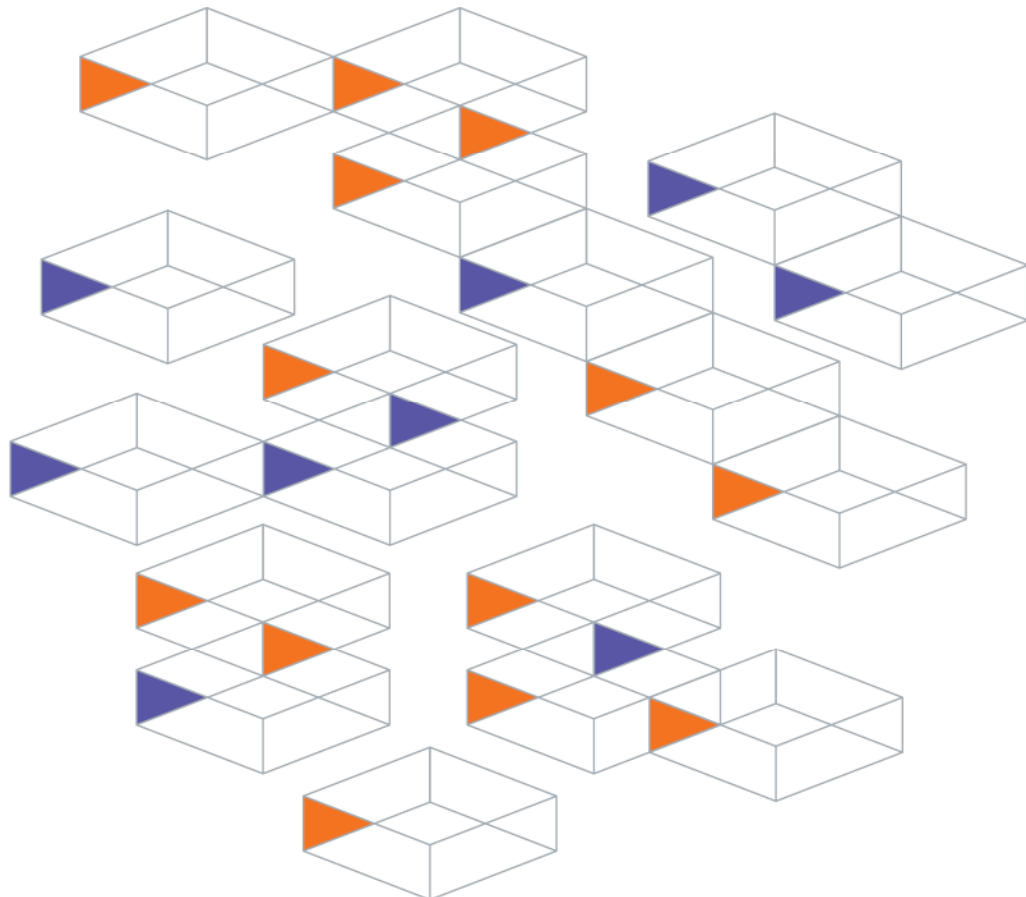


CPB Contractors Pty Ltd

Moorebank Precinct East Stage 1 RALP No. 1

Remediation Action Plan

9 July 2019



Boundaries
are set by those
who are afraid
to push them

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Moorebank Precinct East Stage 1 RALP No. 1

Prepared for
CPB Contractors Pty Ltd

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9 July 2019

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1. Introduction

1.1. General

CPB Contractors Pty Ltd (CPB) engaged Coffey Geotechnics Pty Ltd (Coffey) to prepare this Remediation Action Plan (RAP) for Sydney Intermodal Terminal Alliance's (SIMTA) Moorebank Precinct East (MPE) Stage 1 Rail Access Land Package (RALP) No. 1 (the Rail Link). The SIMTA facility relates to a broader infrastructure package that includes a rail link as well as the development of an intermodal facility consisting of warehouse and distribution facilities, freight village, stormwater and landscaping, servicing and associated works on the eastern side of Moorebank Avenue previously occupied by the Defence National Storage and Distribution Centre (former DNSDC). The SIMTA project is one part of the staged construction of the overall Moorebank Precinct Project, which also includes but is not limited to the development of the Moorebank Intermodal Company (MIC) site on the western side of Moorebank Avenue. The overall precinct will be managed under a Moorebank Precinct Waste Management Strategy, which is being developed by SIMTA.

The project involves the development of a rail link, within an identified rail corridor ('the Rail Corridor'), which connects from the southern part of the SIMTA site to the Southern Sydney Freight Line (SSFL). The Rail Link will pass through Commonwealth land formerly used for Defence-related activities, Sydney Trains-owned land, land on either side of Moorebank Avenue, the southern portion of the Royal Australian Engineers (RAE) golf course, and the privately-owned Glenfield Waste Services (GWS) Facility and quarry to the west of the Georges River and east of the SSFL. The location of the Rail Link is presented in Figure 1.

Between 2015 and early 2018, multiple geotechnical and contamination assessments have been completed for the Rail Link. The objective of the contamination assessments were to assess if the existing soil, groundwater and ground gas conditions beneath the proposed Rail Link would present unacceptable contamination risks to the intended site users, or the environment.

The section of the Rail Link which passes through the GWS Facility was redesigned in 2018 which resulted in several changes to the development, including:

- Realignment of the Rail Link to minimise impacts on the existing GWS Facility.
- Allowance for the operator of the GWS Facility to construct a new Leachate Holding Dam (LHD), which will be located between the Northern and Southern Connections. Leachate from the existing leachate pond will be transferred by GWS to the new LHD once commissioned.
- Decommissioning of the existing LHD and extensive earthworks to construct a rail embankment.
- Allowance for the operator of the GWS Facility to redesign its future landfill cell designs so that future landfill cells are aligned with the rail link. This includes the construction of the new 'Cell X' adjacent the Southern Connection.
- Allowance for the operator of the GWS Facility to increase the capacity of the existing stormwater basin to allow for the final landfill design.
- Construction of new surface water and leachate drainage infrastructure.

For the purpose of this RAP, the Project has been split into the following sections:

- Southern Connection and Cell X wall from Chainage (MB2S)¹ CH39940 to CH40180

¹ MB2S refers to 'Moorebank to South'.

- Northern Connection from Chainage (MB2N)² CH39411 to CH39820
- GWS Facility from Chainage (MB2S) CH40180 to CH40820 and associated changes to stormwater and leachate storage infrastructure
- George River Crossing from Chainage (MB2S) CH40820 to CH40860
- Georges River east bank between Chainage (MB2S) CH40860 to CH40969
- Former RAE Golf Course between Chainage (MB2S) CH40969 to CH41540
- Moorebank Avenue between Chainage (MB2S) CH41540 to CH41620
- Sydney Trains land between Chainage (MB2S) CH41620 to CH41750
- Commonwealth Land (Boot Toe Land) between Chainage (MB2S) CH41750 to CH42030DNSDC South between Chainage (MB2S) CH42030 to CH42150

The extent of each section is shown on Figures 2 to 5. Copies of the Preliminary Development Design Plans are provided in Appendix A.

1.2. Regulatory Framework

1.2.1 Development Consent

Condition C8 of the Development Consent for the project (Application No: SSD6766), issued by the NSW Department of Planning, outlines the following requirements:

'the subject site is to be remediated in accordance with:

- a) The approved Remedial Action Plan;*
- b) State Environmental Planning Policy No 55 – Remediation of Land; and*
- c) The guidelines in force under the Contaminated Land Management Act.*

Amendments to the approved Remedial Action Plan required as a result of further site investigations must be approved by the Site Auditor, in consultation with the EPA'.

1.2.2 Regulations and Guidance

All assessment, remediation and validation works of land contamination management for the Project, will be undertaken in accordance with, but not limited to, all relevant sections of:

- National Environment Protection (Assessment of Site Contamination) Measure 1999, amended in 2013 (ASC NEPM).
- NSW EPA (1995) Sampling Design Guideline
- NSW EPA (2014) 'Waste Classification Guidelines, Part 1: Classifying Waste and Part 5: Acid Sulfate Soils'.
- WA DoH (2009) 'Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia'.
- *Contaminated Land Management Act 1997*

² MB2N refers to 'Moorebank to North'

- Contaminated Land Management Regulations 2013
- HEPA (Jan 2018); PFAS National Environmental Management Plan
- *Work Health and Safety Act 2011*.
- Work Health and Safety Regulations 2011.
- *Protection of the Environment Operations Act 1997*.
- Protection of the Environment Operations Regulations 2014.
- DUAP/ NSW EPA (1998). Managing Land Contamination: State Environmental Planning Policy No 55 Remediation of Land (SEPP 55) and the associated planning policy.
- Managing Asbestos in or on soil (NSW Government, 2014)

1.3. Extent of Remediation and Validation Activities

SIMTA will enter into lease arrangements with the various landowners prior to construction of the Rail Link and taking into consideration that SIMTA will not be the landowner of the future rail corridor, nor the originator of the identified contamination, it is considered that remediation is not required to be undertaken beyond the boundary extent for construction of the Rail Link, as shown on Figures 2 to 5.

Should evidence suggest any contamination identified to be beyond this boundary, remediation works need not be extended outside the Project boundary. Validation samples will be collected as per the validation plan detailed in this RAP and results will be documented as part of the Validation Report. Additionally, validation results will be reviewed to assess future specific management activities that will be required and documented in the Long-Term Site Management Plan.

2. Objectives

The objective of the RAP is to identify appropriate measures by which the identified site contamination can be remediated and/or adequately managed (including appropriate validation) as such there is a low likelihood of contamination posing a risk to human health or the environment and the Rail Link is suitable for industrial/commercial land uses consistent with the rail corridor, in accordance with guidelines endorsed by NSW EPA.

The purpose of the RAP aims to:

- Identify contaminated material subject to remediation.
- Set remediation objectives.
- Review feasible remedial options.
- Select the preferred remedial option or options.
- Outline the procedures and activities associated with implementation of the preferred remediation option(s).
- Outline the requirements for the contractors to prepare environmental and occupational health and safety plans for the remediation.
- Outline the requirements for a contingency plan to be prepared for the remediation.
- Outline the regulatory compliance requirements for the remedial works.
- Provide details of contacts for the period of remediation works.
- Provide a framework for the environmental management plan for remediation work.

This plan addresses the following:

- Remediation and management of contaminated soil arising from the historical use of the site.
- Validation of the remediated areas.
- Health and safety and site control during remediation.

This RAP addresses the remediation activities for the Rail Link. All contamination related management will be undertaken in accordance with the following documentation prepared for the Rail Link:

- Asbestos Management Plan (AMP, Coffey 2018).
- Contamination Management Plan (CMP, Coffey 2018)

Unexpected contaminated finds procedures and material tracking records is outlined in this document and detailed further in the Coffey (2018) CMP. This RAP should be read in conjunction with the *Contamination Management Plan* (Ref: GEOTLCOV24072AH-R03-RevH, 25 May 2018) and *Asbestos Management Plan* (Ref: GEOTLCOV24072AH-R06, 26 July 2018).

3. Construction Methodology

3.1. Key Aspects of Construction

The duration of construction is anticipated to be approximately 18 months. These works generally involve:

- Establishment of three construction compounds to support the Rail Link construction (the Rail East Compound, and the Rail West Compound) providing car parking, offices, amenities, laydown and storage, and material testing areas.
- Clearing of approximately 1.25 hectares (ha) of vegetation within the Sydney Trains, Commonwealth and GWS owned land.
- Construction of the Rail link from the SSFL to the Stage 1 site (intermodal facility), including a bridge over the Georges River, a culvert over Anzac Creek and an underpass under Moorebank Avenue (north of the East Hills Rail Corridor).
- Earthworks to construct rail embankments and batters within the GWS Facility. The earthworks include ground improvement works such as soil pre-loading / surcharge and reinforced earth walls.
- Relocation and protection of existing utilities in an easement adjoining Moorebank Avenue where the Rail Link traverses.
- Construction of utilities and connections to existing and new GWS infrastructure that intersects with the RALP operational footprint.
- Earthworks to construct landfill 'Cell X' embankment adjacent to the Southern Connection.
- Construction of access and egress to and from the Rail Link from Moorebank Avenue and Cambridge Avenue (through GWS Facility).

3.1.1. GWS Construction Activities

The landowner of the GWS Facility will be undertaking construction activities to alter its operations and the RALP design has had to take these changes into account. The works include:

- Construction of a new leachate pond located between the Northern and Southern Connectors for GWS, and transfer leachate to the new pond once commissioned.
- Decommissioning the existing leachate pond within the GWS Facility.
- Extension of the existing stormwater basin in a southerly direction to increase capacity for future landfill operations.
- Construction of a haul road into landfill pit adjacent to existing leachate pond to allow landfill operations to continue separate from RALP works.
- Construction of access road within the southern portion of the GWS facility under the Eastern underpass of the East Hills Line.

3.2. Construction Activities

It is envisaged that the following general sequence of works would be undertaken for each section of the project:

- Site establishment – installing boundary fencing, construction facilities, environmental controls and carrying out pre-clearing vegetation fauna surveys.

- Relocation or protection of services – relocating and protecting electricity, gas, water and telecommunications infrastructure affected by the project.
- Site preparation – clearing and grubbing, topsoil stripping and storage.
- Earthworks – undertaking cut and fill works along the alignment to achieve desired levels, removal of unsuitable material, batter and embankment shaping and ground improvement works.
- Structures – installation of drainage structures, infrastructure and pavement.
- Landscaping and restoration – reuse of topsoil, planting of native plants and seeding disturbed areas with native and cover crops species (note this would take place throughout construction as elements of the project are complete where ongoing disturbance is not anticipated).
- Commissioning – commissioning of new elements of the project and decommissioning of construction facilities.

The section between the GWS Facility will be made up of an embankment that will pass adjacent to active landfill cells and cross inactive cells that have closed and been capped. The bridge over the Georges River will be supported by piers on either side of the river. The remainder of the alignment will be constructed at grade of which the finished levels will be achieved by cut and fill activities. At this stage, dewatering within the GWS Facility is currently anticipated during the construction of the embankment.

It should be noted that finalisation of the detailed design for the Rail Link through the GWS Facility was on-going and that design has been finalised for all other areas of the Rail Link as at April 2018.

4. Site information

The site locality plan is shown in Figure 1. Previous and current site uses are summarised in Table 2.

4.1. Site Identification

The Rail Link, being constructed by CPB on behalf of SIMTA, is part of the overall Moorebank Precinct East project under SSD-6766. This project is one part of the staged construction of the overall Moorebank Precinct Project, which also includes but is not limited to the development of the Moorebank Intermodal Company (MIC) site on the western side of Moorebank Avenue. The overall precinct will be managed under a Moorebank Precinct Waste Management Strategy. The site identification details below are for the Rail Link works only. Details for the overall precinct can be found in the Moorebank Precinct Waste Management Strategy, which is being developed by SIMTA.

Table 1: Site Identification Details

Site Address	Moorebank Avenue, Moorebank, NSW
Title Identification Details	Part Lots 101-104 DP1143827, Part Lot 51 DP 515696, Part Lot 1 DP1048263, Part Lot 5 DP 833516, Part Lot 1 DP1197707, Part Lot 1 DP1197707, Part Lots 1 and 2 DP825352, and Lot 4 DP1197707.
Local Government Authority	Liverpool City Council and Campbelltown City Council
Current Zoning	Based on the Liverpool Council LEP 2016, the proposed rail corridor passes through the following Land Zones: <ul style="list-style-type: none"> - Public Recreation (RE1) - Environmental Management (E3) - General Industrial (IN1) - Infrastructure (SP2) Figure 6 illustrates the different Land Zones which apply to the proposed rail corridor.
Proposed Site Use	Rail corridor associated with Intermodal freight transport facility.

Table 2: Previous and Current Sites

Section of the site	Current Land Owner	Previous site uses	Current site uses
Southern Connection and proposed Cell X wall cut from Chainage (MB2S) CH39800 to CH40180	GWS	Market gardens/farm land until between 1956 and 1970. Storage of landfill overburden between 1994 and 2017	Existing railway lines (Main South Line and Southern Sydney Freight Line). Undeveloped area of the GWS Facility.

Section of the site	Current Land Owner	Previous site uses	Current site uses
Northern Connection from Chainage (MB2N) CH39411 to CH39820	GWS / Sydney Trains	Market gardens/farm land until between 1956 and 1970. Storage of landfill overburden between 1994 and 2017	Existing railway lines (Main South Line and Southern Sydney Freight Line). Undeveloped area of the GWS landfill, current stormwater basin for GWS Facility
Glenfield Waste Service (GWS) facility from Chainage (MB2S) CH40180 to CH40820	GWS	Market gardens/farm land followed by quarrying and landfilling activities since 1950s	Landfill, licensed for accepting General Solid Waste, as defined in NSW POEO Act 1997. It is understood the landfill was previously licensed to accept asbestos waste.
George River Crossing from Chainage (MB2S) CH40820 to CH40860	Crown	Natural waterway	Natural waterway
Georges River east bank between Chainage (MB2S) CH40860 to CH4040969	Commonwealth of Australia	Undeveloped bushland. Defence activities including the School of Military Engineering	Vacant since School of Military Engineering moved out this base in circa 2015/16
Former RAE Golf Course between Chainage (MB2S) CH40969 to CH41540	Commonwealth of Australia	Undeveloped bushland until late 1950s. Military training activities between late 1950s and 1970s. Golf course between late 1970s and circa 2015/16	Cleared land following the removal of the golf course in c.2015/16.
Moorebank Avenue between Chainage (MB2S) CH41540 to CH41620	Commonwealth of Australia	Moorebank Avenue was opened around 1970s	Public road
Sydney Trains land between Chainage (MB2S) CH41620 to CH41750	Railcorp NSW	Used as a temporary construction compound between 1980s and 1990s for the East Hills Line construction	Vacant since 1990s
Commonwealth Land (Boot Toe Land) between Chainage (MB2S) CH41750 to CH42030	Commonwealth of Australia	Undeveloped bushland. Some defence activities	Defence activities
DNSDC South between Chainage (MB2S) CH42030 to CH42150	Commonwealth of Australia	Defence activities	Defence activities

4.2. Site Conditions

The Rail Link passes across a number of parcels of land, as shown in Figure 1. The boundary of the Rail Link is shown on Figures 2 to 5. The site boundary east of the George River is defined as 10m either side of the rail middle line.

To the west of Georges River, the Rail Link alignment runs roughly along the eastern boundary of the Glenfield Waste Service Facility. The Rail Link then crosses the Georges River and continues along the eastern portion of the former RAE Golf Course. Upon exiting the RAE Golf Course, the Rail Link traverse Moorebank Avenue, enters the Sydney Trains Land and continues through Defence Land to DNSDC South.

Site observations made by JBS&G in 2015 and Coffey during the period between 2016 and 2018 during respective investigations and site visits are described below:

- **Northern Connection from Chainage (MB2N) CH39411 to CH39820 and Southern Connection from Chainage (MB2S) CH39800 to CH40180** - The Rail Link divides into the Northern Connection and Southern Connection close to the northern end of the facility which is roughly the topographic high point of the GWS land. The Southern Connection of the Rail Link swings towards the west and south to connect to the SSFL to the west of the current quarry, while the Northern Connection of the Rail Link maintains a northerly direction from the high ground to a lower area where the northern dam of the Glenfield site exists. The Proposed Cell X wall straddles the Southern Connection.
- **Glenfield Waste Service facility from Chainage (MB2S) CH40180 to CH40820** – comprising an active landfill (waste repository) and a former quarry. The proposed Rail Corridor enters the GWS facility at the eastern boundary about 20m north of the existing rail corridor bridge crossing at Georges River. The existing East Hills rail corridor bisects the GWS facility. The Rail Link will pass to the north of the East Hills rail corridor.

The Rail Link enters south-eastern corner of the GWS facility in a location which includes a rehabilitated area. JBS&G (2015) noted that a ‘black liner material’ is present on the sloping embankment. The area also includes a fenced enclosure used to park excavation and other equipment. A gravel access road passes immediately west of the enclosure, leading to the lower excavated landfill areas towards the centre of the landfill. The Rail Link follows the eastern boundary of the GWS facility, which was observed to be at a considerably higher elevation relative to the excavated landfill base and dam. The soil stratigraphy observed within investigation locations TP2, TP3, BH5, BH6 and BH18 indicates this higher ground appears to be constructed from reworked natural materials, potentially excavated at the time of quarrying, given the depth of fill encountered and the general absence of anthropogenic materials within the fill (i.e. in contrast to the anthropogenic inclusions encountered within investigation locations within the landfill).

At the time of the Coffey investigation, Coffey noted a sign at the front of the facility indicated that the site has previously accepted asbestos material, however this practice appears to be discontinued. Observations made during the site walkover also indicated that the current landfill cell batters appear to be lined by geomembrane. A geomembrane, which is most likely a component of the landfill liner, is visible on the top of the western slope leading to the landfill cell that is currently receiving waste. Anecdotal information provided by the GWS Facility Manager also indicated that the base of the current landfill cells is lined with geomembrane, though there is some conjecture on whether the primary component of the liner is a geosynthetic lay liner (GCL) or a geomembrane. As discussed above, there is evidence of a geomembrane anchored at the top (next to the lower access road) and extending down along the landfill cell wall is exposed around chainage (MB2S) CH40461. Based on observations made during the drilling works, leachate barrier system was not installed within the older section of the landfill between (MB2S) CH40600 to CH40740.

Coffey noted that there are two water bodies located within the GWS Facility site; namely, a stormwater basin at the northern end of the facility and a leachate pond in the central eastern part of the landfill. It is understood that the surface water dam will be realigned by GWS and extended in a southerly direction to increase its capacity for future landfill operations. The existing leachate pond will be decommissioned by GWS and understood to be pumped into the new leachate pond which will be constructed between the Northern and Southern Connections. This area of the site has been used historically to store overburden from the landfill operations. Coffey understands that the overburden materials derived from land stripping activities undertaken prior to the quarrying and landfill cell construction activities. The overburden has been used as daily cover material in active landfill cells. Observations made during a recent walkover in 2018 indicates this area has been used to store materials and plant associated with the Rail Link project. No indicators of potential contamination were noted during recent site inspections of this area made by Coffey environmental scientists/engineers following the removal of the overburden.

- **George River Crossing and Georges River East Bank from Chainage (MB2S) CH40820 to CH40969** - the proposed Rail Link alignment passes over the Georges River to the north of the existing rail bridge. Both sides of the riverbank are heavily vegetated. The eastern river bank, further to the north of the rail link, was reportedly used as a former fire training area by Defence (FE Training Area). Some excavation and/or filling were observed adjacent to the existing rail bridge supports, presumably associated with construction of the bridge.
- **Former RAE Golf Course between Chainage (MB2S) CH40969 to CH41540** – to the west of Moorebank Avenue, the RAE Golf Course is mostly open grassed former golf course including former fairways, greens and bunkers with scattered mature trees. A wide row of trees is present along the eastern boundary. To the south is the existing East Hills rail corridor and to the east, Moorebank Avenue. A security fence separates the East Hills rail corridor from the golf course north of the site and west of Moorebank Avenue. Golder (2011a) noted that a former mock Viet Cong village is located in the southern portion of the RAE Golf Course and that it was noted to be outside of the investigation area at the time of the JBS&G (2015a) investigation. CPB has confirmed with Department of Defence that the Viet Cong Village is located outside of the Project boundary and that no excavation is proposed to be carried out in the vicinity of the Viet Cong Village footprint. Further to the north of the Viet Cong Village, and approximately 250m to the north of the Rail Link, is an identified defence Fire Fighting Training Area (FFTA).
- **Moorebank Avenue between Chainage (MB2S) CH41540 to CH41620** – comprises a single carriageway road, built on an embankment increasing in elevation towards the south where the road passes over the East Hills rail corridor, and the adjoining roadway corridor. The road corridor increases in width in the south, probably as a result of the realignment of the road to create the road bridge over the East Hills railway corridor when constructed (in the 1980s). Waste stockpiles and low mounds of waste burial were observed along the eastern embankment of Moorebank Avenue, but not along the western embankment. An unsealed access road is also present along the western embankment where a plastic bag containing ACM was observed near BH15 at the time of the Coffey 2016 investigation.
- **Sydney Trains land between Chainage (MB2S) CH41620 to CH41750** – comprising a triangular parcel of land alignment to Moorebank Avenue. An unsealed accessed road is located along the western site boundary and separately fenced from the Commonwealth Land South / Boot Toe Land and the RailCorp Land to the south of this area. The northern portion comprises patches of grassed areas, dense scrub and open bushland. At the time of the Coffey investigation, low mounds of waste burial were observed in the south-western corner of the area, with waste burial (and containing asbestos fragments) also being observed in this area. A security fence separates the Sydney Trains Land and Moorebank Avenue.
- **Commonwealth Land (Boot Toe Land) between Chainage (MB2S) CH41750 to CH42030** – comprising bushland, located south of the DNSDC South, which includes a cleared area with a narrow fire-trail and overhead power line corridor along the northern boundary. Anzac Creek runs east to west across the northern portion of this land. An unused rail siding runs north-south along the western edge leading from the East Hills railway line in the south into the former DNSDC site. Minor waste material (including a rusted drum) was observed during previous investigation. At the

time of the Coffey investigation, a small stockpile area was noted within the work zone. It appears that some earthworks had been conducted along the fire trail. Asbestos fragments were noted in the stockpile (see Figure 5). The fragments were collected for laboratory analysis.

- **DNSDC South between Chainage (MB2S) CH42030 to CH42150** – comprising open grassed area in the southern portion of the DNSDC site. The area is relatively level, with no obvious feature other than some sparse mature trees and wire mesh security fence along the western and southern boundaries.

4.3. Topography and Drainage

The topography within the GWS facility land has been modified by quarrying and landfilling activities. The eastern boundary of the GWS, along the alignment of the Rail Link, slopes gently to the north, with the highest ground occurring in the north of the GWS facility. Land immediately along the Georges River banks slopes towards the river.

In the northern part of the GWS facility, surface runoff would be captured in the stormwater pond, which overflows into Georges River. Precipitation and surface runoff would by-and-large infiltrate into unsealed ground surfaces in other parts of the GWS facility. Leachate collected from the landfill is channelled towards the leachate pond situated within the eastern part of the GWS Facility, and managed under the existing Environmental Protection License (EPL).

Land to the east of Georges River is generally flat with the topography sloping slightly to the south and west mostly towards Georges River.

Given the moderate to low relief over the remainder of the proposed rail corridor and the ground surface conditions, most of the precipitation will likely infiltrate unsealed ground surfaces, recharge the shallow groundwater environment and eventually flow into ephemeral and perennial surface water features in the vicinity of the site, including Anzac Creek, Glenfield Creek and Georges River.

4.4. Geology

Fluvial deposits of clayey sand and clay are present beneath the Rail Link south of the SIMTA site and east of the Georges River, while the area west of the Georges River are underlain by Quaternary fluvial deposits of medium grained sand, clay and silt. The southern portion of the GWS facility has been quarried and subsequently filled with waste materials including building demolition, shredded car tyres and asbestos disposed in the landfill within the quarry. Surface material and fluvial deposits are underlain at depth by shale and sandstone (Golder, 2011a).

4.5. Hydrogeology

Regional groundwater is understood to flow within shale and alluvial deposits in a north to westerly direction towards the Georges River (Golder, 2010). The two aquifers have been reported, comprising shallow and deep aquifers with groundwater at depths of approximately 6m below ground surface (bgs) to 11mbgs (DP, 2009b; URS, 2002a).

Groundwater flow in the GWS facility is anticipated to be influenced by quarrying and landfilling activities, with general flow in an easterly direction towards the river (Golder, 2011a).

Deep groundwater is reported to exhibit high salinity and therefore provides limited beneficial use. Shallow groundwater was reported to have lower salinity (URS, 2002b).

4.6. Acid Sulfate Soils

Potential Acid Sulfate Soils (ASS) are anticipated within alluvial sediment along the Georges River.

Construction activities associated with the construction of the Rail Link as it traverses the Georges River and the GWS Facility pass through 'Class 5' ASS according to Liverpool LEP 2008 Acid Sulfate Soils Map - Sheet ASS-013 (LEP Amendment 2014). Class 5 relates to areas within 500 metres of adjacent Class 1, 2, 3 or 4 land that is below 5 metres Australian Height Datum (mAHD) by which the watertable is likely to be lowered below 1 mAHD on adjacent Class 1, 2, 3 or 4 land.

In this case, the mapped 'Class 1' ASS area is representative of the bed and lower bank of the Georges River (i.e. below 5 mAHD).

In relation to Rail Link construction activities, the Class 1 ASS area is situated to the north of the proposed construction of the Georges River Bridge and east of a set of railway upon a set of culverts and embankments that traverse the GWS Facility. Although it is unlikely for construction activities to encounter ASS, due to the relative distance of separation between the mapped Class 1 ASS area and construction activities of within a few hundred metres, any ASS encountered during construction works will be handled in accordance with the Project ASS Management Plan.

4.7. Surrounding Land Uses

The proposed Rail Link is surrounded by the following use:

- North – Georges River and the Southern main railway line
- East – Former Defence land, to be redeveloped as part of the MIC.
- South – Older section of the GWS facility and the East Hills railway line
- West – Active section of the GWS facility and the SSFL.

The closest residential areas are located approximately 330 metres to the west and south of the proposed rail corridor.

4.8. Summary of Previous Reports

4.8.1 JBS&G (2015a) Phase 2 Contamination Assessment

JBS&G was commissioned by Tactical Group on behalf of Qube Property Management Services Pty Ltd to conduct a supplementary Phase 2 Environmental Site Assessment (ESA) within the Stage 1 site and Rail Corridor (the Proposal site) of the proposed SIMTA Intermodal Terminal facility. The JBS&G report summarises the findings of a broad range of contamination assessments conducted prior to 2015 in relation to the proposed Rail Link and the proposed Intermodal Terminal facility. The summary below includes information relating to the proposed Rail Link only.

Based on the soil analytical results, JBS&G noted that *'most of the reported concentrations of the CoPCs for soil samples from previous and current investigations were below the adopted NEPC (2013) human health commercial / industrial criteria, with the exception of one soil sample collected from the western portion of the GWF [GWS Facility] where lead was detected at concentration exceeding the adopted human health criteria'*. JBS&G recommended *'further management to mitigate potential risks to future workers during the development of this area'*.

Further, asbestos containing material (ACM) was identified in the fill material at 0.3-0.4mbgs in a test pit excavated within the former RAE golf course which might be related to historic burials or filling activities. JBS&G considered the ACM finds have the potential to pose a risk to future workers at the site should the ACM be disturbed. JBS&G recommended that *'in line with the mitigation of this risk, is assumed that the removal and/or appropriate management of surface ACM would be conducted in parallel with the hazardous materials removal work prior to the demolition of existing buildings. The characterisation / delineation, excavation and disposal of potential bonded ACM impacted fill from the golf course should be conducted prior to the commencement of the planned development works in*

this area. Any asbestos impacted material exceeding NEPC (2013) land use criteria will need to be managed and/or disposed of as 'Special (asbestos) Waste'.

JBS&G concluded that *'the site is considered suitable for ongoing commercial / industrial use [subject to the limitations and management of the impacts discussed above]. There is no gross or widespread contamination that would unreasonably restrict development and use of the site. It is recommended that a Remediation Action Plan (RAP) be developed to address the aforementioned impacted areas to minimise the risk to future workers at the Proposal site. As a precautionary measure, it is also recommended that an unexpected finds protocol be incorporated in future site management plans to ensure the protection of future onsite workers'.*

4.8.2 Coffey (2018I): Land Contamination Status Report

To assist CPB with the design of the Rail Link, Coffey was engaged by CPB to undertake a phase of geotechnical and contamination investigation between February and April 2016. The findings of these investigations were presented in the Land Contamination Status Report. A number of supplementary investigations were completed in 2017 and 2018 in response to specific issues within the Rail Link, including:

- Coffey (Oct, 2017); *Moorebank Intermodal Rail Link: PFAS Assessment Report – Royal Australia Engineers (RAE) Golf Course* (Ref: GEOTLCOV24072AF; dated 5th October 2017).
- Coffey (2018a) *Lead Hotspot Delineation Test Pitting in the Glenfield Waste Services (GWS) Tip, Moorebank NSW*. Report ref. GEOTLCOV24072AG-L01, dated 23 February, 2018.
- Coffey (2018b) *Test-pit Investigation – Glenfield Waste Services (GWS) Tip, Moorebank NSW*. Report ref. GEOTLCOV24072AG-L02, dated 22 February, 2018.
- Coffey (2018c) *Groundwater Investigation, Glenfield Waste Services Landfill, Glenfield NSW*. Report ref. GEOTLCOV24072AG-L03, dated 22 February, 2018.
- Coffey (2018e) *Moorebank Intermodal Rail Link: GWS Data Gap Investigation Report*. Dated 1 August 2018. Ref. GEOTLCOV24072AH-L03.
- Coffey (2018f) *Moorebank Intermodal Rail Link: GWS Lead Hotspot Delineation Report (draft)*

The findings of these reports were collated and presented within the Land Contamination Status Report (Coffey, 2018I), which presents an assessment of risks from contamination sources identified in relation to the Rail Link. A concise summary of the contamination sources identified are summarised below:

- Bonded asbestos containing material (ACM) fragment at AIMS01-SIMTA located along the Former RAE Golf Course at chainage MB2S CH41000, at a depth of 0.3m.
- ACM impacted fill material within the fill material at TP11 and TPE12, between the sections from the east of Moorebank Avenue to Sydney Trains land between chainage MB2S CH41620 to 41678. Friable asbestos is potentially present in the fill material within the Sydney Trains land as the ACM was noted to be fragile during investigation.
- Bonded ACM fragments in a stockpile (ASB-FC) located to the south of Anzac Creek at chainage MB2S CH41920.
- Elevated ammonia was detected in groundwater sample collected from BH18S and the surface water samples from the existing surface water pond and leachate pond located within the GWS facility.
- Elevated methane concentrations were recorded in the two gas monitoring wells BH8 and BH9A and the groundwater monitoring wells BH5S, BH5D, BH18S and BH18D. The highest borehole flow rate was measured at 7.8L/hr at BH9A. These wells are located within the GWS Facility. Measurements from these wells equate to gas Characteristic Situation (CS) ranging from 1 to 4,

with the highest CS assigned to measurements made from BH9A (refer Appendix C). In relation to landfill gas identified at the GWS Facility, given that the proposed Rail Link is an above ground rail line running in an open area, there is negligible opportunities for accumulation of ground gases in structures, as gases migrating up through the landfill cover will be readily released into the atmosphere. The only exception to this would be gas accumulation within buried infrastructure (such as utility pits or trenches).

- Groundwater samples collected from monitoring wells installed within and/or adjacent to the RAE Golf Course Section during the supplementary PFAS investigation (Coffey, 2017). The contaminant plume appears to be linked with the known/suspected areas within the wider Defence Estate where PFAS had been used in firefighting training areas and /or historic placement of soil from these areas (EP Risk 2016, 2017). PFAS has been reported within soil in localised areas along the RAE Golf Course Section of the Rail Link, although at concentrations that are unlikely to pose health risks to future site users. PFAS concentrations reported in groundwater present potential risks to aquatic species in the Georges River.
- Lead impacted material within portions of the Southern Connection and the Cell X wall (refer to Figure 2) has the potential to pose unacceptable risks to human health. Leachate analysis indicates the lead detected within this area is mobile, presenting potential risks to environmental receptors.

It is understood that dewatering is not expected to be required for pile and pier construction. Groundwater generated as a result of construction activities will need to be managed based on the water quality in accordance with the Project Construction Environmental Management Plan.

An unexpected finds protocol has been developed in the project specific Contamination Management Plan which should be implemented during construction activities. Management and handling of asbestos materials should be undertaken in accordance with the project specific Asbestos Management Plan.

ASS was recorded in one soil sample collected from the alluvial soils in BH14 which is located adjacent to the Georges River. CPB has prepared an Acid Sulfate Soil Management Plan which will be implemented during construction works.

4.9. Conceptual Site Model

A detailed Conceptual Site Model (CSM) was developed within the Land Contamination Status Report (Coffey, 2018I). A copy of the CSM has been provided in Tables D1 and D2 within Appendix D

4.10. Areas Requiring Remediation or Management

Based on the findings of the previous investigations summarised within the Land Contamination Status Report (Coffey, 2018d), four areas have been identified that have been assessed to require remediation in the context of the proposed Rail Link. These areas are further discussed in Table 3. The remediation areas are shown on Figures 2 to 5.

Table 3: Areas Requiring Remediation

Remediation Area	Description	Contaminant of Concern
Remediation Area #1 (see Figure 2) MB2S CH39900 to CH40095	Lead impacted material within a portion of the Southern Connection and the proposed Cell X wall cut to depths of up to 3.5m bgs. Based on the area of the lead remediation area	Lead

Remediation Area	Description	Contaminant of Concern
	(1,270m ²), if all soils to a depth of 3.5m ³ bgs are considered to require remediation, then the total volume of lead impacted soils is approximately 4,500m ³ (un-bulked).	
Remediation Area #2 (see Figure 5) MB2S CH41620 to 41678 (TPE11 and TPE12)	ACM impacted fill material within the fill material at TP11 and TPE12, between the sections from the east of Moorebank Avenue to Sydney Trains land (chainage MB2S CH41620 to 41678). Friable asbestos is potentially present in the fill material within the Sydney Trains land as the ACM was noted to be fragile during investigation. The proposed construction of the Project is expected to involve excavation into these asbestos impacted areas requiring remediation at these locations to be necessary.	Asbestos
Remediation Area #3 (see Figure 5) MB2S CH41920	Bonded ACM fragments in a stockpile (ASB-FC) located to the south of Anzac Creek at chainage MB2S CH41920. This stockpile is located in proximity to the proposed work area and thereby likely to require removal prior to work commencing at this location.	Asbestos
GWS Facility (Figures 2 and 3)	Ground gas ingress and accumulation in future underground service pits to mitigate potential health and safety risk (explosion and inhalation of toxic gas) to future maintenance workers. It is noted that the area proposed within Figures 2 and 3 takes account that the proposed future extent of the landfill will adjoin the Southern Connection, and assumes that similar gas conditions will occur that those reported adjoining active and closed cells of the GWS Facility.	Ground Gas

It should be noted during the Coffey 2016 investigation that an ACM fragment was also observed at AIMS01-SIMTA; located along the Former RAE Golf Course at chainage MB2S CH41000 and at a depth of 0.3m. Further remediation of the bonded asbestos containing material (ACM) fragment is not proposed due to the following reasons:

- The bonded ACM fragment was removed during the investigation.
- No further bonded ACM fragments were observed in the contamination test pits excavated by JBS&G in 2015 and the geotechnical test pits excavated by Coffey in 2016.
- No evidence of friable asbestos was observed by the JBS&G 2015 and Coffey 2016 investigations at this location.

The Rail Link alignment within the Former RAE Golf Course is confirmed to be relocated slightly to the north from the original design at the time of preparing this RAP. Whilst Coffey recommended that further assessment may be required as a result of the relocation in Coffey (2016a), it is considered that action on this recommendation is no longer necessary for the following reasons:

³ Lead impacted soils were previously detected at depths of up to 3.0m bgs.

- The former Viet Cong Village is not located within the revised Rail Link alignment (which was the main driver at the time of Coffey (2016a)).
- Significant soil contamination was not identified within this section other than the ACM fragment recovered by JBS&G (2015). Given the typically random distribution of asbestos contamination, asbestos finds may still be encountered during construction.

In consultation with CPB, asbestos encountered in other areas than those noted in Table 3 above during the construction of the Rail Link will be treated as an unexpected find and be managed in accordance with the procedures as outlined Section 8.

Elevated ammonia was detected in the shallow groundwater well BH18S within the GWS Facility land, which was considered attributable to landfilling operations. Groundwater quality will be monitored during the removal of the leachate dam and construction of the Rail Link to assess changes.

PFAS concentrations were detected above the HSLs for:

- Drinking water in monitoring wells MW3008, MW3009, MW2010, MW3011, BH14 and BH15 within the RAE Golf Course and CMW01 within the GWS Facility.
- Recreational activities in monitoring wells MW3009, MW3010 and MW3011 within the RAE Golf Course.
- Freshwater and Marine ecosystems (99% species protection) in monitoring wells MW3008, MW3009, MW2010, MW3011, BH14 and BH15 within the RAE Golf Course.

As noted above, the PFAS detected in groundwater beneath the Rail Link are considered to be associated with a Defence training activities and form part of a larger plume that extends from the north of the rail corridor. Whilst PFAS has not been detected in soils at concentrations that pose potential risks to health, it is recommended that excavation beneath the water table is avoided, where possible in areas where PFAS contamination has been detected in groundwater. Where excavation beneath the water table is required, appropriate management controls are necessary. Management of PFAS contaminated groundwater and/or saturated soils must be conducted in accordance with the site specific Contamination Management Plan.

4.11. Data Gaps and Uncertainties

As detailed in the LCSR, the following data gaps were identified within the GWS Facility:

- Quality of sediment in the base of the existing leachate pond and quality of soil and groundwater beneath existing leachate pond following decommissioning

It is proposed that these data gaps are addressed during validation works, as detailed in Section 7.5.4

5. Remediation Plan

5.1. Remediation Objective

The proposed Rail Link is constructed for use as a freight rail link for the proposed intermodal facility development. The remediation objective is to reduce the risk posed to human health and the environment to acceptable levels during construction and render the site suitable for the intended rail use once construction has been completed.

5.2. Remediation Assessment Criteria

With regards to selecting the criteria for validation, the most applicable land use scenario of the proposed Rail Link is considered to be Commercial / Industrial HIL-D as described in Schedule B7 of ASC NEPM (NEPC, 2013).

5.3. Remediation Hierarchy

NSW DEC (2006) outlines the following preferred hierarchy for implementing remediation and management of contaminated land:

- On-site treatment of the soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level.
- Off-site treatment of excavated soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level, after which the soil is returned to the site.

If the above are not practical, the following should be considered:

- Removal of contaminated soil to an approved site or facility, followed where necessary by replacement with clean fill; or
- Consolidation and isolation of the soil on-site by containment within a properly designed barrier.
- Furthermore, the NSW DEC (2006) states where the assessment indicates remediation would have no net environmental benefit or would have a net adverse environmental effect, then implementation of an appropriate management strategy would be required.

5.4. Feasible Remedial Options

Remediation options considered for the Project are summarised in Table 4.

Table 4: Evaluation of Remedial Options

Soil contamination – Asbestos	
Option	Evaluation of suitability
Excavation, on-site treatment and on-site reuse	This option is not considered feasible due to the nature of contamination (asbestos) contained within the fill material.
Excavation, off-site treatment and reuse	As above, this option is not considered feasible due to the nature of contamination (asbestos) contained within the fill material.

Excavation and off-site disposal	This option is suitable as it completely removes the impacted soil from the site which provides improved confidence in the outcome of the remedial works.
Onsite containment and/or isolation	This option is technically feasible. However, ongoing liabilities would rest with the Rail Link, and future monitoring and management of the capping layer would be required (i.e. under a Long-Term Management Plan (LTEMP). Furthermore, the consent of the landowners on whose land the containment is being undertaken, would be required to implement this option.
Soil contamination – Lead	
Option	Evaluation of suitability
Excavation, on-site treatment and on-site reuse	This option is not considered feasible due to the nature of contamination (lead) contained within the fill material.
Excavation, off-site treatment and reuse	As above, this option is not considered feasible due to the nature of contamination (lead) contained within the fill material.
Excavation and off-site disposal (disposal outside of the rail link)	This option is suitable as it completely removes the impacted soil from the site which provides improved confidence in the outcome of the remedial works.
Onsite containment and/or isolation	This option is technically feasible. However, ongoing liabilities would rest with the Rail Link, and future monitoring and management of the capping layer would be required (i.e. under a Long-Term Management Plan (LTEMP). Furthermore, the consent of the landowners on whose land the containment is being undertaken, would be required to implement this option.
Ground gas ingress and accumulation in underground structures	
Option	Evaluation of suitability
Air ventilation	This option involves the introduction of ventilation in the structures as such air can enter into the structures. This option is generally undertaken during detailed design phase. This option is suitable.
Gas membrane	This option involves the installation of gas membrane around the structures to minimise gas ingress occurring at the first instance. This option is technically feasible.

5.5. Rationale for the Selection of the Preferred Remedial Strategy

In reviewing the various remediation options and in consultation with CPB, the following criteria were considered in the selection preferred remedial strategy:

- **Environmental impacts** – consideration was given on the impacts on the surrounding environment (e.g. air, soil, water, ecology etc.), use of natural resources and generation of wastes.
- **Social impacts** – consideration was given to health risks to workers during construction, and impacts on neighbouring communities.
- **Economic impacts** - consideration of direct and indirect costs/benefits.

5.6. Preferred Remedial Options

Table 5 summarises the preferred remediation option for each contamination source.

Table 5: Summary of Preferred Remedial Option

Contamination Source	Preferred Remedial Option
Asbestos Impacts Soil	<p>Excavation and Offsite Disposal</p> <ul style="list-style-type: none"> Excavation and offsite disposal option has been selected as the preferred remedial option for management of the asbestos impacted materials for this Project. Removal of the source from the site negates the need for ongoing management of the material. <p>Onsite encapsulation will remain an alternate remedial option for the asbestos impacted soils in the event that 'excavation and offsite disposal' is not considered feasible.</p>
Lead Impacted Soils	<p>Excavation and Offsite Disposal (disposal outside of the rail link)</p> <ul style="list-style-type: none"> Excavation and offsite disposal option has been selected as the preferred remedial option for management of the lead impacted materials for this Project. Section 6.5.1 presents the discussion for the proposed disposal of the lead impacted soils. Removal of the source from the site negates the need for ongoing management of the material. <p>Onsite encapsulation will remain an alternate remedial option for the lead impacted soils in the event that 'excavation and offsite disposal' is not considered feasible.</p>
Ground Gas	<p>Gas Membrane</p> <ul style="list-style-type: none"> A gas membrane will significantly reduce the amount of gas passing into the pit. The gas membrane is not anticipated to result in additional impacts on the surrounding environment or community. Risks associated with the ingress of ground gas will be managed over the long term through an Environmental Management Plan (EMP).

Coffey's selected remediation strategy is based on the understanding that CPB are in the process of obtaining approval from NSW EPA to consider the RALP as one single site under POEO Act. In such a scenario, excavated materials could be transferred from one property to another as it is considered as one single site. It is also understood that CPB are currently seeking consents from the landowners to implement this option.

6. Proposed Remediation Activities

The following sections outline the remediation work that will be required within the site based on information provided by CPB and data from previous investigations.

The standard environmental control and mitigation measures required for similar construction works would still need to be in place for the remediation work, including those described in the development consent conditions. Information on controls and mitigation measures are further discussed in Section 10.

Unless otherwise identified, activities discussed below will be the responsibility of the contractor or its representative.

6.1. Remediation Activities

An overview of the proposed remediation strategy includes the following activities:

- Planning documents and asbestos licensing;
- Notifications to regulatory authorities and receipt of appropriate permits;
- Site establishment and preparation;
- Further delineation assessment to optimise remediation (Lead impacted area only);
- Notification to SIMTA & Landowner of lead impacted material quantities following delineation.
- Notification to SafeWork NSW (formerly WorkCover NSW) (asbestos impacted area only);
- Remediation and management of contaminated area;
- Waste classification and off-site disposal (if required); and
- Preparation of validation report (refer to Section 11).

The sections below present descriptions of the relevant tasks associated with the above activities.

6.2. Planning Documents and Asbestos Licensing

The project specific CMP and AMP will need to make reference to safety and environmental control measures associated with remediation.

Whilst friable asbestos was not identified during 2015 and 2016 investigations, based on the volume of asbestos to be recovered in the Sydney Trains section of the Rail Link, the remedial works at this section may involve the removal and relocation and reburial of friable asbestos impacted soils where a SafeWork NSW Class A licensed asbestos removal contractor and asbestos assessor will need to be engaged.

A licensed asbestos assessor or suitably qualified consultant will be responsible for:

- Implementation of an Asbestos Management Plan (AMP);
- Air monitoring for airborne asbestos fibres;
- Guide remediation excavation and provide a clearance certificate following effective removal of asbestos impacted soils.

The Class A licensed asbestos removalist contractor is responsible for:

- Preparation of an Asbestos Removal Control Plan (based on AMP requirements);
- Lodging a "Friable Works Permit" with SafeWork NSW (refer to Section 6.3.);
- Supervision of all asbestos removal work.

A Class A asbestos removal contractor is only required to supervise works when the asbestos impacted material that is deemed friable will be removed from site. If the asbestos is deemed bonded, a Class A removalist and asbestos assessor will not be required, however a Class B licensed asbestos removalist is still required as the quantity of non-friable asbestos is more than 10m².

6.3. Notifications to SafeWork NSW

The follow sections describe relevant notifications under NSW regulations.

Friable

In the instance where friable asbestos be identified, asbestos removal works undertaken in this area must be undertaken by a Class A licensed asbestos removalist. The Class A asbestos removalist must notify SafeWork NSW 5 days prior to removal works being undertaken and have received the permit to proceed with the works.

Bonded

Bonded asbestos must be removed by either a Class B or Class A licensed asbestos removalist given that the volume is estimated to be greater than 10m². As a minimum, SafeWork NSW requires notification for Class B asbestos removal works in this instance. If degraded fragments of ACM are encountered during site works, these fragments will need to be handled as friable asbestos. Associated asbestos removal works would need to be continued by a Class A licensed asbestos removalist rather than a Class B licensed asbestos removalist.

6.4. Site Establishment

It is expected that permanent and/or temporary fencing will be erected and maintained to designate the construction site. Additional fencing may be required to designate remediation areas, particularly if construction works will be undertaken concurrently with remediation. The purpose of the fencing is to restrict access to authorised personnel only and minimising inadvertent exposure of contaminants to other site personnel and instance of cross contamination. The need for additional fencing will be determined onsite with CPB personnel prior to the commencement of remediation activities.

For any remediation activities CPB will need to nominate:

- Temporary stockpiling areas along with sediment and erosion control structures;
- Equipment and truck decontamination areas (i.e. wash down bays); and
- Truck load out areas relative to excavation activity.

6.5. Remediation and Management of Contamination

6.5.1. Remediation of Lead Impacted Area: Excavation and Placement within GWS Cell B2 Extension

The estimated volume of soils requiring remediation is 4,000m³.

Coffey understands CPB have sought legal advice in relation to the movement of the lead impacted material to a lined cell of the GWS Facility (referred to as Cell B2 Extension). The legal advice is presented in Appendix E. The legal advice concludes that the lead impacted material may be placed within GWS Facility (from a legal perspective) under development consent SSD6766 and is able to be carried out under the existing Environmental Protection Licenses held in relation to the GWS Facility and MURL. Coffey understands that the Site Auditor has also endorsed the movement of lead impacted material to Cell B2 Extension (Also presented in Appendix E).

Coffey understands that CPB intend on placing the impacted material within Cell B2 Extension, in consultation with the NSW EPA. The soils within the lead impacted area will be excavated and placed within the cell. The soils may be temporarily stockpiled if required, and appropriate controls and management should be implemented to avoid excessive rain water from entering the stockpile. A programme of validation should be undertaken to demonstrate that lead impacted soils have been removed from the lead remediation area. The scope for validating the lead impacted soils within the lead remediation area is discussed in Section 7.5.1

Contingency Plan

Offsite Disposal

If placement of lead impacted soils within Cell B2 Extension is not considered practical due to some unforeseen circumstances, the contingency plan would be to excavate these materials and dispose them to a licensed landfill facility. The lateral extent of excavation would be similar to that shown in Figure 2.

A waste classification assessment of the lead impacted soils must be undertaken prior to offsite disposal.

A programme of validation would be undertaken to demonstrate that the removal of lead impacted soils has been effective in mitigating health and environmental risks. The scope for validating the lead impacted soils within the lead remediation area is discussed in Section 7.5.1.

6.5.2. Remediation of Asbestos Impacted Area (Excavation and Containment)

Sydney Trains Land (CH41620 to CH41750)

Asbestos impacted soil identified in this section of the Rail Link will be excavated under the guidance of a licensed asbestos assessor. Asbestos remedial activities are to be carried out by a licensed asbestos removalist. The work must comply with an AMP and Asbestos Removal Control Plan (prepared by the Class A licensed asbestos removal contractor). The likely extent of excavation is discussed in Table 2 and shown on Figure 3. Validation sampling will be undertaken in accordance with the procedures outlined within Section 7.5.2. The depth of excavation is assumed to be the base of the construction depth⁴.

The containment cell is required to be constructed with geotextile and at least 0.5m below the construction depth (i.e. a minimum of 0.5m of soil or rock separation layer should exist between the top of the contained material and track base). Following placement, a separate geotextile marker layer should be placed above the containment cell to serve as a warning sign to future works that contaminated soil material is present below as well as to provide a physical separation from the

⁴ Construction depth is anticipated to be at least 0.5m below the final design level to accommodate base track construction and underground service installation.

surrounding area. The marker layer shall be a non-woven geotextile in a colour that contrasts to existing soils (e.g. orange) to improve its visibility to future personnel working in the vicinity of the marker layer. A survey plan showing the location(s) of the containment cell is required to be included in the Validation Report and LTEMP. Material movement is required to be tracked using a Material Tracking Register as outlined in Coffey (2016b) CMP.

Should asbestos impacted material remain at the base of the excavation, a geotextile marker layer should be placed to provide a warning sign to future workers and to provide a physical separation from the underlying contamination. The marker layer should comprise a non-woven geotextile in a colour that contrasts to existing soils (e.g. orange) to improve its visibility to future personnel working in the vicinity of the marker layer. A survey plan showing the location(s) of the containment cell is required to be included in the Validation Report and LTEMP. This information should also be cross-referenced/appended to operations and maintenance documents for the Rail Link.

Near Anzac Creek (MB2S CH41920)

The asbestos containing stockpile should be removed and reburied in other parts of the Rail Link. If asbestos is identified beneath the stockpile, further excavation is to be carried out until the validation criteria has been met, or construction depth is reached. Remediation is also to be terminated once the lateral extent of the work zone is reached (i.e. remediation will not be extended beyond the area covered by the Project).

A licensed asbestos assessor shall undertake a visual assessment of the area for visible fragments of ACM or other suspicious material. The licensed asbestos removal contractor (Class A or Class B) will be advised of ACM occurrence and will either remove them by hand (if occupying a small area) or instruct the excavator to undertake further excavation.

The licensed asbestos removal contractor shall supervise works until asbestos has been either removed from the work area or adequately capped to remove the exposure pathway. The work must comply with an AMP and Asbestos Removal Control Plan.

Remedial excavation works should be carried out in manageable sizes to minimise the potential for the generation of airborne fibres and management requirements.

The validation works will be undertaken by a licensed asbestos assessor and will entail validation of excavated surfaces and collecting soil samples for laboratory testing, as necessary to assess whether the remediation goals have been met.

As mentioned in the previous section, the containment cell is required to be constructed with geotextile and at least 0.5m below the construction depth (i.e. a minimum of 0.5m of soil or rock separation layer should exist between the top of the contained material and track base). Following placement, a separate geotextile marker layer should be placed above the containment cell to serve as a warning sign to future works that contaminated soil material is present below as well as to provide a physical separation from the surrounding area. The marker layer should comprise a non-woven geotextile in a colour that contrasts to existing soils (e.g. orange) to improve its visibility to workers undertaking excavations in the future. A survey plan showing the location(s) of the containment cell is required to be included in the Validation Report and LTEMP. Material movement is required to be tracked using a Material Tracking Register as outlined in Coffey (2016b) CMP.

If material is required to be stockpiled on-site then this material should be stockpiled as per the recommendations in the AMP (Coffey, 2016a).

6.5.3. Installation of Ground Gas Mitigation Measures

Coffey understand that 11 service pits will be constructed within Remediation Area 4 of the rail link within the GWS facility. To mitigate risks associated with the ingress of hazardous ground gases, a

GCL liner will be installed as part of the compacted rail embankment construction. A CQA report will be prepared for the liner. The basis for the proposed mitigation system is summarised in Appendix C. Correspondence relating to an RFI raised by CPB for the proposed mitigation system is also included within Appendix C.

The opportunities for accumulation of ground gases that ingress the pit(s) will be abated by compacting the rail embankment, installing a GCL liner, and utilising concrete pits. Future entry to the pits must be undertaken in accordance with confined space conditions.

7. Validation Plan

7.1. General

The objective of the validation works is to collect suitable and adequate data to demonstrate the remediation/management objective has been achieved and the Rail Link is suitable for the proposed land use from a contamination perspective.

7.2. Validation Methodology

The validation methodology utilises a combination of field observations to assess effective removal of impacted soils. Samples will be collected from the walls and base of the excavation at predetermined depths based on previous investigation records and/or visual observations.

If assessment criteria are met, then the earthworks associated with construction activities will continue.

If assessment criteria are not met, but the remedial excavations reach the lateral and/or vertical extents of the project boundary, it is proposed that a maker layer will be placed around the excavation as a separate layer.

Validation sampling is also used for assessing suitability of excavated soils for re-use on-site or suitability of imported materials for use onsite; in accordance with EPA waste disposal requirements. Field observations will be used as an initial screen to assess residual impacts but soil sampling and laboratory analysis of representative samples will be the primary validation method to be used to confirm validation.

Once the excavation is validated, a registered surveyor will need to record the extent and depth (or elevation of the base) of the excavation and general site features including lot boundary, topography, pavement, etc.

Validation procedures, quality control and assessment criteria are described in the following sections.

7.3. Validation Field Observations

Validation observations across the entire project area will be undertaken by a qualified environmental professional. Asbestos validation activities shall be undertaken by a licensed asbestos assessor, or qualified environmental professional who meets the definition of a Competent Person, as outlined within Schedule B1 of ASC NEPM (NEPC, 2013). It is intended that these inspections will be undertaken on a systematic basis as construction works progress through the site and aim to identify and assess the significance of unexpected finds or potentially contaminated materials/soils that are not consistent with previous investigation records (refer Section 8).

These observations will be documented for presentation within the Validation Report, and should be cross referenced to specific chainage reference, photographs and samples collected as part of assessing unexpected finds or potentially contaminated materials/soils (if any).

7.4. Soil Sampling Methodology

Sample collection will be undertaken with the assistance of an excavator or as a manual grab sample directly from the excavation. Where an excavator is used, samples will be collected as manual grab samples from the centre of the excavator bucket to avoid potential cross-contamination.

Soil samples from the stockpiles will be collected by hand at least 0.3m below the surface of the stockpile to obtain a representative sample. If stockpiles are large then it may be necessary to excavate trenches into the stockpile, using an excavator, in order to observe materials and collect representative samples from the centre of the stockpile.

Soil samples will be placed in clean, laboratory prepared and supplied 250mL glass jars, which will be filled to minimise headspace and immediately sealed with Teflon lined caps to reduce the loss of volatiles. Samples will be then labelled and placed directly into ice filled cooler boxes for temporary storage and then later transport to the laboratory.

Samples for asbestos fines (FA/AF) analysis will be placed in plastic zip-lock bags as required by WA DOH (2009) guidelines. Asbestos validation sampling procedure is further discussed in Section 7.5.3. For the purpose of waste classification, asbestos samples can be analysed only for presence / absence of asbestos.

Samples for PFAS will be placed directly into laboratory supplied PFAS appropriate sample bottles/jars. The sampling procedures for PFAS shall be conducted in accordance with current relevant guidance, including WA DoE (2016), Interim Guideline on the Assessment and Management of Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS).

Sampling, sample handling and quality assurance/quality control (QA/QC) procedures will be undertaken in accordance with good industry practice including that outlined within Schedule B2 of the ASC NEPM (NEPC, 2013) and AS4482 (2005): Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil [Parts 1 and 2]. The analysis will be undertaken at a NATA accredited laboratory.

7.5. Validation Procedures – Known Areas of Contamination

7.5.1. Validating the Removal of Lead Impacted Soils

Excavation Area Validation

Following excavation of soils from the lead remediation area, a programme of validation sampling shall be conducted to gather evidence to demonstrate the lead has been removed. As a guide, validation samples shall be collected from the excavation surfaces at the following rates after the lead impacted soil has been removed:

Excavation Wall: Every 10 linear meters, one sample per 0.5m depth until excavation depth has been reached.

Excavation Base: One sample per 50m².

Validation of Material Movement

Coffey understands that the lead impacted soils are stockpiled within the GWS Facility. This section details the methodology to validate and track the material movement into the GWS Cell B2 Extension.

A survey of the current lead impacted stockpile footprint must be carried out prior to material movement. Following the completion of all material movement into Cell B2 Extension, a survey of the former lead impacted stockpile footprint must be carried out to demonstrate that the material has been moved. The survey drawings (before and after) shall be presented within the site validation report.

Daily truck tracking registers will be used to record the movement of lead impacted material from the lead impacted stockpile, to the Cell B2 Extension. The tracking registers must include the following information at a minimum:

- Date;
- Movement details (must clearly state movement is from the lead impacted stockpile to the Cell B2 Extension);
- Volume and weight of soils deposited to Cell B2 Extension per day;
- Signature of driver, or foreman overseeing works.

At the completion of the movement of all soils to Cell B2 Extension, these tracking registers must be accompanied by a covering letter from the civil contractor undertaken the movement. The covering letter must acknowledge that all lead impacted soils have been placed within the Cell B2 Extension.

These records must be included within the site validation report.

7.5.2. Validation Sampling – Asbestos

Validation sampling of the remedial excavation will depend on the following:

- The excavation extent and depth;
- If the excavation is terminated within fill material;
- If the excavation is terminated within natural soils.

Upon completion of excavation works, if excavation walls and base are within natural soils, a visual inspection of the walls and base should be undertaken by a licensed asbestos assessor. Should the excavation walls and base be within fill material, soil samples will be collected from the excavations. The inspection will involve two passes along the walls and base with a rake, with a 90° direction change between the passes.

Validation sampling frequency will be carried out in general accordance with the Western Australia Department of Health: *Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia (WA DOH, 2009)* where excavations terminate within fill material, and comprise the following:

- It is proposed that one wall sample to be collected every 5 linear metre from each of the wall and one base sample to be collected every 25m².
- Visually checking the base of the remedial excavation to confirm absence of ACM.
- Collection of a 500mL sample for AF/FA analysis if friable asbestos be identified during remediation. If asbestos finds are not identified during remedial activities no AF/FA analysis be required.

An LTEMP will be required to manage the ongoing contamination risks of the asbestos remaining in-situ.

7.5.3. Asbestos Sampling Methods

The asbestos sampling methods will be in accordance WA DOH, 2009 and comprise the following:

- Where appropriate, 10 litres of material will be spread out for inspection on a contrasting colour material, or sieved through a 7mm sieve, and any ACM picked out and placed into a labelled zip lock bag for later weighing by a contract laboratory;
- If friable asbestos be identified, one wetted 500mL sample will be collected for laboratory analysis for asbestos identification in accordance with "Guidelines for The Assessment, Remediation and Management of Asbestos-Contaminated Sites - May 2009 - Recommended Procedures for Laboratory Analysis of Asbestos in Soil"; and

- Where asbestos is detected in any sample, the concentration of asbestos as fragments (ACM) and as loose fibres (FA or AF) will be compared with the validation assessment criteria.

This validation process is considered to be consistent with Table 8 of the WA DOH (2009) guidelines.

7.5.4. Sampling to Address Data Gaps

The identified data gaps within the site are to be addressed prior to the commencement of construction works to refine existing controls and/or inform the need for additional controls to mitigate environmental/health risks. The proposed validation methodology and CoPCs for each data gap is outlined within Table 6 below.

Table 6: Proposed Sampling to address Data Gaps

Data Gap Investigation Area	Proposed Sampling Activities	CoPCs
Existing GWS Leachate Pond and Decommission	<p>Groundwater data for monitoring wells sampled by GWS adjacent to the leachate pond shall be reviewed to assess the groundwater quality.</p> <p>Collect samples of soil beneath the leachate pond to determine soil quality and future suitability of the material.</p> <p>Three test pits should be conducted within the leachate pond located within the site. Samples should be generally collected at the surface, 0.5m, and then every 0.5m to a depth of 2.0m below the ground surface, or refusal.</p>	<p>Soil: Heavy Metals, BTEX, TPH</p> <p>Soil and Groundwater: Ammonia, Heavy Metals, BTEX, TPH, PFAS, nutrients, pH, EC</p>

7.6. Validation of Imported Fill Criteria

Fill material that is proposed to be imported to the site will need to be:

- Certified Virgin Excavated Natural Material (VENM), or
- Materials approved under general or specific Resource Recovery Exemptions (RRE), such as Excavated Natural Material (ENM), where applicable.

Material that cannot be classified either as VENM or in accordance with an RRE will not be permitted for use as fill for this Project.

A suitably qualified and experienced environmental consultant will review the certification documentation provided by the material suppliers to assess whether materials proposed to be imported to the site are suitable for use from a contamination perspective. Where appropriate documentation is not available, sampling and laboratory testing will be undertaken to demonstrate the material to be imported is VENM or in accordance with the relevant RRE classifications.:

Imported material from each source site will be observed by the environmental consultant as it is delivered to site to confirm:

- a. that it appears consistent with the source; and
- b. that there is no visual or olfactory evidence of contamination such as staining, anthropogenic materials or odours.

In the case that discrepancies exist, the imported material will be refused entry to the site and not considered suitable for use until appropriately validated.

The source site, volume, associated chemical test certificates and placement locations of the imported fill material will be recorded within a Material Tracking Register (a template is included in CMP) that is maintained by the Principal Contractor or their appointed representative. These records will be presented within the Site Validation Report.

7.7. Validation of Gas Mitigation Measures

The installation of GCL and HDPE membrane must be constructed to reasonable levels of workmanship and an independent CQA report must be prepared to confirm the membrane was constructed as intended. A CQA plan should be prepared outlining how the liner will be inspected for the CQA report. The soil compaction records of the embankment shall be retained. Photographic records of the concrete pits and liner installation should also be taken during installation of the pits and liner.

These records alongside the as-built drawings showing the location/orientation of subsurface pits shall be presented within the Validation Report.

An LTEMP will be required to ensure the integrity of the membrane, embankment and concrete pits remain appropriate. The LTEMP must also restrict access into the pits to confined space entry conditions only.

7.8. Validation Assessment Criteria

With regards to selecting the criteria for validation, the most applicable land use scenario of the proposed Rail Link is considered to be Commercial / Industrial HIL-D as described in Schedule B7 of ASC NEPM (NEPC, 2013).

Validation of Asbestos

For Asbestos, the ASC NEPM (NEPC, 2013) provides guidance on assessment of asbestos in soil and references the Western Australian Department of Health (WA DOH) guidelines (2009).

The ASC NEPM (NEPC, 2013) amendment will be used to assess risks posed by asbestos if identified. Based on the above guidelines, Coffey proposes to adopt the following as the acceptance criteria for assessment:

- No apparent visible fragments of asbestos containing material (ACM) present at the surface (surface defined as the upper 0.1m).
- No respirable fibres of asbestos identified in soil validation samples.
- The concentration of asbestos fines (AF) and/or friable asbestos (FA) should not exceed 0.001% w/w.
- If one or more fragments of bonded ACM are found in validation samples, then the concentration of bonded ACM should not exceed 0.04% w/w.

Validation of Lead

For lead in soil the HIL-D criteria will be adopted as the validation assessment criteria (1,500 mg/kg).

7.9. Data Gap Assessment Criteria

The data gap assessment criteria selected for the site are listed in Table 7.

Table 7: Data Gap Assessment Criteria

Contaminant of Concern	Published background range (mg/kg)	Human Health Investigation and Screening Levels HIL-D (mg/kg)	HSL-D Direct Contact ⁴ (mg/kg)	Intrusive Maintenance Worker ^{4/5} (mg/kg)	Management Limits ⁶ (mg/kg)
Arsenic	5 to 11 ¹	3,000 ²	-	-	N/A
Cadmium	0.25 ¹	900 ²	-	-	N/A
Chromium	6 to 21 ¹	3,600 ²	-	-	N/A
Copper	6 to 32 ¹	240,000 ²	-	-	N/A
Lead	13 to 44 ¹	1,500 ²	-	-	N/A
Nickel	5 to 50 ¹	6,000 ²	-	-	N/A
Mercury	0.05 ¹	730 ²	-	-	N/A
Zinc	17 to 77 ¹	400,000 ²	-	-	N/A
F1 (TPH C ₆ -C ₉)	< LOR	-	-	-	700 / 800 ⁸
F1 (TPH C ₆ -C ₉ less BTEX)	< LOR	260 ³	26,000	82,000 / NL	-
F2 (TPH C ₁₀ -C ₁₆)	< LOR	-	-	-	1,000
F2 (TPH C ₁₀ -C ₁₆ less Naphthalene)	< LOR	NL ³	20,000	62,000 / NL	-
F3 (TPH C ₁₆ -C ₃₄)	< LOR	NL ³	27,000	85,000 / NL	2,500 / 3,500 ⁸
F4 (TPH C ₃₄ -C ₄₀)	< LOR	NL ³	38,000	120,000 / NL	10,000
Benzene	< LOR	3 ³	230	1,100 / 77	-
Toluene	< LOR	NL ³	99,000	120,000 / NL	-
Ethylbenzene	< LOR	NL ³	27,000	85,000 / NL	-
Total Xylene	< LOR	230 ³	81,000	130,000 / NL	-
Naphthalene	< LOR	NL ³	11,000	29,000 / NL	-
Carcinogenic PAH as Benzo(a)pyrene TEQ	< LOR	40 ²	-	-	-
Total PAHs	< LOR	4,000 ²	-	-	-
VHCs	< LOR	-	-	-	-
OCP	< LOR	45 to 3,600 ²	-	-	-
OPP	< LOR	-	-	-	-
PCBs	< LOR	7 ²	-	-	-
Phenols	< LOR	660 to 240,000 ²			

Asbestos	< LOR	0.001% - FA / AF ⁷ 0.05% - ACM ⁷	-	-	-
PFOS + PFHxS (groundwater)	< LOR	0.7 (ug/L) ⁹	-	-	-
PFOA (groundwater)	< LOR	5.6 (ug/L) ⁹	-	-	-

Table 7 notes:

1. NSW soils for new suburbs in low traffic areas listed on page 17 (South Australian Health Commission (1995)). Only adopted for imported materials as a general reference. Depending on source of material, other reference data may be adopted.
2. Table 1A(1) – Schedule B(1), Guideline on the Investigation Levels for Soil and Groundwater (NEPC, 2013)
3. Table 1A(3) – Soil Health Screening Levels for Vapour Intrusion (NEPC, 2013) for Sand, depth 0 to <1m
4. Table B4 - Soil Health Screening levels for Direct Contact and Intrusive Maintenance Worker (CRC Care, 2011)
5. Table B3 – Soil Health Screening Levels for Vapour Intrusion (Intrusive Maintenance Worker) (CRC Care, 2011) – Sand, depth 0 to <2m.
6. NEPC (2013) - Table 1B(7) – Management Limits for TPH Fractions F1 to F4 in soils
7. NEPC (2013) Schedule B(1) Investigation Levels). (Commercial / Industrial).
8. Management limits guidelines for “coarse”/“fine” soil textures.
9. HEPA (2018)

NL = HSLs are non-limiting
TEQ = Toxicity Equivalent Quotient
LOR = Laboratory reporting limit

Relevant assessment criteria from the ANZECC & ARMICANZ (2000) and HEPA (2018) shall be used to assess potential ecological risks from groundwater near the existing leachate pond.

8. Unexpected Finds Protocol

Contamination that may not have been detected during previous investigation works may be discovered during the course of the project. Such contamination may be discovered due to observations such as:

- Odour
- Discolouration or staining of soil or rock
- Seepage of unusual liquids from soil or rock
- Unusual odours or sheens on groundwater and/or surface water
- Unusual metal objects
- Unexploded ordnance
- Presence of underground storage tanks
- Presence of oil
- Presence of waste or rubbish above or below ground
- Potential asbestos containing material
- Unusual colour in soil
- Unusual colour in groundwater and/or surface water

Where field observations encounter ground conditions that are not consistent with records from previous investigations, this shall trigger the unexpected finds protocol. Should unexpected contamination as assessed by the qualified environmental professional monitoring construction activities, works will stop in the affected part of the project area. This area will be isolated to minimise potential for disturbance to the affected soils.

The qualified environmental professional monitoring construction works will assess the unexpected find and provide advice regarding:

- a) Preliminary assessment of potential or actual contamination and need for immediate management controls;
- b) What further assessment and/or remediation works are required and how such works are to be undertaken in accordance with contaminated site regulations and guidelines. For example, this may comprise further investigation to delineate the extent of contamination.
- c) Preparation of an addendum to the remediation action plan (if necessary) or provide clean up advice;
- d) Remediation works required (where applicable);
- e) Validation works required following remediation works (if applicable). Validation works should be guided by the qualified environmental professional, and the validation outcomes documented for presentation within the Validation Report

The Site Auditor should be informed of the unexpected find once a preliminary assessment is made.

Works should not recommence in the affected area until approval has been received from the project Environment Manager, who has reviewed the advice from the qualified environmental professional. The relevant Health and Safety Plan for the project should also be reviewed following the uncovering of the unidentified find and advice received from the environmental professional.

Unexpected finds encountered during remediation works at the site will be managed in general accordance with the Contamination Management Plan (Coffey, 2016b), or Asbestos Management Plan (Coffey, 2016c).

9. Waste Classification and Off-site Disposal

9.1. Waste Classification

The project specific Waste Management Plan (WMP) will need to be adhered to during all works including remediation.

Excess materials that cannot be reused, will be assessed in accordance with *Waste Classification Guidelines* (NSW EPA, 2014), and guidance provided within the general immobilisation approvals published by the NSW EPA under the Protection of the Environment Operations (Waste) Regulation 2014.

In the instance where the 'cap and contain' option becomes unfeasible, contaminated materials are required to be excavated for off-site disposal. Based on the soil analytical results obtained from the Coffey (2016a) the waste classifications for the materials to be generated from each of the remediation areas are:

- Remediation Area #1 (lead impacted material) – Hazardous waste. It should be noted that this is a preliminary classification only. The final waste classification will be confirmed based on analysis of actual soil materials removed during the construction of the Southern Connection, if required.
- Remediation Areas #2 and #3 (asbestos impacted material) – General Solid Waste managed as Special Waste (Asbestos)

9.2. Transportation of Waste

CPB should note the following with respect to soil and liquid (if any) waste generated as part of site remediation:

- The waste generator has responsibility for all waste and its disposal to an appropriately licensed facility.
- All waste should be transported and disposed in accordance with the requirements of Protection of the Environment Operations (Waste) Regulation 2014 (the Waste Regulation).
- The waste must be disposed offsite to an appropriately licenced waste facility and prior approval sought from this facility before transporting offsite. Depending on the facility, CPB should allow up to 7 days for this approval process.
- All impacted soil and water requiring offsite disposal will be transported and disposed of to either a licensed landfill or liquid waste facility. Prior to waste leaving the site, a written approval from the receiver will be obtained and included in the site validation report. All material leaving the site will be tracked and documented.
- The waste generator should carefully consider its obligations with respect to managing asbestos waste and follow asbestos management protocols. These protocols are typically outlined in the project specific Asbestos Management Plan (AMP).
- From 1 July 2015 asbestos loads greater than 100kg, or more than 10 square metres of asbestos sheeting will require special monitoring requirements. The NSW EPA requires the waste generator use the "WasteLocate" system which is described at this link <http://www.epa.nsw.gov.au/wasteregulation/transport-asbestos-tyres.htm>. Failure to do so will result in prosecution.
- Any waste leaving the site that is classified as "restricted solid waste" or "asbestos waste" will need to be transported by an appropriately licensed contractor in accordance the Waste Regulations.

- The Waste Regulation makes it an offence to transport waste generated in NSW by motor vehicle for disposal more than 150 kilometres from the place of generation, unless the waste is transported to one of the two nearest lawful disposal facilities to the place of generation (even if that facility is located more than 150 kilometres from its place of generation).

The volume, associated chemical test certificates and final destination will be recorded within a material tracking register (a template is included in the Contamination Management Plan) that is maintained by the Contractor or their appointed representative. These records will be presented within the Validation Report.

10. Site Management Plan

10.1. Site Management

Site management during remediation works (such as water, dust, noise, temporary stockpiling) will be carried out in accordance with the project specific Construction Environmental Management Plan (CEMP). Specific remediation related management is summarised below.

10.2. Health and Safety

The Project Safety Representative will assess and determine the specific occupational health and safety requirements that need to be implemented for the delineation sampling and any remediation works; particularly when handling materials impacted by lead and asbestos, and undertaking subsurface works in areas over, or adjacent to the GWS landfill. Additional personnel protective equipment (PPE) may be required, where applicable and subject to assessment by the project Safety Representative.

All site personnel shall be informed and fully trained through a site induction procedure in relation to the potential hazards of the site regarding contamination and on site safety procedures.

10.3. Asbestos Management

ACM will be handled and disposed in accordance with *Managing Asbestos in or on soil* (NSW Government, 2014), and in accordance with a site specific Asbestos Management Plan (AMP).

10.4. Management of PFAS Contamination

Where excavation beneath the water table is required, appropriate management controls for PFAS contaminated groundwater and soils is necessary during construction. Groundwater displaced as part of construction activities would require treatment to enable discharge to local sewer connection, storm water drainage system, or discharge to ground in accordance with consent conditions from the relevant authority. If treatment is not a viable option, appropriate off-site disposal will be required.

Given that PFAS has been reported within soil that will be excavated as part of the Rail Link, it is recommended that effective management controls are established to prevent stockpiled spoil entering site drains or surface water receptors. Spoil excavated from PFAS contaminated areas as part of the proposed development should be assessed prior to reusing such materials within the site. This assessment shall be based on the principles that reuse of the material must not lead to an unacceptable risk to human health and/or the environment, or an increase in the level of risk at or near the location in which it is used. This assessment should consider relevant COPCs in addition to PFAS.

Management of PFAS contaminated groundwater (and saturated soils) shall be conducted in accordance with a project specific Contamination Management Plan (CMP) and Construction Soil and Water Management Plan (CSWMP), which include the requirement to prevent potentially contaminated groundwater being mixed, diluted, or reused on the project until testing and treatment occurs as required.

10.5. Key Stakeholders and Roles

The stakeholders directly involved in the remediation are listed in Table 7.

Table 7: Remediation Project Stakeholders

Organisation	Role
SIMTA	Project proponent
Department of Planning and Environment	Planning approval authority
CPB Contractors Pty Ltd	Contractor responsible for the implementation of this RAP
Coffey	Preparation of the Project's Remediation Action Plan and provision of contamination validation, environmental monitoring and advice in relation to the management of unexpected finds
	NSW EPA Accredited Site Auditor
	Review and endorsement of RAP, Validation Report, and other documentation
	Preparation of site audit report
TBA	Preparation of Validation Report

10.6. Long term environmental management plan

Following the completion of remediation works, a LTEMP will be prepared by a suitably qualified environmental professional. The management will include, but not limited to:

- A summary of the remediation works undertaken on site;
- The extent and nature of contamination requiring on-going management following the completion of remediation works;
- A summary of contamination issued encountered at the lateral or vertical boundaries of the site;
- Monitoring requirements for workers conducting periodic maintenance of buried services and/or inspection of utility pits along the GWS Facility; and
- Health and safety requirements including the provision of appropriate work permits to conduct intrusive works on site (such as subsurface maintenance workers).

At this stage, it is envisaged that the LTEMP would form part of the Operational Environmental Management Plan (OEMP) required to address condition F4, under the Minister's Conditions of Consent under Application No SSD 6766.

11. Validation Report

At the completion of remediation and validation works, a validation report will be prepared in general accordance with the relevant sections of Guidelines for Consultants Reporting on Contaminated Sites (NSW OEH, 2011) other relevant guidance endorsed by the NSW EPA and inconsideration of the requirements of State Environmental Planning Policy No. 55 – Remediation of Land.

The validation report will include:

- Executive summary
- Scope of work
- Site identification
- Summary of site condition, environmental context, and surrounding environment
- Summary of site history and previous investigations
- Remediation activities undertaken, including a summary of the extent and observations of excavation/s, waste documentation
- Validation sampling and analysis plan (including methodology), where relevant
- QA / QC protocols for field works and laboratory analysis
- Ongoing site maintenance and monitoring requirements
- Conclusions and recommendations.

Following the validation report, the following documents will be submitted to the Department of Environment and Planning to address Condition C8 outlined within the Minister's Conditions of Consent under Application No SSD 6766

12. References

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- Coffey (Feb, 2018d) – Data Gap Assessment, Moorebank Intermodal Rail Link, Moorebank NSW. Dated 23 February, 2018. Ref. GEOTLCOV24072AH-L01
- Coffey (2018e) Moorebank Intermodal Rail Link: GWS Data Gap Investigation Report. Dated 1 August 2018. Ref. GEOTLCOV24072AH-L03.
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**Important Information about Your Coffey
Environmental Report**

Important information about your Coffey Environmental Report

Introduction

This report has been prepared by Coffey for you, as Coffey's client, in accordance with our agreed purpose, scope, schedule and budget.

The report has been prepared using accepted procedures and practices of the consulting profession at the time it was prepared, and the opinions, recommendations and conclusions set out in the report are made in accordance with generally accepted principles and practices of that profession.

The report is based on information gained from environmental conditions (including assessment of some or all of soil, groundwater, vapour and surface water) and supplemented by reported data of the local area and professional experience. Assessment has been scoped with consideration to industry standards, regulations, guidelines and your specific requirements, including budget and timing. The characterisation of site conditions is an interpretation of information collected during assessment, in accordance with industry practice,

This interpretation is not a complete description of all material on or in the vicinity of the site, due to the inherent variation in spatial and temporal patterns of contaminant presence and impact in the natural environment. Coffey may have also relied on data and other information provided by you and other qualified individuals in preparing this report. Coffey has not verified the accuracy or completeness of such data or information except as otherwise stated in the report. For these reasons the report must be regarded as interpretative, in accordance with industry standards and practice, rather than being a definitive record.

Your report has been written for a specific purpose

Your report has been developed for a specific purpose as agreed by us and applies only to the site or area investigated. Unless otherwise stated in the report, this report cannot be applied to an adjacent site or area, nor can it be used when the nature of the specific purpose changes from that which we agreed.

For each purpose, a tailored approach to the assessment of potential soil and groundwater contamination is required. In most cases, a key objective is to identify, and if possible quantify, risks that both recognised and potential contamination pose in the context of the agreed purpose. Such risks may be financial (for example, clean up costs or constraints on site use) and/or physical (for example, potential health risks to users of the site or the general public).

Limitations of the Report

The work was conducted, and the report has been prepared, in response to an agreed purpose and scope, within time and budgetary constraints, and in reliance on certain data and information made available to Coffey.

The analyses, evaluations, opinions and conclusions presented in this report are based on that purpose and scope, requirements, data or information, and they could change if such requirements or data are inaccurate or incomplete.

This report is valid as of the date of preparation. The condition of the site (including subsurface conditions) and extent or nature of contamination or other environmental hazards can change over time, as a result of either natural processes or human influence. Coffey should be kept apprised of any such events and should be consulted for further investigations if any changes are noted, particularly during construction activities where excavations often reveal subsurface conditions.

In addition, advancements in professional practice regarding contaminated land and changes in applicable statutes and/or guidelines may affect the validity of this report. Consequently, the currency of conclusions and recommendations in this report should be verified if you propose to use this report more than 6 months after its date of issue.

The report does not include the evaluation or assessment of potential geotechnical engineering constraints of the site.

Interpretation of factual data

Environmental site assessments identify actual conditions only at those points where samples are taken and on the date collected. Data derived from indirect field measurements, and sometimes other reports on the site, are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact with respect to the report purpose and recommended actions.

Variations in soil and groundwater conditions may occur between test or sample locations and actual conditions may differ from those inferred to exist. No environmental assessment program, no matter how comprehensive, can reveal all subsurface details and anomalies. Similarly, no professional, no matter how well qualified, can reveal what is hidden by earth, rock or changed through time.

The actual interface between different materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but

steps can be taken to reduce the impact of unexpected conditions.

For this reason, parties involved with land acquisition, management and/or redevelopment should retain the services of a suitably qualified and experienced environmental consultant through the development and use of the site to identify variances, conduct additional tests if required, and recommend solutions to unexpected conditions or other unrecognised features encountered on site. Coffey would be pleased to assist with any investigation or advice in such circumstances.

Recommendations in this report

This report assumes, in accordance with industry practice, that the site conditions recognised through discrete sampling are representative of actual conditions throughout the investigation area. Recommendations are based on the resulting interpretation.

Should further data be obtained that differs from the data on which the report recommendations are based (such as through excavation or other additional assessment), then the recommendations would need to be reviewed and may need to be revised.

Report for benefit of client

Unless otherwise agreed between us, the report has been prepared for your benefit and no other party. Other parties should not rely upon the report or the accuracy or completeness of any recommendation and should make their own enquiries and obtain independent advice in relation to such matters.

Coffey assumes no responsibility and will not be liable to any other person or organisation for, or in relation to, any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report.

To avoid misuse of the information presented in your report, we recommend that Coffey be consulted before the report is provided to another party who may not be familiar with the background and the purpose of the report. In particular, an environmental disclosure report for a property vendor may not be suitable for satisfying the needs of that property's purchaser. This report should not be applied for any purpose other than that stated in the report.

Interpretation by other professionals

Costly problems can occur when other professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, a suitably qualified and experienced environmental consultant should be retained to explain the implications of the report to other professionals referring to the report and then review plans and specifications produced to see how other professionals have incorporated the report findings.

Given Coffey prepared the report and has familiarity with the site, Coffey is well placed to provide such

assistance. If another party is engaged to interpret the recommendations of the report, there is a risk that the contents of the report may be misinterpreted and Coffey disowns any responsibility for such misinterpretation.

Data should not be separated from the report

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, laboratory data, drawings, etc. are customarily included in our reports and are developed by scientists or engineers based on their interpretation of field logs, field testing and laboratory evaluation of samples. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

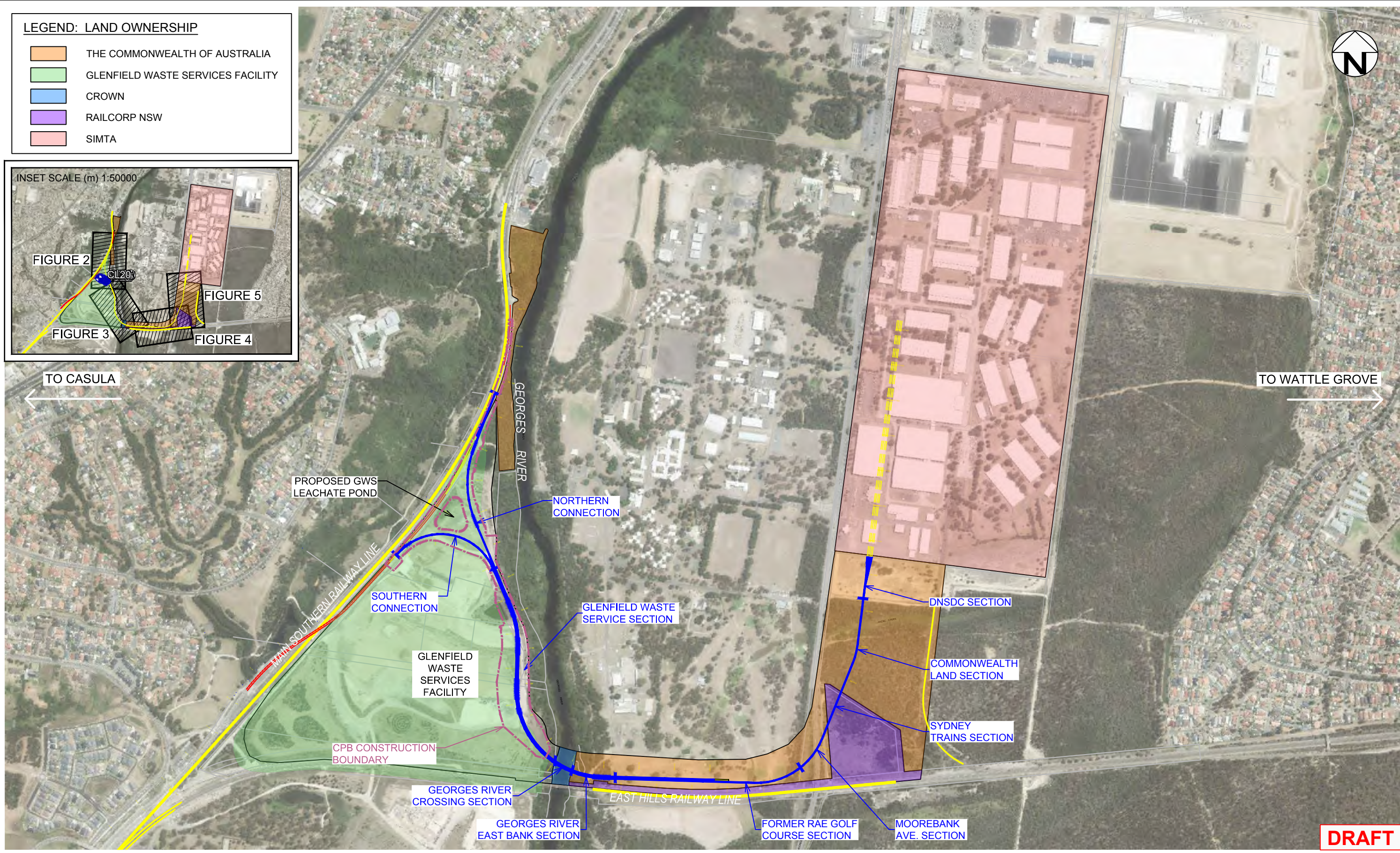
This report should be reproduced in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties.

Responsibility

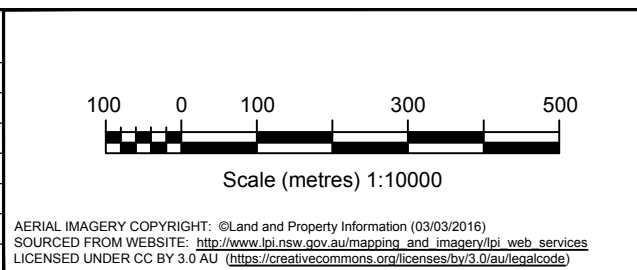
Environmental reporting relies on interpretation of factual information using professional judgement and opinion and has a level of uncertainty attached to it, which is much less exact than other design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. As noted earlier, the recommendations and findings set out in this report should only be regarded as interpretive and should not be taken as accurate and complete information about all environmental media at all depths and locations across the site.

Figures

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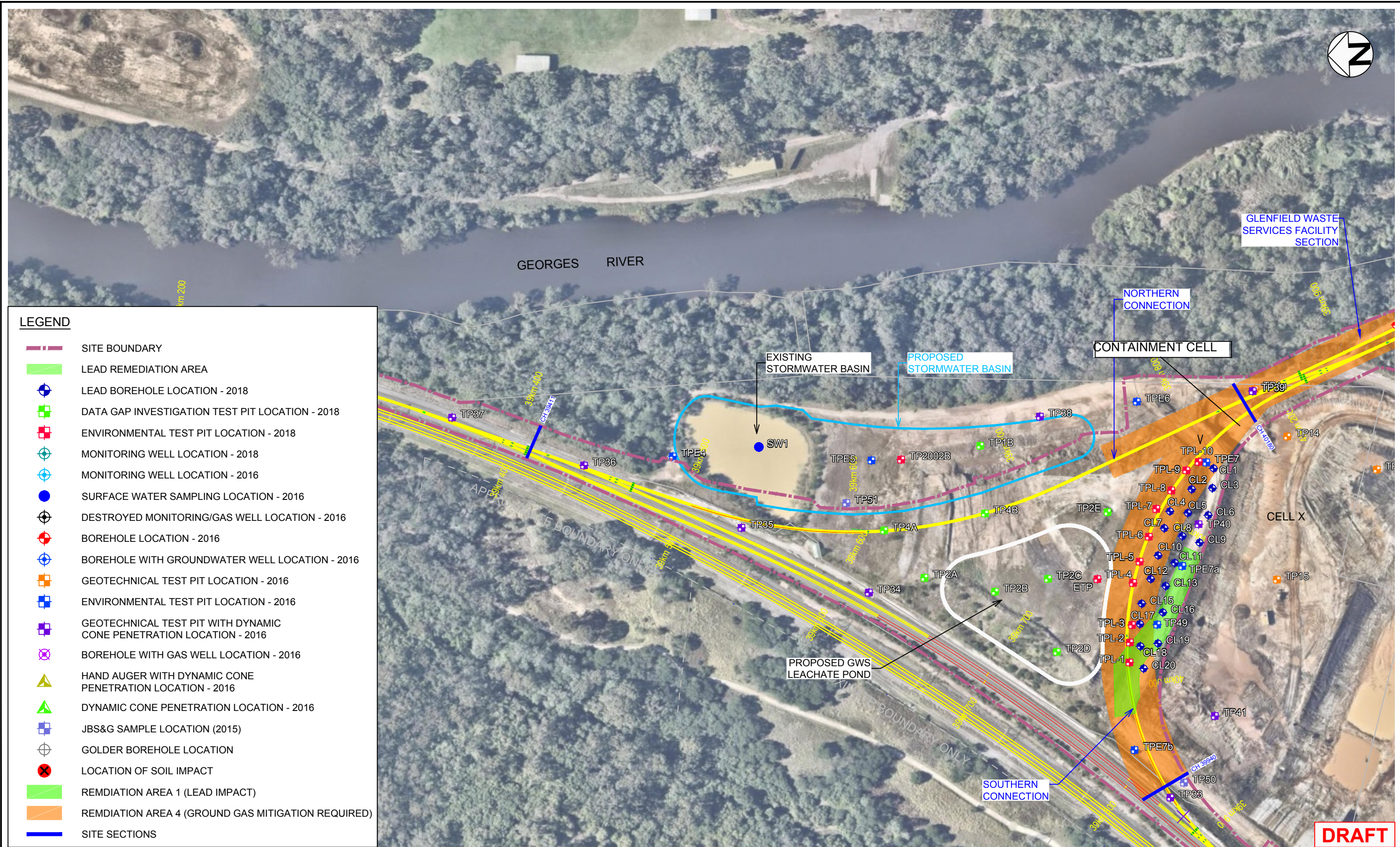


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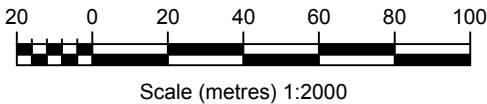


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project: MOOREBANK INTERMODAL RAIL LINK REMEDIATION ACTION PLAN MOOREBANK, NSW	
title: SITE LOCALITY PLAN	
project no: 754-GEOTLCOV24072AH-R02	figure no: FIGURE 1
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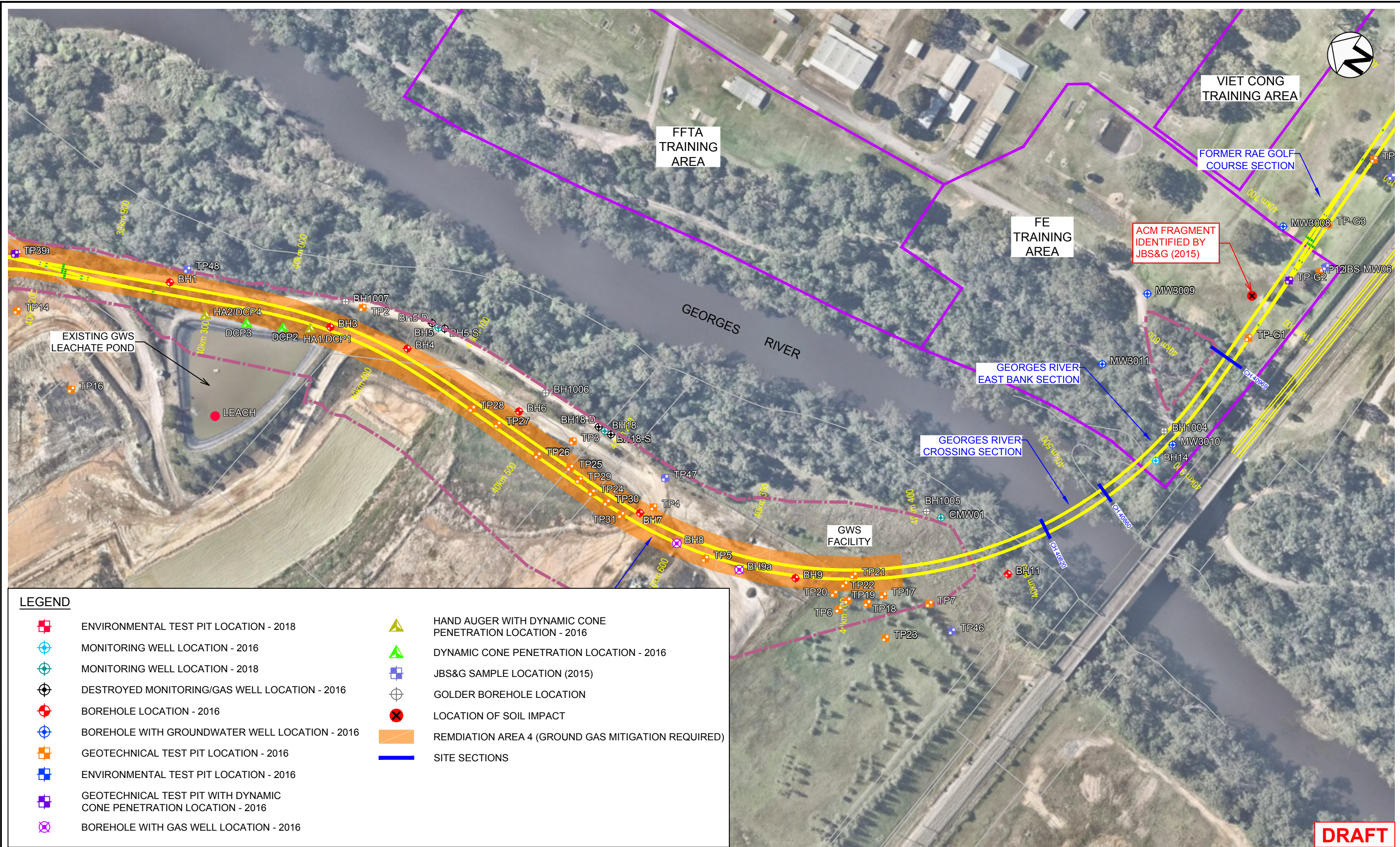


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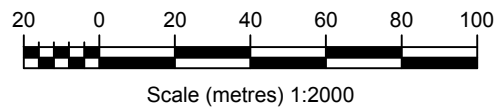
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| | MONITORING WELL LOCATION - 2016 | | DYNAMIC CONE PENETRATION LOCATION - 2016 |
| | MONITORING WELL LOCATION - 2018 | | JBS&G SAMPLE LOCATION (2015) |
| | DESTROYED MONITORING/GAS WELL LOCATION - 2016 | | GOLDER BOREHOLE LOCATION |
| | BOREHOLE LOCATION - 2016 | | LOCATION OF SOIL IMPACT |
| | BOREHOLE WITH GROUNDWATER WELL LOCATION - 2016 | | REMEDIATION AREA 4 (GROUND GAS MITIGATION REQUIRED) |
| | GEOTECHNICAL TEST PIT LOCATION - 2016 | | SITE SECTIONS |
| | ENVIRONMENTAL TEST PIT LOCATION - 2016 | | |
| | GEOTECHNICAL TEST PIT WITH DYNAMIC CONE PENETRATION LOCATION - 2016 | | |
| | BOREHOLE WITH GAS WELL LOCATION - 2016 | | |

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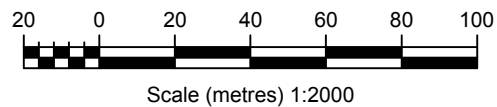


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	A	ORIGINAL ISSUE					



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approved	-
date	20 / 09 / 18
scale	AS SHOWN
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client:	CPB CONTRACTORS PTY LTD		
project:	MOOREBANK INTERMODAL RAIL LINK REMEDIAION ACTION PLAN MOOREBANK, NSW		
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project no:	754-GEOTLCOV24072AH-R02	figure no:	FIGURE 4
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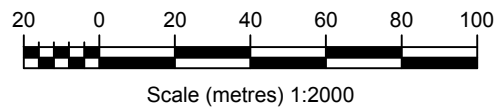
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| | MONITORING WELL LOCATION - 2016 | | DYNAMIC CONE PENETRATION LOCATION - 2016 |
| | MONITORING WELL LOCATION - 2018 | | JBS&G SAMPLE LOCATION (2015) |
| | DESTROYED MONITORING/GAS WELL LOCATION - 2016 | | GOLDER BOREHOLE LOCATION |
| | BOREHOLE LOCATION - 2016 | | LOCATION OF SOIL IMPACT |
| | BOREHOLE WITH GROUNDWATER WELL LOCATION - 2016 | | REMDIAION AREA 2 AND 3 (ASBESTOS IMPACT) |
| | GEOTECHNICAL TEST PIT LOCATION - 2016 | | SITE SECTIONS |
| | ENVIRONMENTAL TEST PIT LOCATION - 2016 | | |
| | GEOTECHNICAL TEST PIT WITH DYNAMIC CONE PENETRATION LOCATION - 2016 | | |
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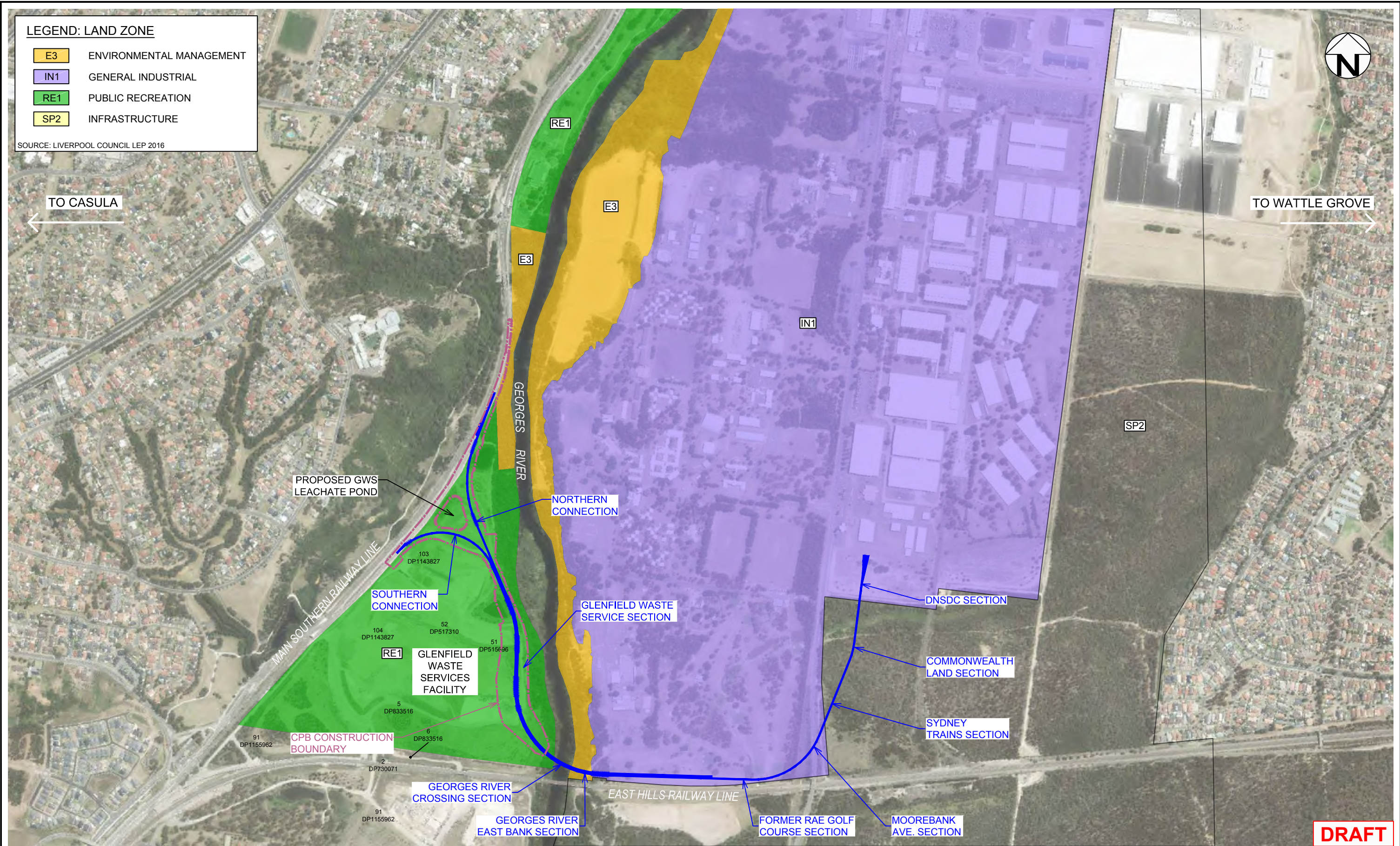


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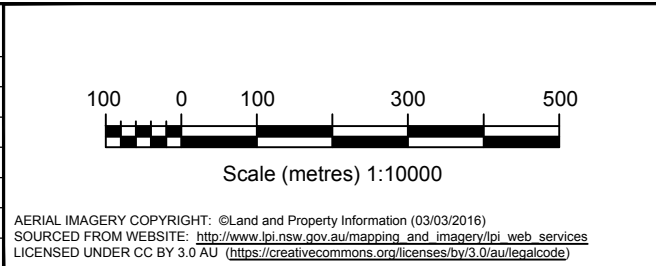


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project no:	754-GEOTLCOV24072AH-R02	figure no:	FIGURE 5
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original size	A3



client: CPB CONTRACTORS PTY LTD	
project: MOOREBANK INTERMODAL RAIL LINK REMEDIAL ACTION PLAN MOOREBANK, NSW	
title: SITE IDENTIFICATION AND LAND ZONE	
project no: 754-GEOTLCOV24072AH-R02	figure no: FIGURE 6
rev: A	

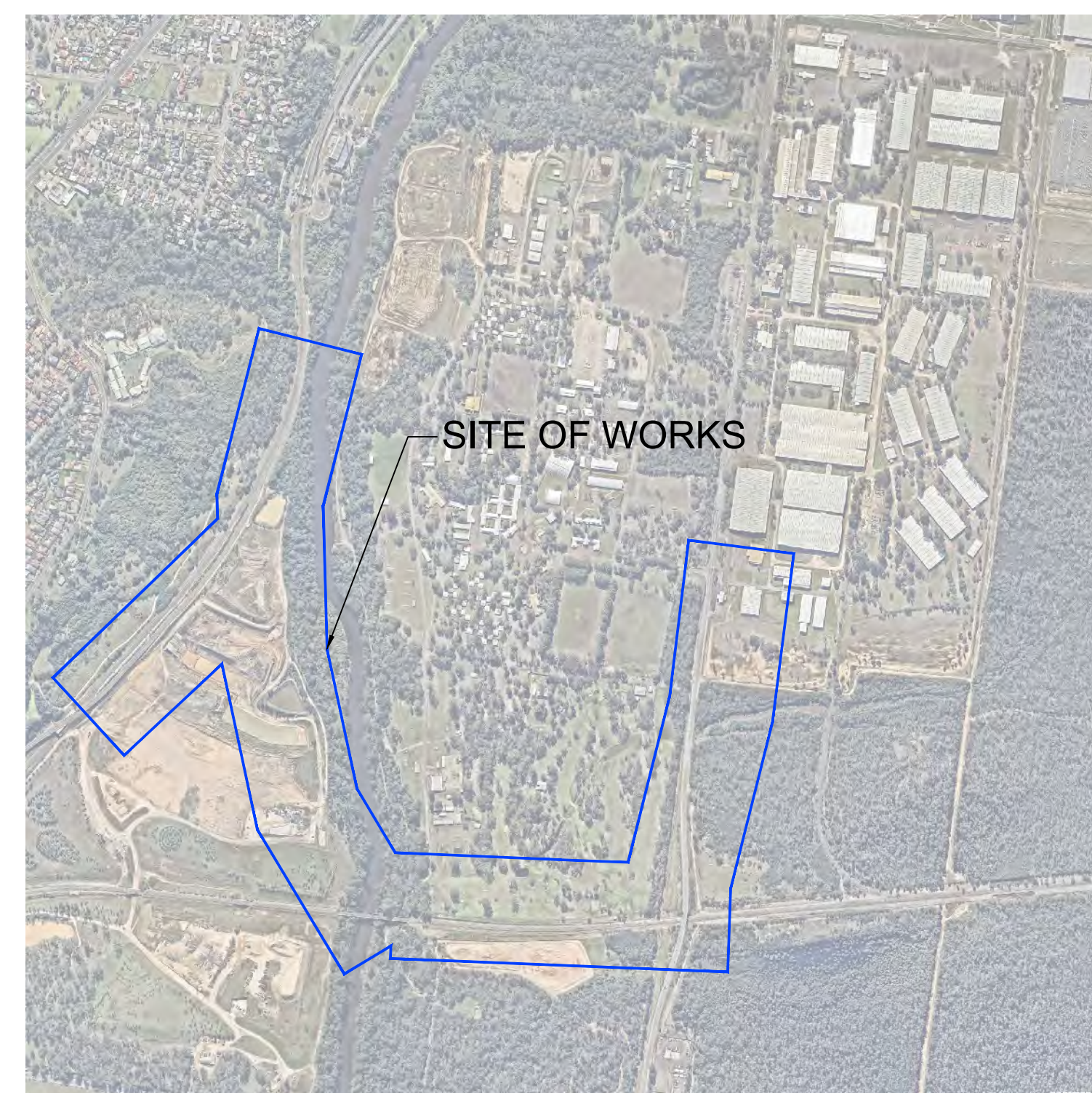
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**Appendix A – Bulk
Preliminary
Development
Design Plans**



MOOREBANK INTERMODAL TERMINAL DEVELOPMENT- PACKAGE 1- RALP No.1 BULK EARTHWORKS - COVERSHEET

LOCALITY PLAN



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ABN: 54 005 139 873

A person using the Aurecon drawings and other data accepts the risk of using the drawings and other data:
1. In electronic form without requesting and checking them for accuracy against the original hard copy versions;
2. For any purposes not agreed to in writing by Aurecon.
Wherever a discrepancy in the contract documents is found and unless directed otherwise by the Principal/Engineer, the contractor shall adopt, at their own cost the greater quantum, class of finish, grade, or specification where applicable.

FOR CONSTRUCTION

ARTC No	TNSW EDMS No	SIZE	DATE	DRAWING No.	PROJECT No.	WBS	TYPE	DISC	NUMBER	REV	
		A1	20.01.17	N01031	-	PWD	-	DRG	-	0001	- 01

03020303

GENERAL NOTES

1. EARTHWORKS DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT ID : N01031-PWD-SPE-EWK-0001).
2. THE WORKS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS (DOCUMENT ID: N01031-PWD-SPE-EWK-0001) AND THE PREVAILING ARTC AND RMS SPECIFICATIONS AS NOTED IN THE PROJECT SPECIFICATIONS.
3. ALL DESIGN, MATERIALS, EQUIPMENT, WORKMANSHIP AND INSTALLATION SHALL COMPLY WITH THE LATEST REVISION OF THE RELEVANT ENGINEERING STANDARD AS DETAILED IN THE MOOREBANK INTERMODAL TERMINAL DEVELOPMENT RALP N01 - PPR APPENDIX 8, PERFORMANCE SPECIFICATION UNLESS OTHERWISE NOTED IN THE DRAWINGS OR EARTHWORKS SPECIFICATIONS.
4. COMPACTION TESTING SHALL BE CARRIED OUT TO MEET THE MINIMUM REQUIREMENTS IN ACCORDANCE WITH THE PROJECT EARTHWORKS SPECIFICATION.
5. REVEGETATION WORKS INCLUDES SPREADING AND COMPACTION OF SITE WON TOPSOIL AND HYDRO SEEDING OF BATTERS AND DISTURBED LANDS.

EMBANKMENT

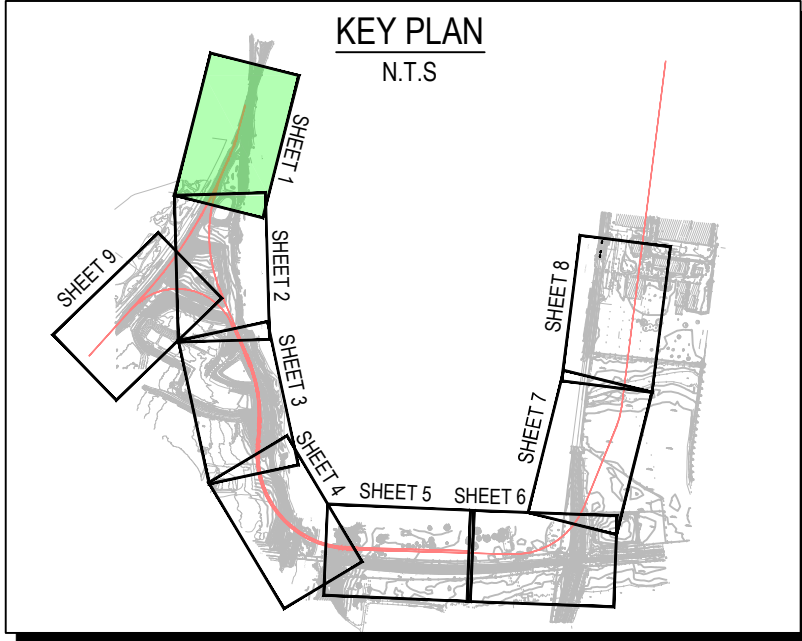
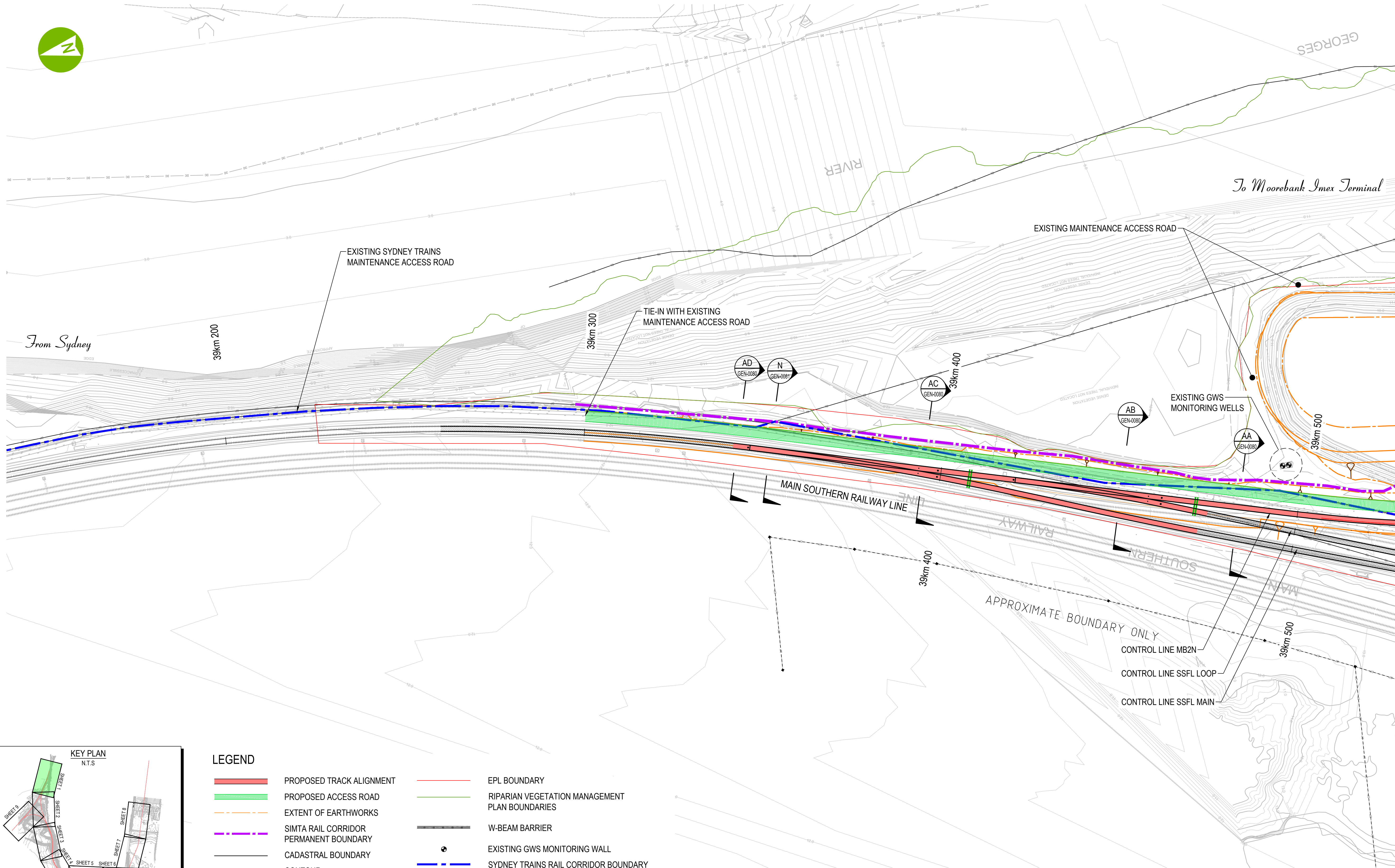
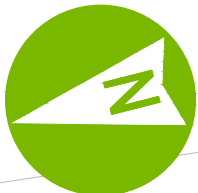
1. TERRACES/ BENCHES IN EXISTING EMBANKMENT BATTERS SHALL BE INSPECTED BY A SUITABLY QUALIFIED GEOTECHNICAL ENGINEER FOR UNSUITABLE MATERIALS OR WATER SEEPAGE PRIOR TO PLACEMENT OF FILL MATERIAL.
2. EMBANKMENT FOUNDATIONS TO BE INSPECTED BY A SUITABLY QUALIFIED GEOTECHNICAL ENGINEER AND TREATMENT TYPE APPROVED AFTER PROOF ROLLING IN ACCORDANCE WITH THE PROJECT EARTHWORKS SPECIFICATION.

CUTTING

1. ALL CUT FLOORS SHALL BE PROOF ROLLED OR TREATED WHERE APPROPRIATE IN ACCORDANCE WITH THE PROJECT EARTHWORKS SPECIFICATION. THE FORMATION SHALL BE INSPECTED FOR UNSUITABLE MATERIALS PRIOR TO PLACEMENT OF FILL MATERIAL BY A SUITABLY QUALIFIED GEOTECHNICAL ENGINEER.
2. PROOF ROLLING TO BE WITNESSED AND THE CUT FLOOR TREATMENT TYPE APPROVED BY A SUITABLY QUALIFIED GEOTECHNICAL ENGINEER.
3. CUT BATTERS AND BENCH WIDTHS SHALL BE CONFIRMED BY A GEOTECHNICAL ENGINEER ON SITE BASED ON EXPOSED GROUND CONDITIONS.
4. CUT BATTERS ARE TO BE CLEANED AND INSPECTED BY A SUITABLY QUALIFIED GEOTECHNICAL ENGINEER.

MATERIALS

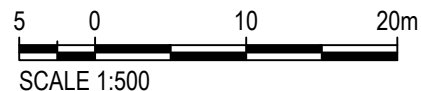
1. WHERE THE ENGINEER CONSIDERS THAT THE MATERIAL IN THE BOTTOM OF CUTTINGS OR IN THE NATURAL SURFACE BENEATH EMBANKMENTS IS UNSUITABLE FOR TRACK STRUCTURE OR EMBANKMENT SUPPORT, SUCH MATERIAL SHALL BE EXCAVATED AS DIRECTED BY THE GEOTECHNICAL ENGINEER AND DISPOSED OF TO SPOIL.
2. SITE WON MATERIAL AND IMPORTED MATERIAL FOR USE IN STRUCTURAL ZONES SHALL COMPLY WITH THE REQUIREMENTS NOTED IN PROJECT EARTHWORKS SPECIFICATION (DOCUMENT ID: 01031-PWD-SPE-EWK-0001).
3. CAPPING MATERIAL SHALL COMPLY WITH THE REQUIREMENTS NOTED IN PROJECT EARTHWORKS SPECIFICATION (DOCUMENT ID: 01031-PWD-SPE-EWK-0001).



LEGEND

- | | | | |
|--|--|--|--|
| | PROPOSED TRACK ALIGNMENT | | EPL BOUNDARY |
| | PROPOSED ACCESS ROAD | | RIPARIAN VEGETATION MANAGEMENT PLAN BOUNDARIES |
| | EXTENT OF EARTHWORKS | | W-BEAM BARRIER |
| | SIMTA RAIL CORRIDOR PERMANENT BOUNDARY | | EXISTING GWS MONITORING WALL |
| | CADASTRAL BOUNDARY | | SYDNEY TRAINS RAIL CORRIDOR BOUNDARY |
| | CONTOUR | | 1.5m HIGH BOLLARD |
| | FUTURE INTERMODAL TERMINAL | | |

PLAN
1:500



CLIENT		REV	DATE	REVISION DETAILS	APPROVED	SCALE	SIZE	FOR CONSTRUCTION		PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1					
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						DRAWN		APPROVED		DRAWING No.	PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV
								DATE 20.01.17		N01031		PWD	DRG	GEN	0010	01



GEORGES RIVER

CUT/FILL - WEST SIDE
GEORGES RIVER BRIDGE

CUT	25500m³
FILL	16300m³
TOPSOIL CUT	0m³
TOPSOIL FILL	675m³

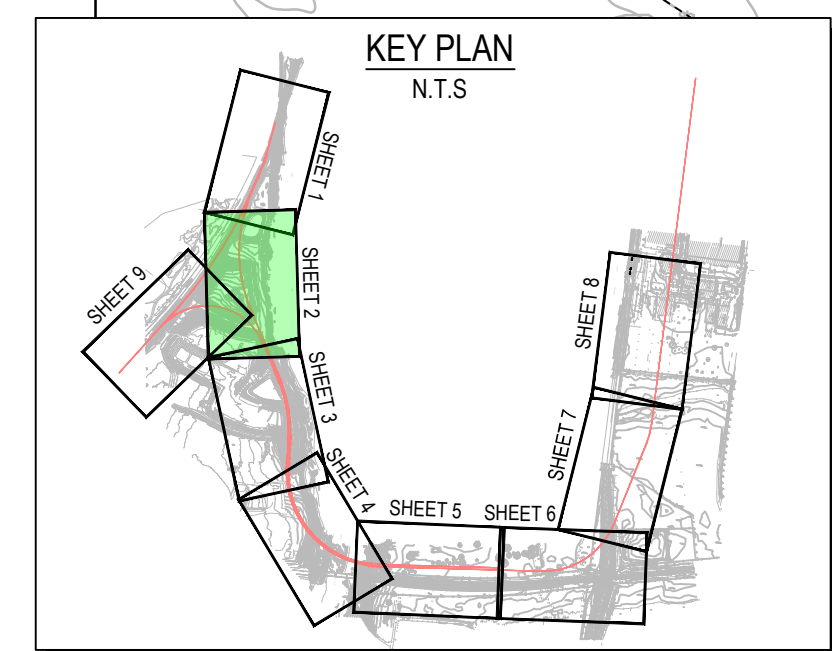
LEGEND

	PROPOSED TRACK ALIGNMENT		EPL BOUNDARY
	PROPOSED ACCESS ROAD		RIPARIAN VEGETATION MANAGEMENT
	EXTENT OF EARTHWORKS		W-BEAM BARRIER
	SIMTA RAIL CORRIDOR PERMANENT BOUNDARY		EXISTING GWS MONITORING WALL
	CADASTRAL BOUNDARY		SYDNEY TRAINS RAIL CORRIDOR BOUNDARY
	CONTOUR		1.5m HIGH BOLLARD
	FUTURE INTERMODAL TERMINAL		

NOTE:
EARTHWORKS IMPACTED BY GWS
LANDFILL RE-DESIGN VARIATION
ON HOLD.

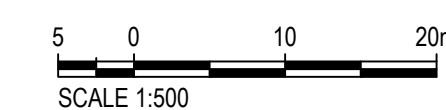
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ADJOINS DRG N01031-PWD-DRG-GEN-0012



PLAN
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ADJOINS DRG N01031-PWD-DRG-GEN-0018



ARTC DRAWING No. EDMS No. EDMS REV.

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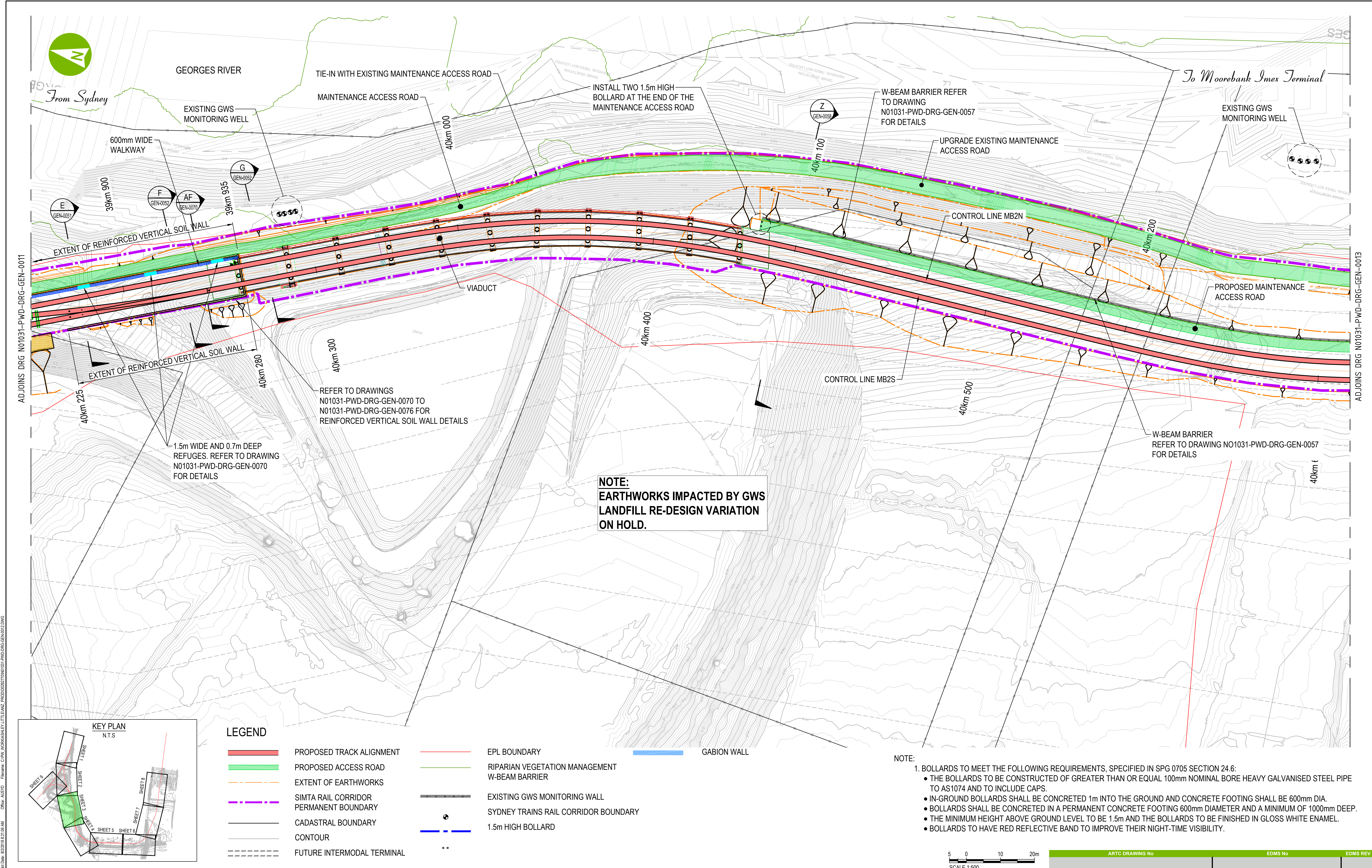
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01	20.01.17	ACCEPTED FOR CONSTRUCTION
02	09.06.17	ACCEPTED FOR CONSTRUCTION RE-SUBMISSION
03	07.02.18	ACCEPTED FOR CONSTRUCTION RE-SUBMISSION



SCALE AS SHOWN	SIZE A1
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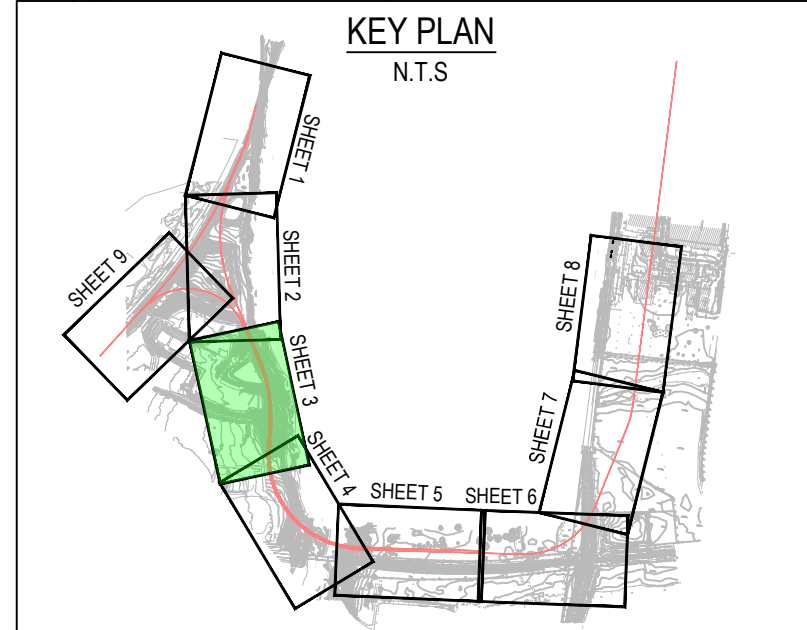
FOR CONSTRUCTION	DATE 20.01.17
APPROVED	

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DRAWING No.	PROJECT No.	ZONE	TYPE	DISC	NUMBER
N01031		PWD	DRG	GEN	0011
					REV 03



NOTE:
EARTHWORKS IMPACTED BY GWS
LANDFILL RE-DESIGN VARIATION
ON HOLD.

- NOTE:
1. BOLLARDS TO MEET THE FOLLOWING REQUIREMENTS, SPECIFIED IN SPG 0705 SECTION 24.6:
 - THE BOLLARDS TO BE CONSTRUCTED OF GREATER THAN OR EQUAL 100mm NOMINAL BORE HEAVY GALVANISED STEEL PIPE TO AS1074 AND TO INCLUDE CAPS.
 - IN-GROUND BOLLARDS SHALL BE CONCRETED 1m INTO THE GROUND AND CONCRETE FOOTING SHALL BE 600mm DIA.
 - BOLLARDS SHALL BE CONCRETED IN A PERMANENT CONCRETE FOOTING 600mm DIAMETER AND A MINIMUM OF 1000mm DEEP.
 - THE MINIMUM HEIGHT ABOVE GROUND LEVEL TO BE 1.5m AND THE BOLLARDS TO BE FINISHED IN GLOSS WHITE ENAMEL.
 - BOLLARDS TO HAVE RED REFLECTIVE BAND TO IMPROVE THEIR NIGHT-TIME VISIBILITY.



LEGEND

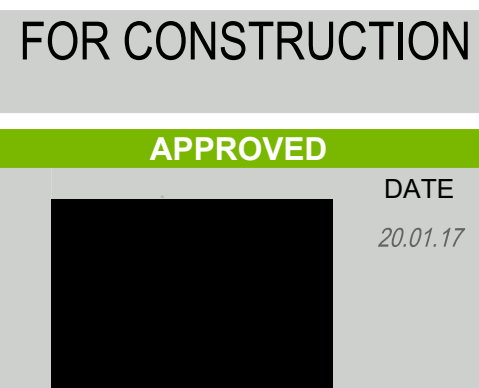
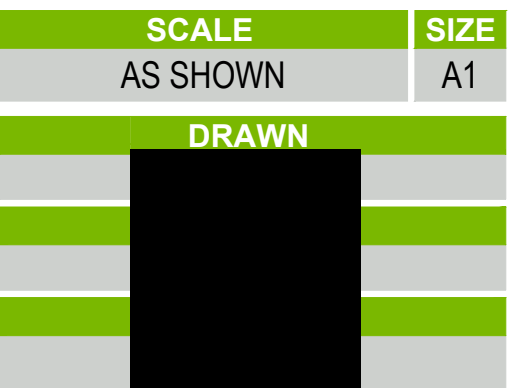
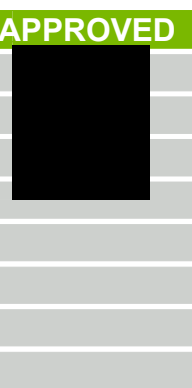
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| | PROPOSED TRACK ALIGNMENT | | EPL BOUNDARY |
| | PROPOSED ACCESS ROAD | | RIPARIAN VEGETATION MANAGEMENT |
| | EXTENT OF EARTHWORKS | | W-BEAM BARRIER |
| | SIMTA RAIL CORRIDOR PERMANENT BOUNDARY | | EXISTING GWS MONITORING WALL |
| | CADASTRAL BOUNDARY | | SYDNEY TRAINS RAIL CORRIDOR BOUNDARY |
| | CONTOUR | | 1.5m HIGH BOLLARD |
| | FUTURE INTERMODAL TERMINAL | | |



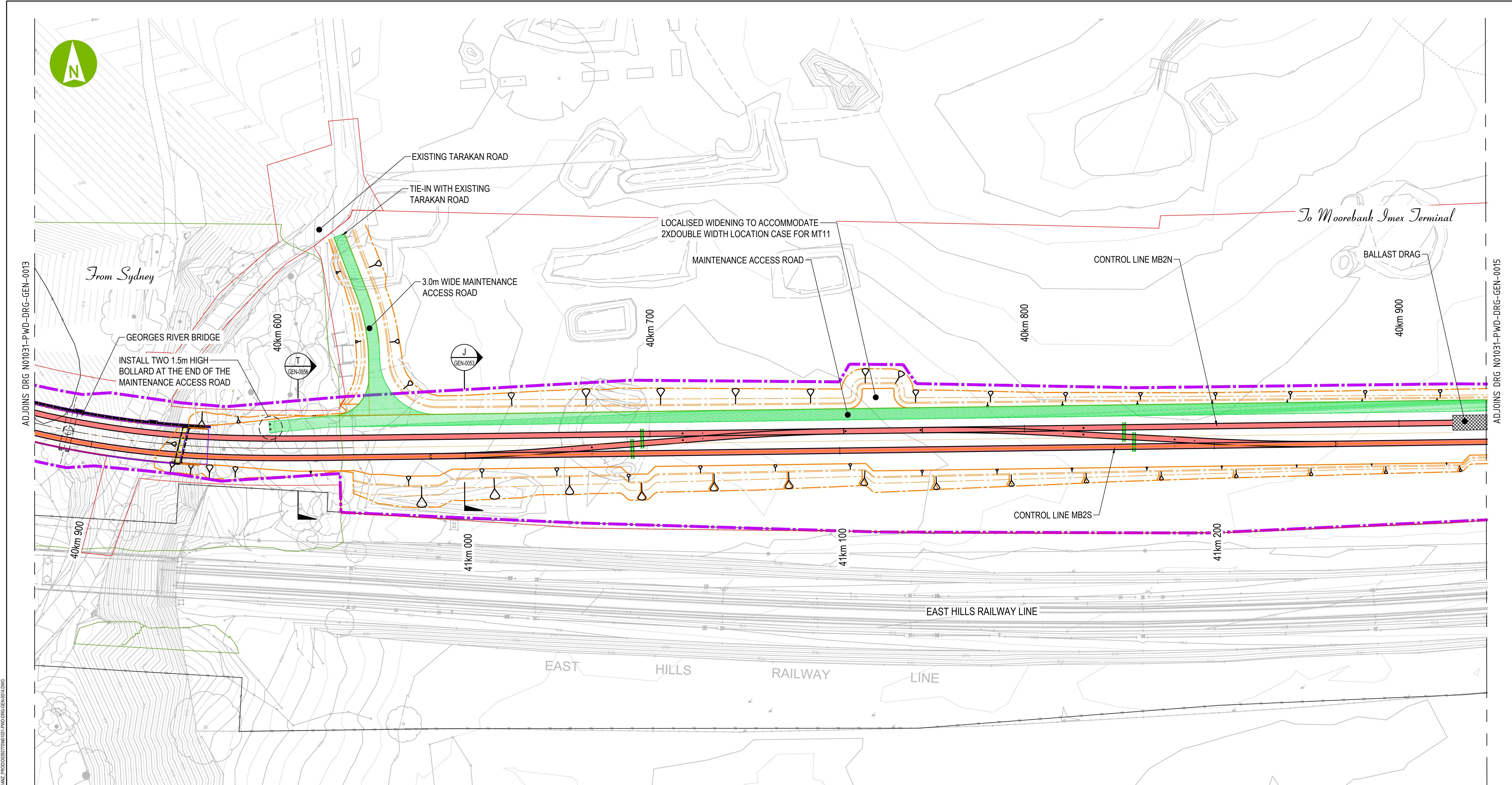
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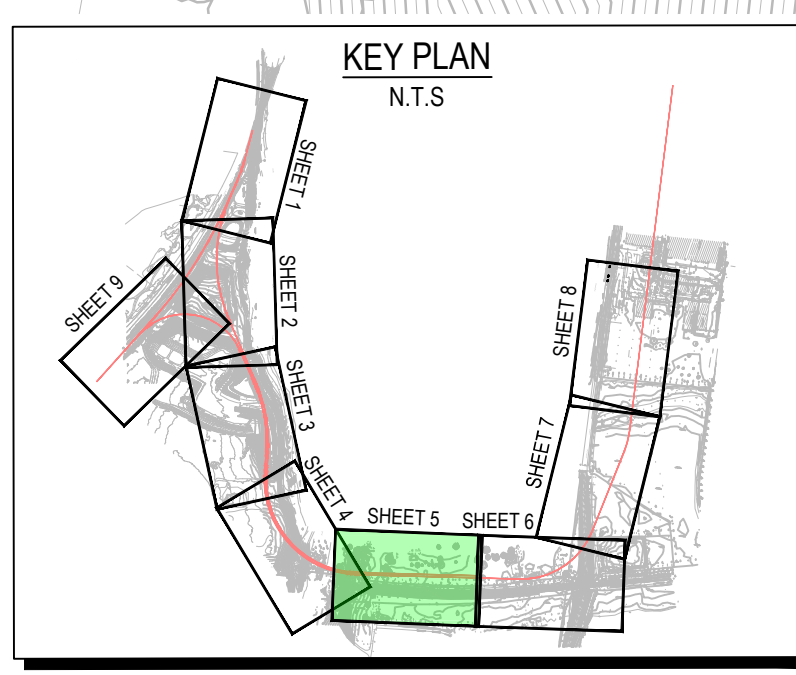
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01	20.01.17	ACCEPTED FOR CONSTRUCTION
02	07.02.18	ACCEPTED FOR CONSTRUCTION RE-SUBMISSION



PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1
TITLE	BULK EARTHWORKS GENERAL ARRANGEMENT PLAN SHEET 3 OF 9
DRAWING No.	N01031
PROJECT No.	
ZONE	PWD
TYPE	DRG
DISC	GEN
NUMBER	0012
REV	02



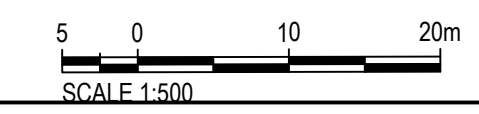
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LEGEND			
	PROPOSED TRACK ALIGNMENT		EPL BOUNDARY
	PROPOSED ACCESS ROAD		RIPARIAN VEGETATION MANAGEMENT PLAN BOUNDARIES
	EXTENT OF EARTHWORKS		W-BEAM BARRIER
	SIMTA RAIL CORRIDOR PERMANENT BOUNDARY		EXISTING GWS MONITORING WALL
	CADASTRAL BOUNDARY		SYDNEY TRAINS RAIL CORRIDOR BOUNDARY
	CONTOUR		1.5m HIGH BOLLARD
	FUTURE INTERMODAL TERMINAL		

CUT/FILL - WEST SIDE GEORGES RIVER BRIDGE	
CUT	32100m³
FILL	2200m³
TOPSOIL CUT	7400m³
TOPSOIL FILL	760m³

- NOTE:
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 - BOLLARDS TO HAVE RED REFLECTIVE BAND TO IMPROVE THEIR NIGHT-TIME VISIBILITY.

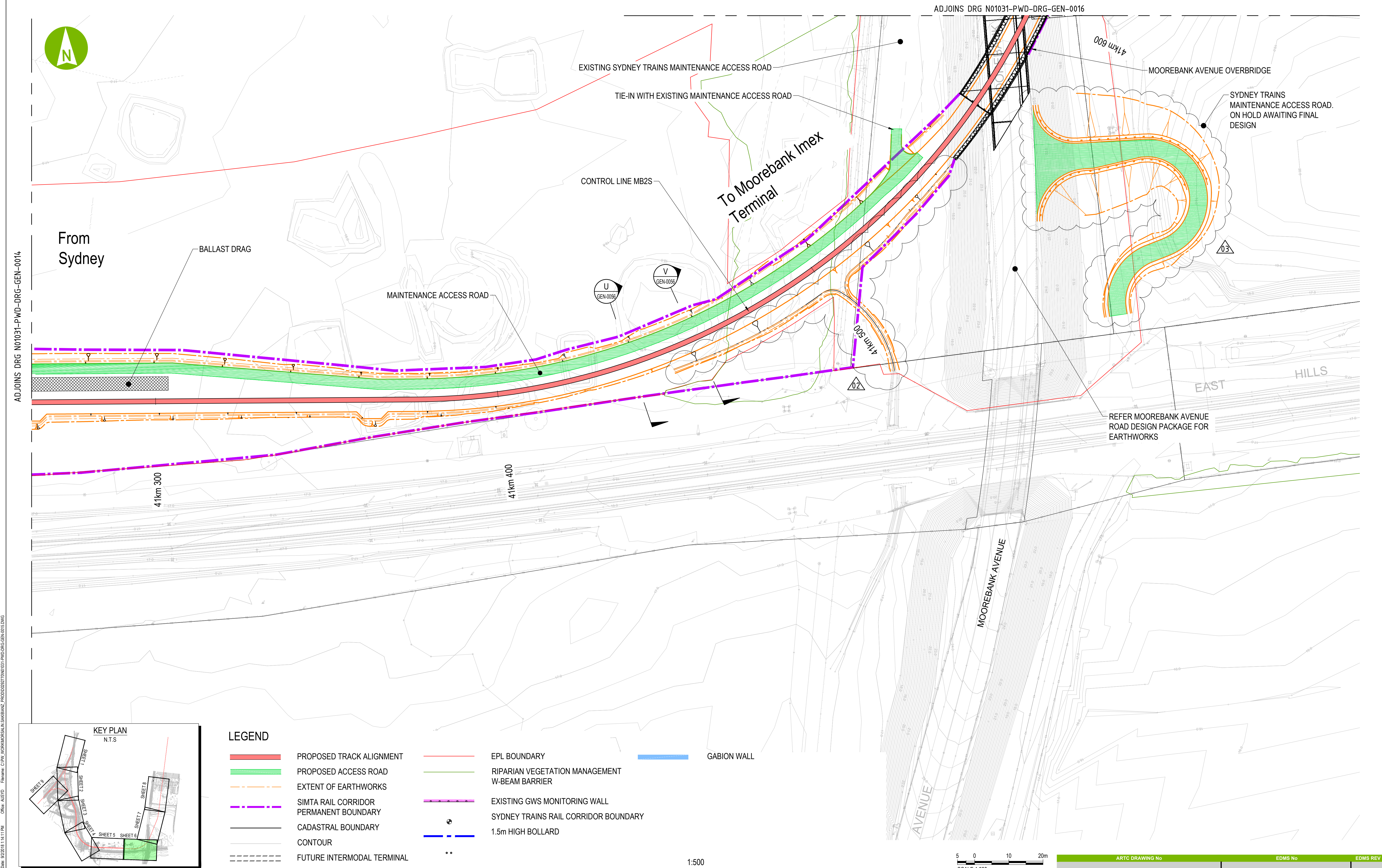


REV	DATE	REVISION DETAILS
01	20.01.17	ACCEPTED FOR CONSTRUCTION
02	09.06.17	ACCEPTED FOR CONSTRUCTION RE-SUBMISSION

SCALE	SIZE
AS SHOWN	A1

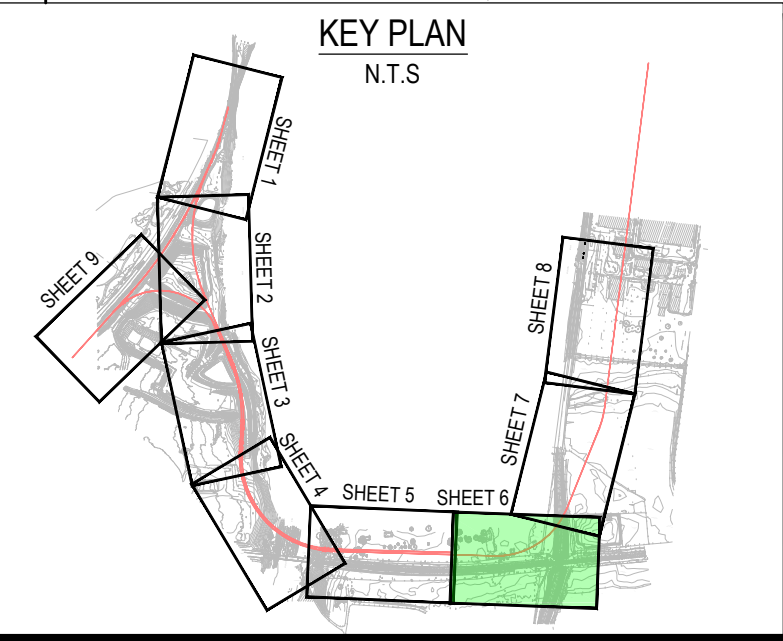
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APPROVED
DATE 20.01.17

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PROJECT			MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1					
TITLE			BULK EARTHWORKS GENERAL ARRANGEMENT PLAN SHEET 5 OF 9					
DRAWING No.			PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV
			N01031	PWD	DRG	GEN	0014	02



AD JOINS DRG N01031-PWD-DRG-GEN-0014

Proj Date: 20/01/17 11:11 PM Office: AUS/01 Filename: C:\PM\WORK\MOOREBANK\SAV\BANK\PROJECTS\N01031-PWD-DRG-GEN-0015.DWG



LEGEND

- | | | | | | |
|--|--|--|--------------------------------------|--|-------------|
| | PROPOSED TRACK ALIGNMENT | | EPL BOUNDARY | | GABION WALL |
| | PROPOSED ACCESS ROAD | | RIPARIAN VEGETATION MANAGEMENT | | |
| | EXTENT OF EARTHWORKS | | W-BEAM BARRIER | | |
| | SIMTA RAIL CORRIDOR PERMANENT BOUNDARY | | EXISTING GWS MONITORING WALL | | |
| | CADASTRAL BOUNDARY | | SYDNEY TRAINS RAIL CORRIDOR BOUNDARY | | |
| | CONTOUR | | 1.5m HIGH BOLLARD | | |
| | FUTURE INTERMODAL TERMINAL | | | | |

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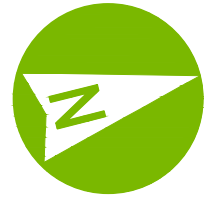


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02	26.10.17	ACCEPTED FOR CONSTRUCTION	
03	26.10.17	ACCEPTED FOR CONSTRUCTION RESUBMISSION	

SCALE	SIZE
AS SHOWN	A1

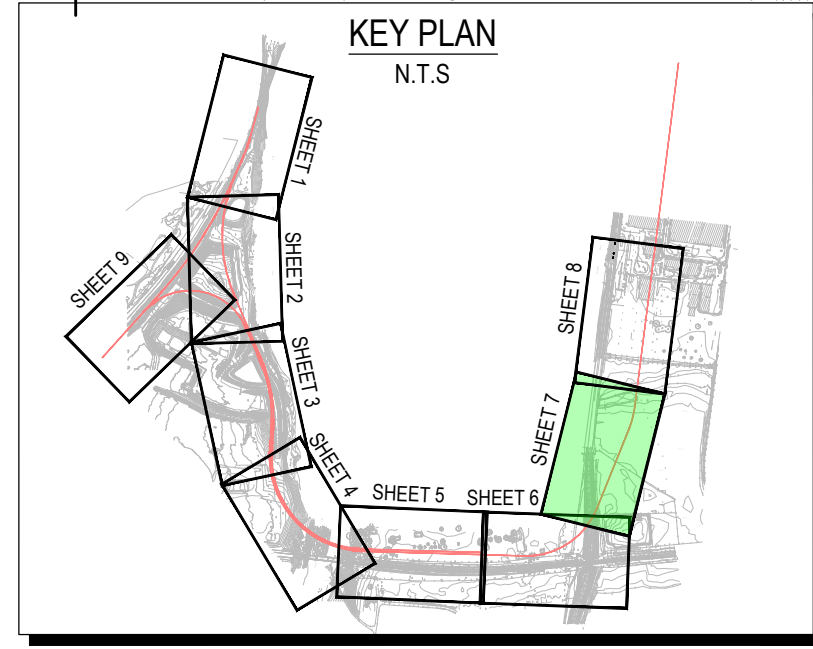
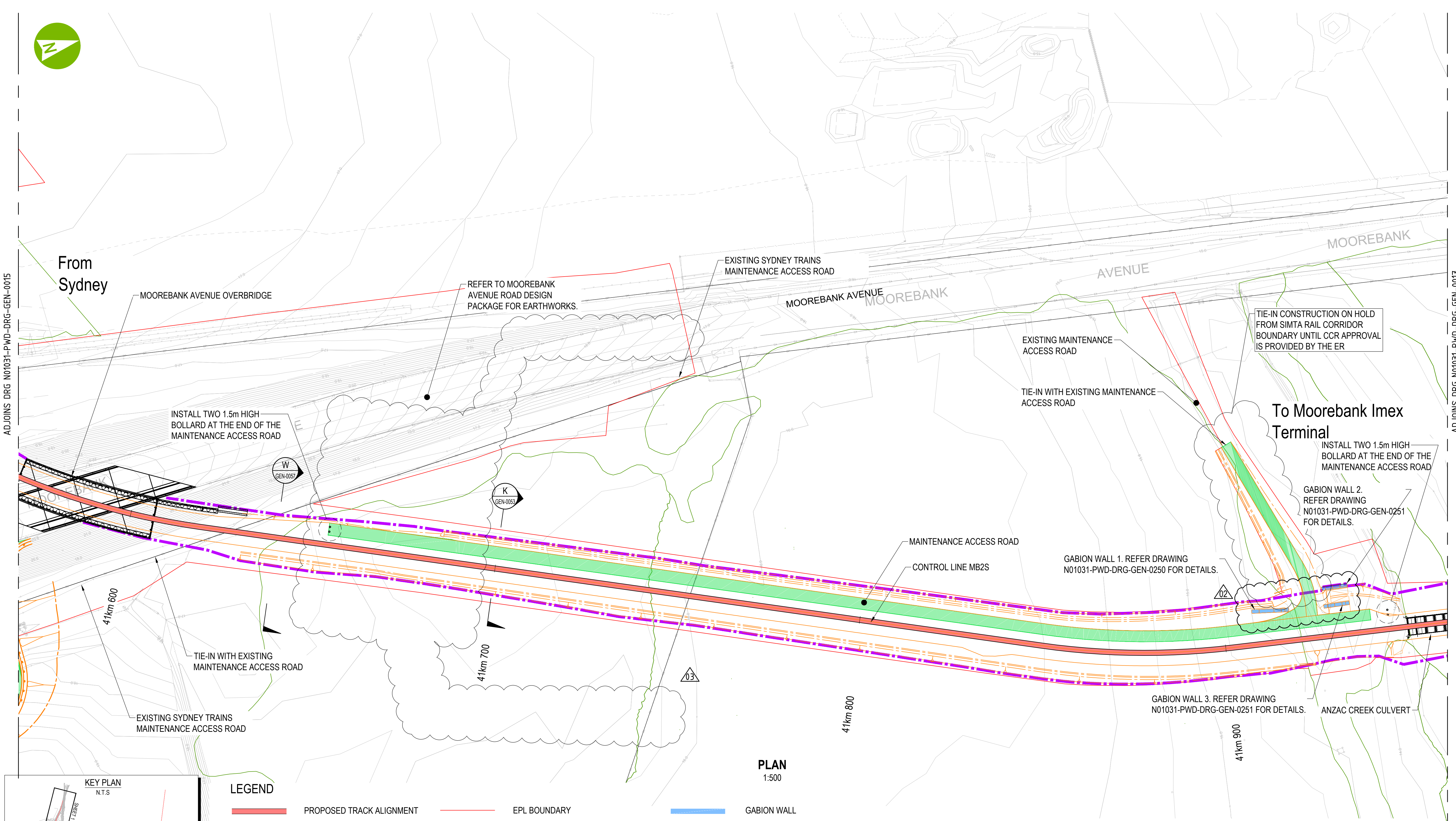
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ARTC DRAWING No			EDMS No			EDMS REV					
PROJECT			MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1								
TITLE			BULK EARTHWORKS GENERAL ARRANGEMENT PLAN SHEET 6 OF 9								
DRAWING No.		PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV				
N01031		-	PWD	-	DRG	-	GEN	-	0015	-	03



AD JOINS DRG N01031-PWD-DRG-GEN-0015

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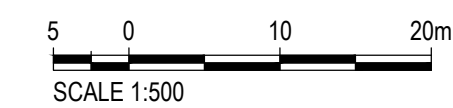


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	PROPOSED TRACK ALIGNMENT		EPL BOUNDARY		GABION WALL
	PROPOSED ACCESS ROAD		RIPARIAN VEGETATION MANAGEMENT		
	EXTENT OF EARTHWORKS		W-BEAM BARRIER		
	SIMTA RAIL CORRIDOR PERMANENT BOUNDARY		EXISTING GWS MONITORING WALL		
	CADASTRAL BOUNDARY		SYDNEY TRAINS RAIL CORRIDOR BOUNDARY		
	CONTOUR		1.5m HIGH BOLLARD		
	FUTURE INTERMODAL TERMINAL				

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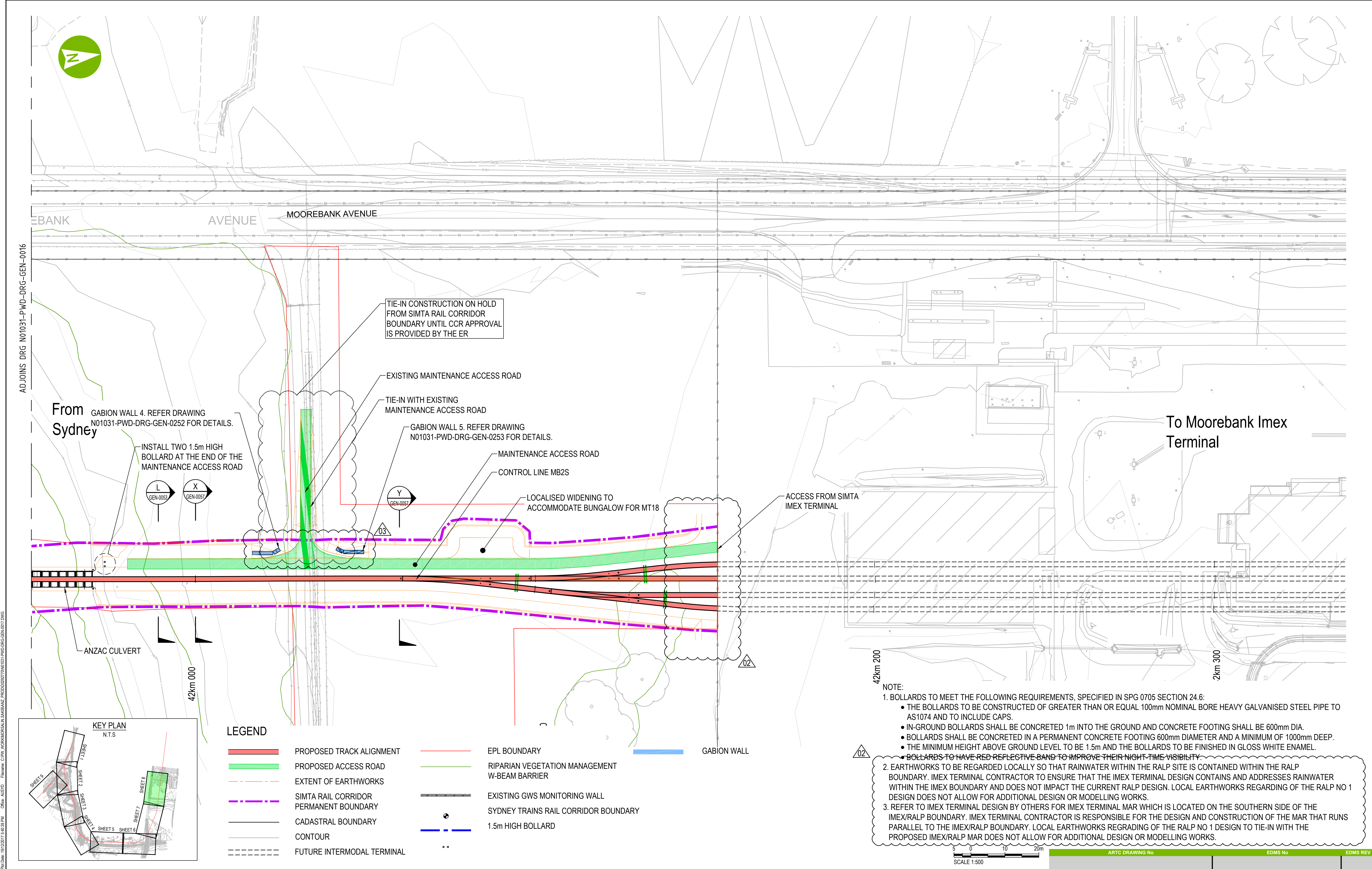


REV	DATE	REVISION DETAILS	APPROVED
01	20.01.17	ACCEPTED FOR CONSTRUCTION	
02	19.12.17	ACCEPTED FOR CONSTRUCTION RE-SUBMISSION	
03	09.02.17	ACCEPTED FOR CONSTRUCTION RE-SUBMISSION	

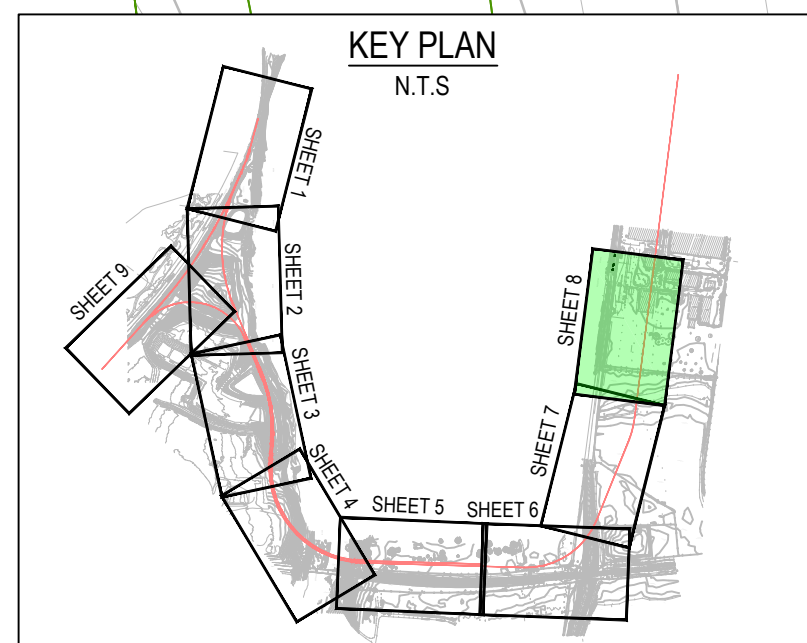
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AS SHOWN	A1

FOR CONSTRUCTION

ARTC DRAWING No	EDMS No	EDMS REV
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TITLE	BULK EARTHWORKS GENERAL ARRANGEMENT PLAN SHEET 7 OF 9	
DRAWING No.	PROJECT No.	ZONE
N01031	N01031	PWD
	TYPE	DISC
	DRG	GEN
	NUMBER	REV
	0016	03



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LEGEND

	PROPOSED TRACK ALIGNMENT		EPL BOUNDARY
	PROPOSED ACCESS ROAD		RIPARIAN VEGETATION MANAGEMENT
	EXTENT OF EARTHWORKS		W-BEAM BARRIER
	SIMTA RAIL CORRIDOR PERMANENT BOUNDARY		EXISTING GWS MONITORING WALL
	CADASTRAL BOUNDARY		SYDNEY TRAINS RAIL CORRIDOR BOUNDARY
	CONTOUR		1.5m HIGH BOLLARD
	FUTURE INTERMODAL TERMINAL		

NOTE:

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 - THE MINIMUM HEIGHT ABOVE GROUND LEVEL TO BE 1.5m AND THE BOLLARDS TO BE FINISHED IN GLOSS WHITE ENAMEL.
 - BOLLARDS TO HAVE RED REFLECTIVE BAND TO IMPROVE THEIR NIGHT TIME VISIBILITY.
- EARTHWORKS TO BE REGARDED LOCALLY SO THAT RAINWATER WITHIN THE RALP SITE IS CONTAINED WITHIN THE RALP BOUNDARY. IMEX TERMINAL CONTRACTOR TO ENSURE THAT THE IMEX TERMINAL DESIGN CONTAINS AND ADDRESSES RAINWATER WITHIN THE IMEX BOUNDARY AND DOES NOT IMPACT THE CURRENT RALP DESIGN. LOCAL EARTHWORKS REGARDING OF THE RALP NO 1 DESIGN DOES NOT ALLOW FOR ADDITIONAL DESIGN OR MODELLING WORKS.
- REFER TO IMEX TERMINAL DESIGN BY OTHERS FOR IMEX TERMINAL MAR WHICH IS LOCATED ON THE SOUTHERN SIDE OF THE IMEX/RALP BOUNDARY. IMEX TERMINAL CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND CONSTRUCTION OF THE MAR THAT RUNS PARALLEL TO THE IMEX/RALP BOUNDARY. LOCAL EARTHWORKS REGRADING OF THE RALP NO 1 DESIGN TO TIE-IN WITH THE PROPOSED IMEX/RALP MAR DOES NOT ALLOW FOR ADDITIONAL DESIGN OR MODELLING WORKS.

SCALE 1:500





REV	DATE	REVISION DETAILS	APPROVED
01	20.01.17	ACCEPTED FOR CONSTRUCTION	
02	09.06.17	ACCEPTED FOR CONSTRUCTION RE-SUBMISSION	
03	19.12.17	ACCEPTED FOR CONSTRUCTION RE-SUBMISSION	

SCALE	SIZE
AS SHOWN	A1

FOR CONSTRUCTION	DATE
	20.01.17

ARTC DRAWING No		EDMS No		EDMS REV		
PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1					
TITLE	BULK EARTHWORKS GENERAL ARRANGEMENT PLAN SHEET 8 OF 9					
DRAWING No.	PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV
	N01031	PWD	DRG	GEN	0017	03



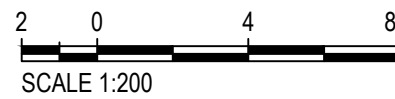
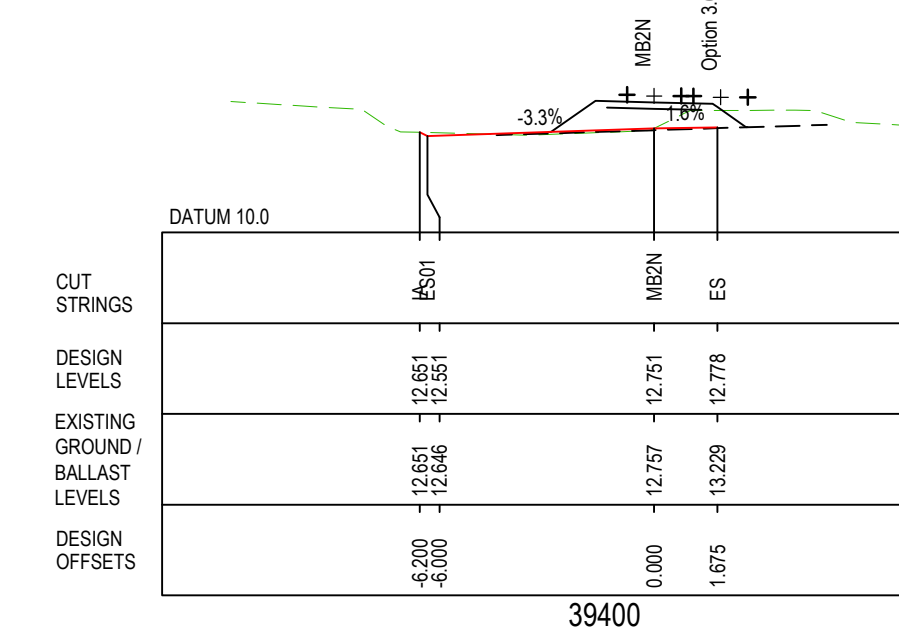
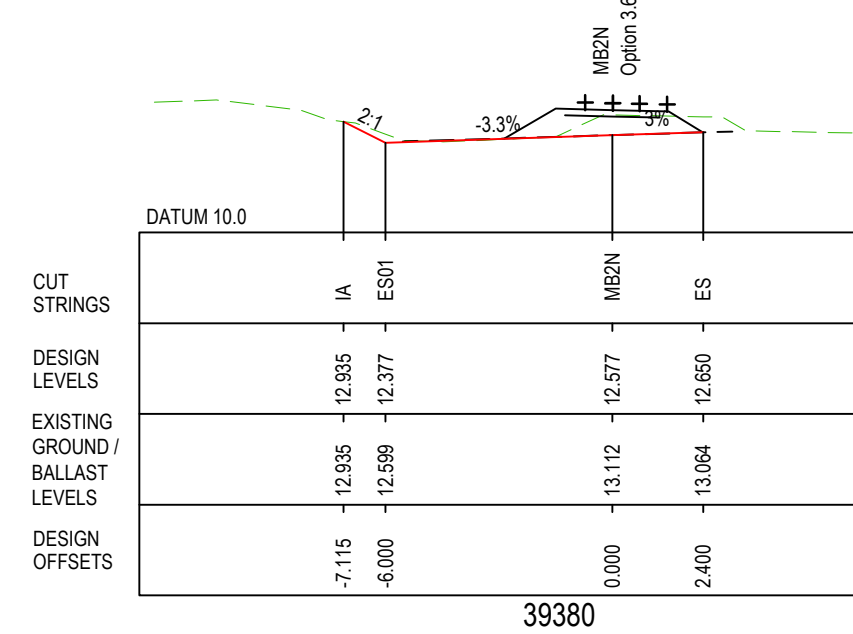
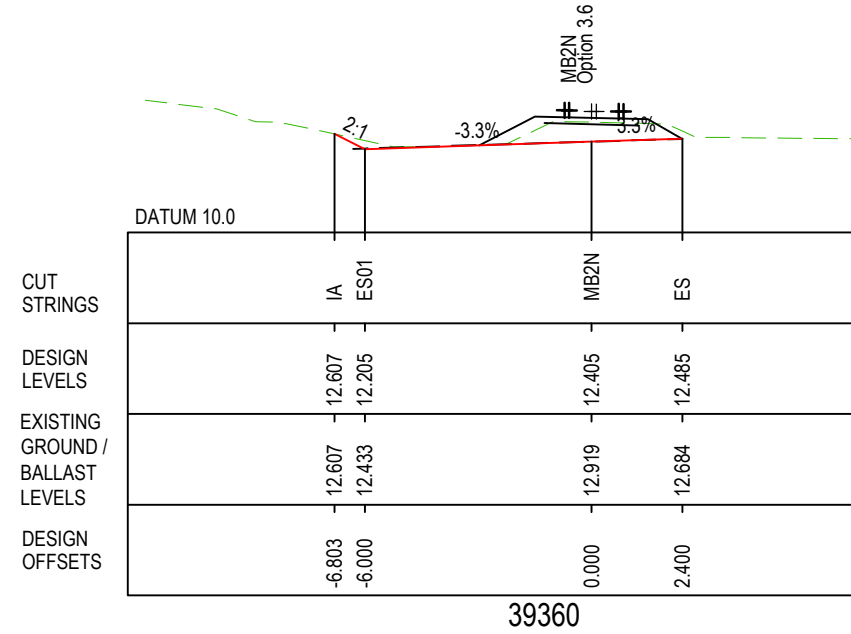
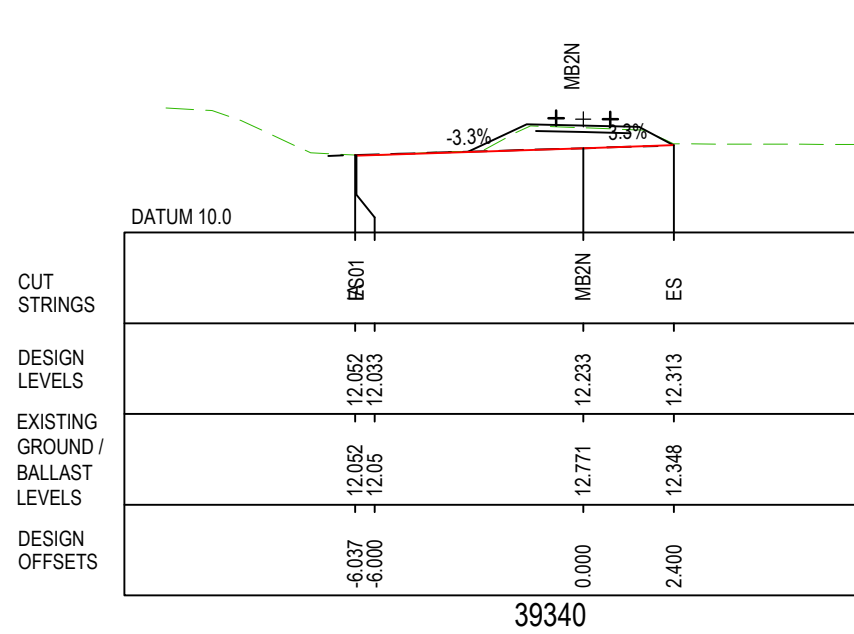
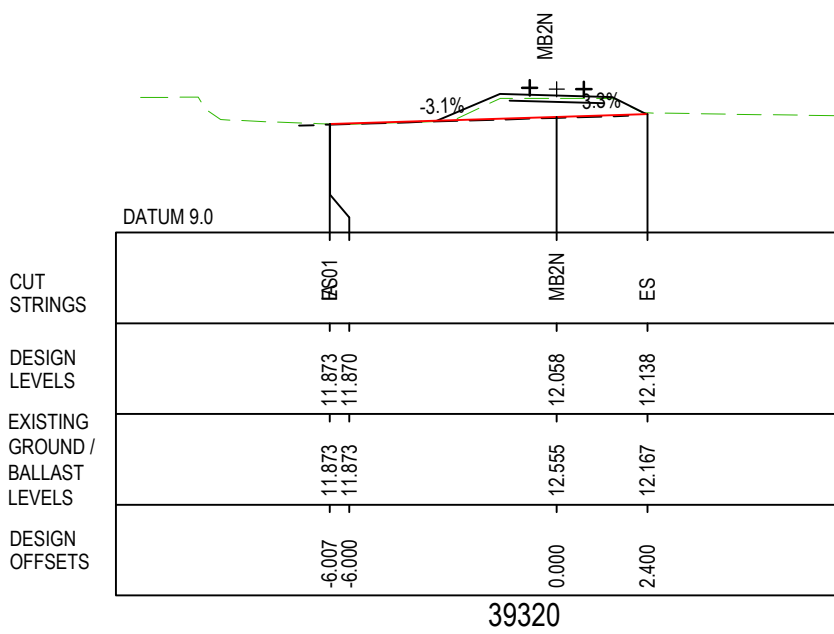
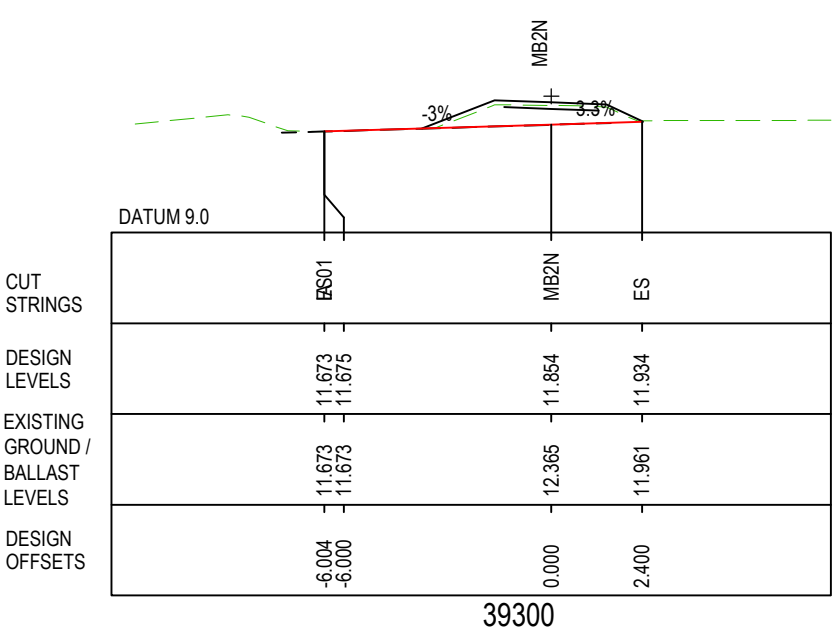
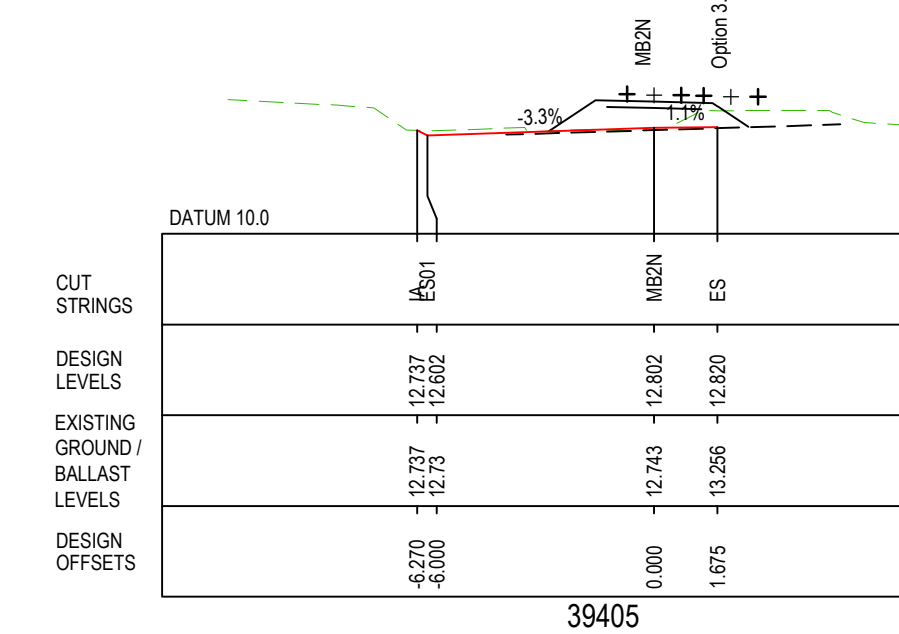
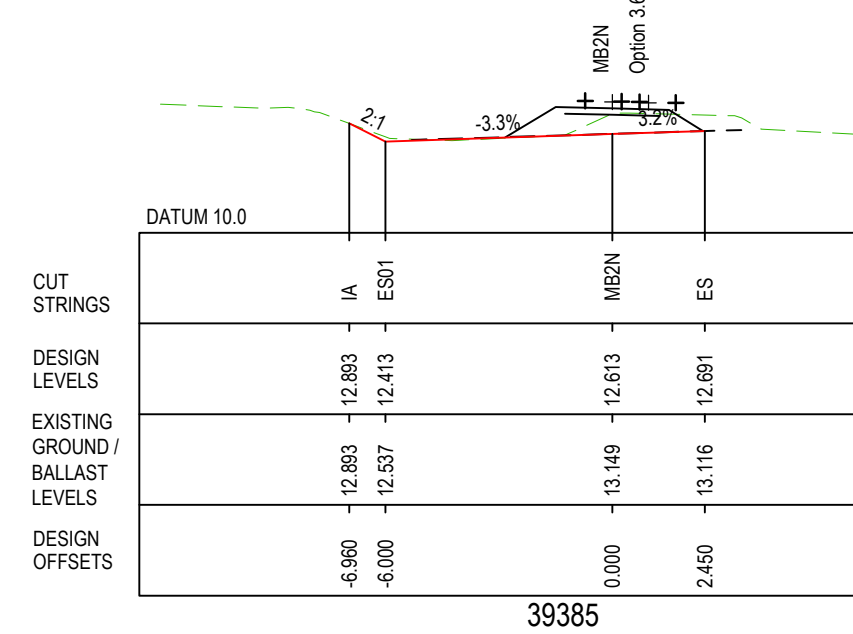
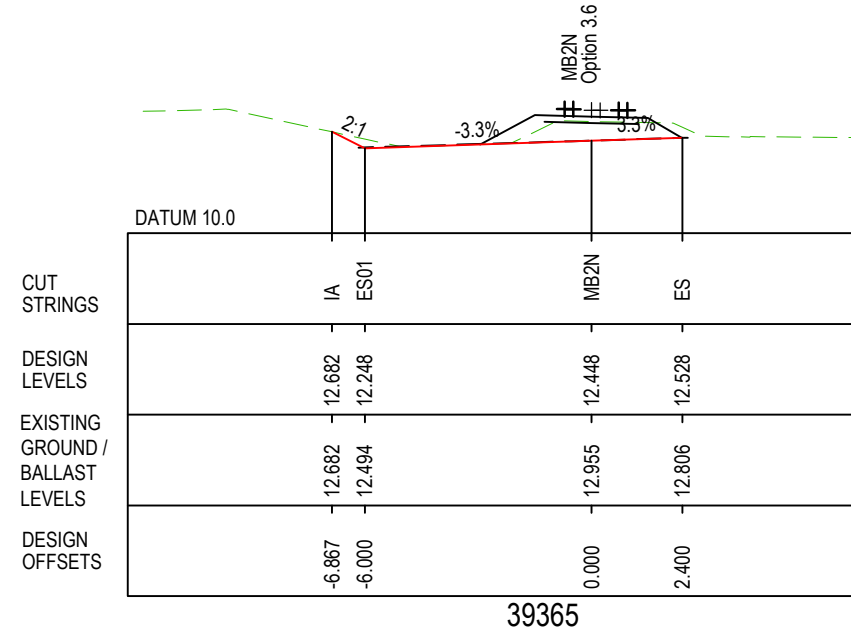
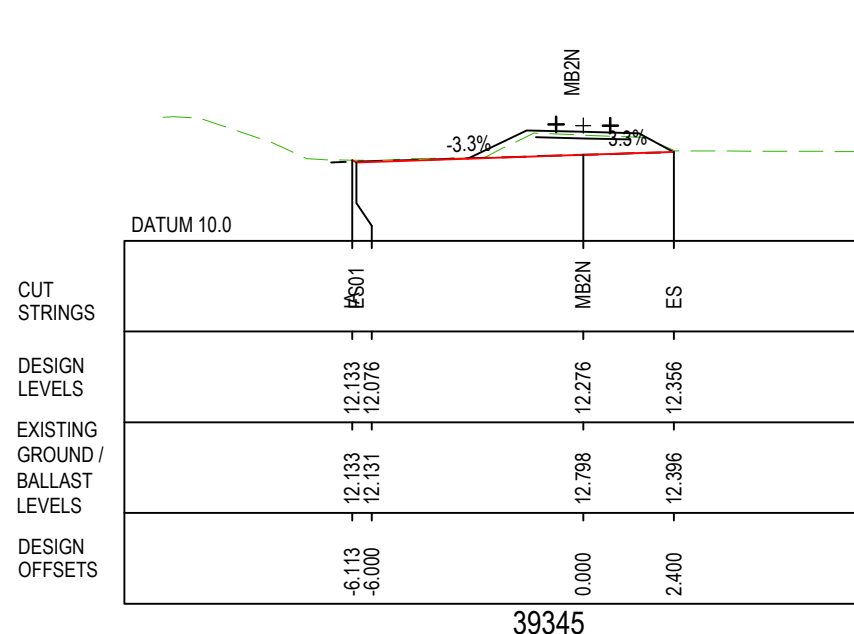
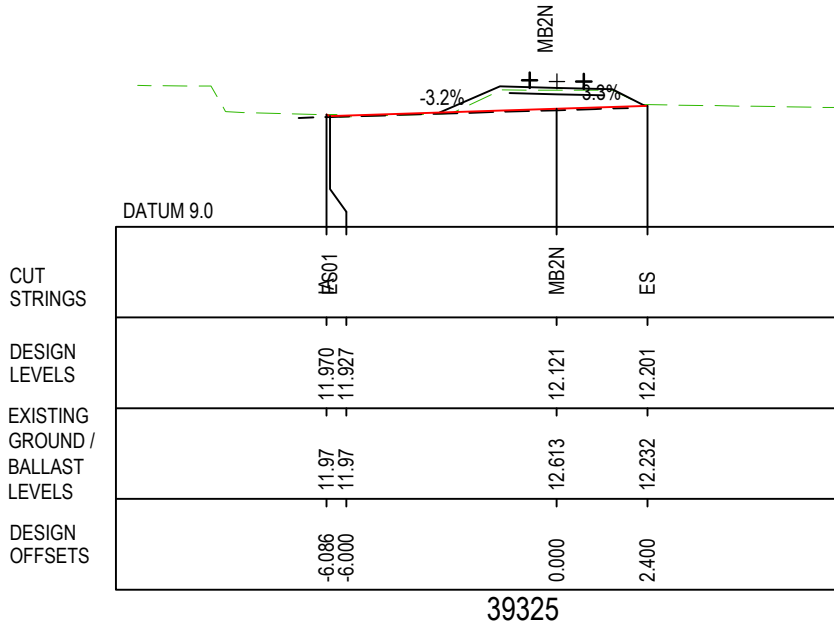
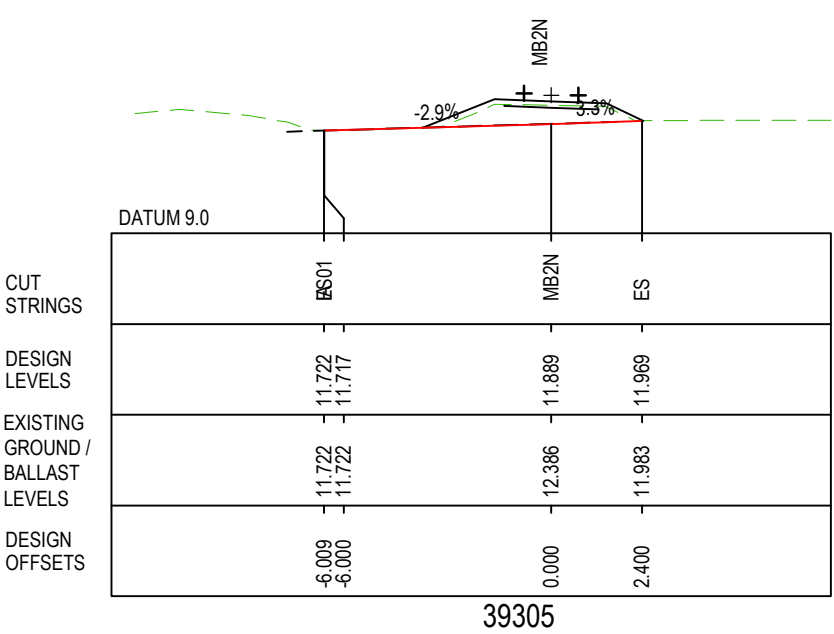
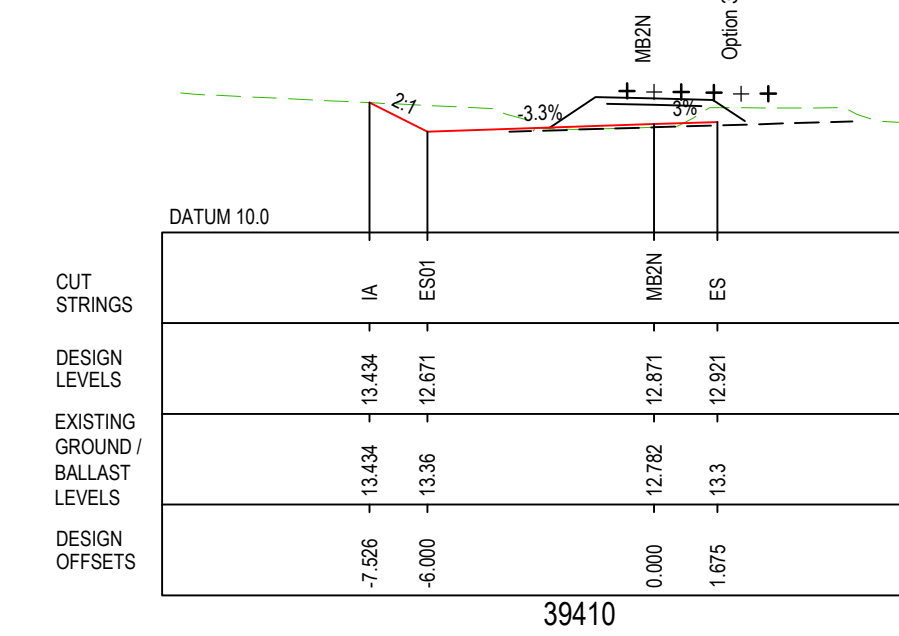
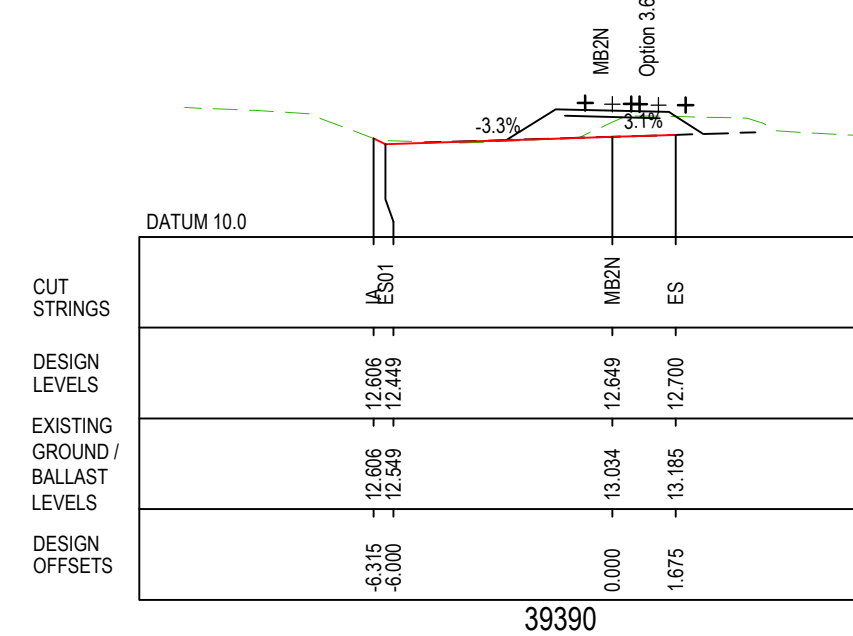
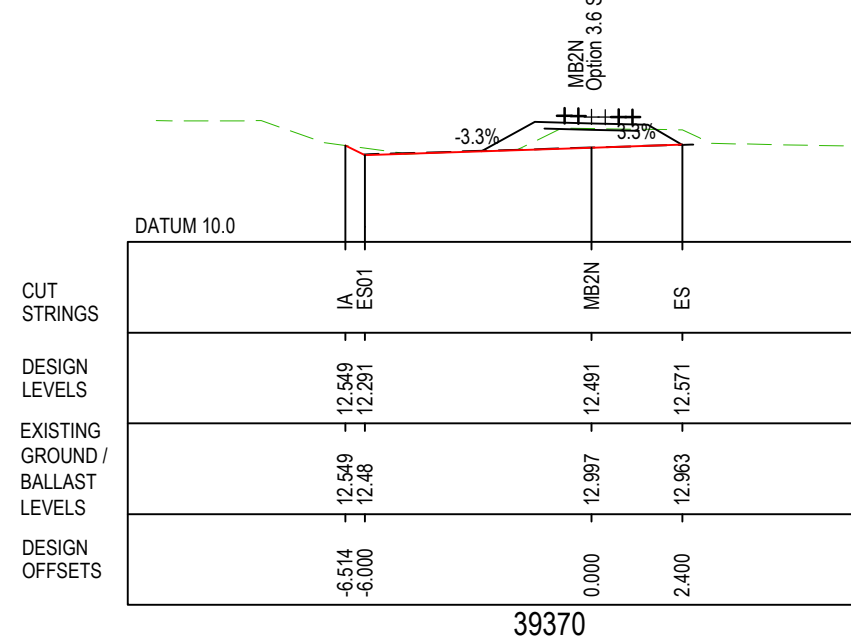
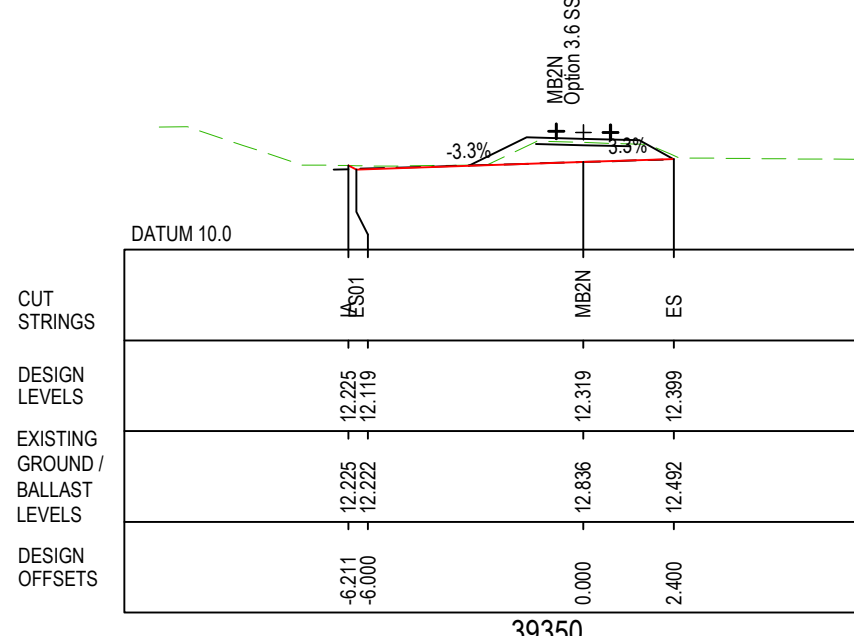
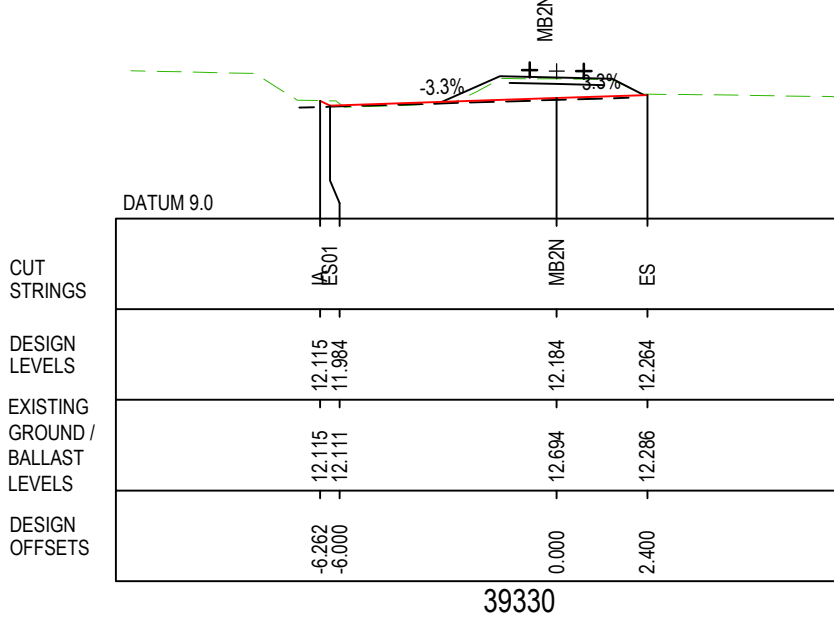
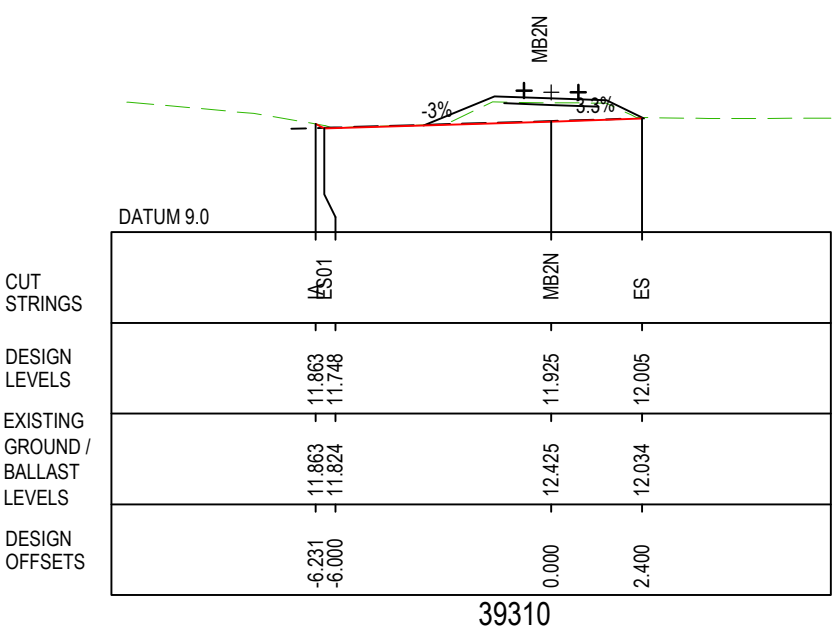
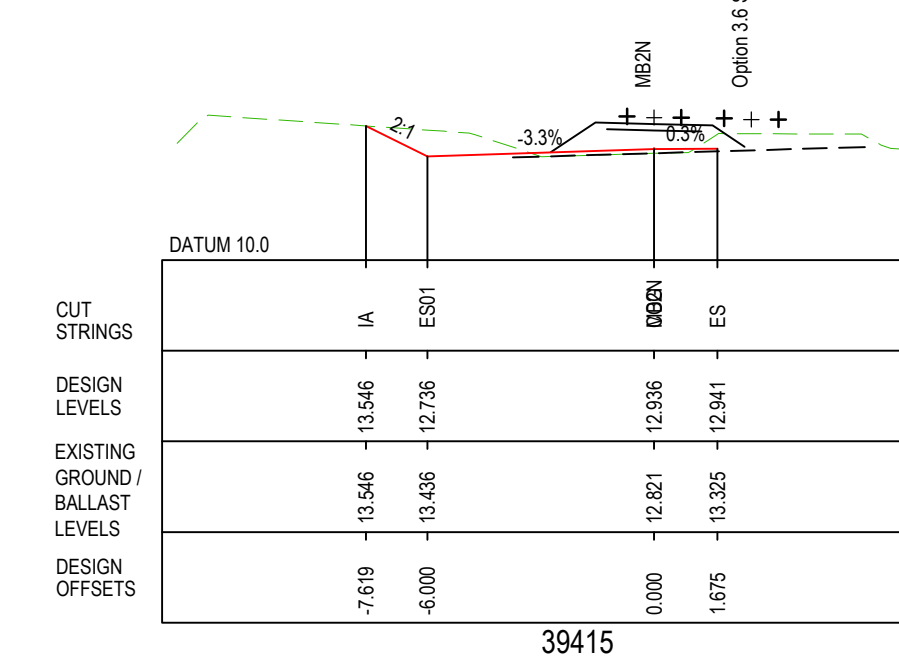
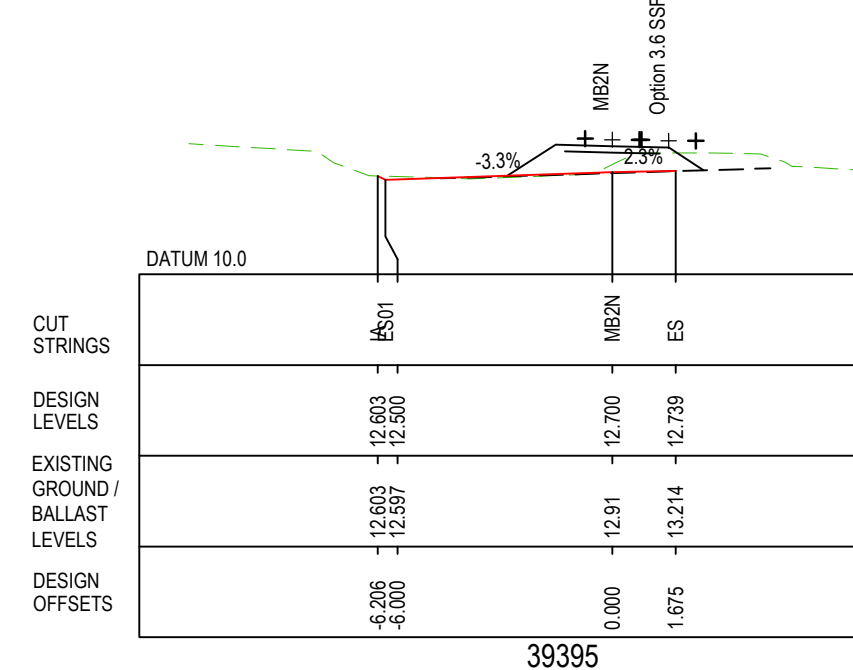
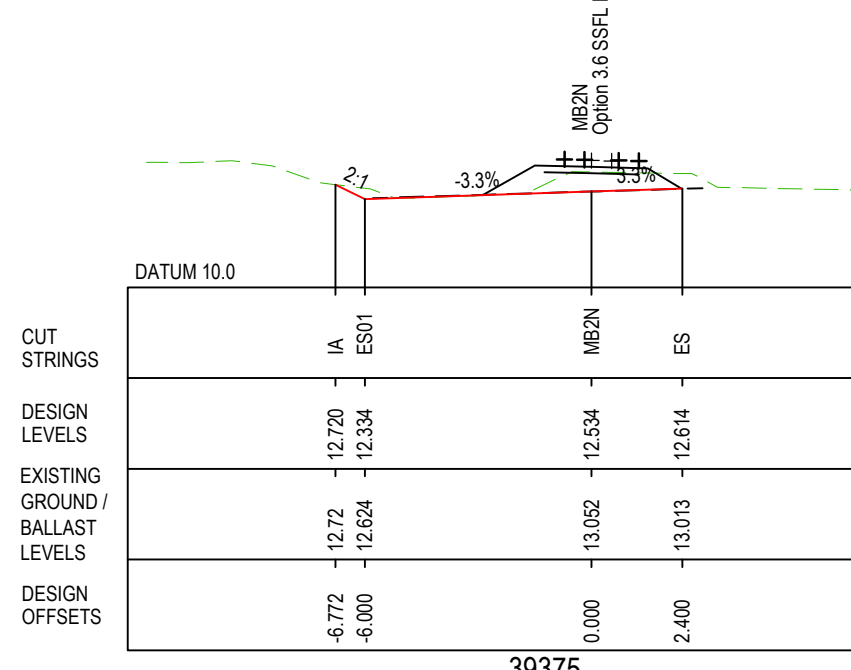
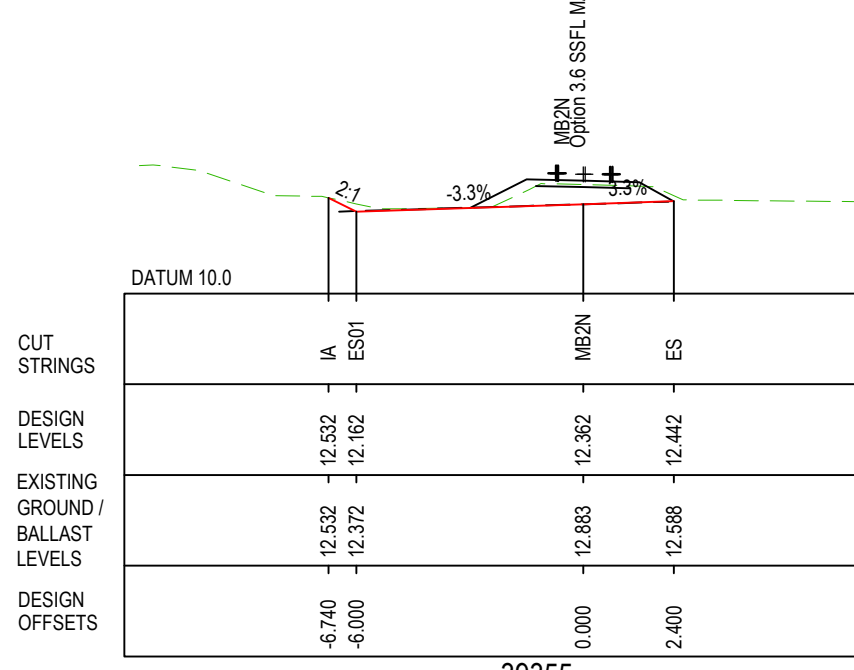
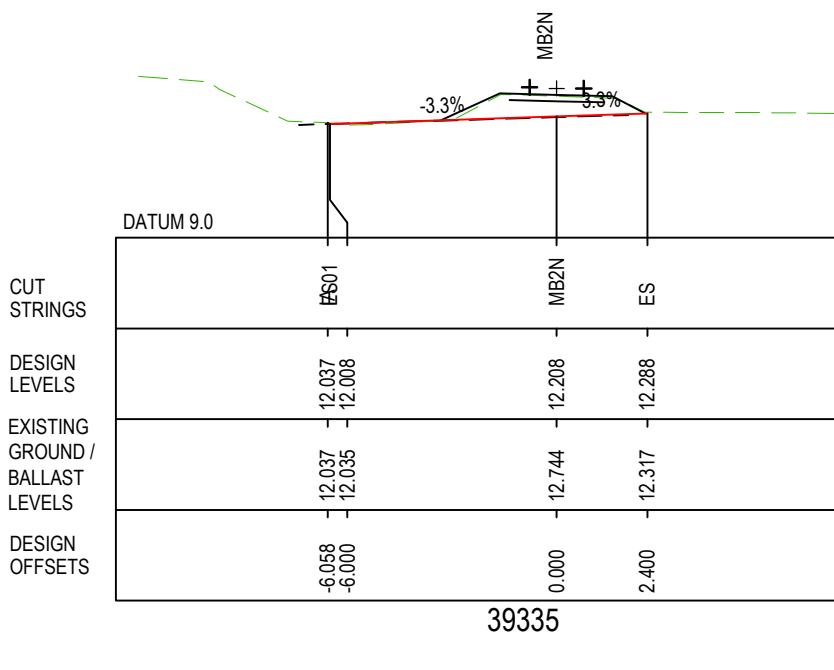
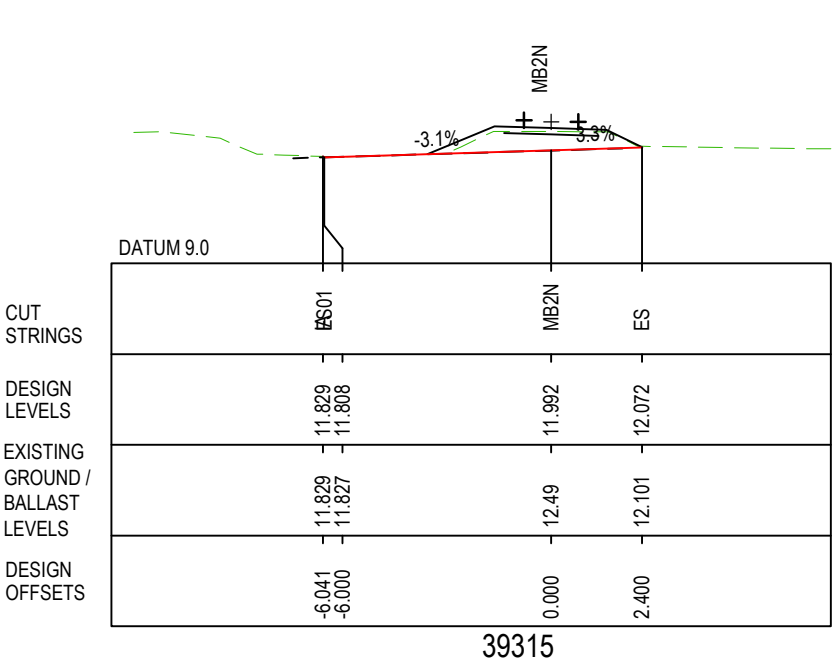
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		02	09.06.17	ACCEPTED FOR CONSTRUCTION RE-SUBMISSION											
		03	07.02.18	ACCEPTED FOR CONSTRUCTION RE-SUBMISSION											
								DATE	TITLE						
								20.01.17							
									DRAWING No.	PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV
										N01031	- PWD	- DRG	- GEN	0018	- 03

LEGEND

- DESIGN SURFACE (TOP OF CAPPING)
EXISTING SURFACE / TOP OF SSFL BALLAST
ASSUMED TOP OF SSFL EXISTING CAPPING LAYER (REFER NOTE 1)
BRIDGE STRUCTURE
PROPOSED RAIL DESIGN

NORTHERN CONNECTION TIE-IN INTERFACE TO ARTC ALIGNMENT NOTES:

1. THE TOP OF EXISTING CAPPING LEVELS (UNDERNEATH SSFL BALLAST) HAVE BEEN INTERPOLATED FROM EXISTING SURVEY FOR THE PURPOSE OF EARTHWORKS DESIGN DEVELOPMENT AND MODELLING. TOP OF EXISTING CAPPING LEVELS TO BE CONFIRMED DURING CONSTRUCTION.
2. BASED ON THE INTERPOLATED TOP OF EXISTING CAPPING LEVELS, THE EXISTING CAPPING LAYER TO BE RETAINED AND TOPPED UP TO DESIGN SURFACE LEVELS TO ACHIEVE REQUIRED BALLAST DEPTHS AND CROSSFALLS.
3. EXISTING SSFL BALLAST PROFILE REQUIRE MINOR ALTERATION TO FACILITATE MINOR VERTICAL CHANGE TO THE EXISTING SSFL LINES AND FIT DEEPER TURNOUT BEARERS.



Proj Date: 2/8/2017 3:12:33 PM File Name: C:\PM\WORKSPACE\LEV\LITTLEANZ\PROJECTS\2017\N01031\PMO.DWG CEN\MS.DWG



REV	DATE	REVISION DETAILS	APPROVED
01	20.01.17	ACCEPTED FOR CONSTRUCTION	

SCALE	SIZE	FOR CONSTRUCTION
AS SHOWN	A1	

ARTC DRAWING No	EDMS No	EDMS REV
PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1	
TITLE	BULK EARTHWORKS NORTHERN CONNECTION CROSS SECTIONS SHEET 1 OF 15	
DRAWING No.	PROJECT No.	ZONE
	N01031	PWD
		TYPE
		DRG
		DISC
		GEN
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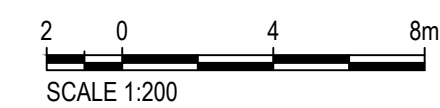
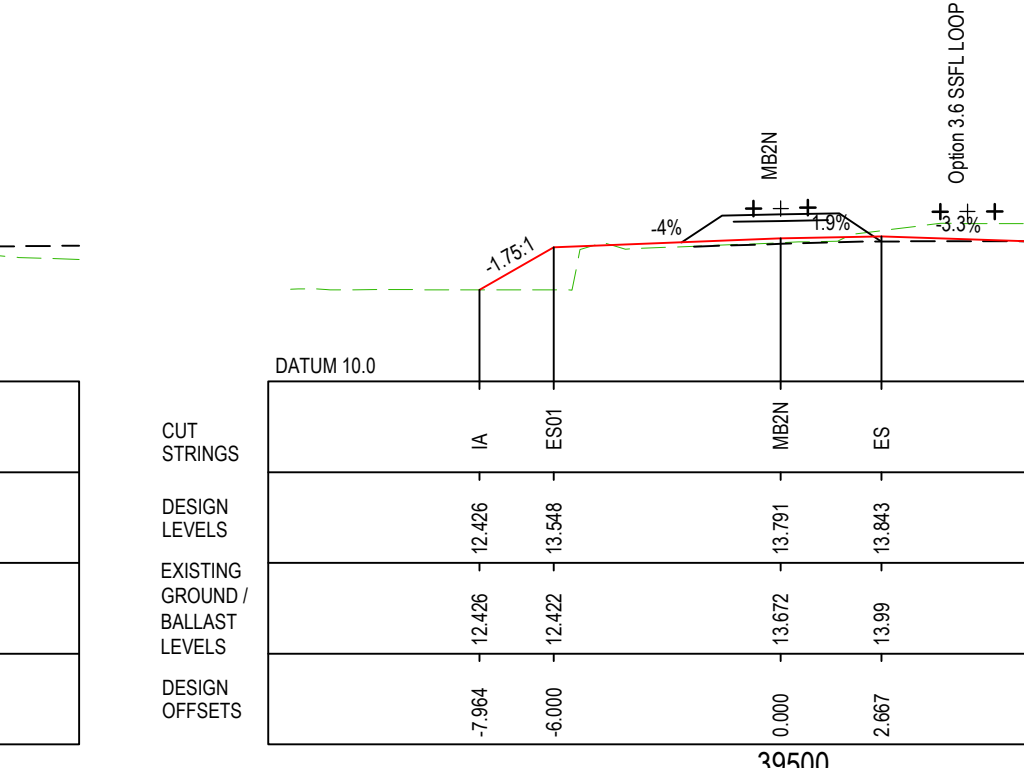
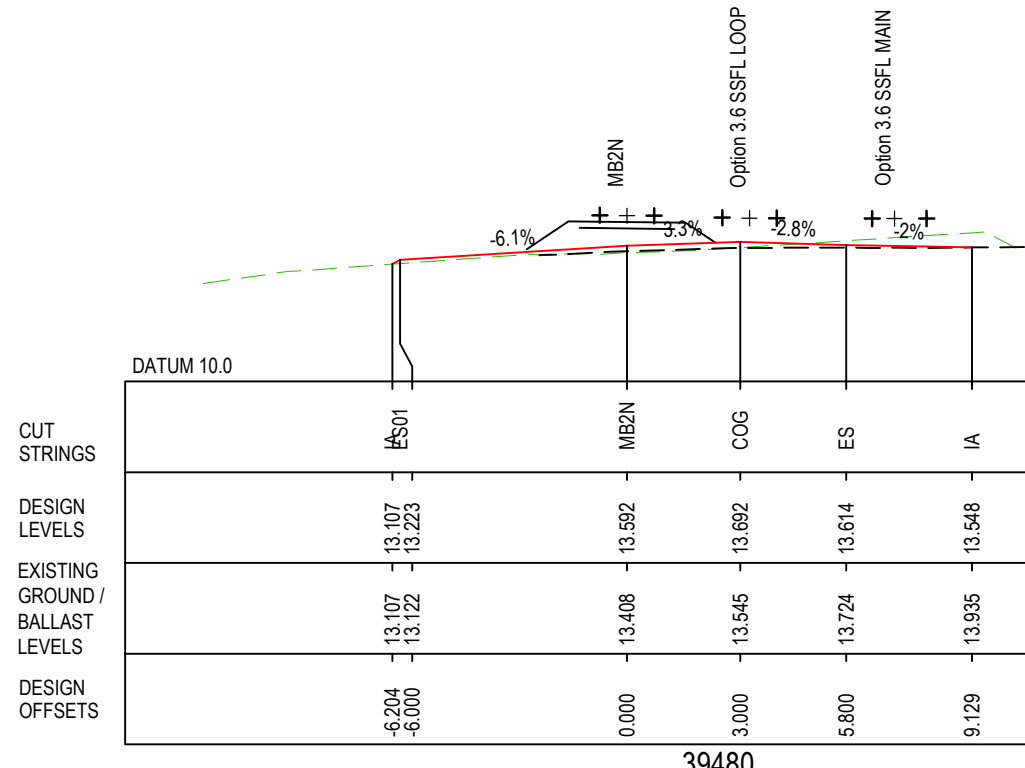
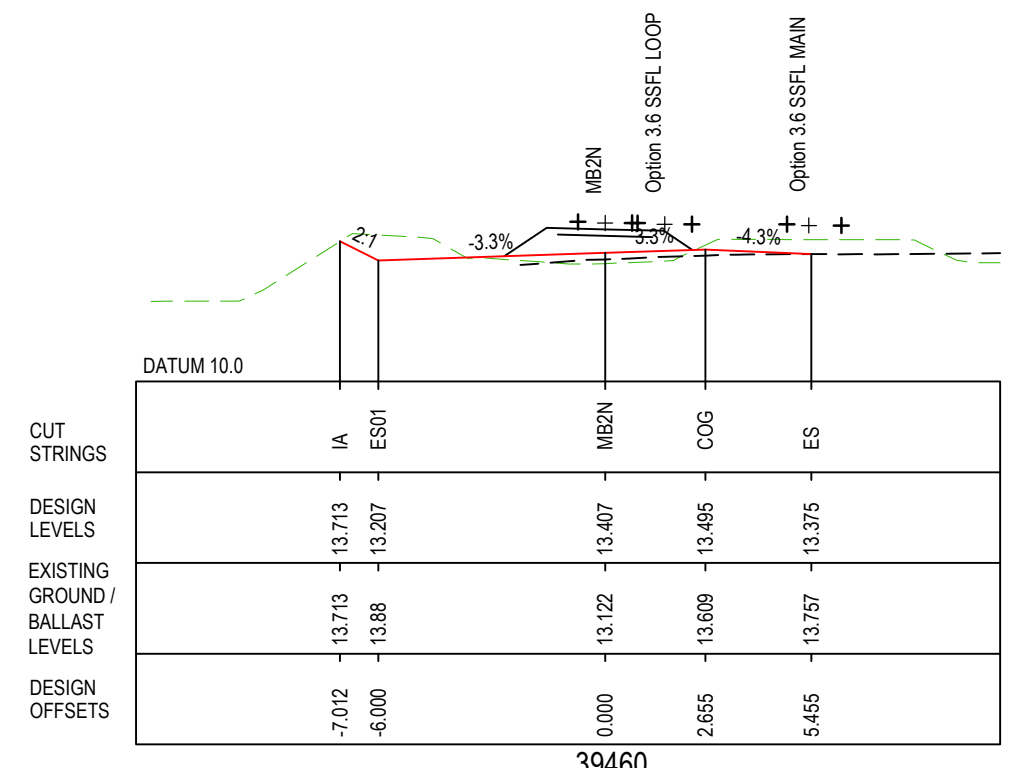
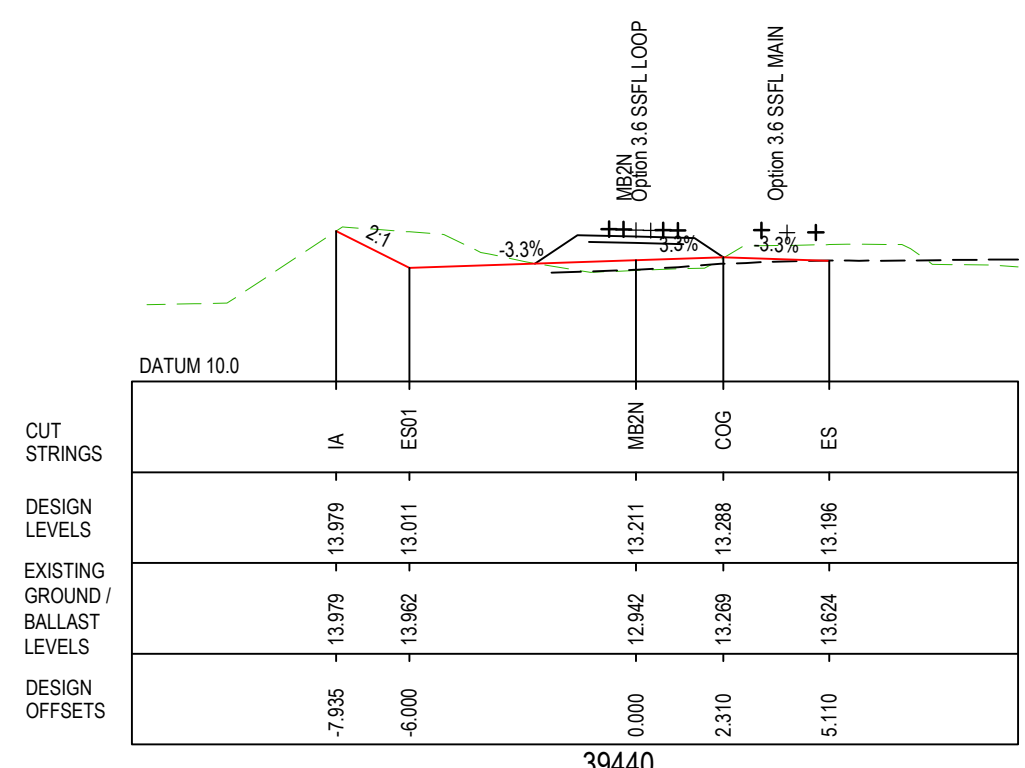
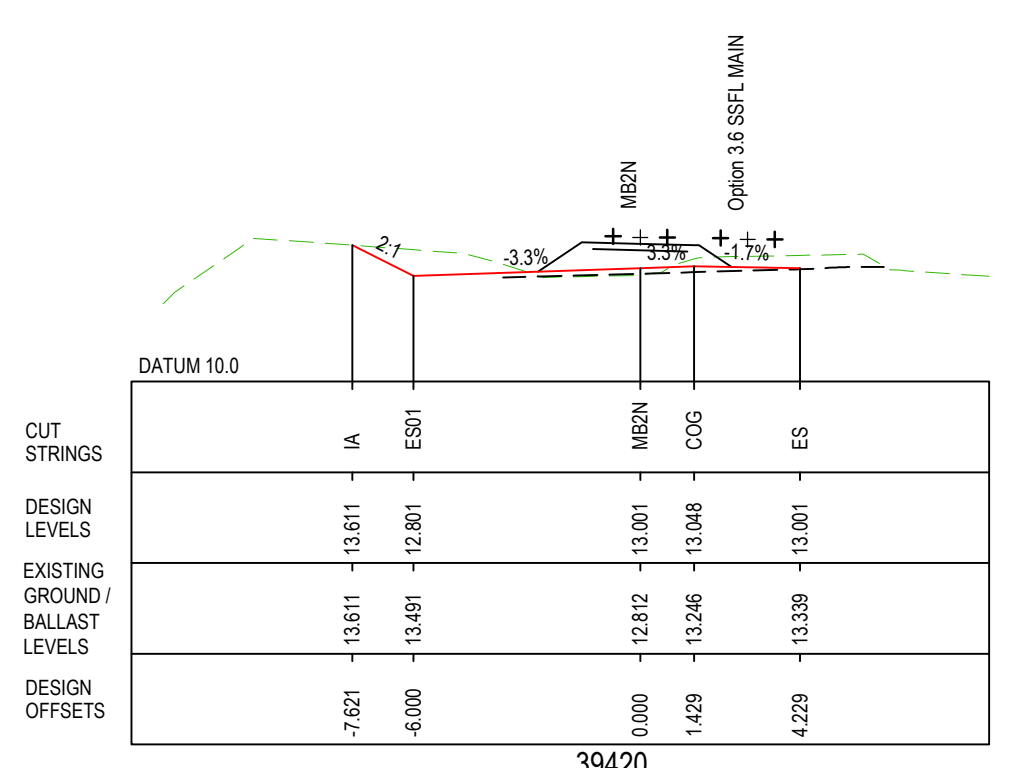
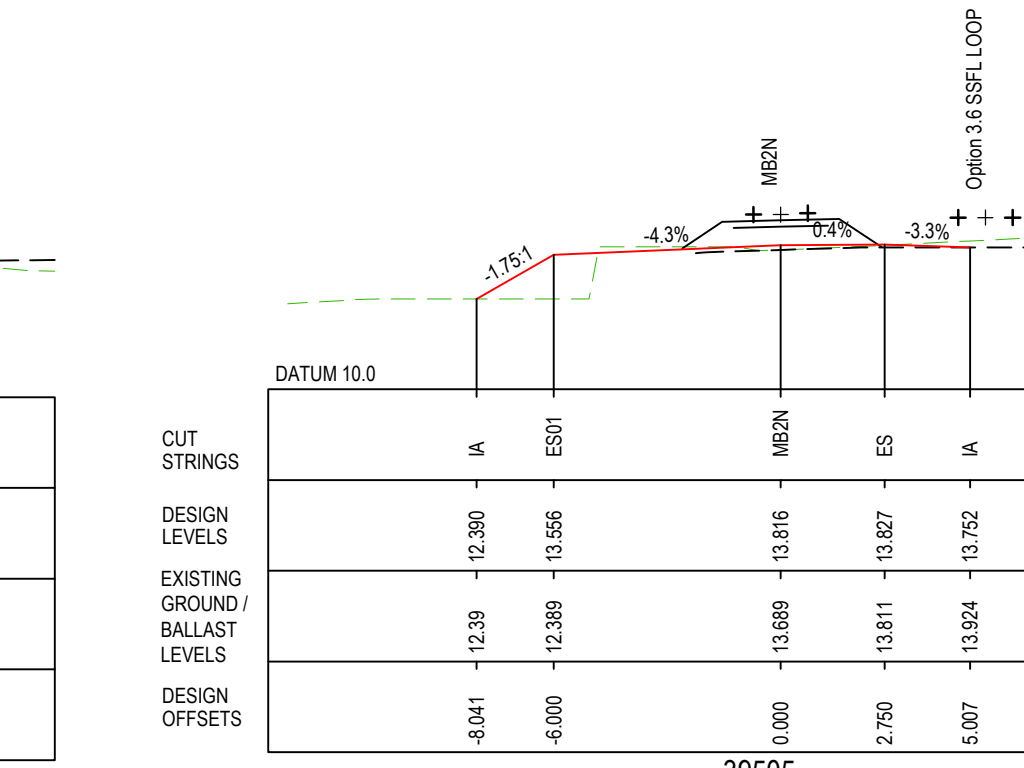
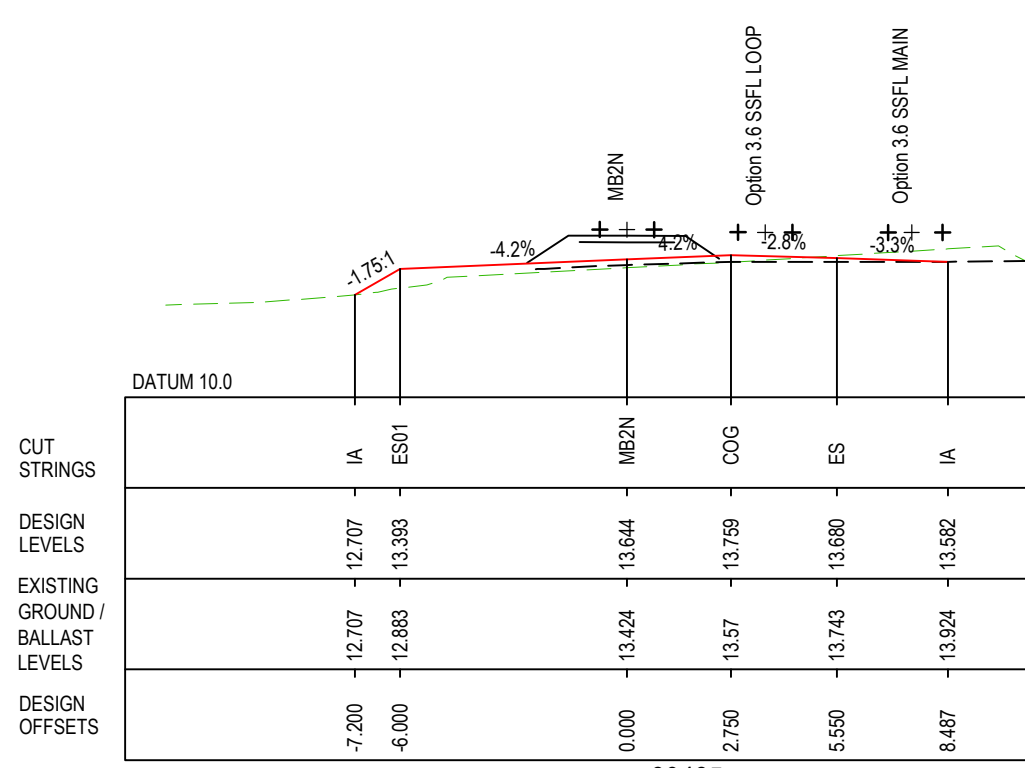
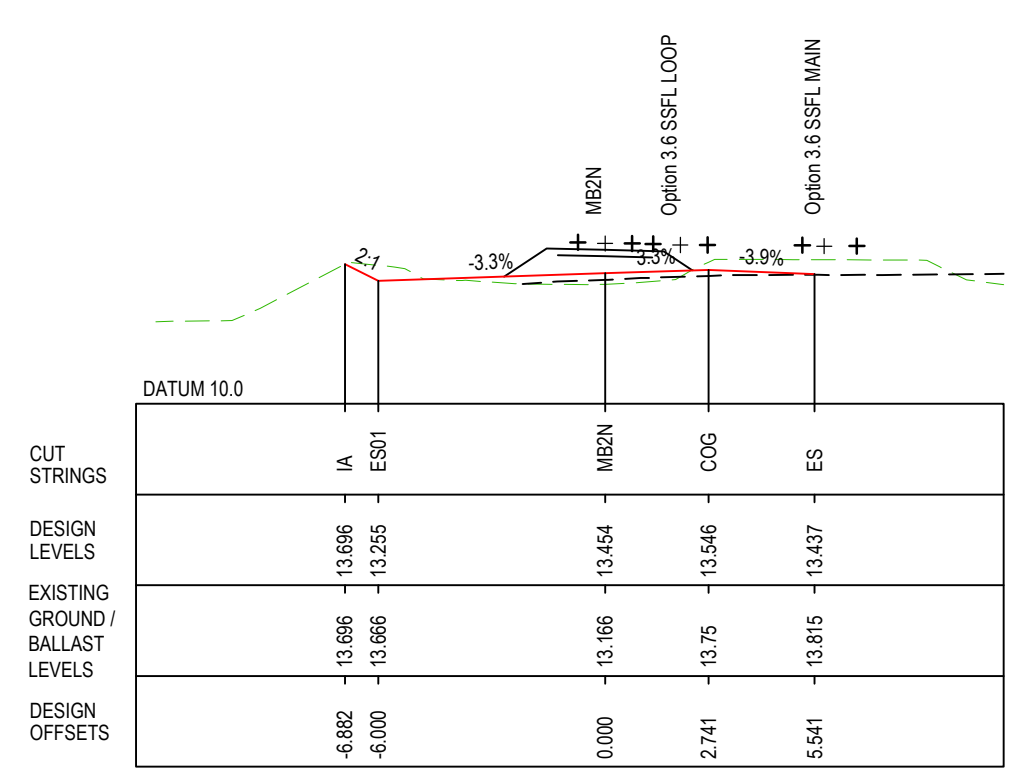
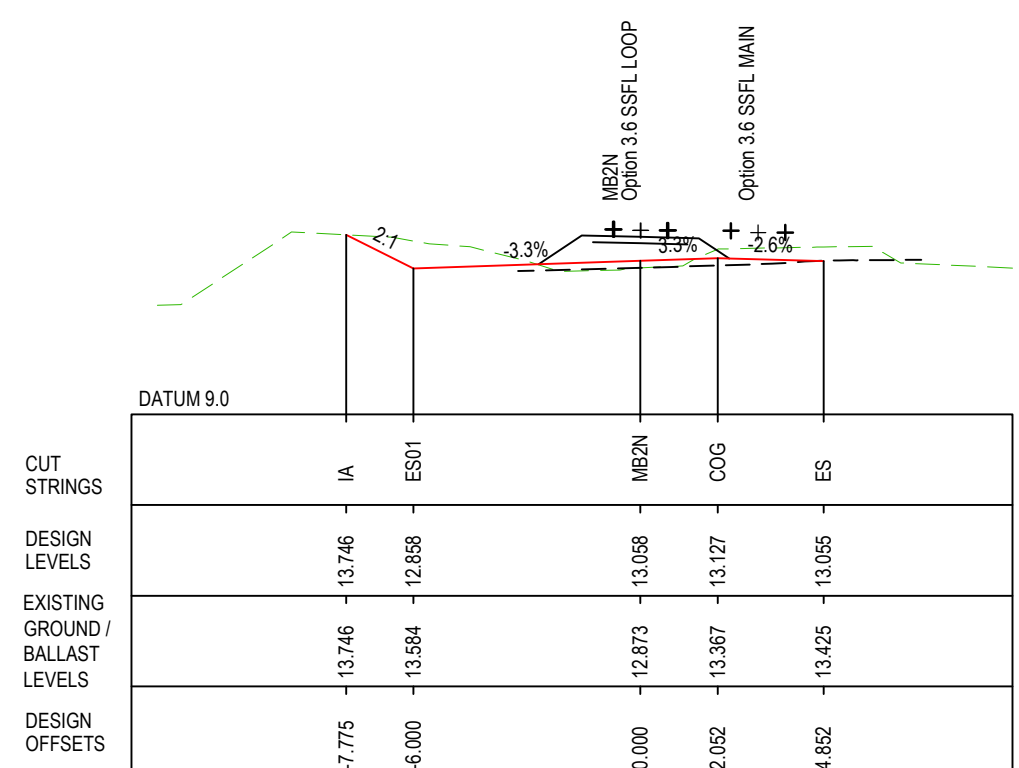
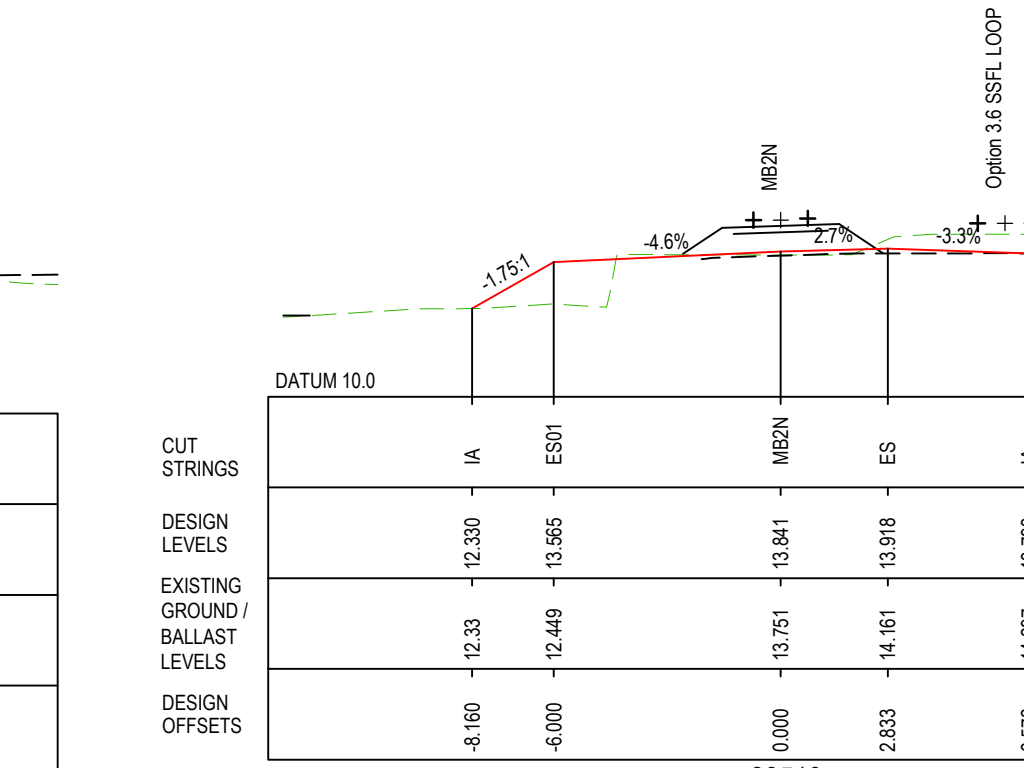
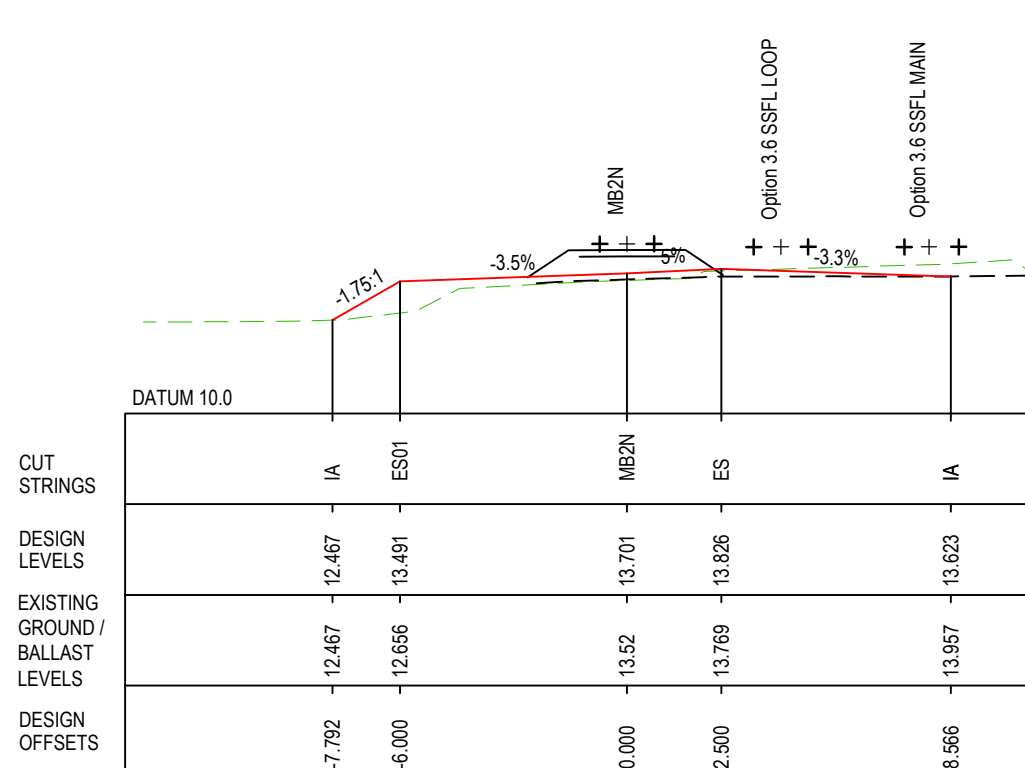
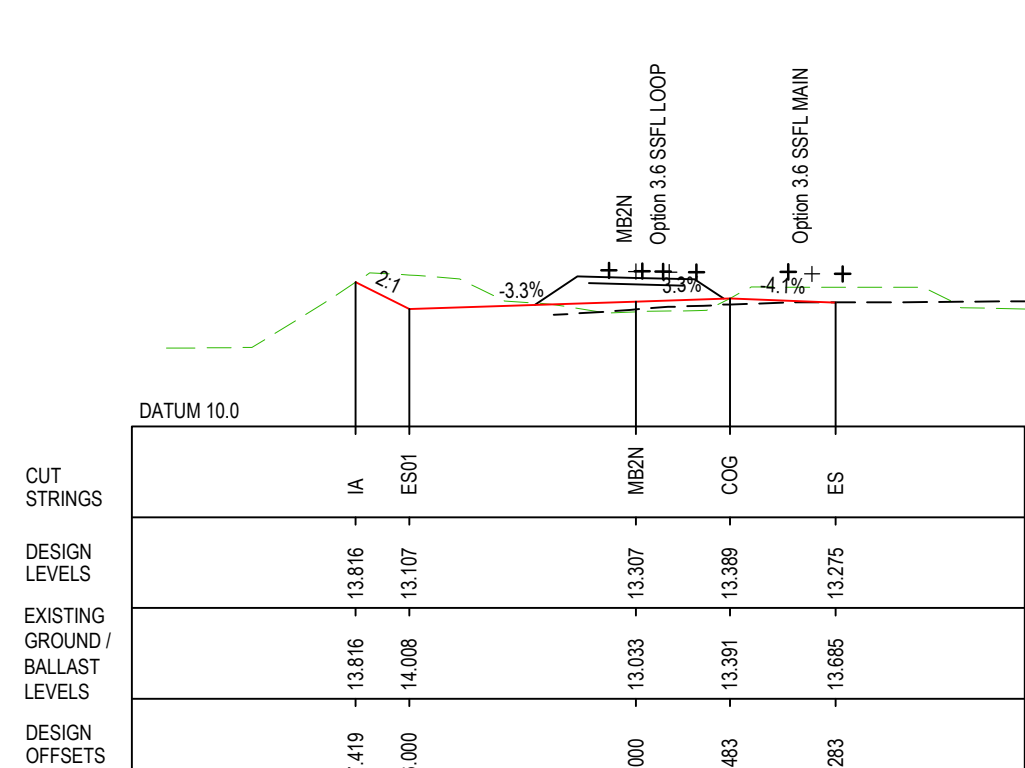
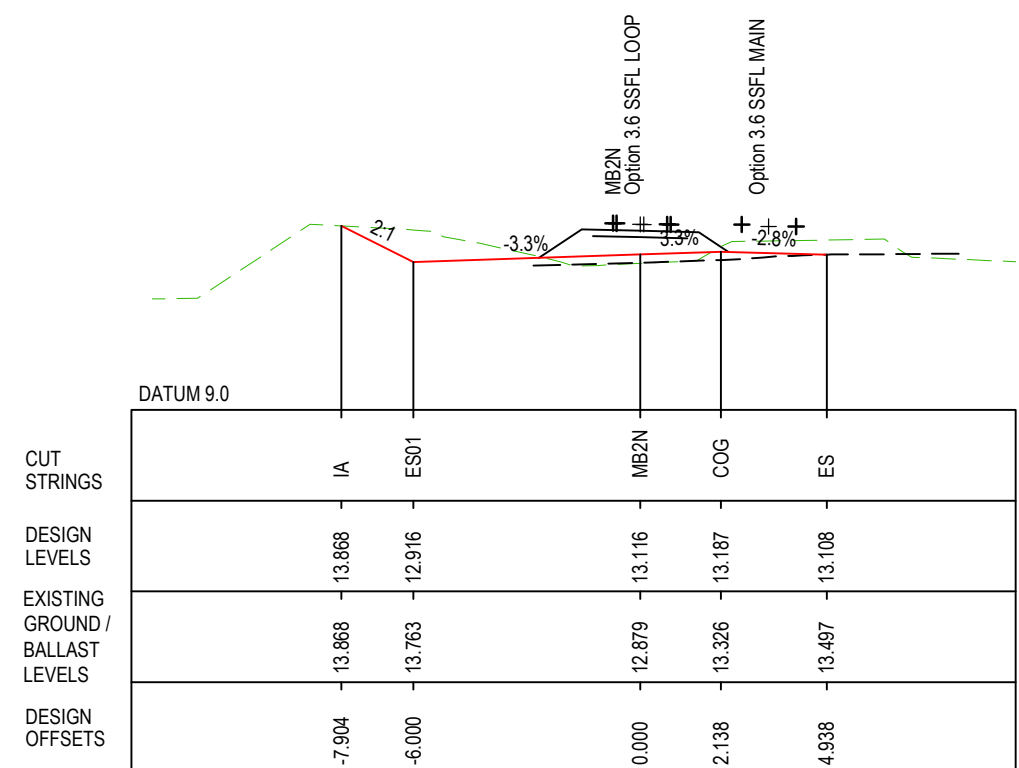
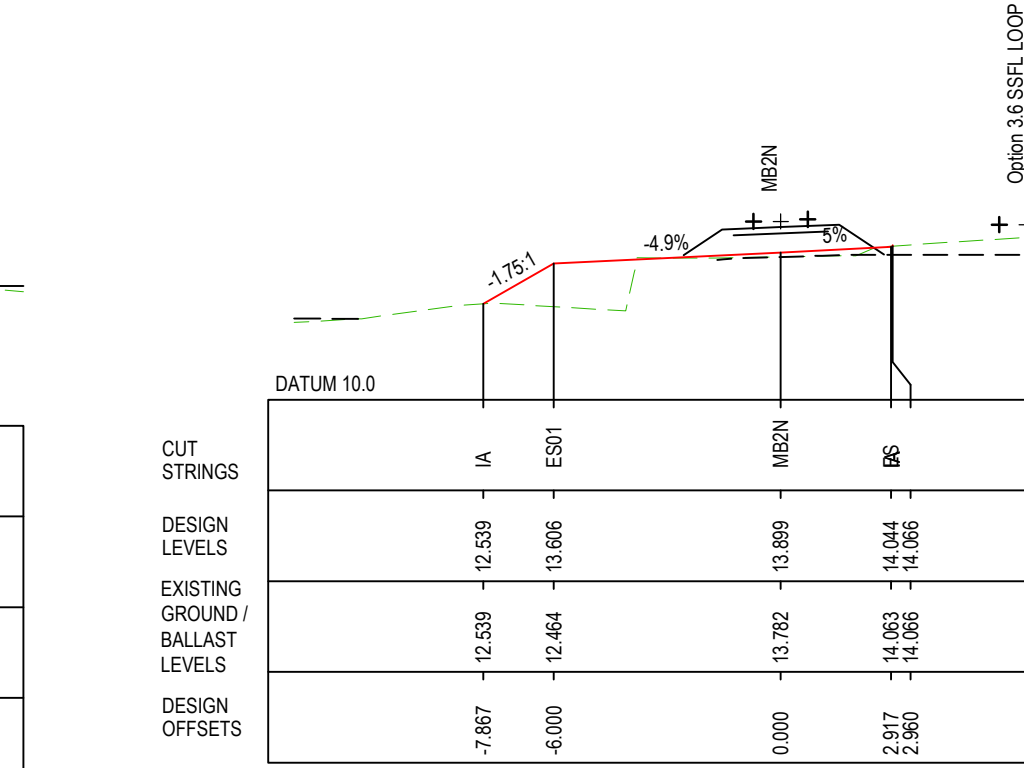
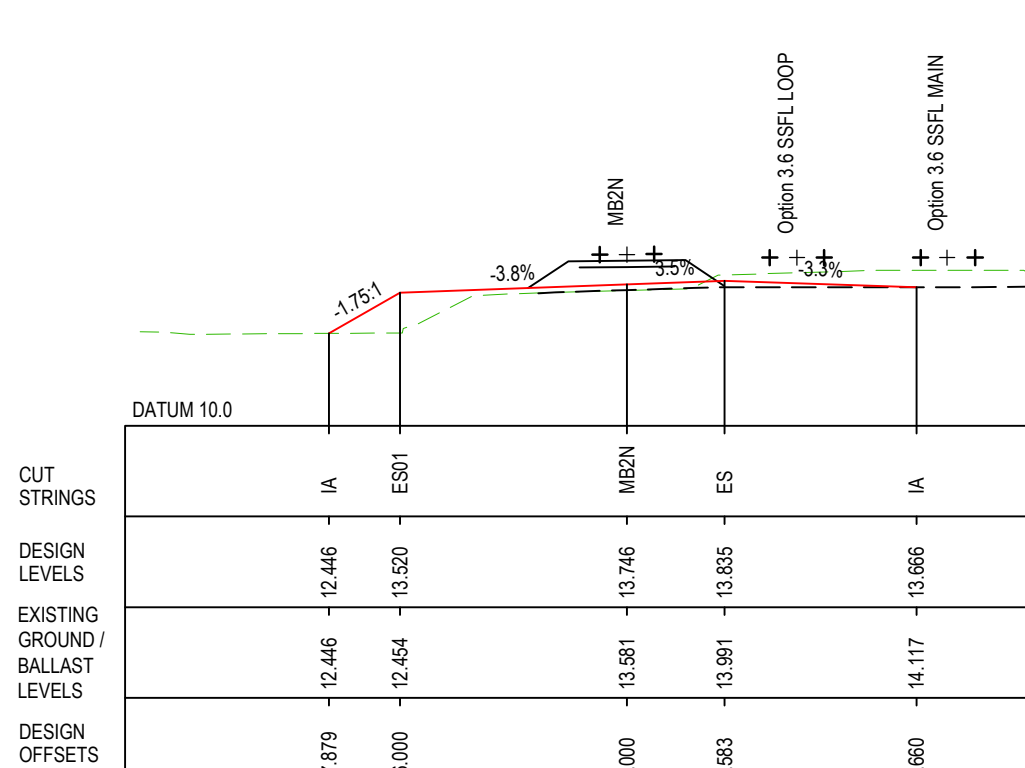
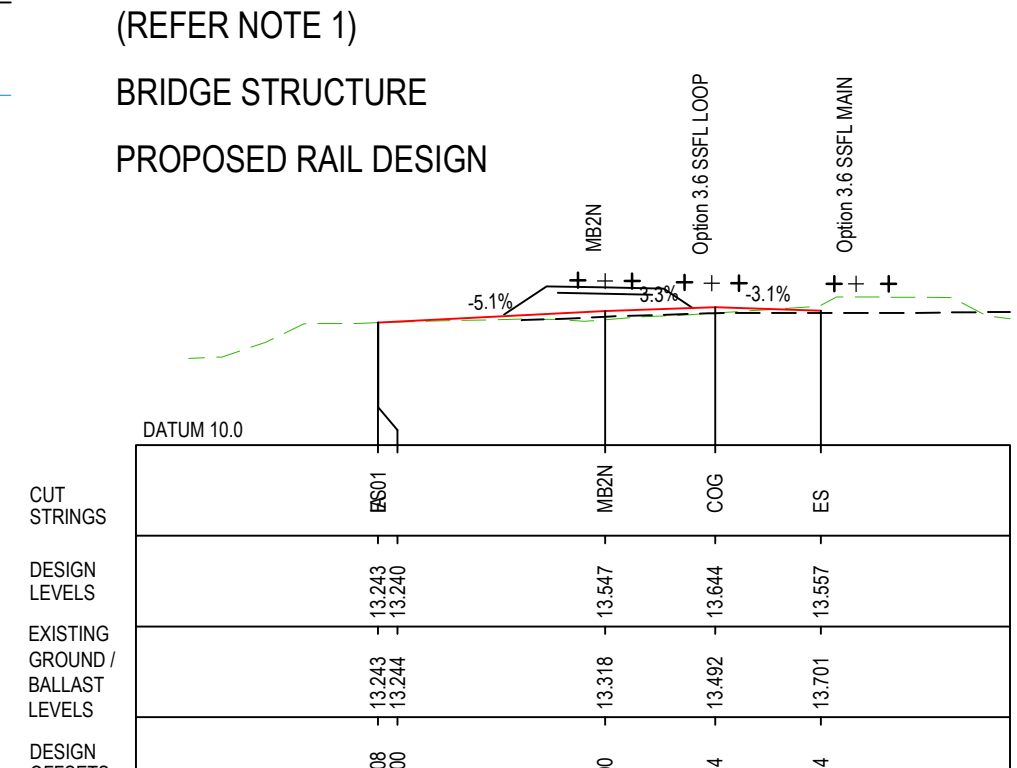
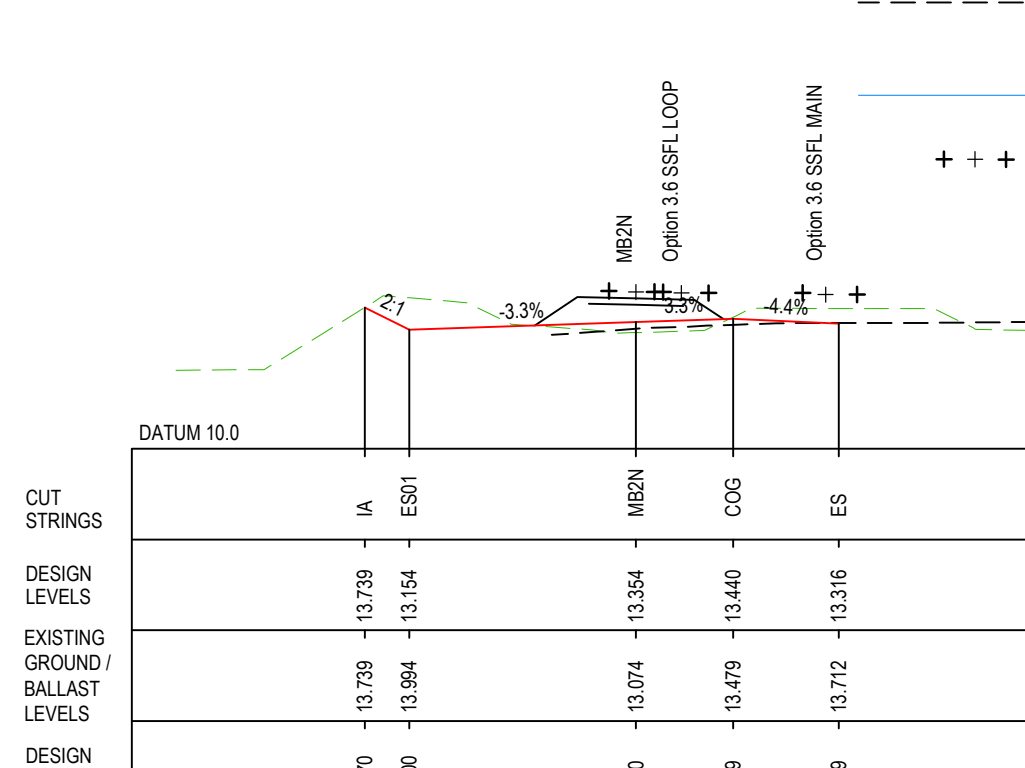
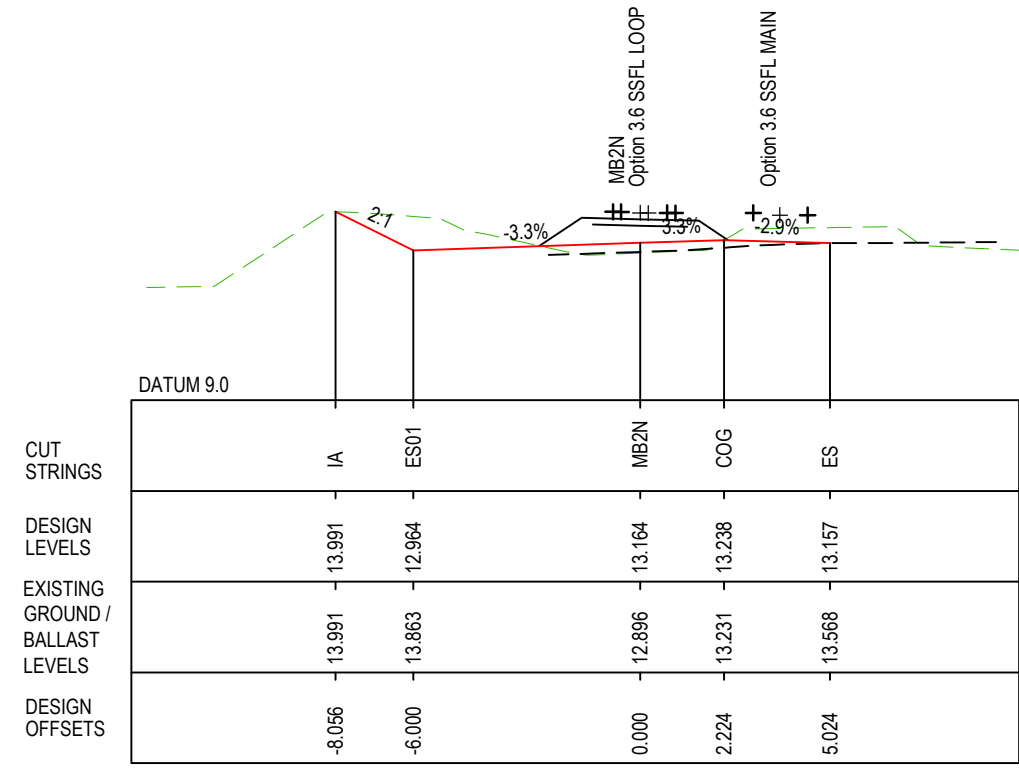
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LEGEND

- DESIGN SURFACE (TOP OF CAPPING)
- EXISTING SURFACE / TOP OF SSFL BALLAST
- ASSUMED TOP OF SSFL EXISTING CAPPING LAYER (REFER NOTE 1)
- BRIDGE STRUCTURE
- PROPOSED RAIL DESIGN

NORTHERN CONNECTION TIE-IN INTERFACE TO ARTC ALIGNMENT NOTES:

1. REFER DRAWING N01031-PWD-DRG-GEN-0025 FOR NORTHERN CONNECTION NOTES.

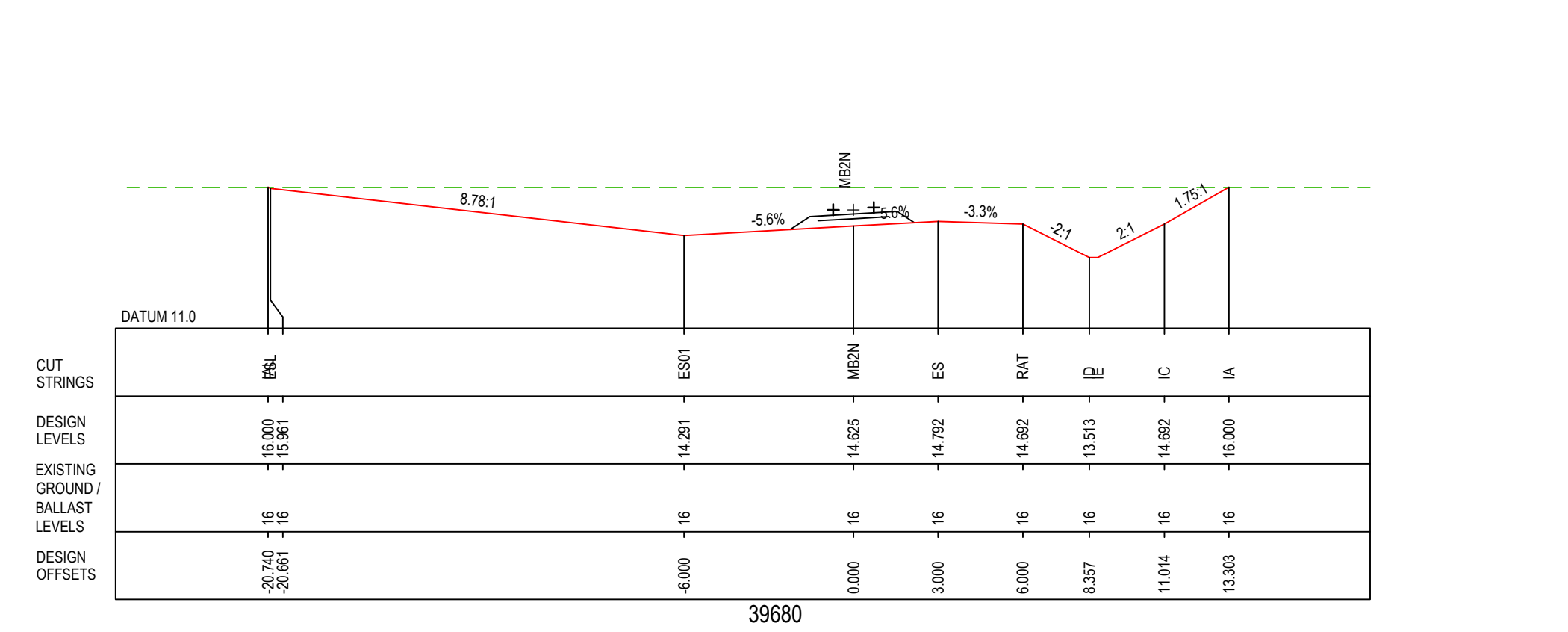
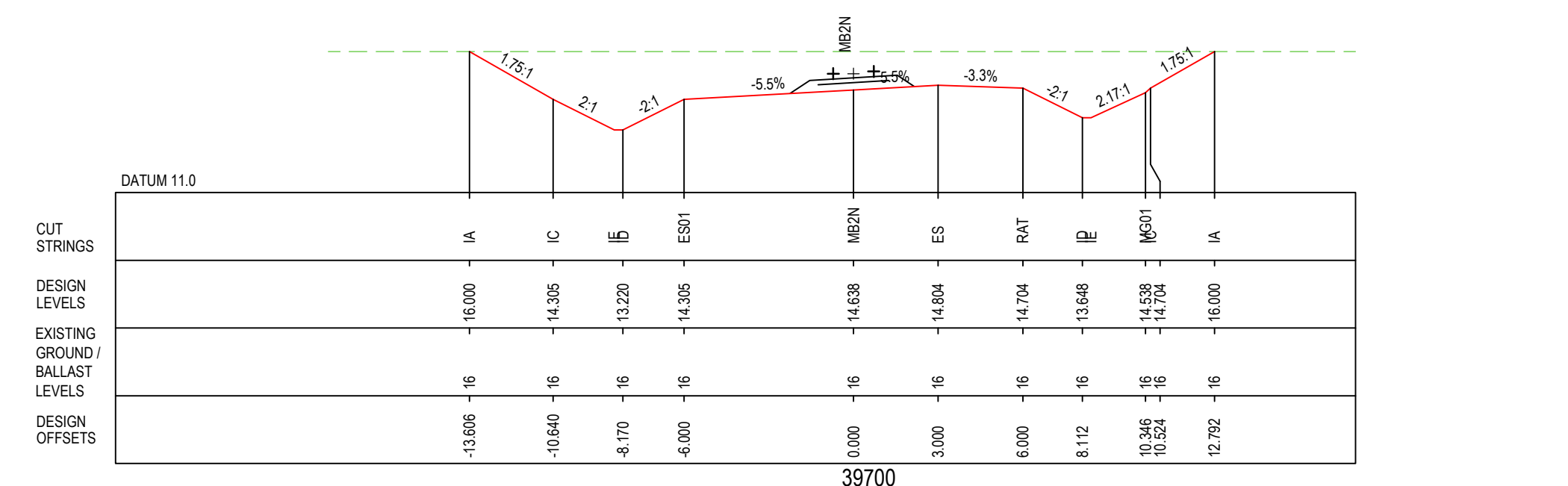
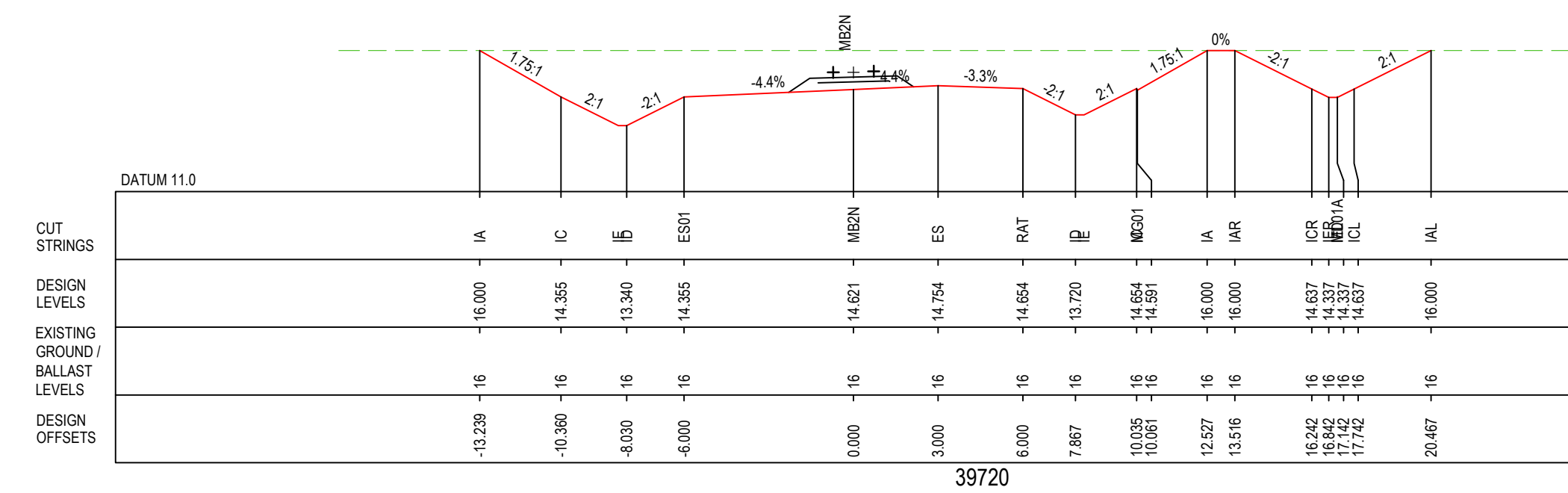
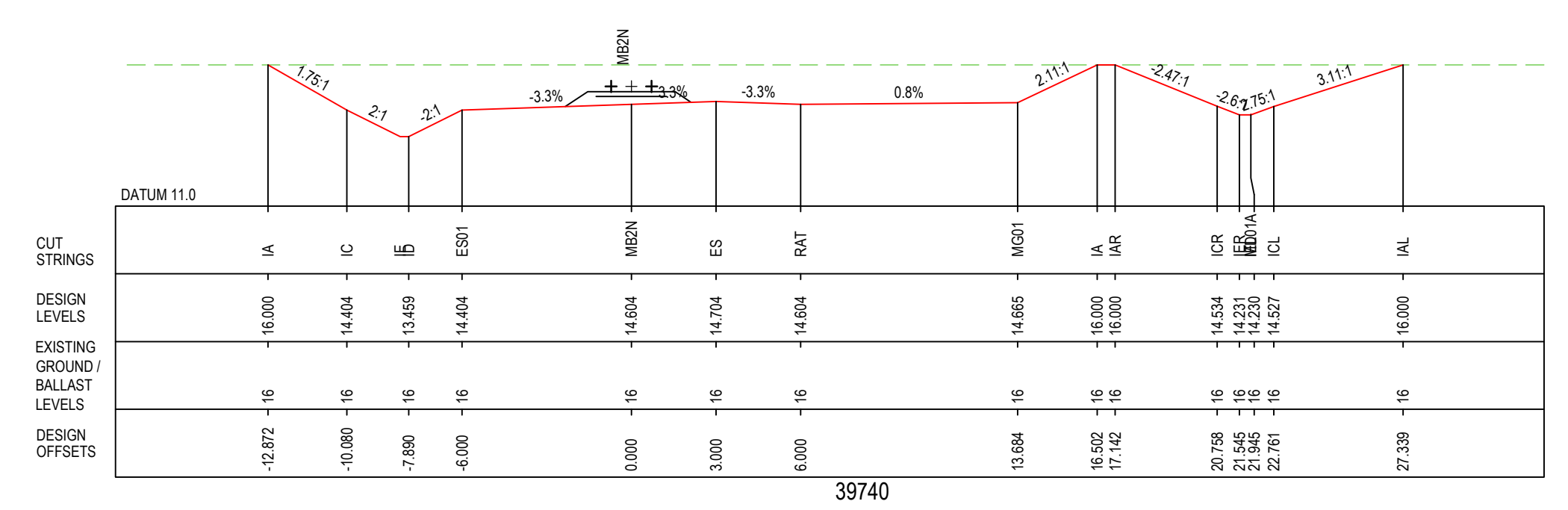
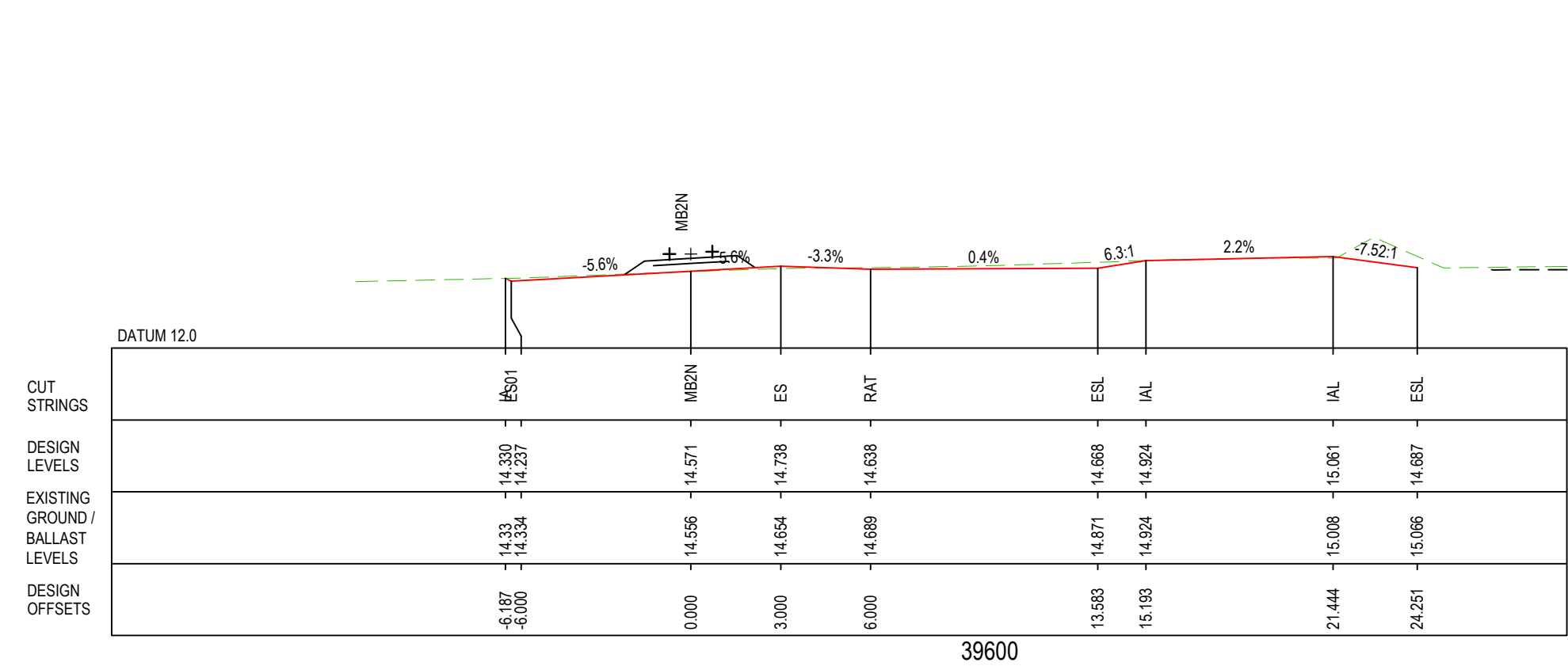
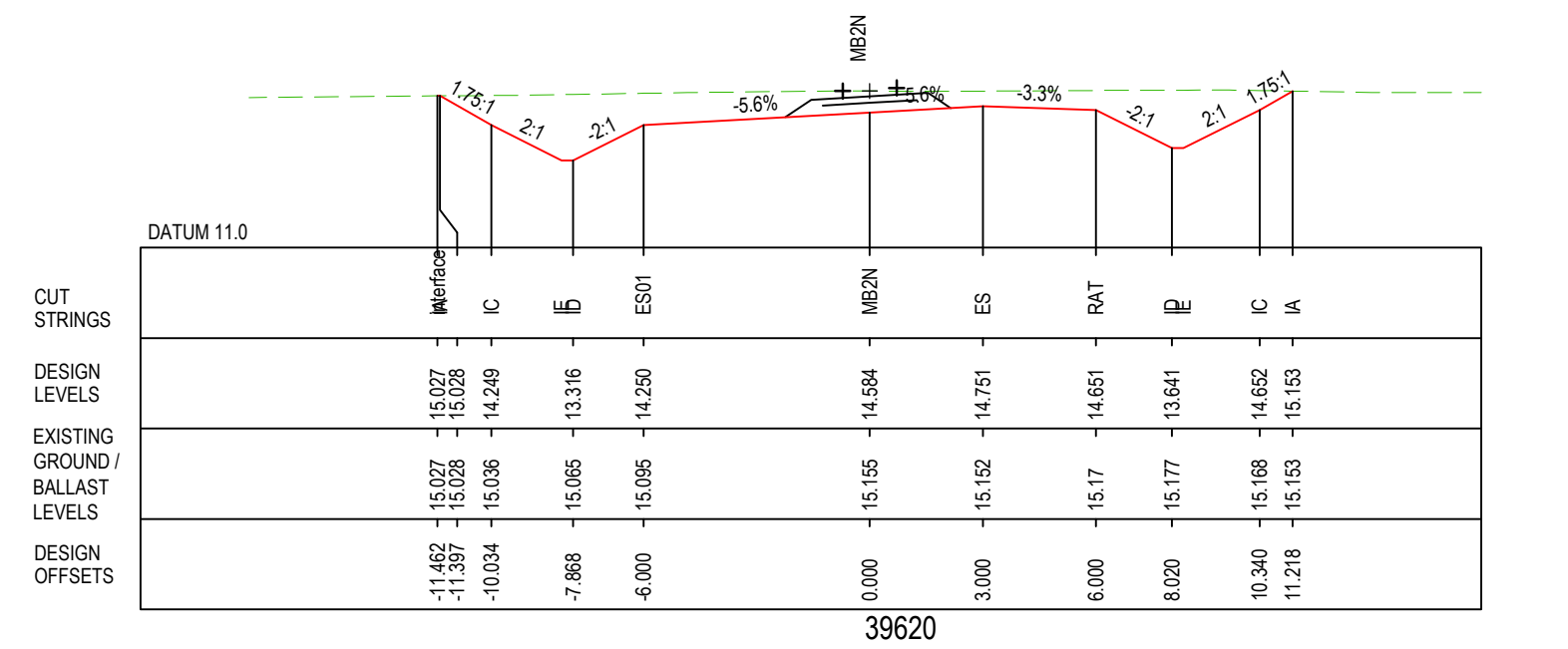
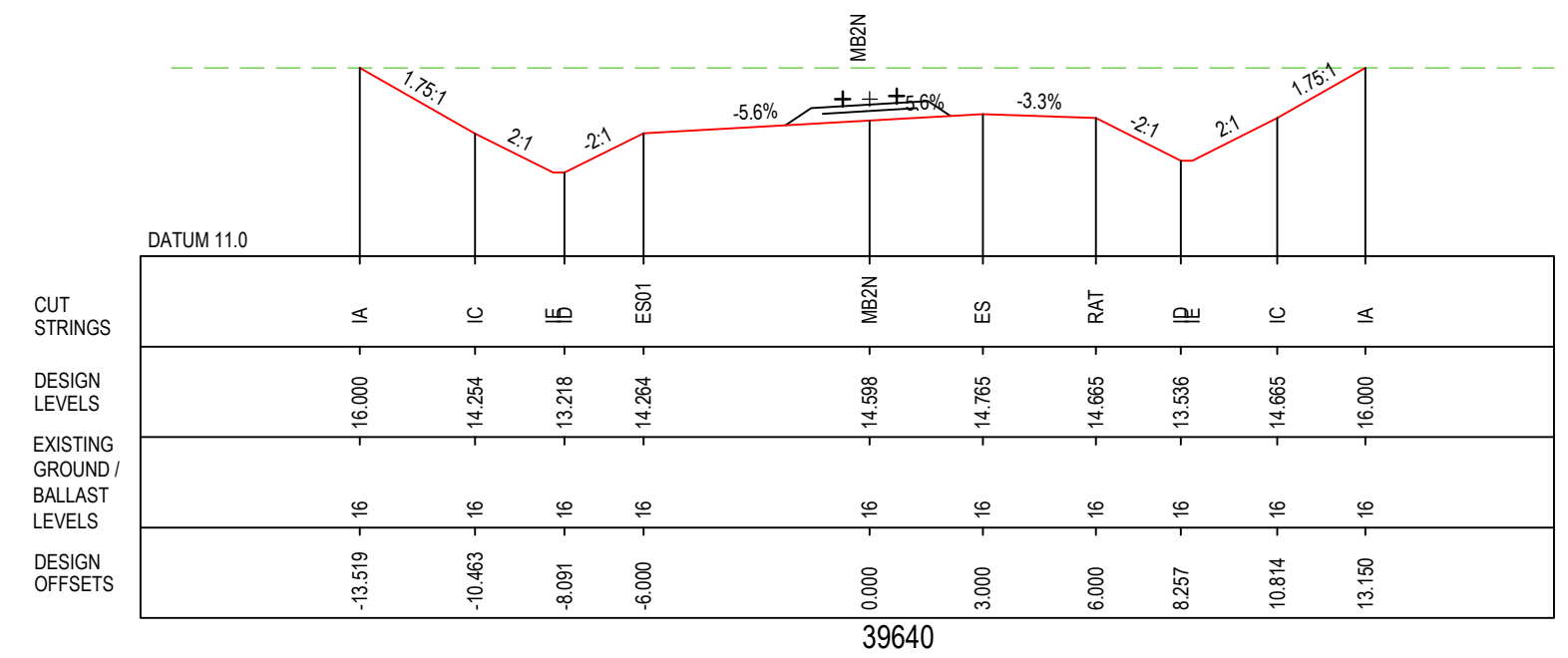
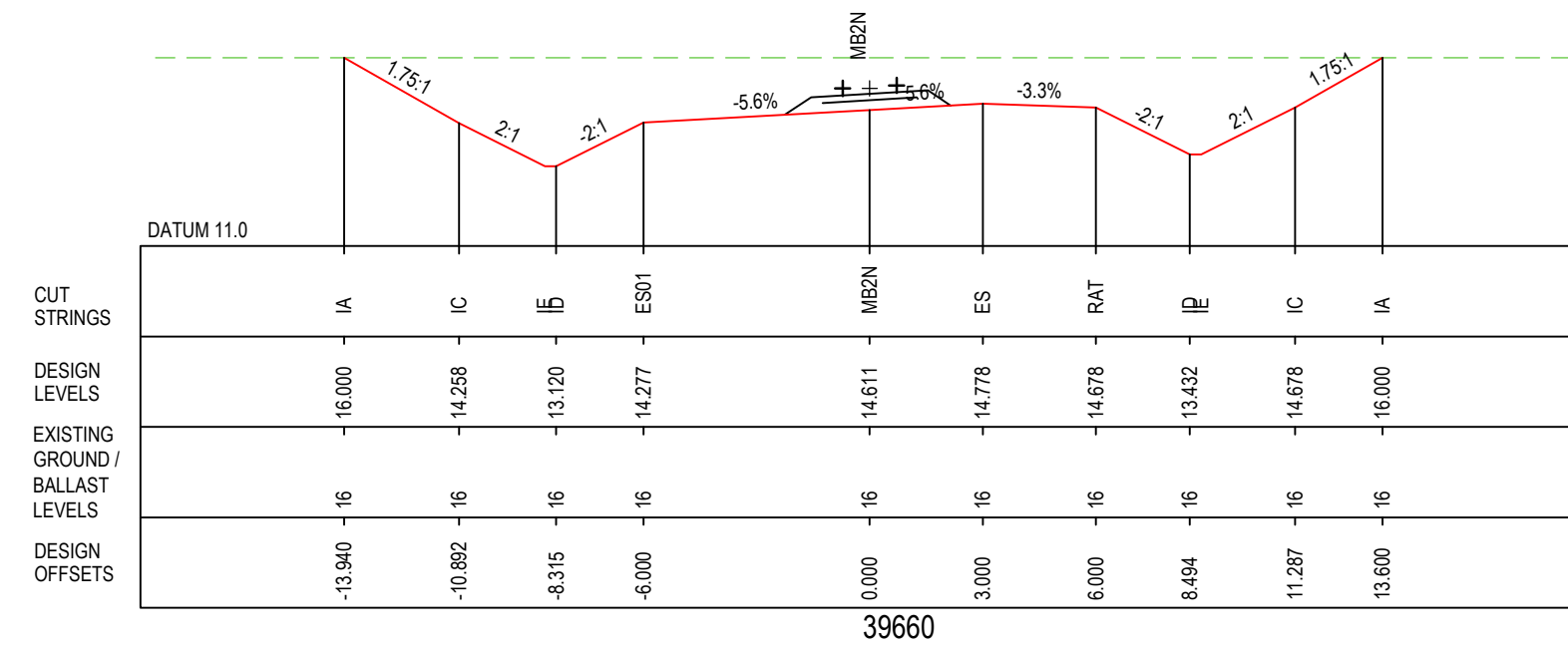
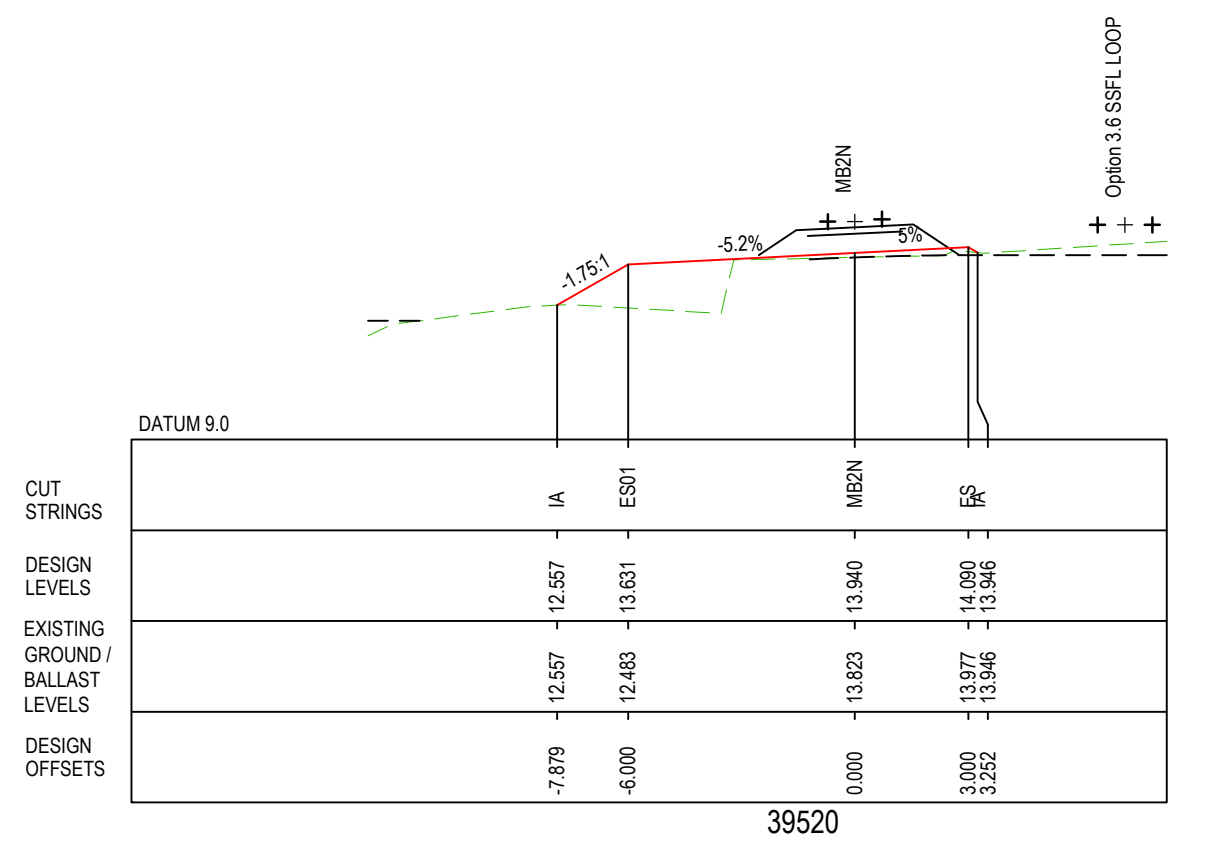
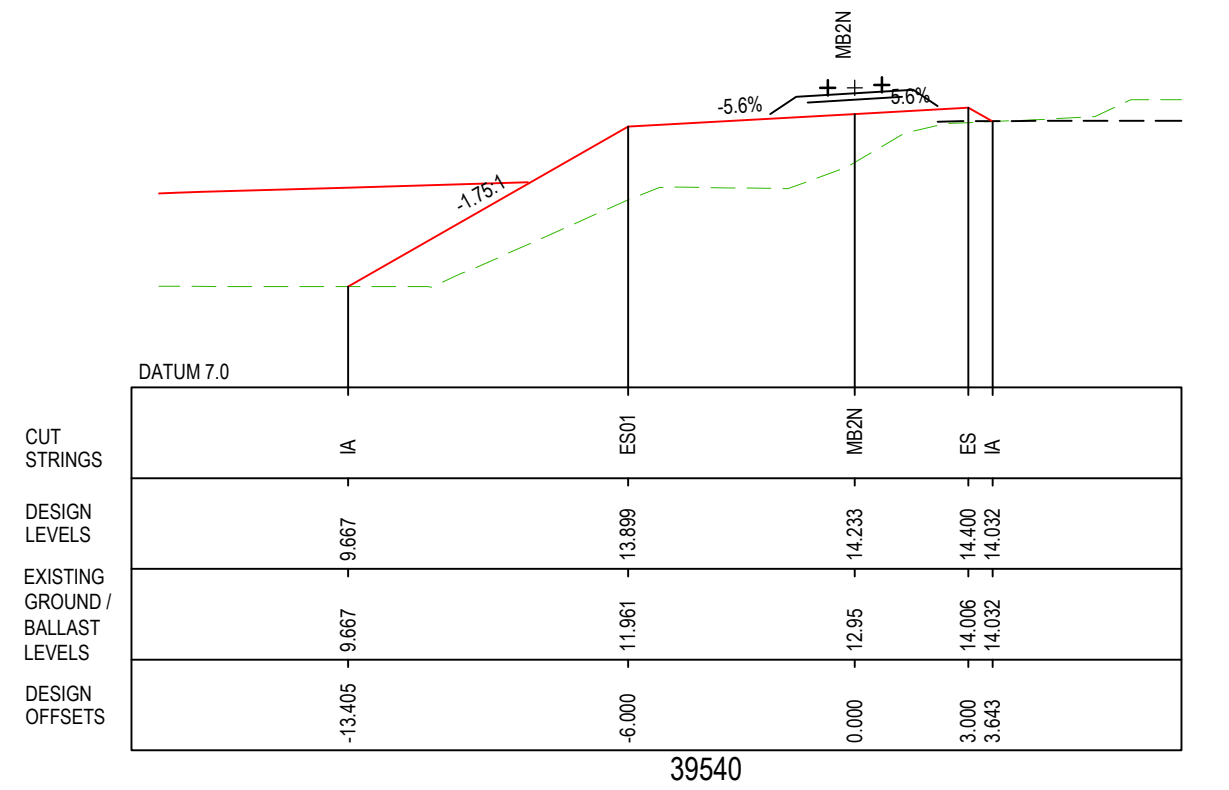
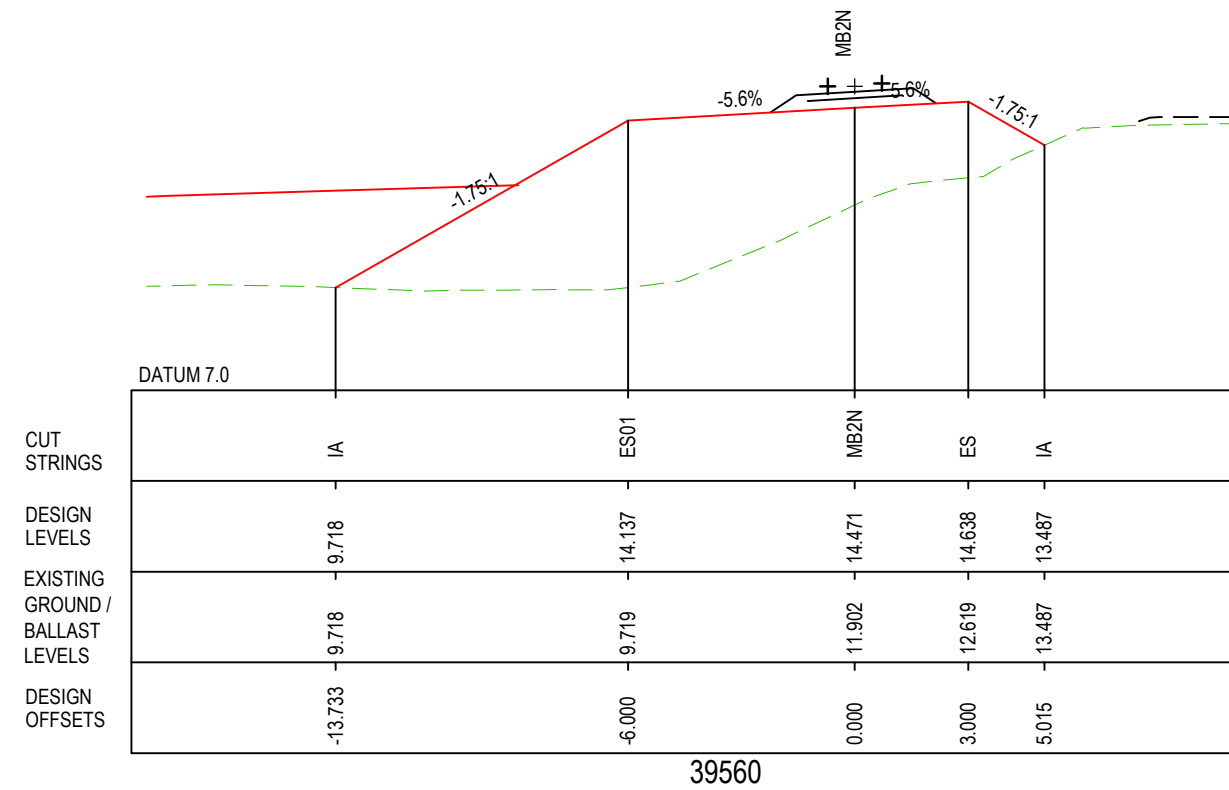
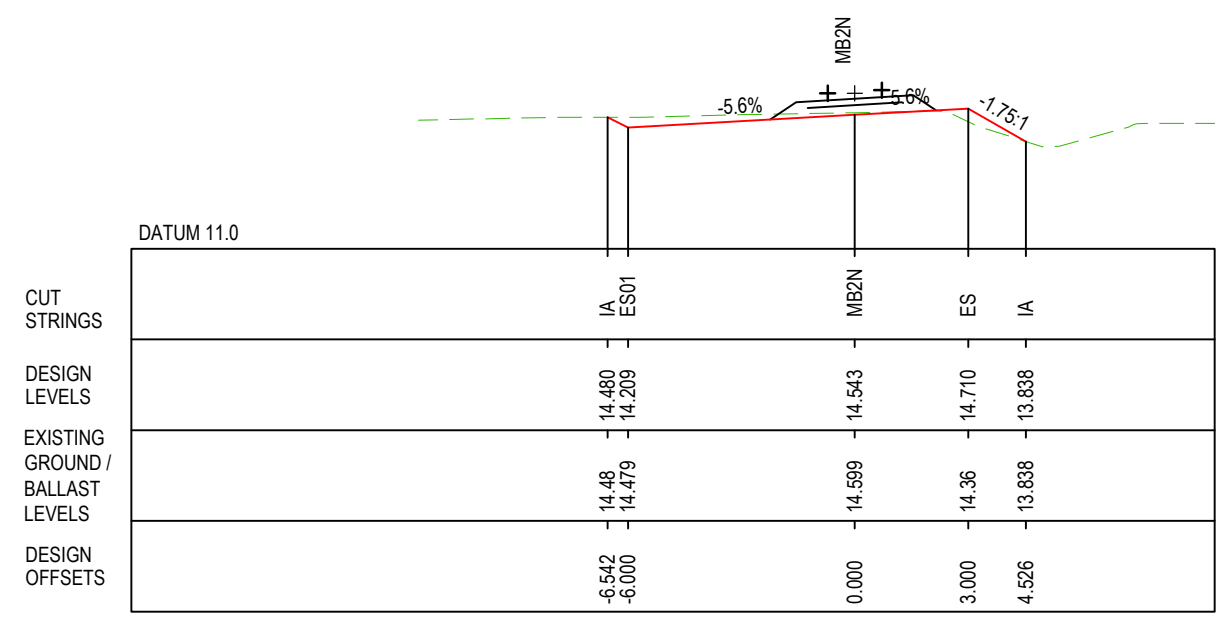


REV	DATE	REVISION DETAILS	APPROVED
01	20.01.17	ACCEPTED FOR CONSTRUCTION	

SCALE	SIZE	FOR CONSTRUCTION
AS SHOWN	A1	

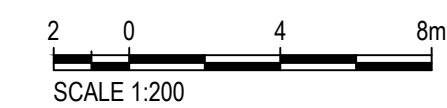
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TITLE	BULK EARTHWORKS NORTHERN CONNECTION CROSS SECTIONS SHEET 2 OF 15	
DRAWING No.	PROJECT No.	ZONE
N01031		PWD
	TYPE	DISC
	DRG	GEN
	NUMBER	REV
	0026	01

Plot Date: 2/8/2017 3:15:58 PM Office: AUS/01 Filename: C:\PM\WORKSPACE\LEV\LITTLEANZ\PROJECTS\2017\NO1031\FWD\DRG\GEN\027.DWG



LEGEND

- DESIGN SURFACE (TOP OF CAPPING)
- EXISTING SURFACE / TOP OF SSFL BALLAST
- ASSUMED TOP OF SSFL EXISTING CAPPING LAYER (REFER NOTE 1)
- BRIDGE STRUCTURE
- PROPOSED RAIL DESIGN



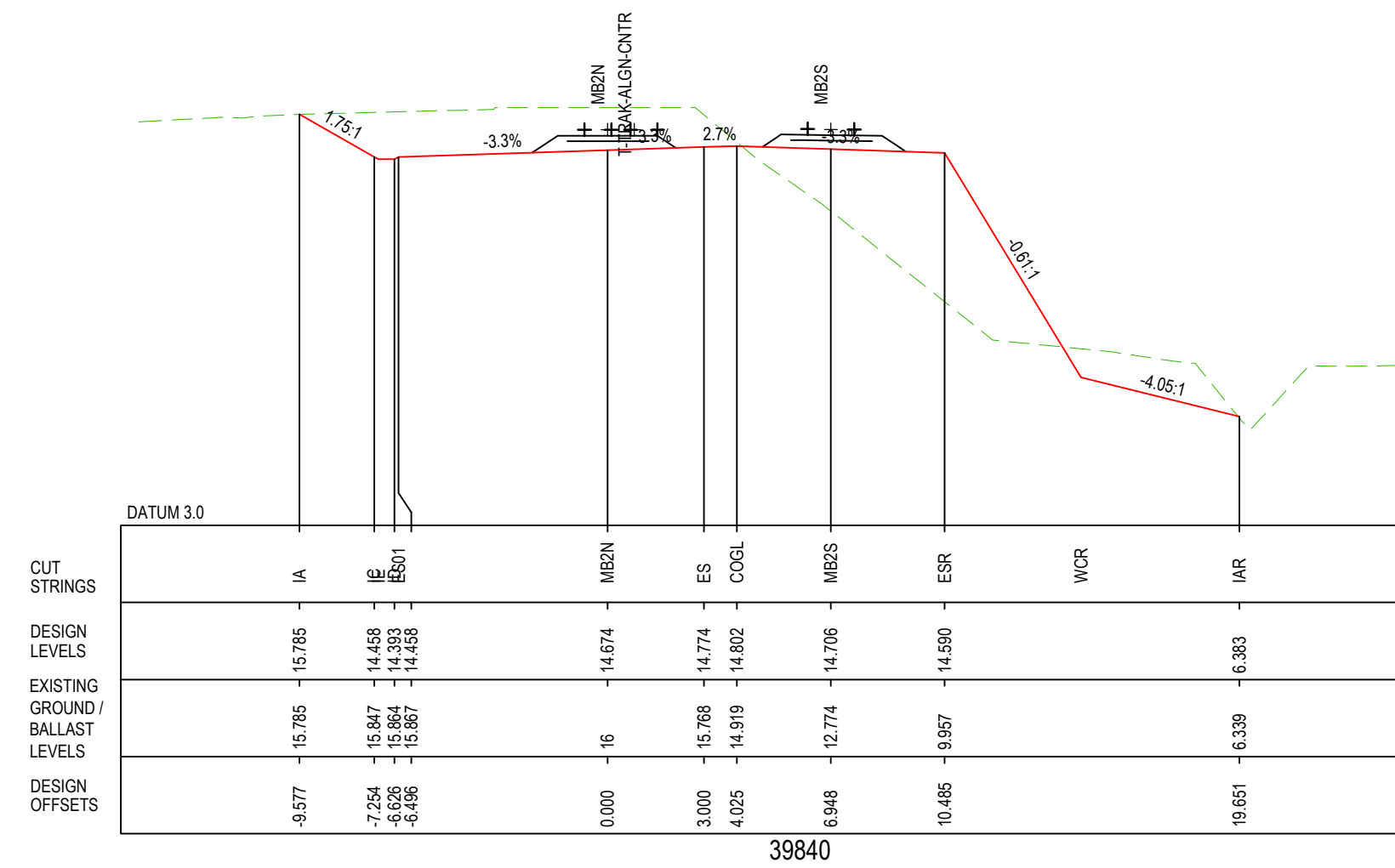
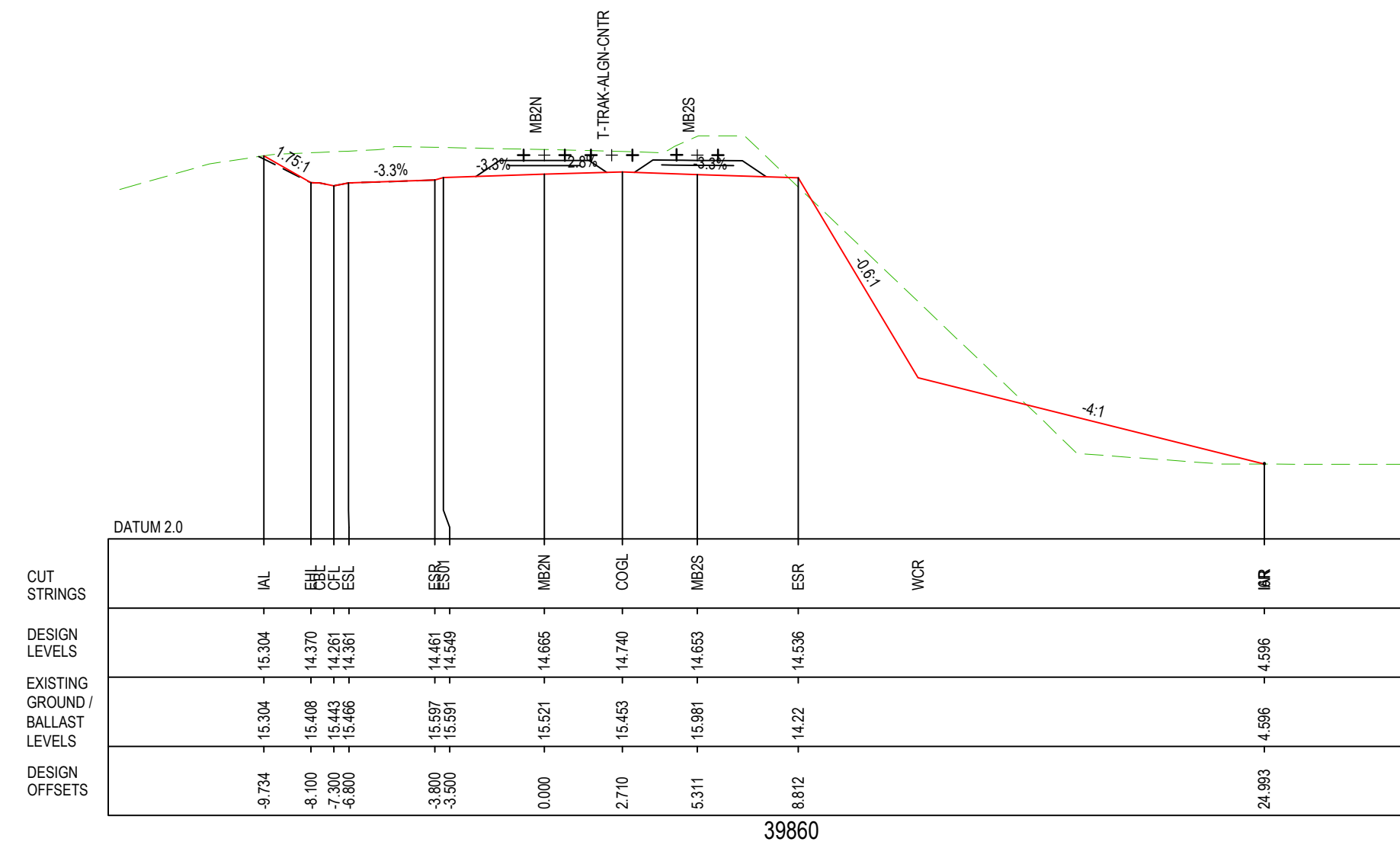
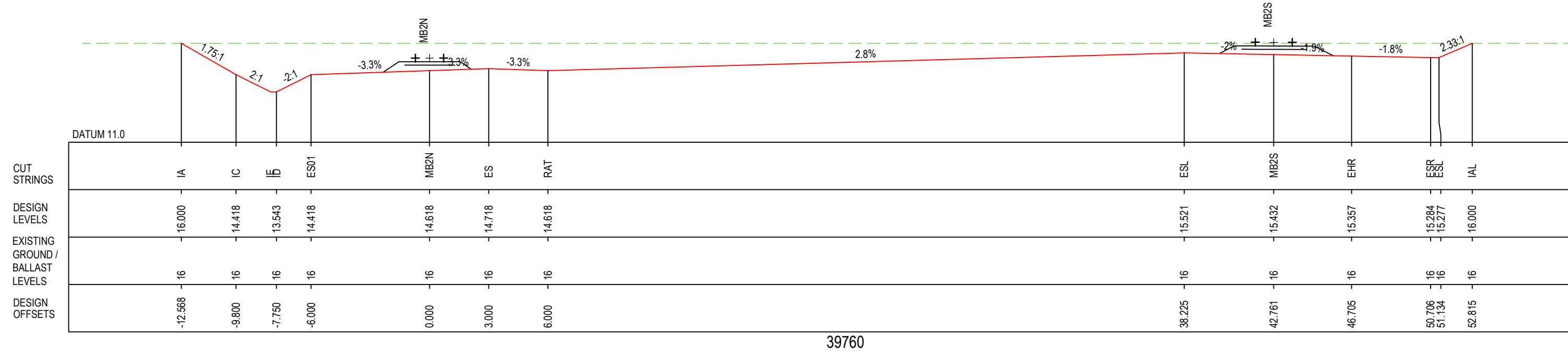
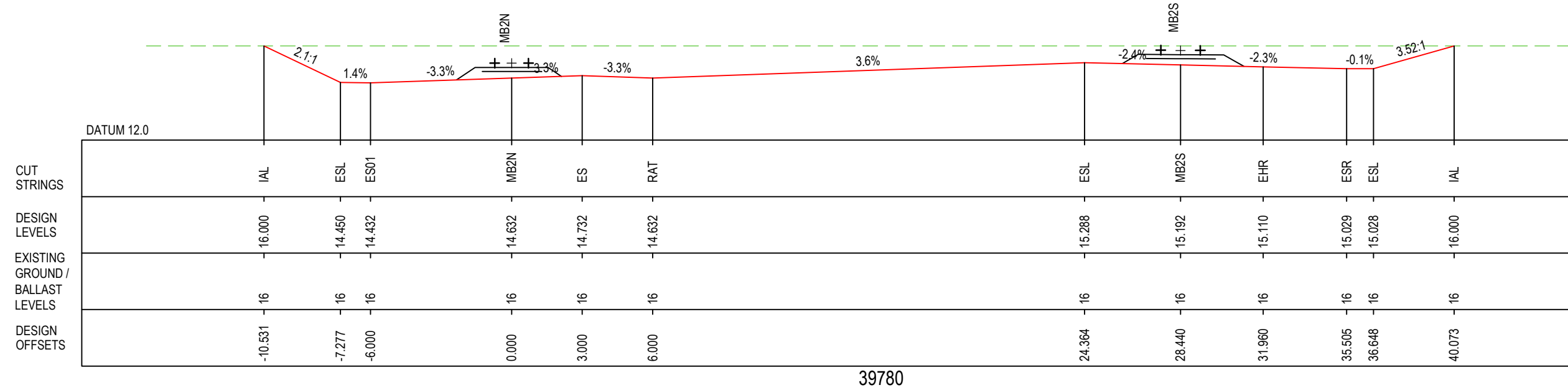
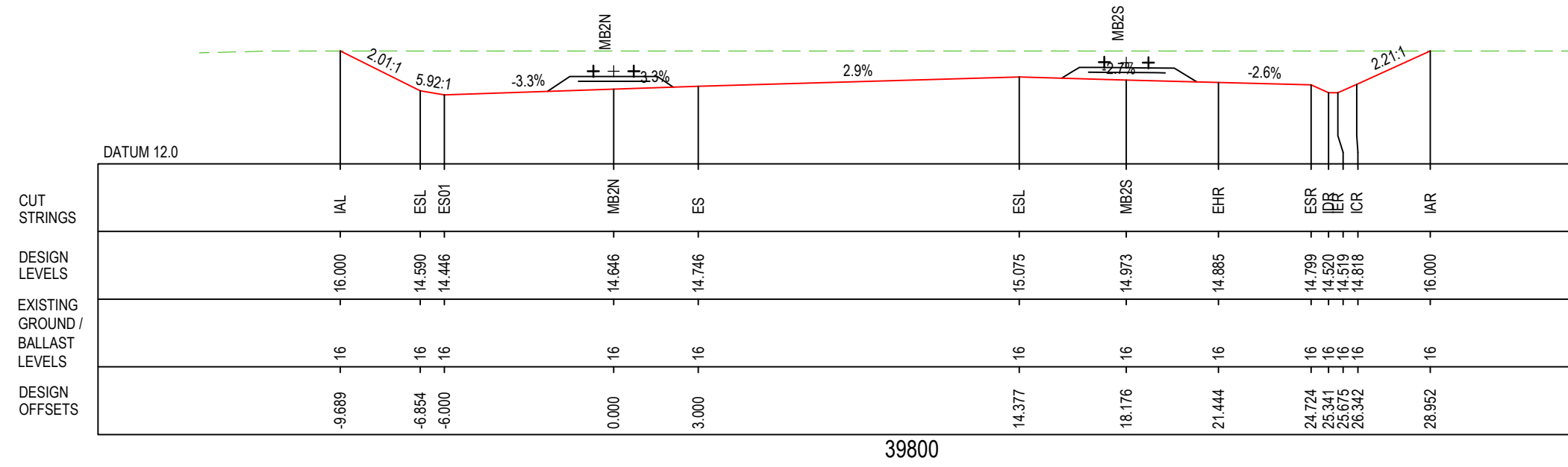
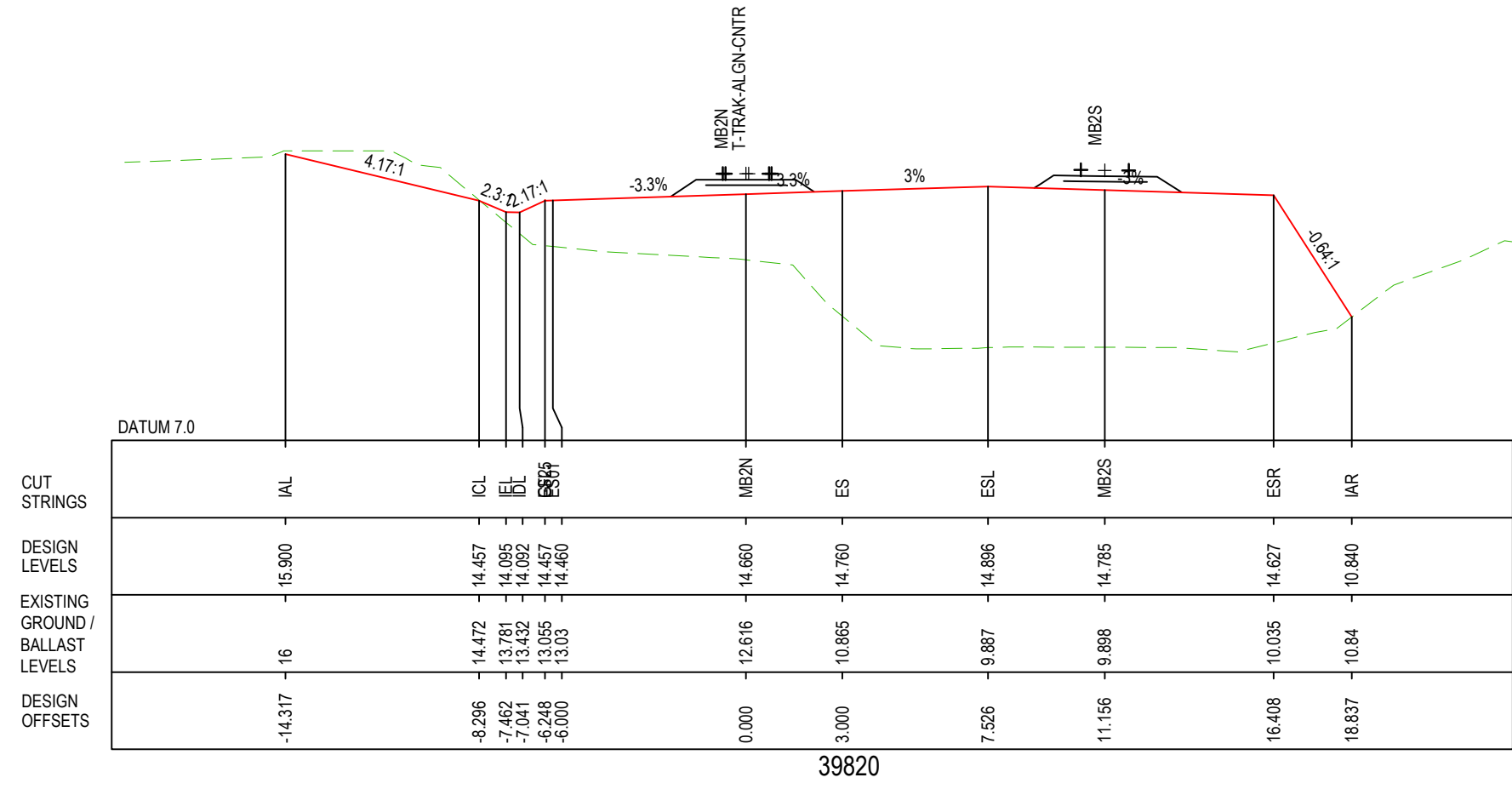
REV	DATE	REVISION DETAILS	APPROVED
01	20.01.17	ACCEPTED FOR CONSTRUCTION	

SCALE	SIZE
AS SHOWN	A1

FOR CONSTRUCTION

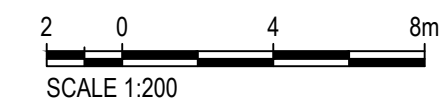
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DRAWING No.	PROJECT No.	ZONE
	N01031	PWD
	TYPE	DISC
	DRG	GEN
	NUMBER	REV
	0027	01

Plot Date: 28/01/17 10:01:14 AM Office: AUS/01 File Name: C:\PM\WORKSPACE\LEYLITTLE\NZ PROJ\02\2017\01\031\FWD\DRG-GEN\002.DWG



LEGEND

- DESIGN SURFACE (TOP OF CAPPING)
- EXISTING SURFACE / TOP OF SSFL BALLAST
- ASSUMED TOP OF SSFL EXISTING CAPPING LAYER (REFER NOTE 1)
- BRIDGE STRUCTURE
- PROPOSED RAIL DESIGN



REV	DATE	REVISION DETAILS
01	20.01.17	ACCEPTED FOR CONSTRUCTION

APPROVED

SCALE	SIZE
AS SHOWN	A1



FOR CONSTRUCTION
APPROVED
DATE 20.01.17

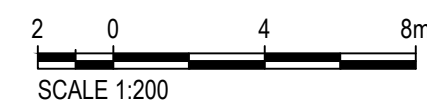
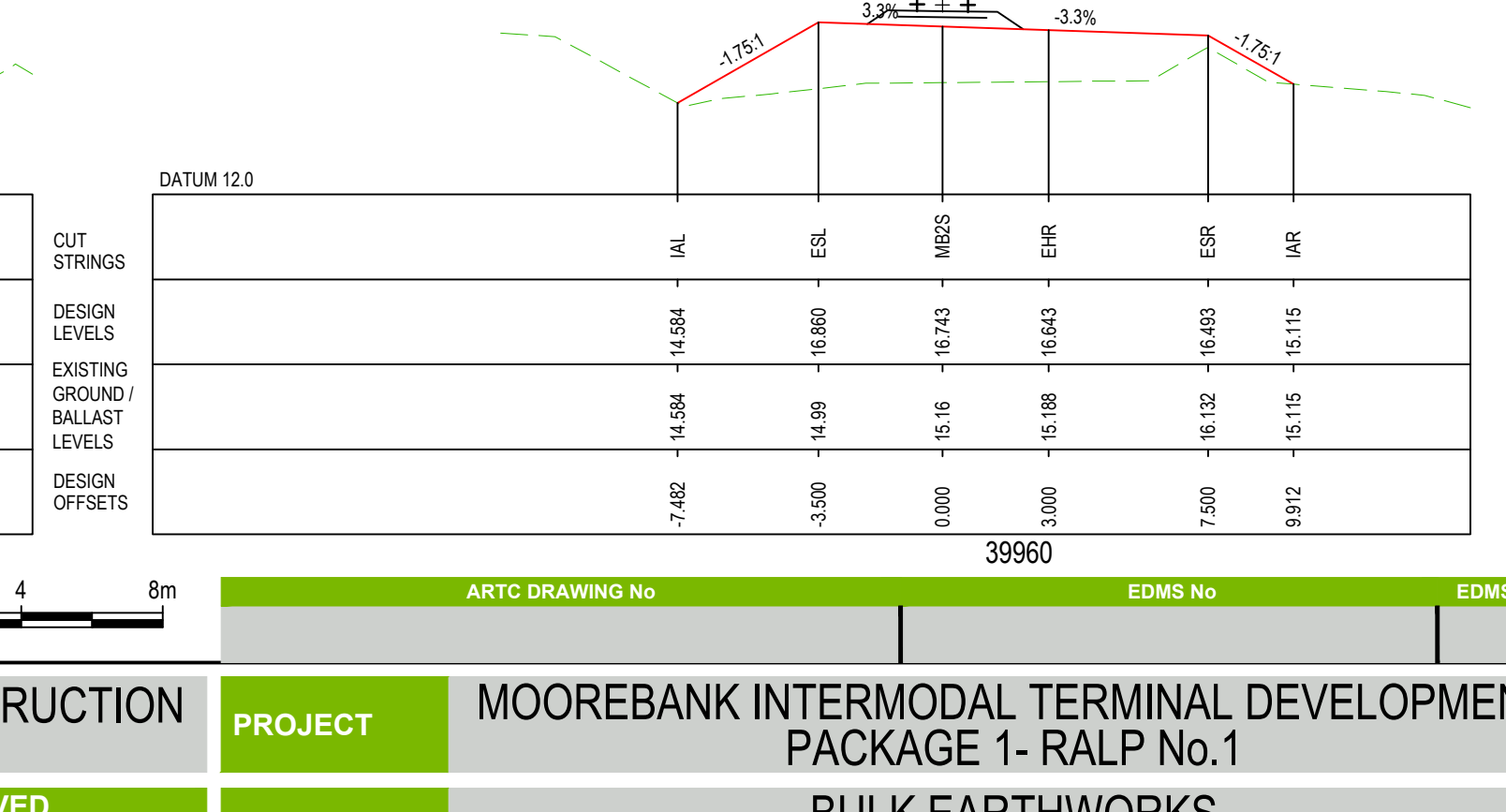
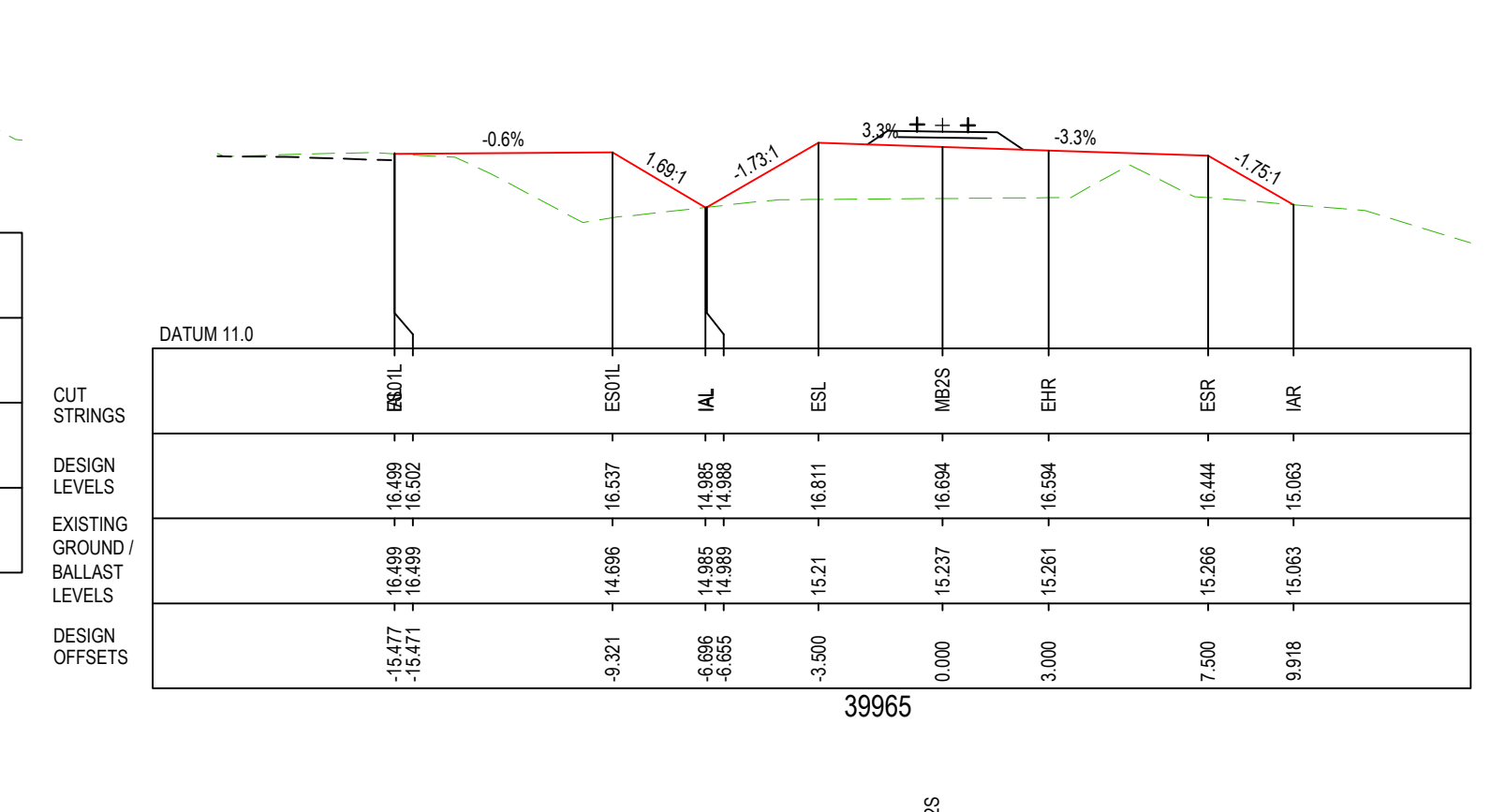
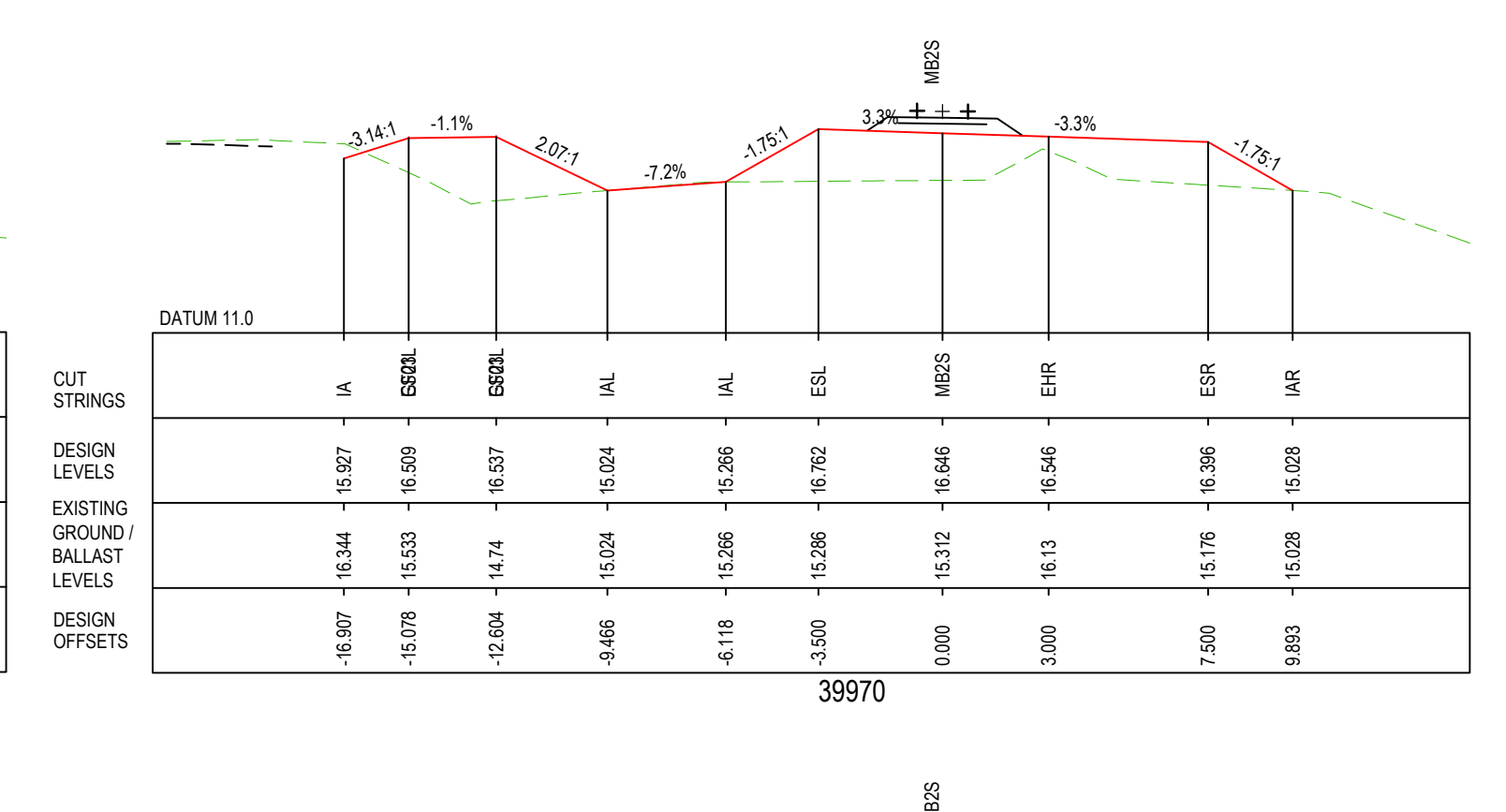
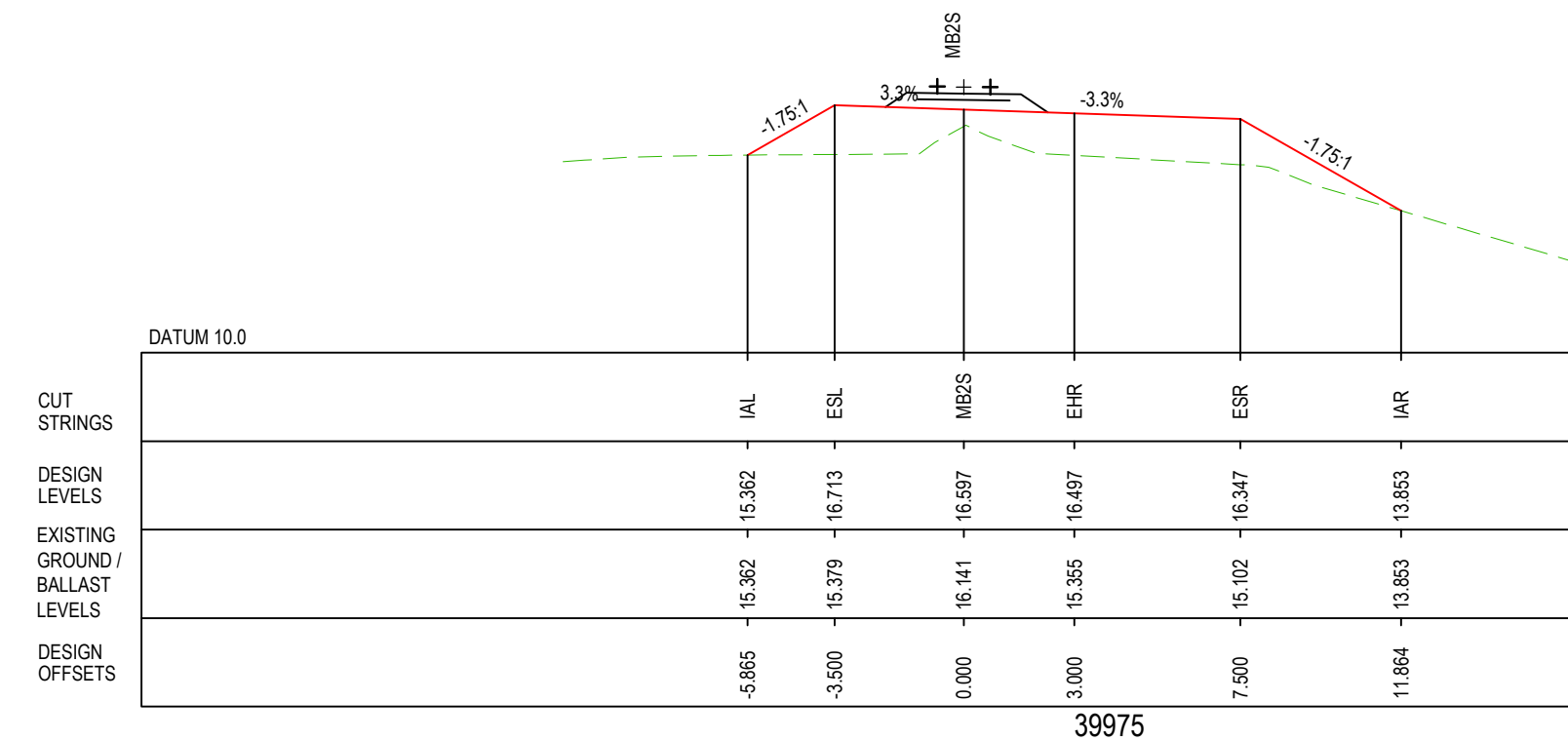
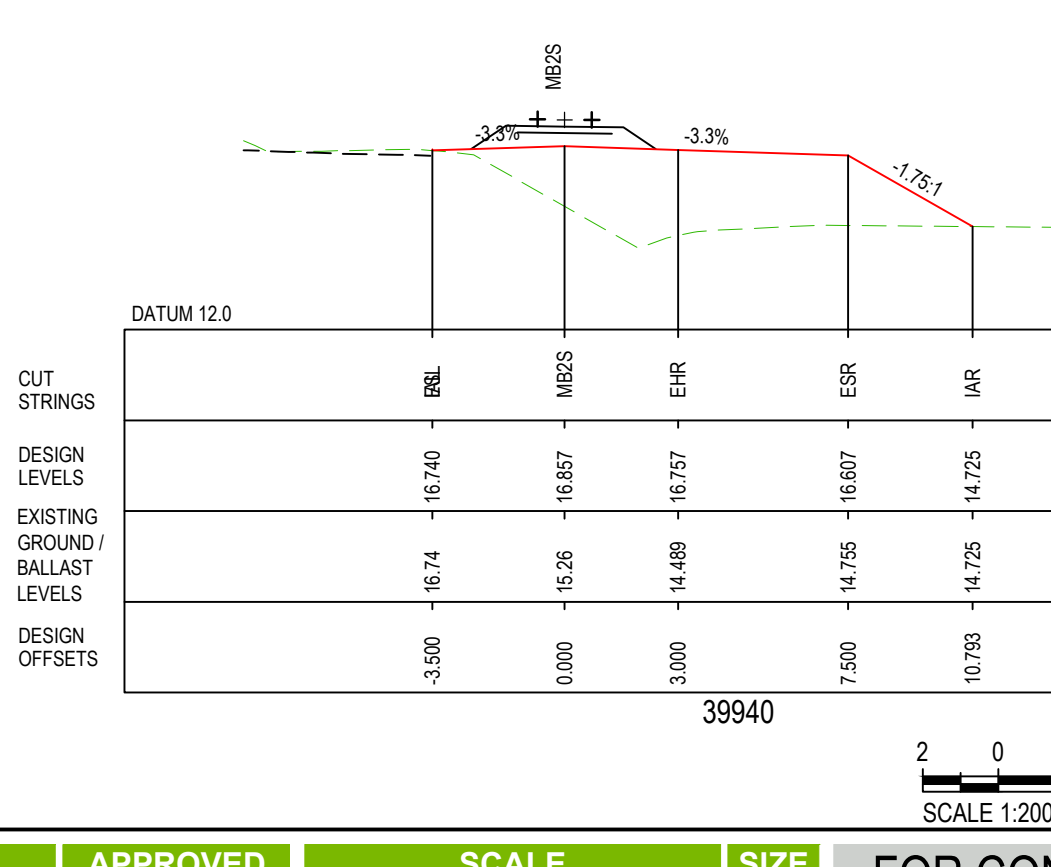
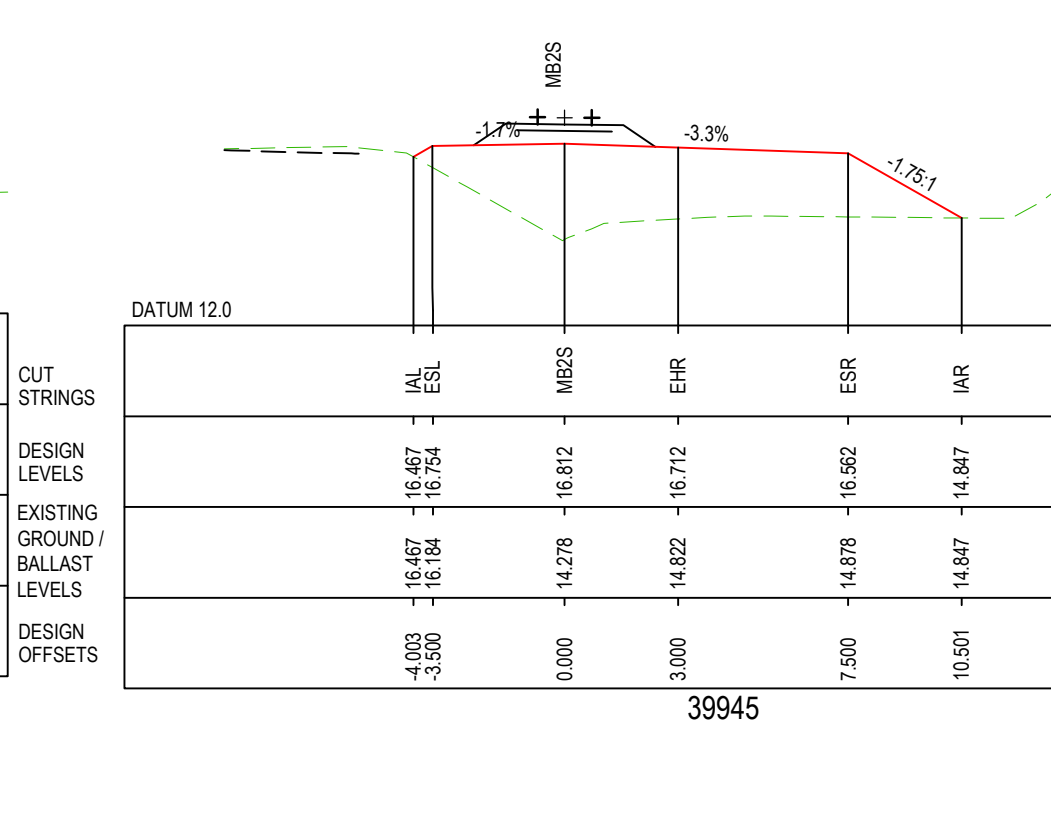
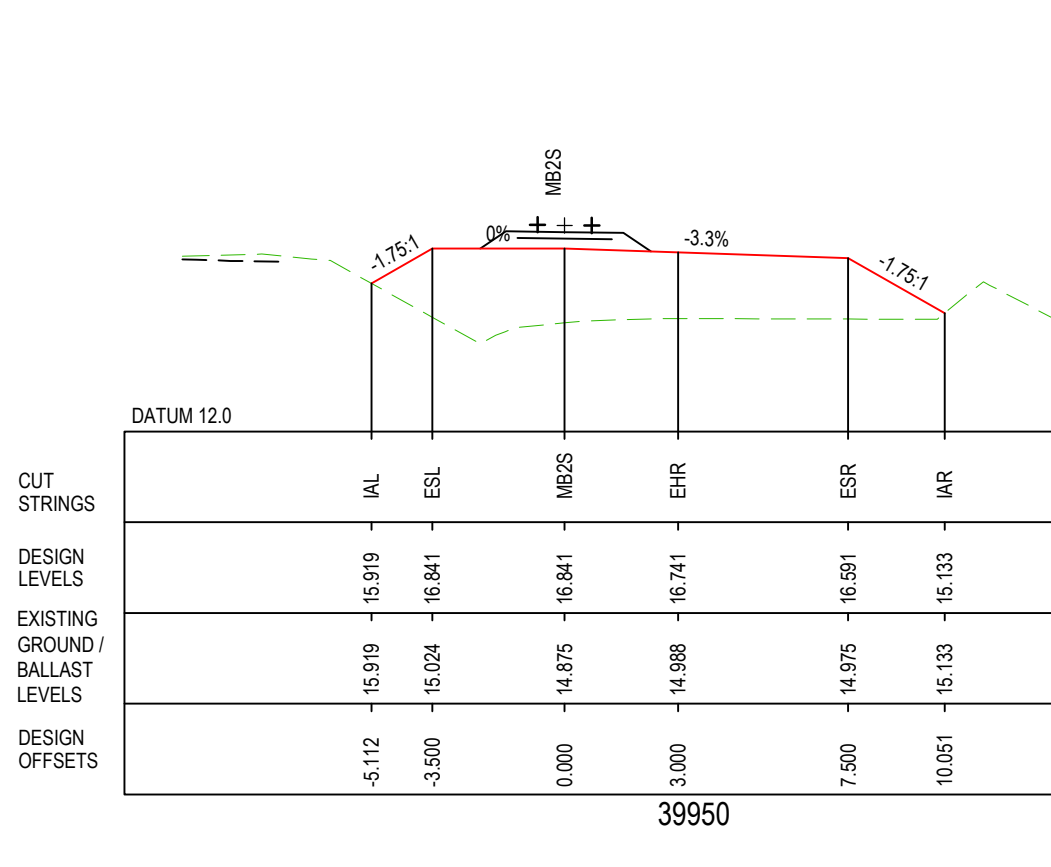
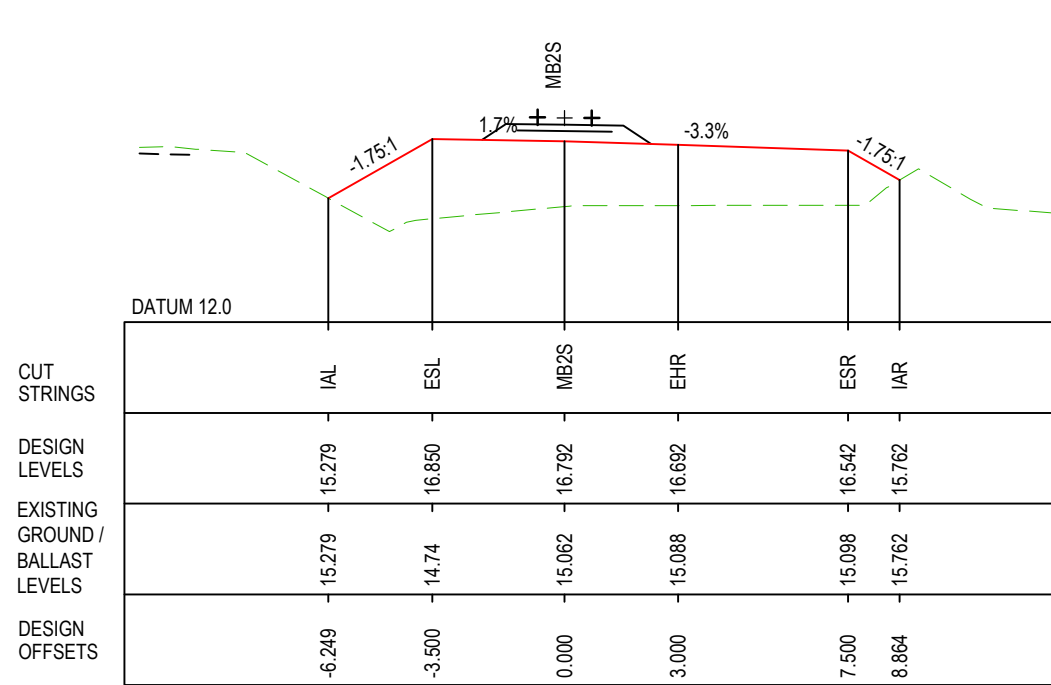
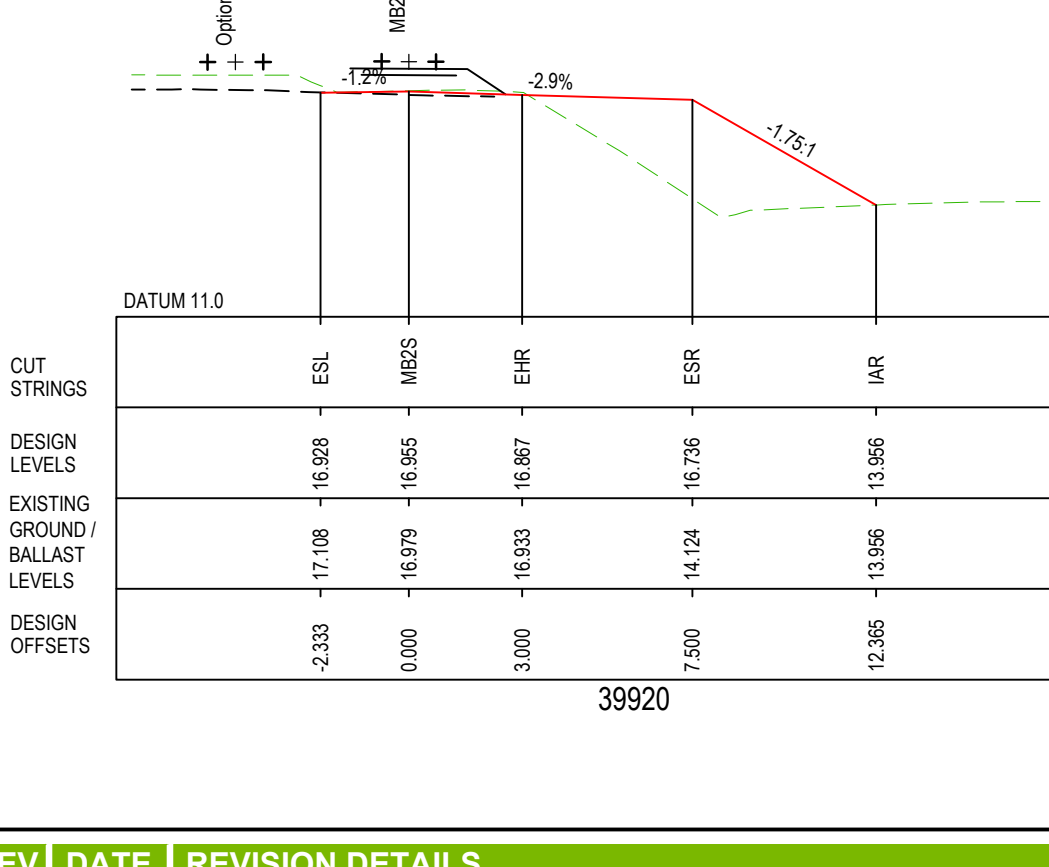
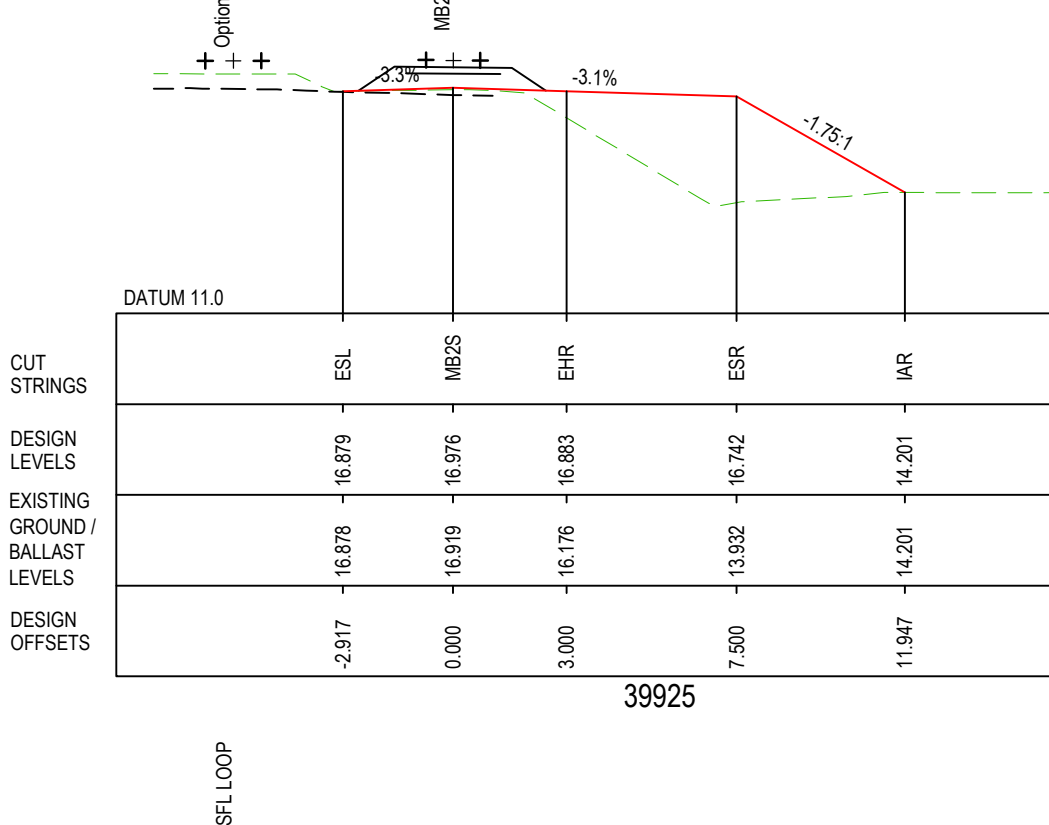
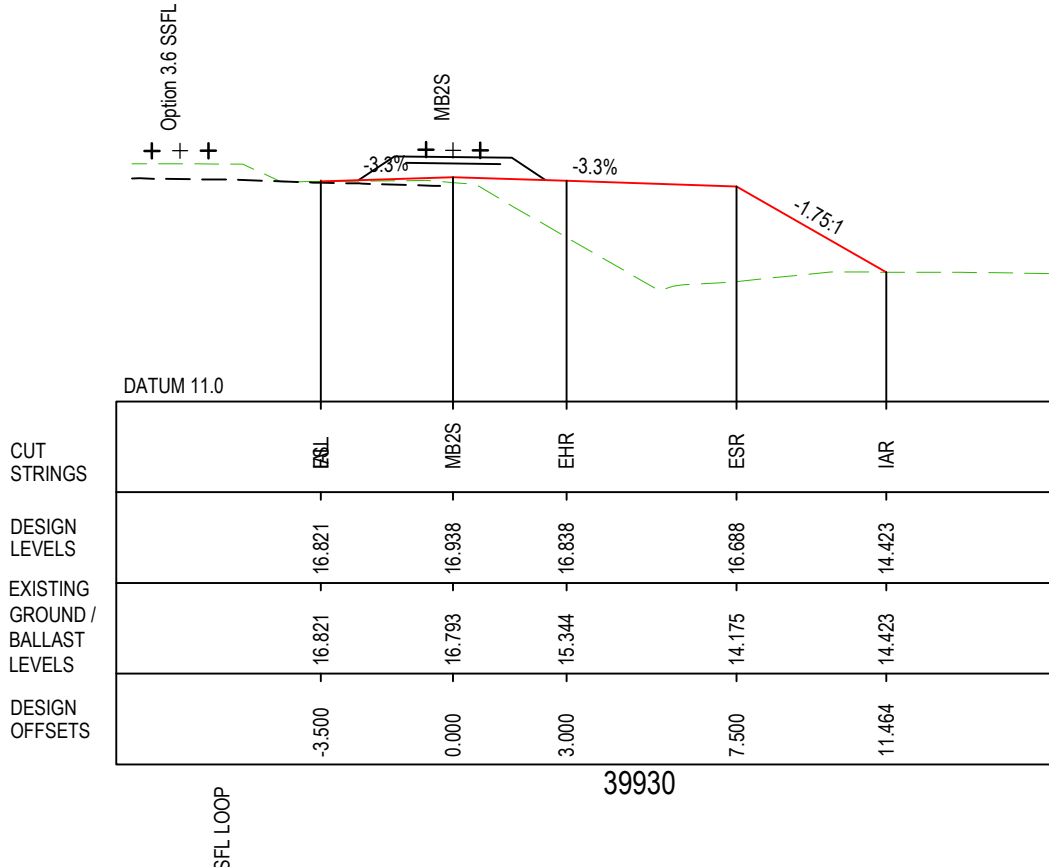
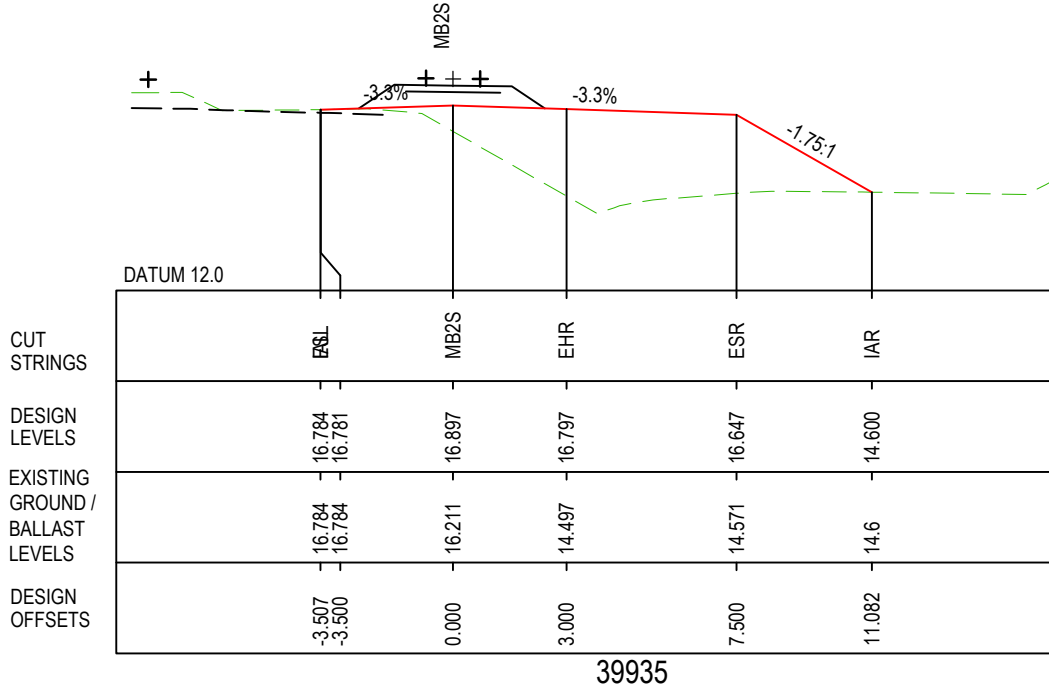
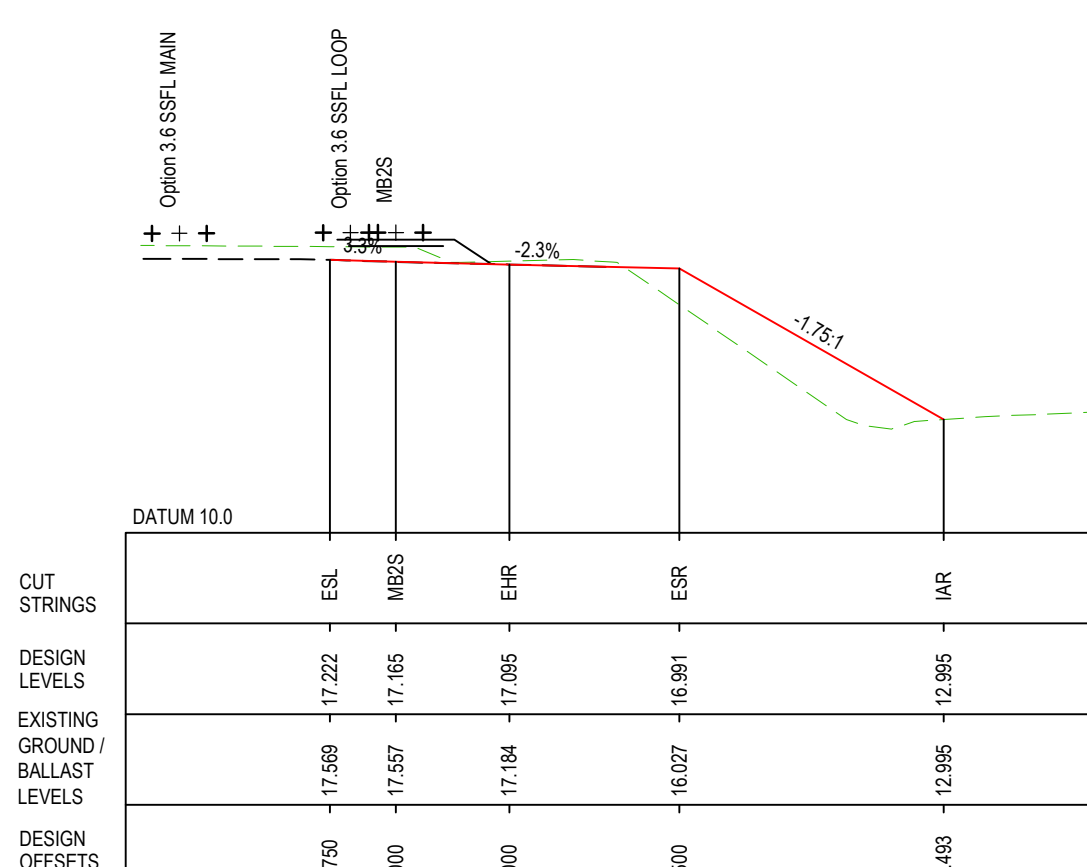
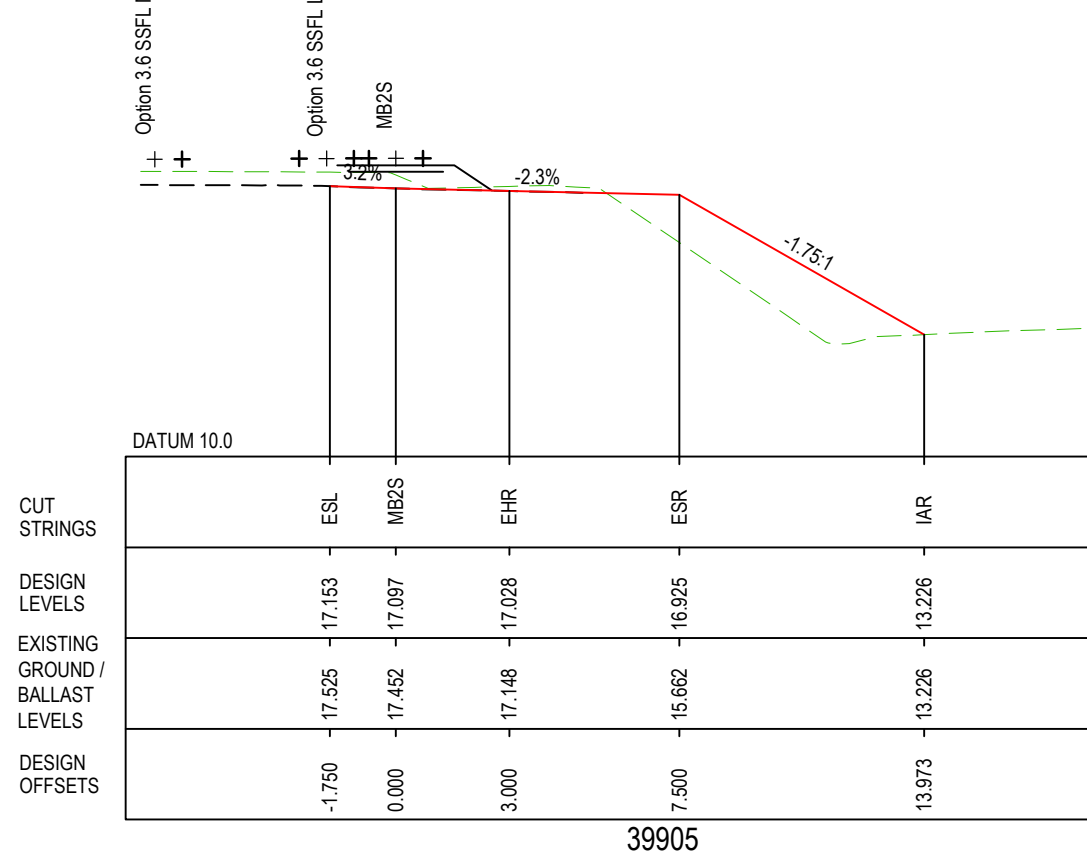
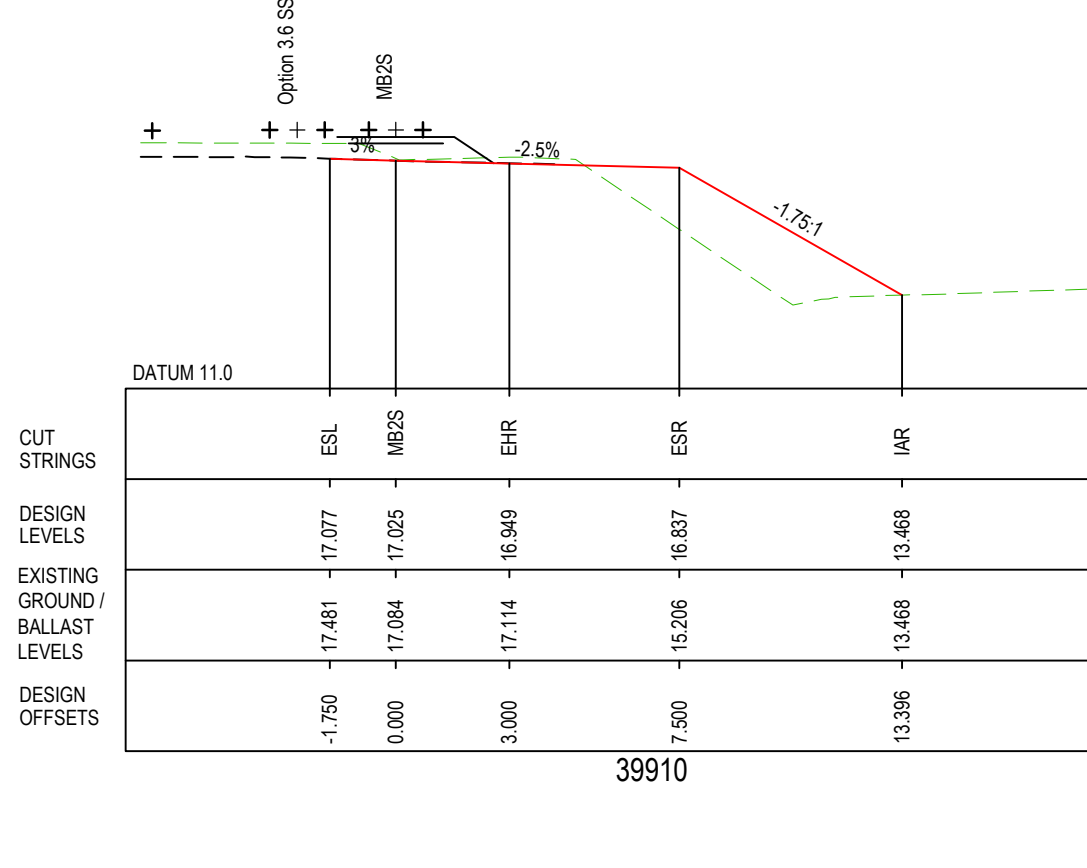
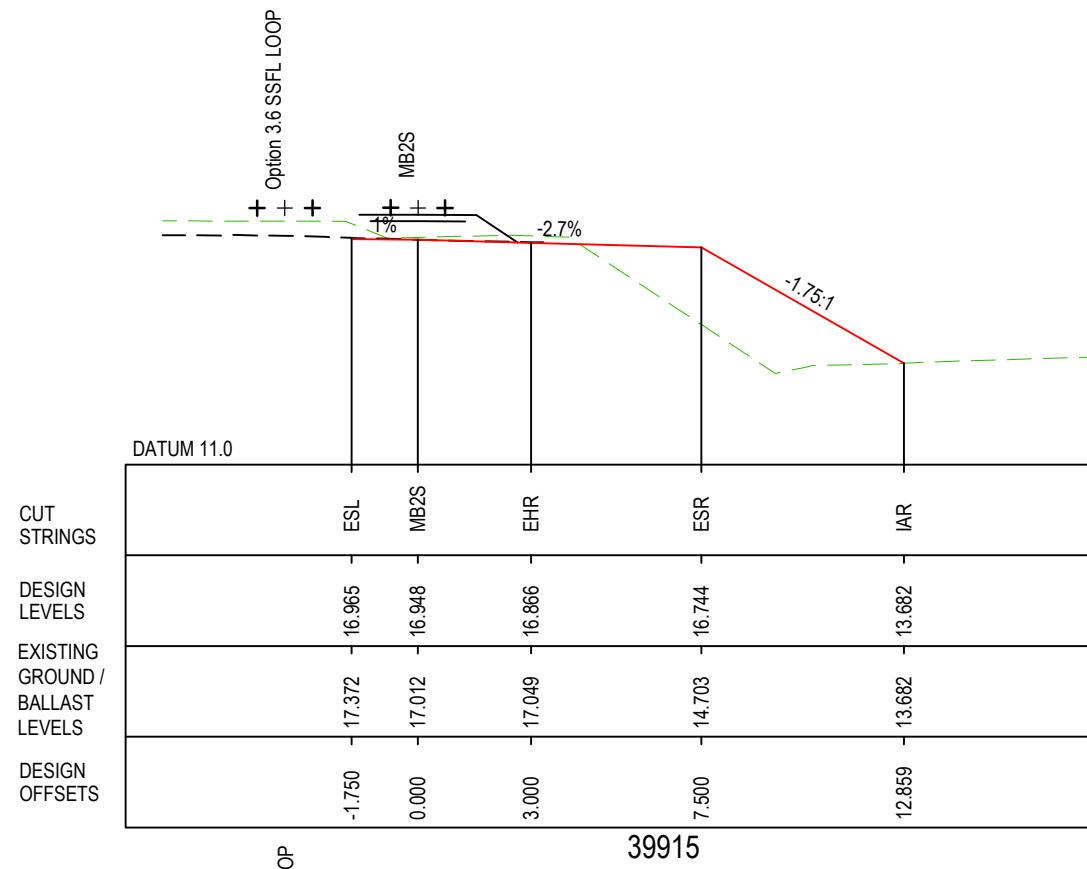
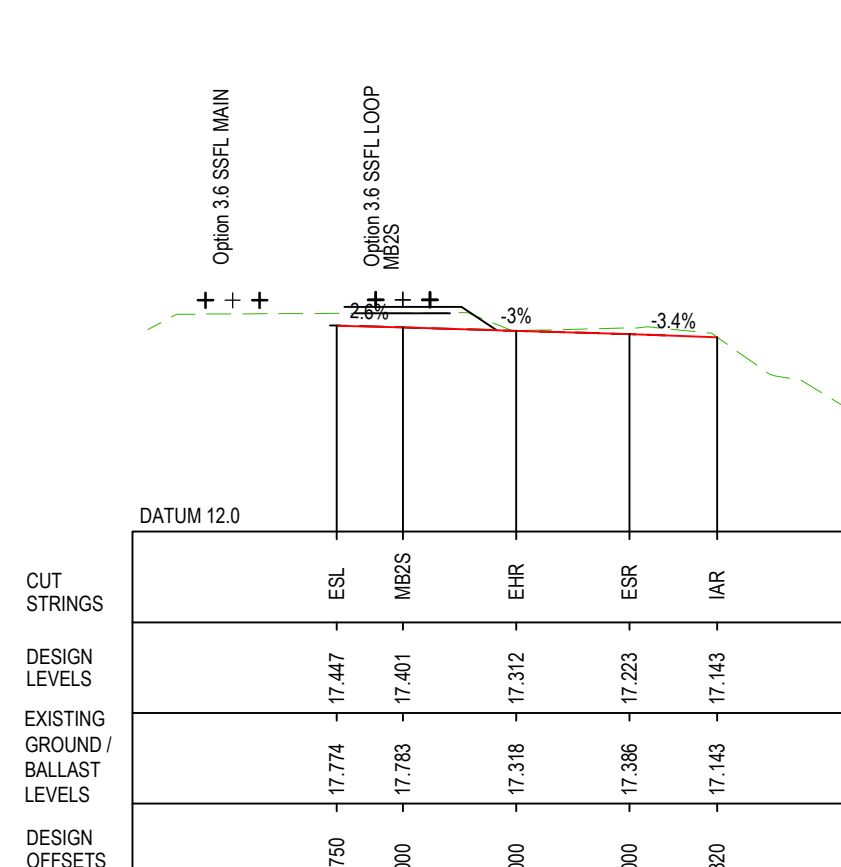
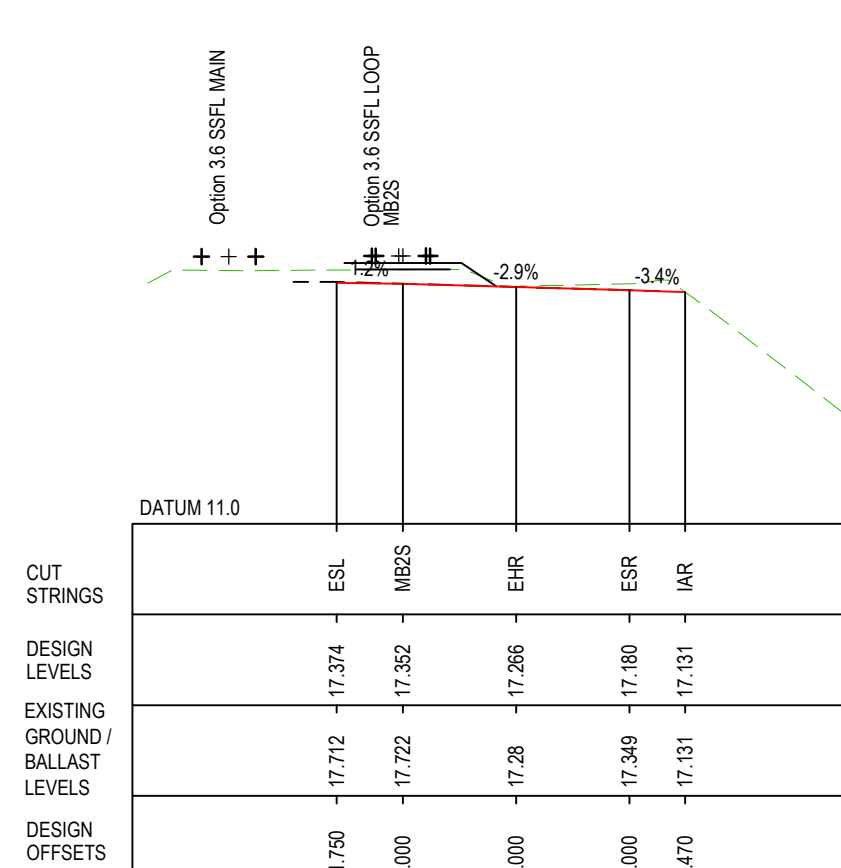
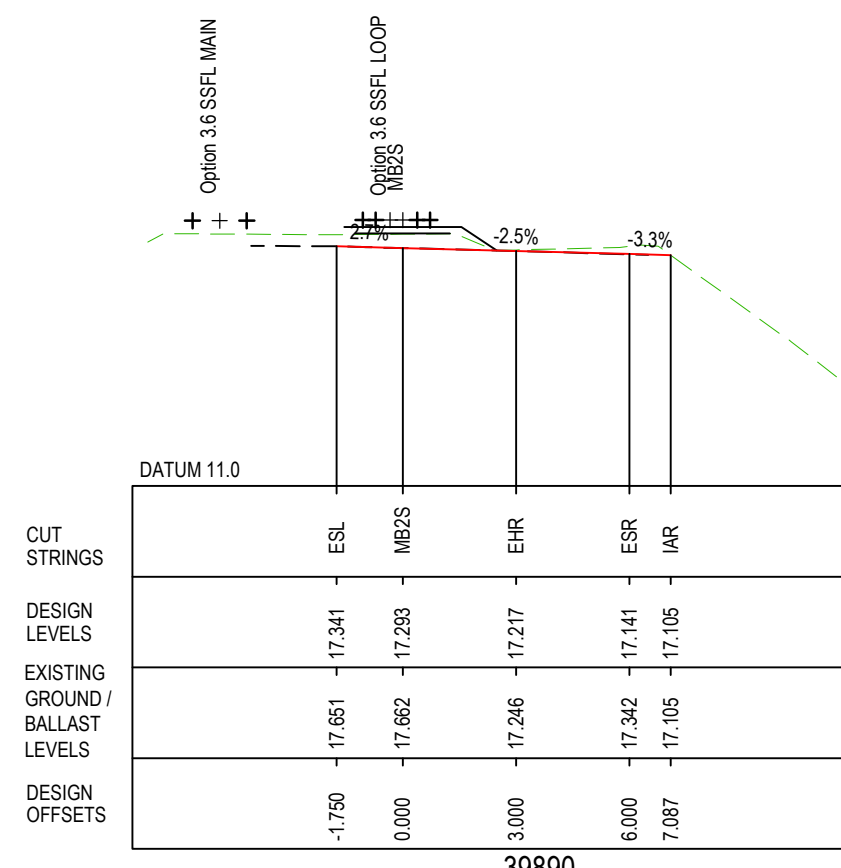
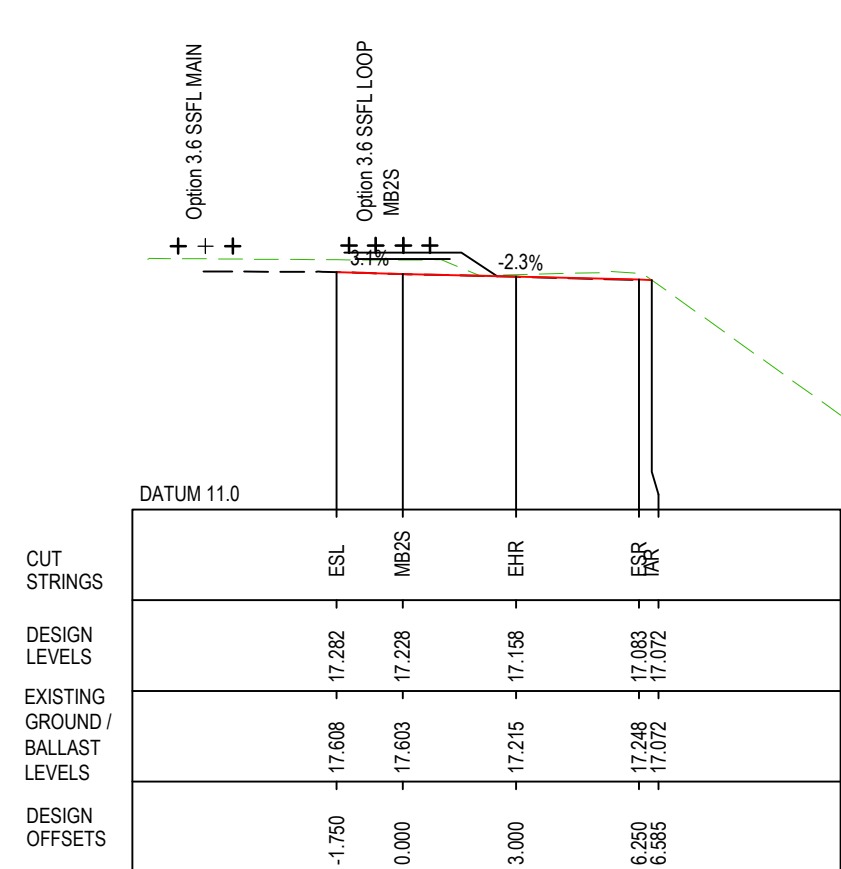
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TITLE	BULK EARTHWORKS NORTHERN CONNECTION CROSS SECTIONS SHEET 4 OF 15	
DRAWING No.	PROJECT No.	ZONE
	N01031	0000
	TYPE	DISC
	DRG	GEN
	NUMBER	REV
	0028	01

SOUTHERN CONNECTION TIE-IN INTERFACE TO ARTC ALIGNMENT NOTES:

1. THE TOP OF EXISTING CAPPING LEVELS (UNDERNEATH SSFL BALLAST) HAVE BEEN INTERPOLATED FROM EXISTING SURVEY FOR THE PURPOSE OF DESIGN DEVELOPMENT AND MODELLING. TOP OF EXISTING CAPPING LEVELS TO BE CONFIRMED DURING CONSTRUCTION.
2. BASED ON THE INTERPOLATED TOP OF EXISTING CAPPING LEVELS, THE CAPPING LAYER TO BE RETAINED.
3. EXISTING SSFL BALLAST PROFILE REQUIRE MINOR ALTERATION TO FACILITATE MINOR VERTICAL CHANGE TO THE EXISTING SSFL LINES AND FIT DEEPER TURNOUT BEARERS.

LEGEND

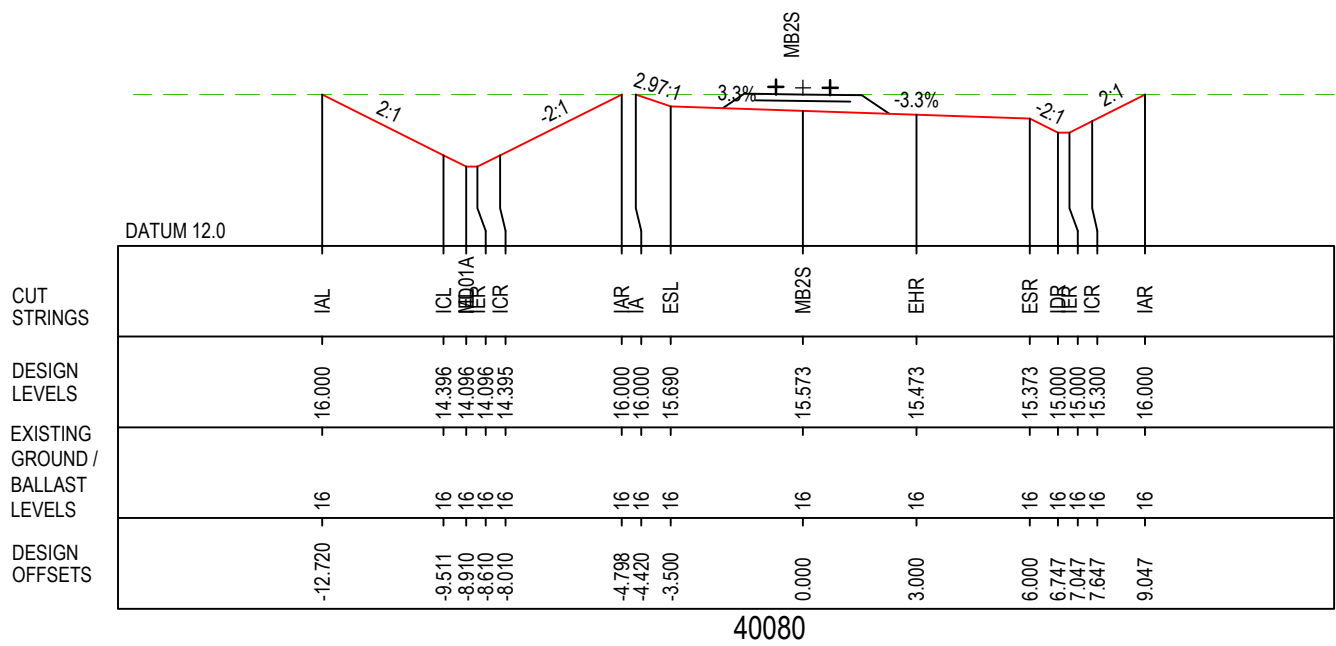
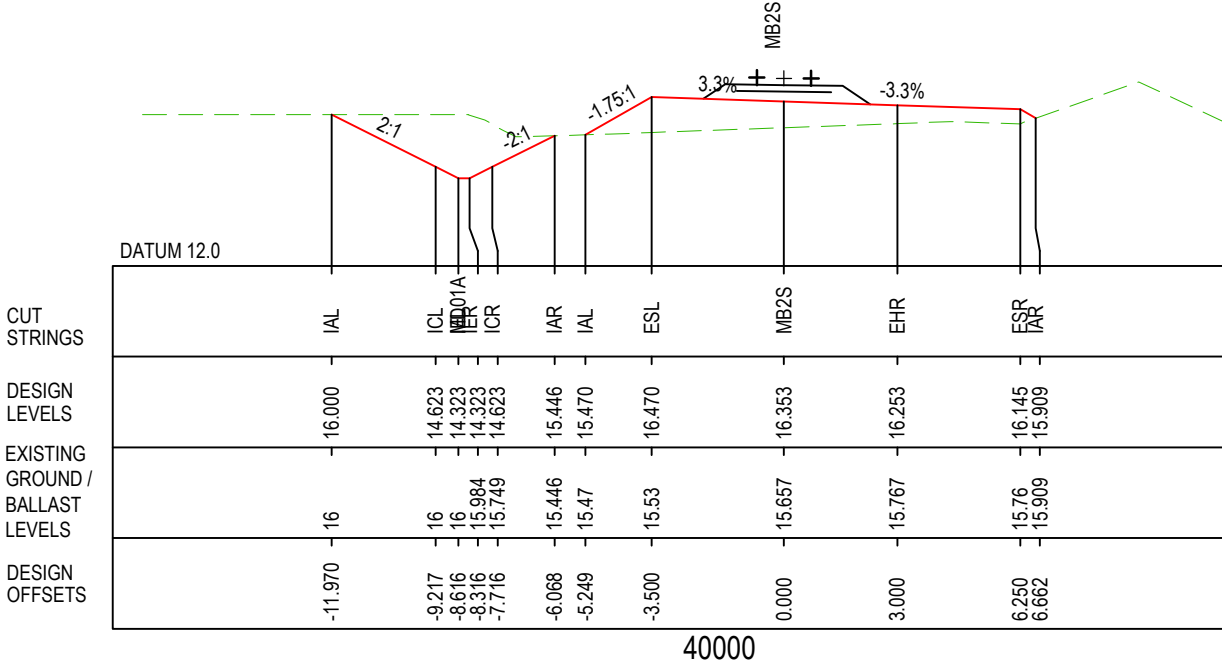
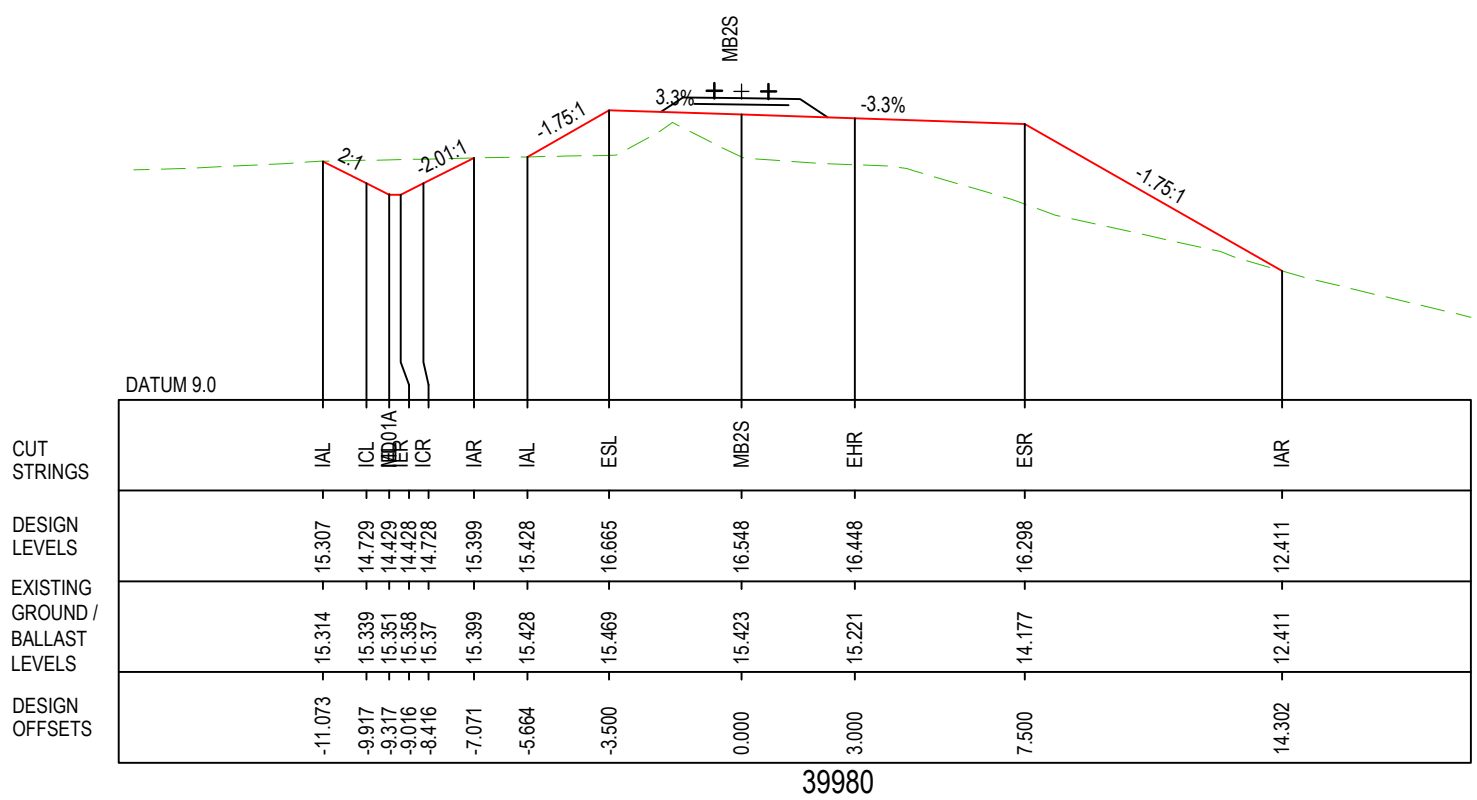
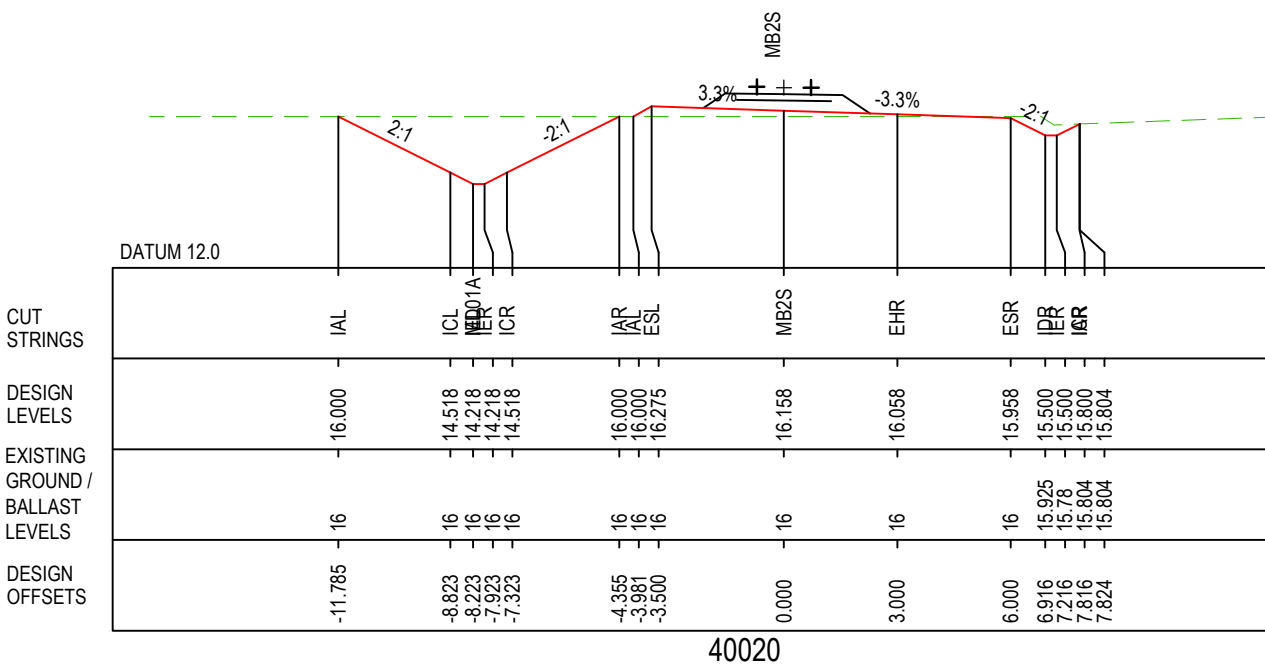
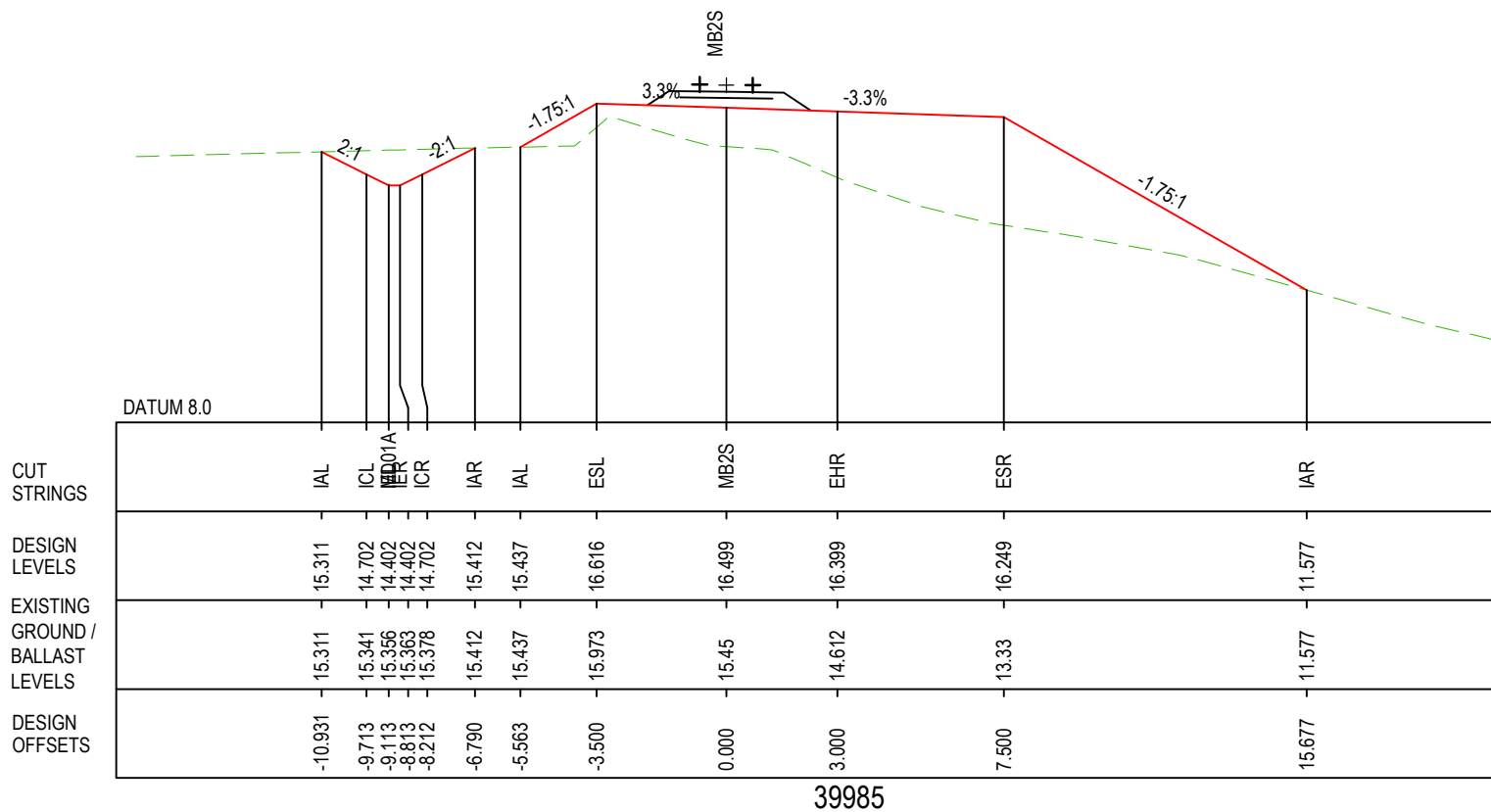
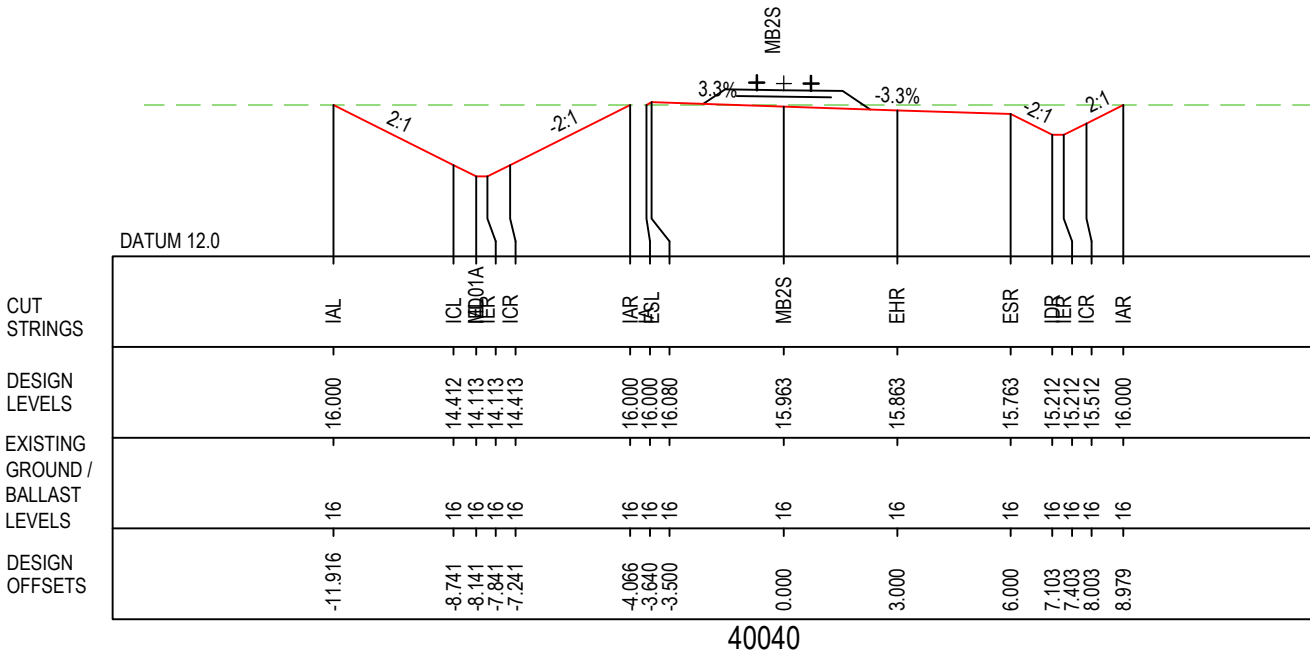
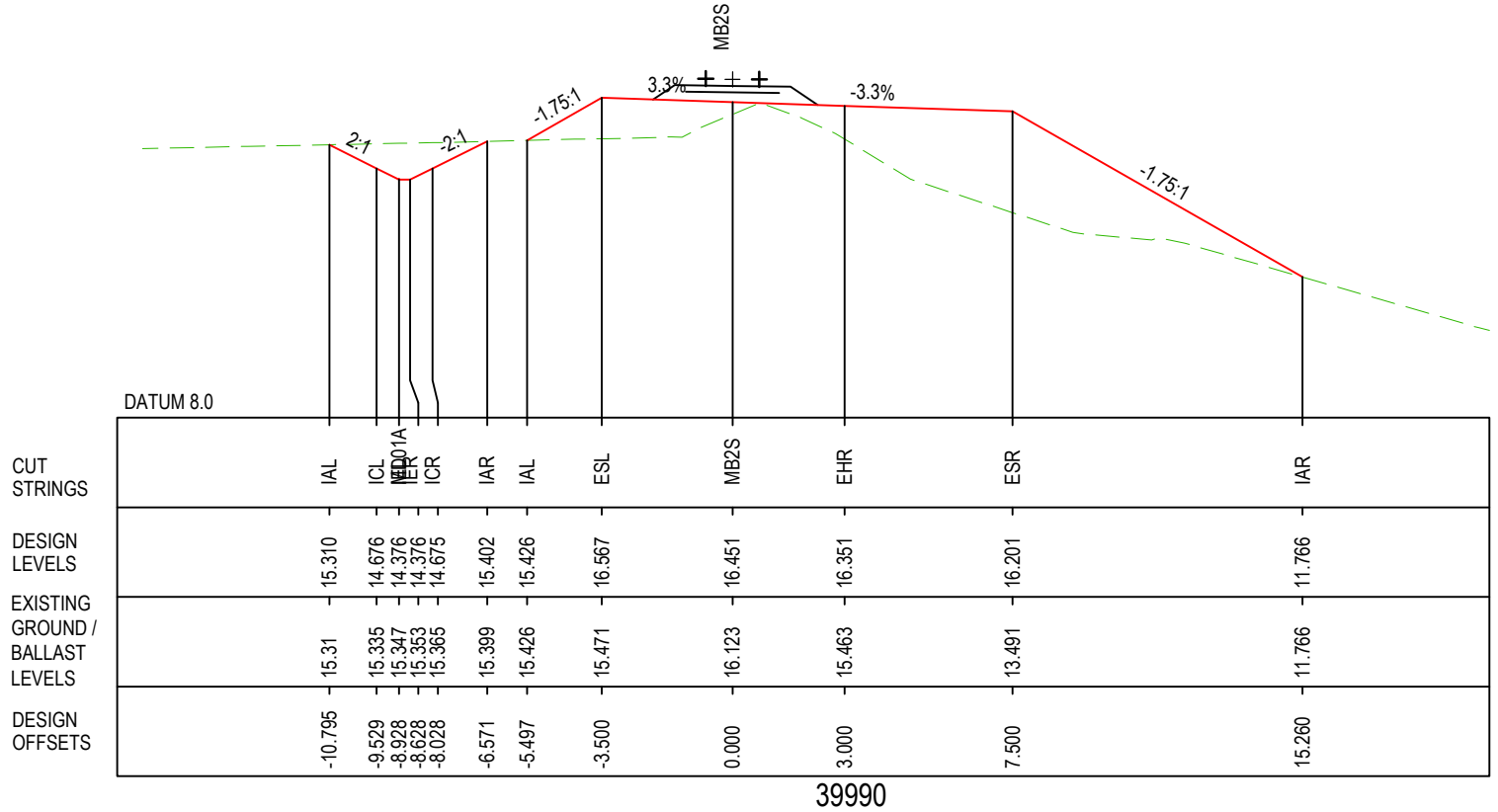
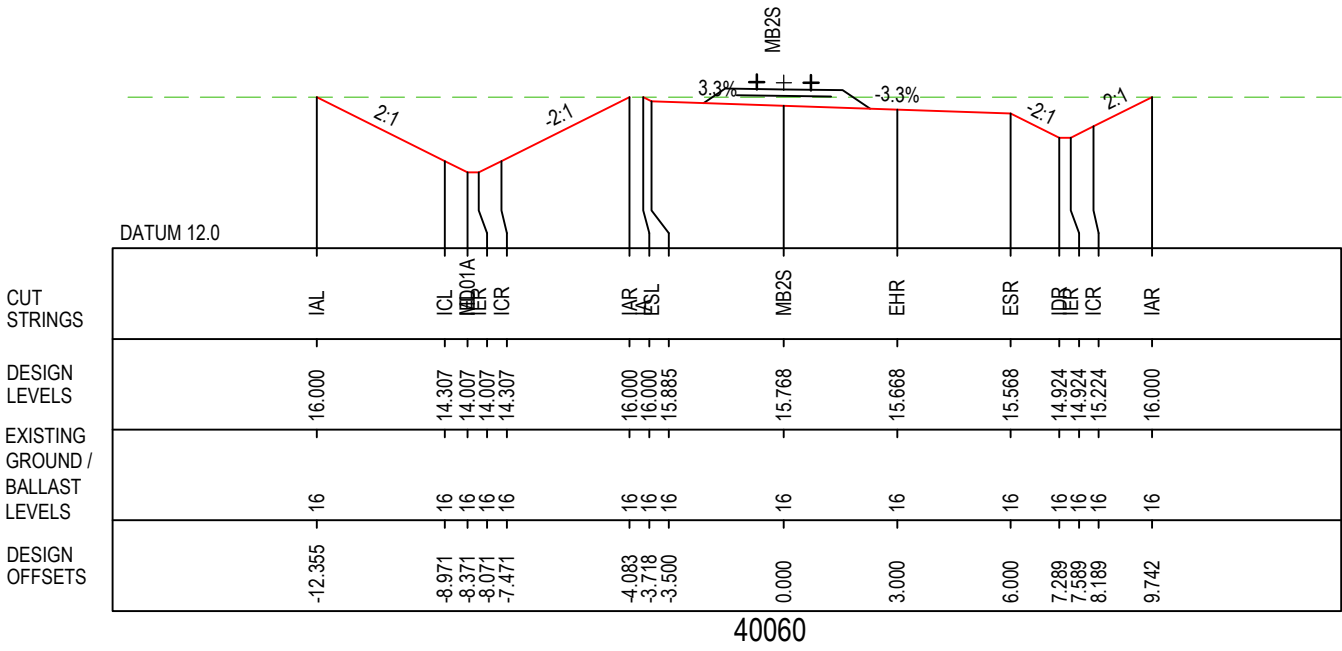
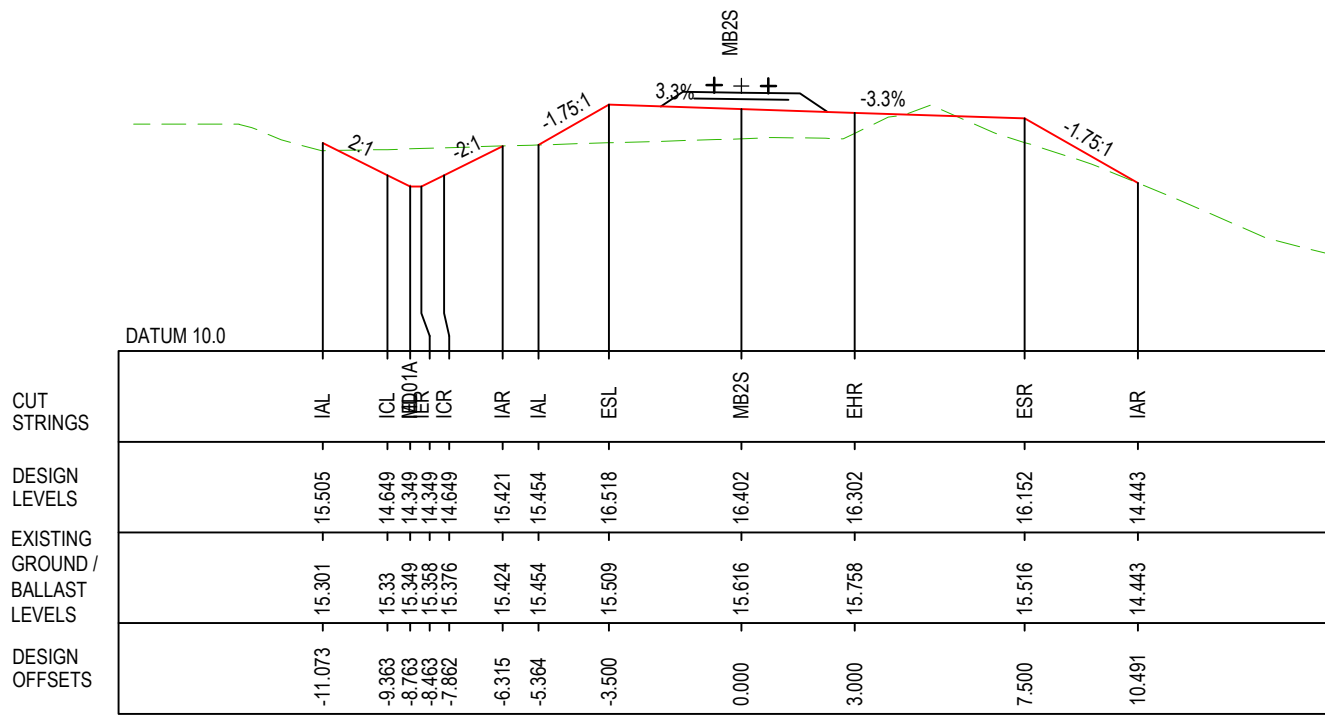
	DESIGN SURFACE (TOP OF CAPPING)
	EXISTING SURFACE / TOP OF SSFL BALLAST
	ASSUMED TOP OF SSFL EXISTING CAPPING LAYER (REFER NOTE 1)
	BRIDGE STRUCTURE
	PROPOSED RAIL DESIGN



ARTC DRAWING No				EDMS No				EDMS REV	
PROJECT		MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1							
TITLE		BULK EARTHWORKS SOUTHERN CONNECTION CROSS SECTIONS SHEET 5 OF 15							
DRAWING No.		PROJECT No.	ZONE	TYPE	DISC	NUMBER		REV	
		N01031	- PWD	- DRG	- GEN	0030		- 01	

LEGEND

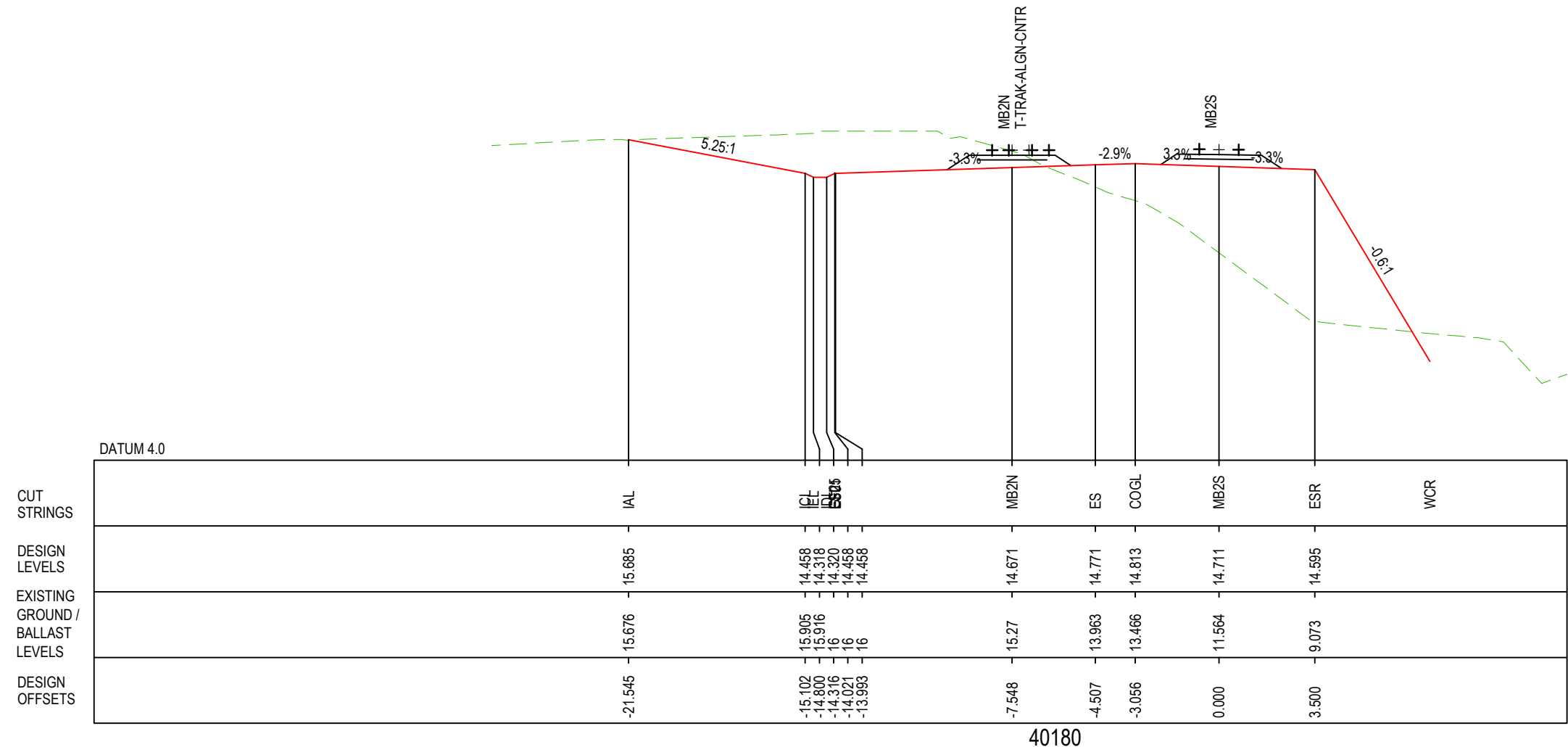
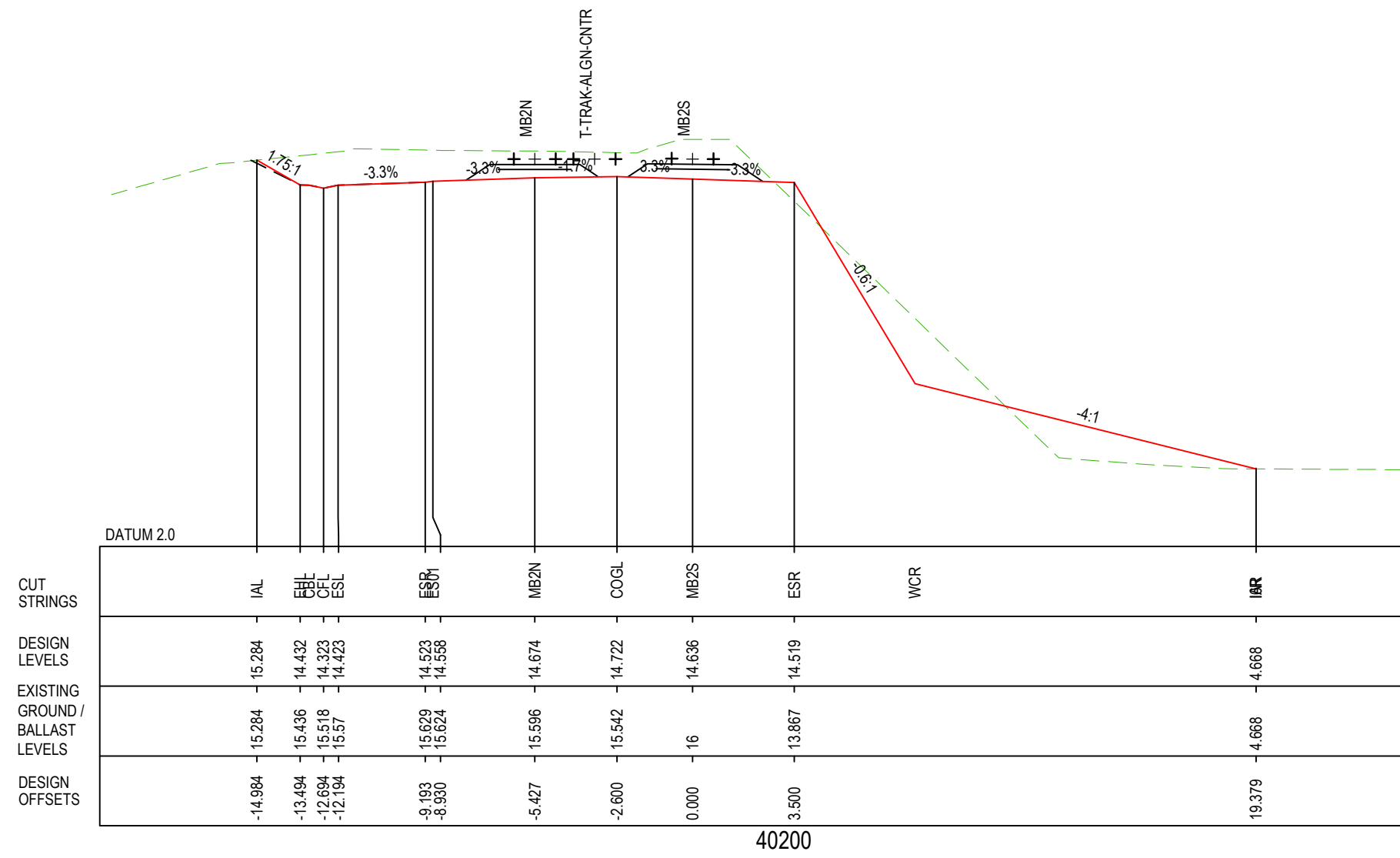
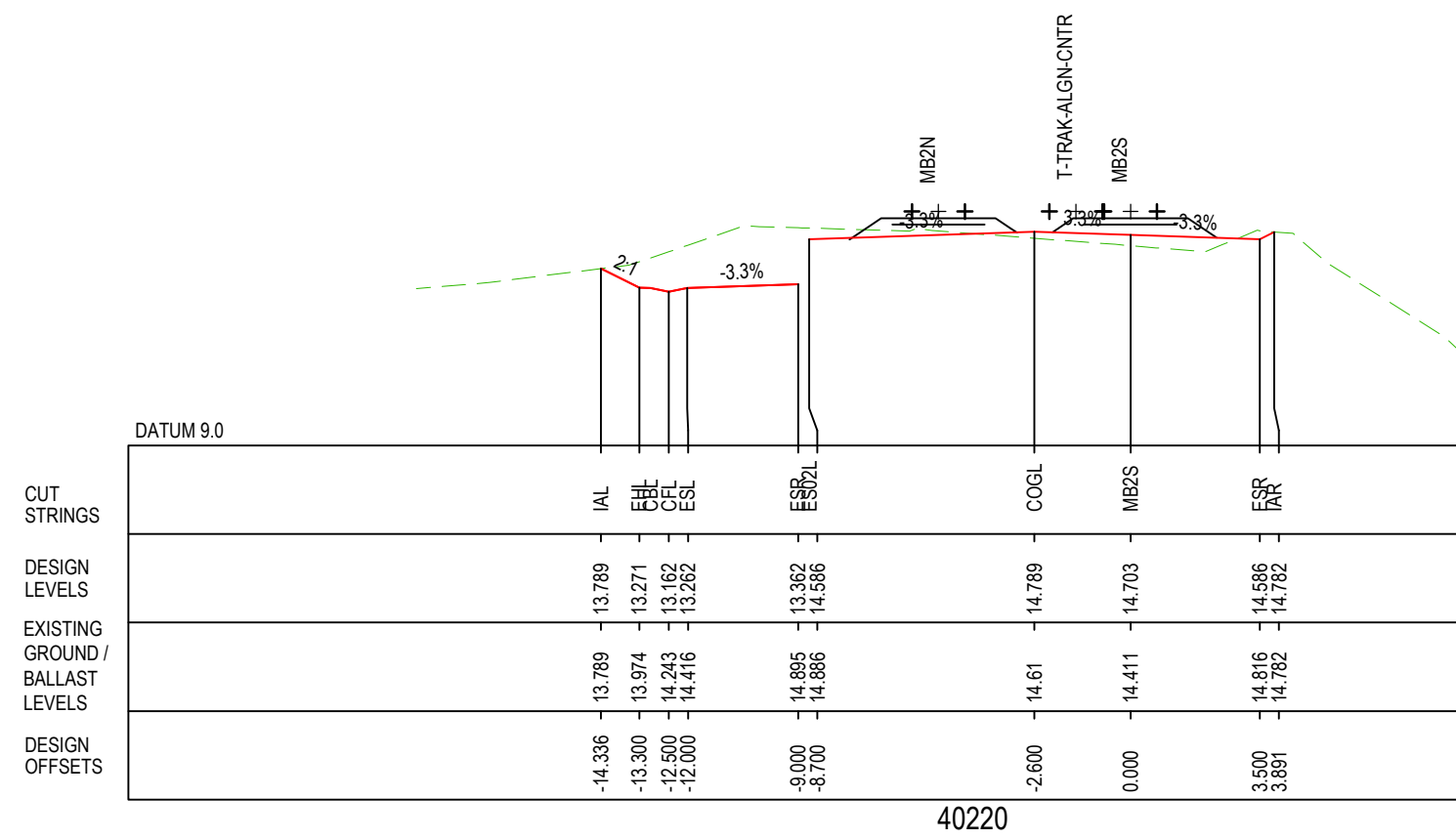
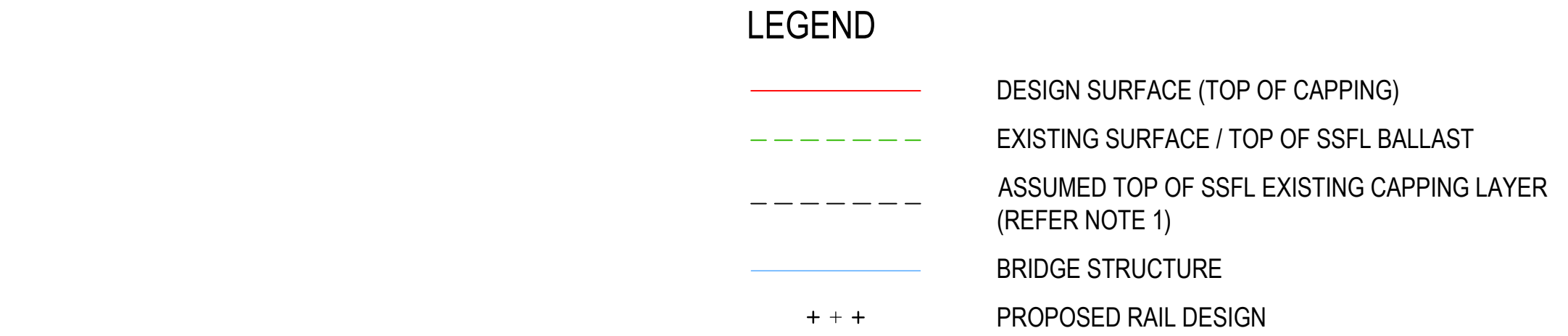
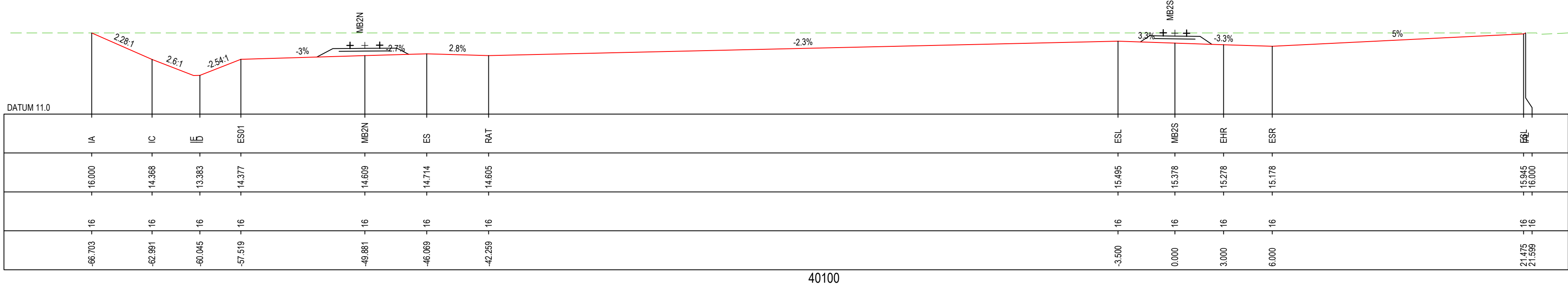
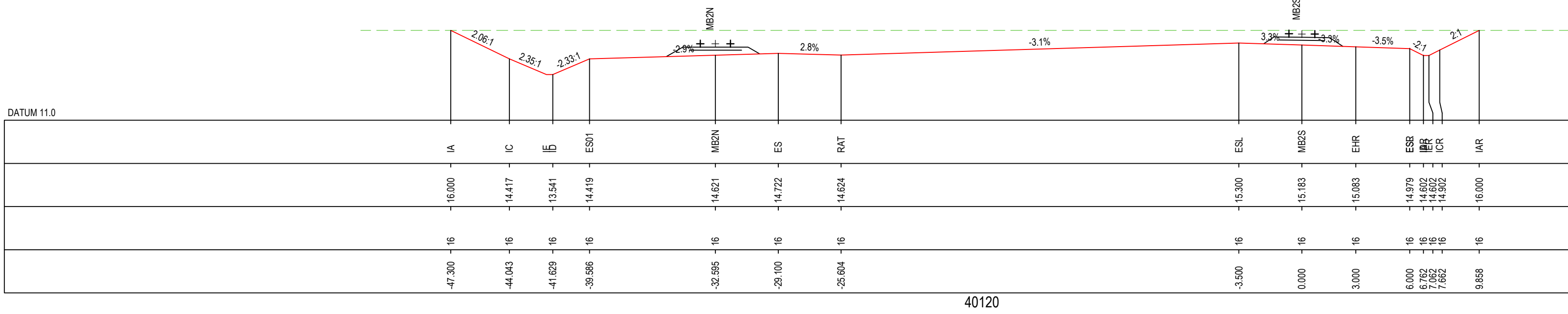
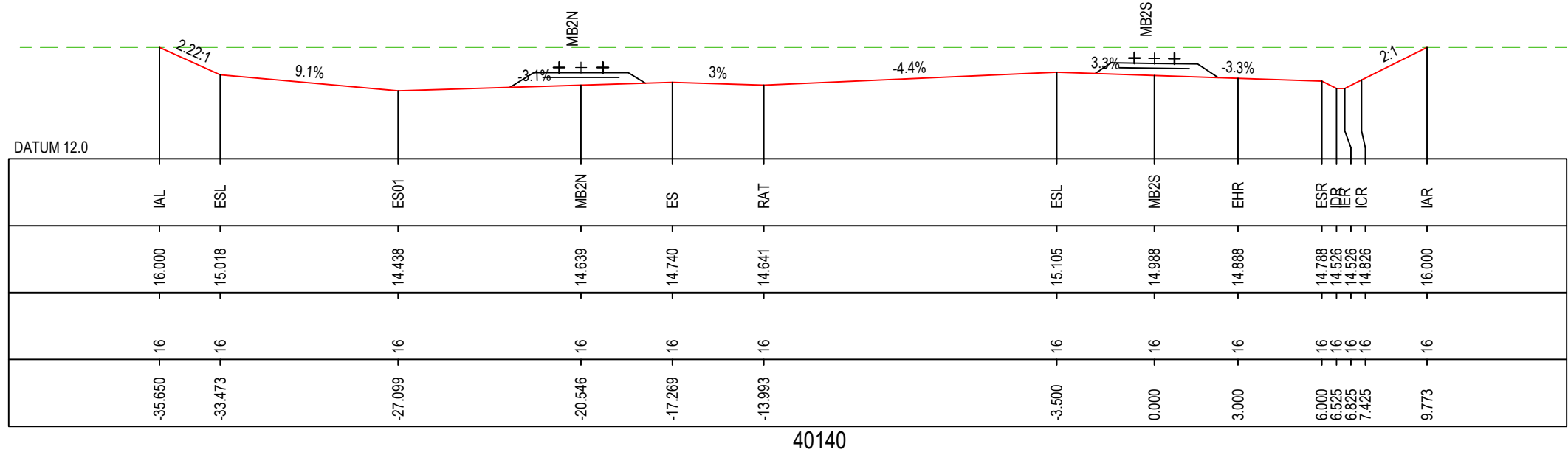
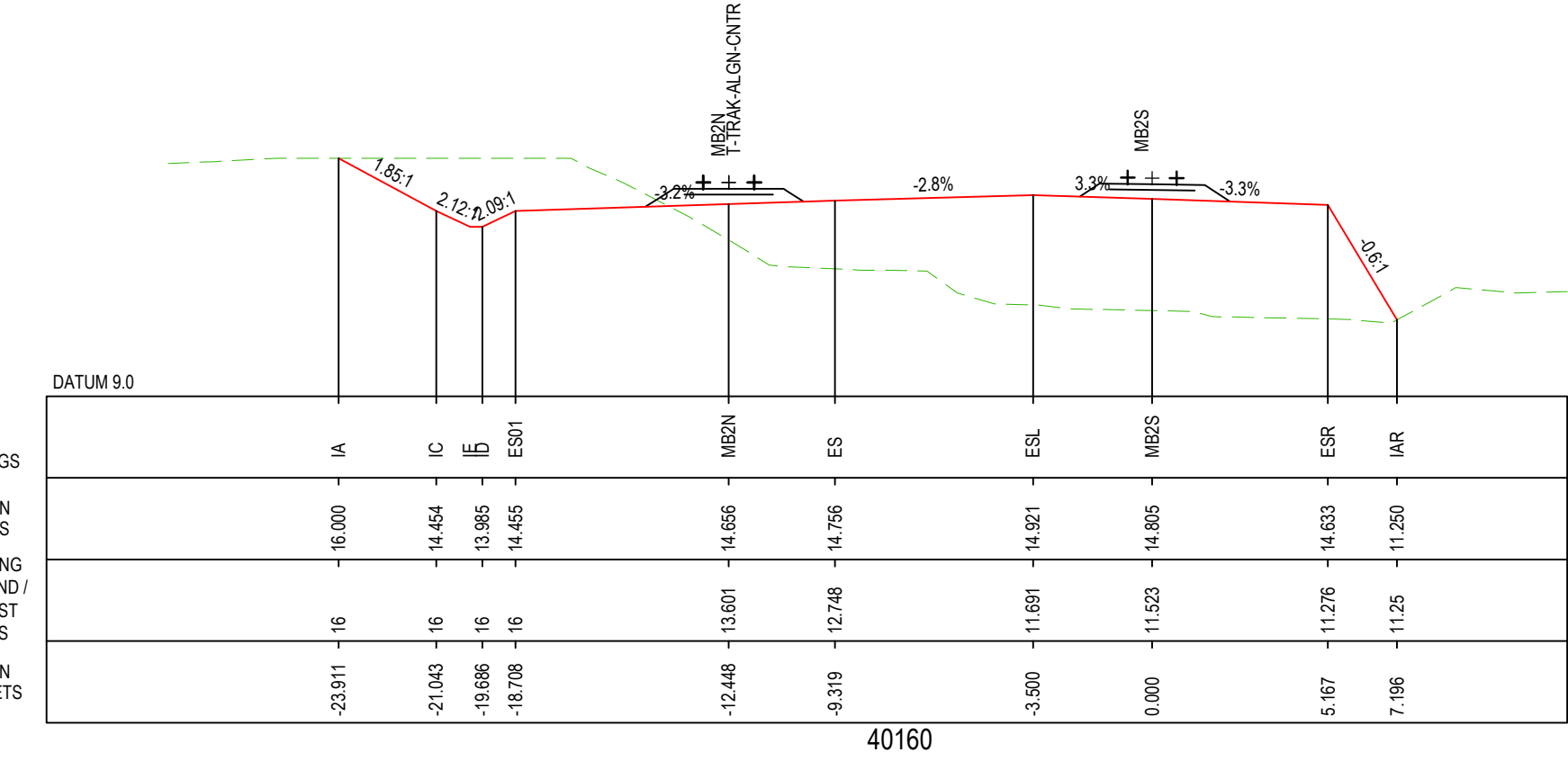
- DESIGN SURFACE (TOP OF CAPPING)
- EXISTING SURFACE / TOP OF SSFL BALLAST
- ASSUMED TOP OF SSFL EXISTING CAPPING LAYER (REFER NOTE 1)
- BRIDGE STRUCTURE
- PROPOSED RAIL DESIGN



REV	DATE	REVISION DETAILS	APPROVED
01	20.01.17	ACCEPTED FOR CONSTRUCTION	

ARTC DRAWING No			EDMS No			EDMS REV		
PROJECT			MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1					
TITLE			BULK EARTHWORKS SOUTHERN CONNECTION CROSS SECTIONS SHEET 6 OF 15					
DRAWING No.			PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV
			N01031	- PWD	- DRG	- GEN	0031	- 01

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REV	DATE	REVISION DETAILS	APPROVED
01	20.01.17	ACCEPTED FOR CONSTRUCTION	

SCALE	SIZE
AS SHOWN	A1

FOR CONSTRUCTION	APPROVED

ARTC DRAWING No		EDMS No			EDMS REV	
PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1					
TITLE	BULK EARTHWORKS SOUTHERN CONNECTION CROSS SECTIONS SHEET 7 OF 15					
DRAWING No.	PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV
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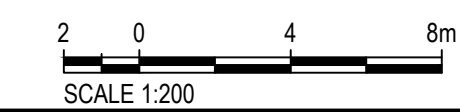
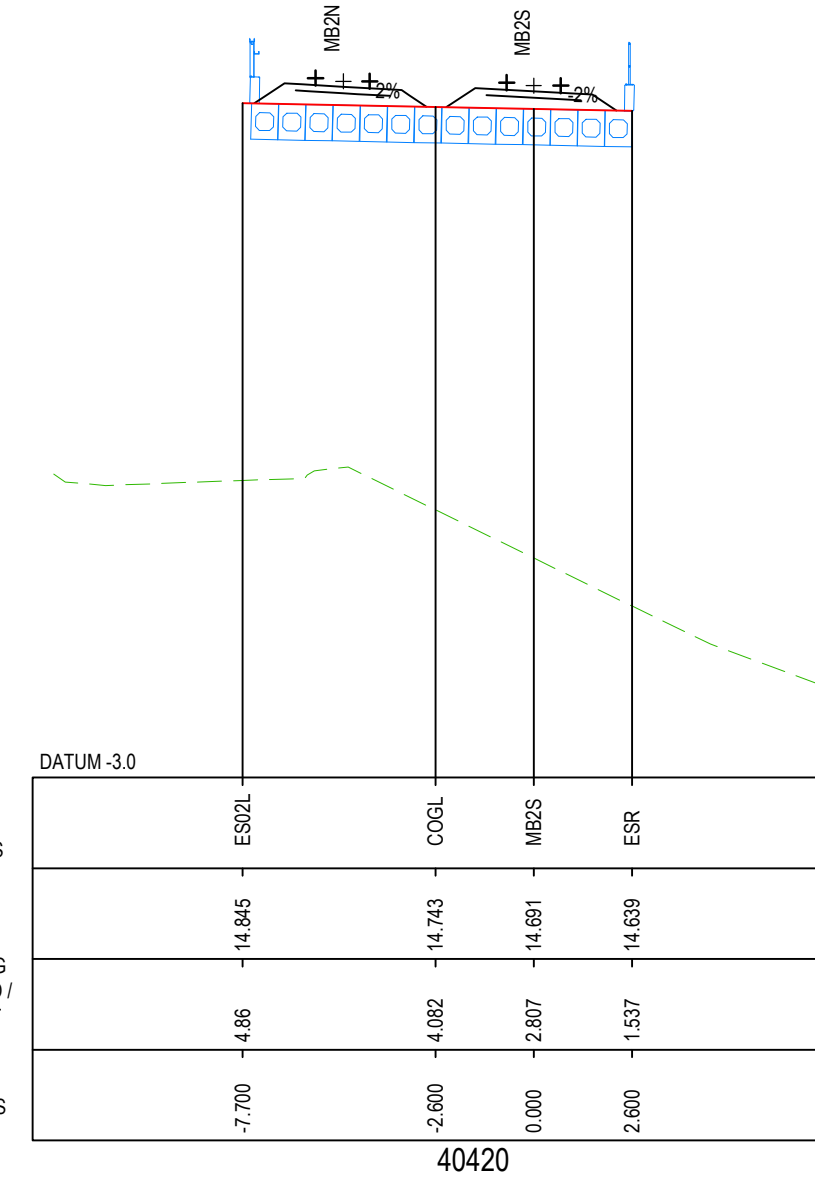
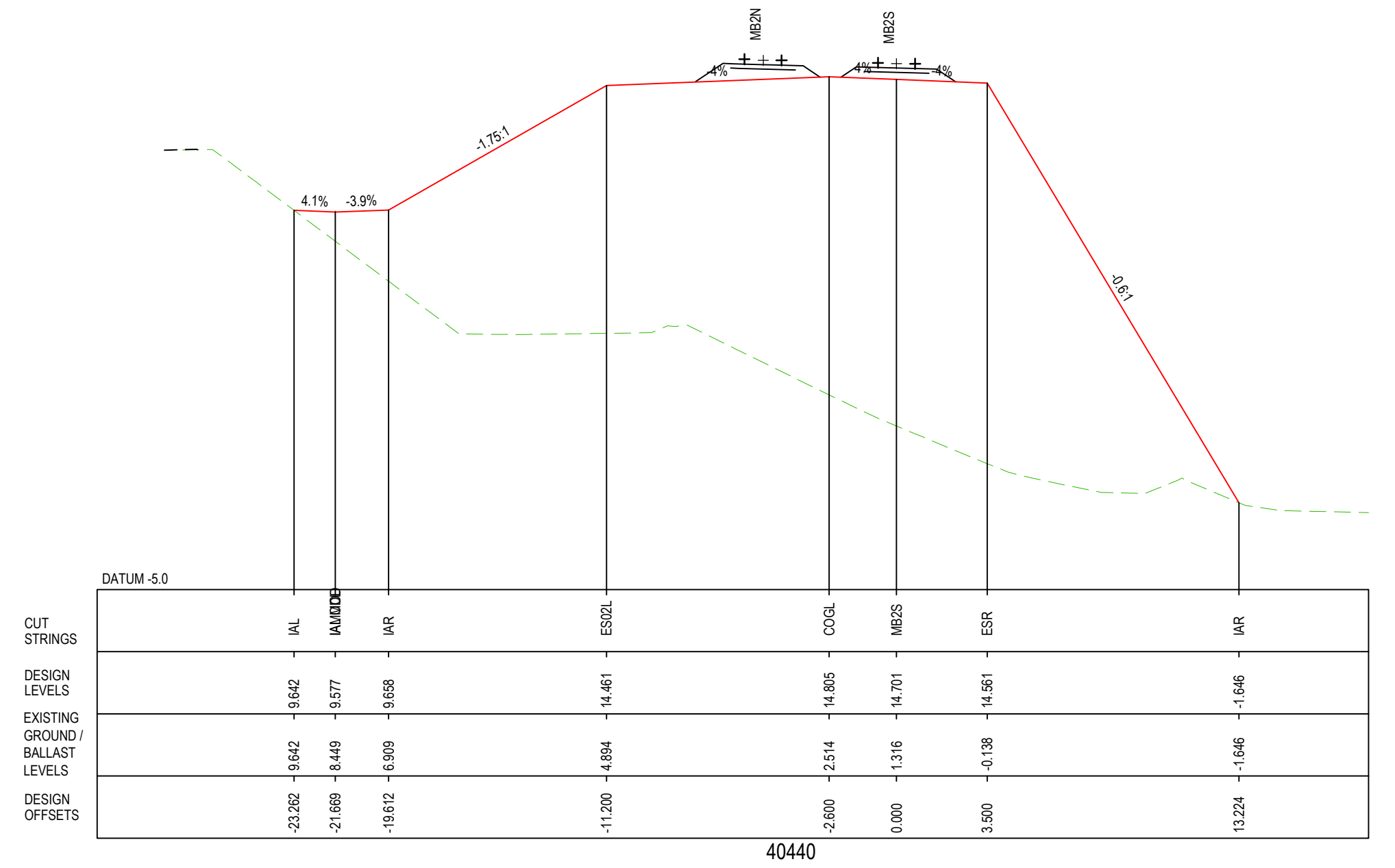
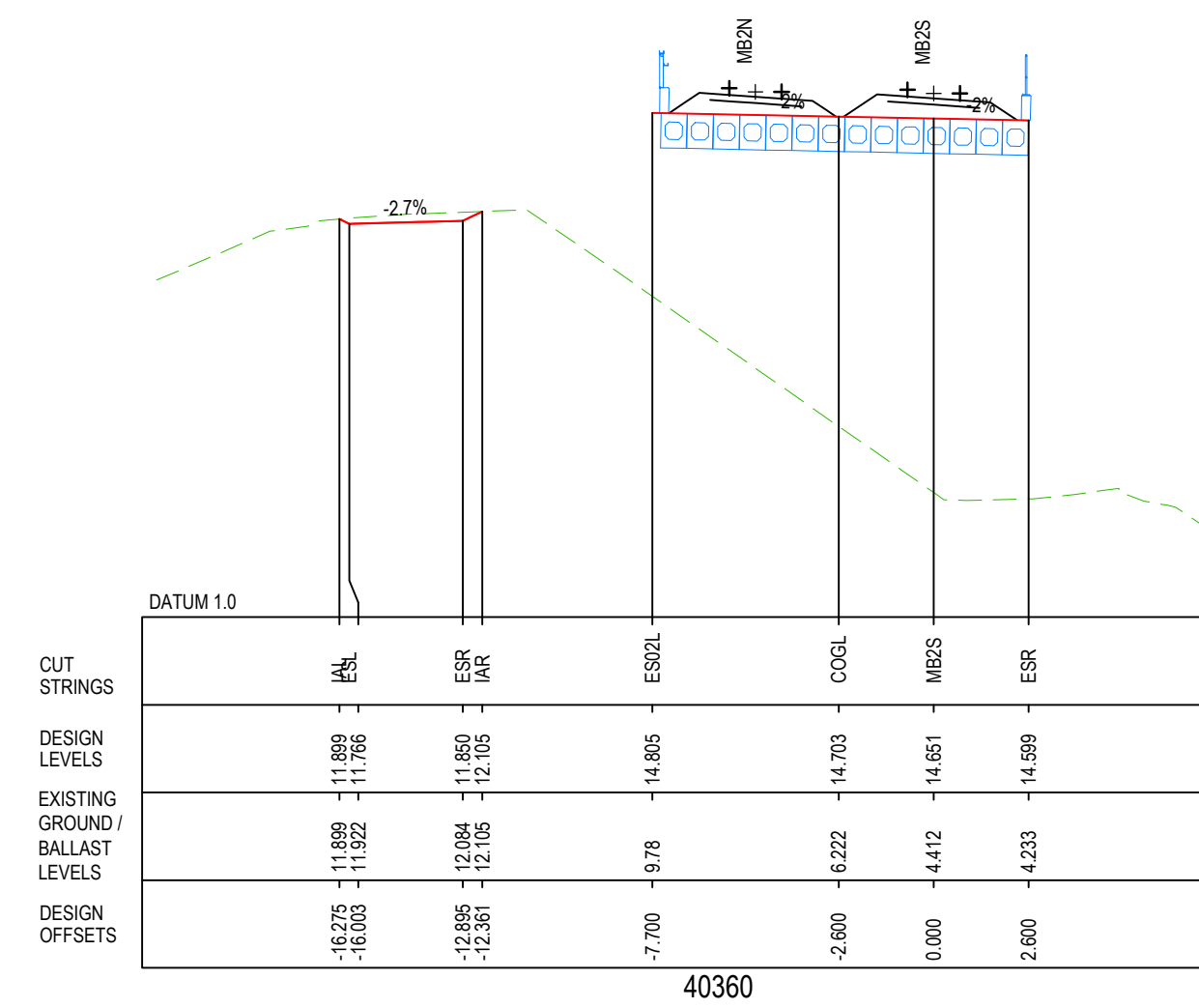
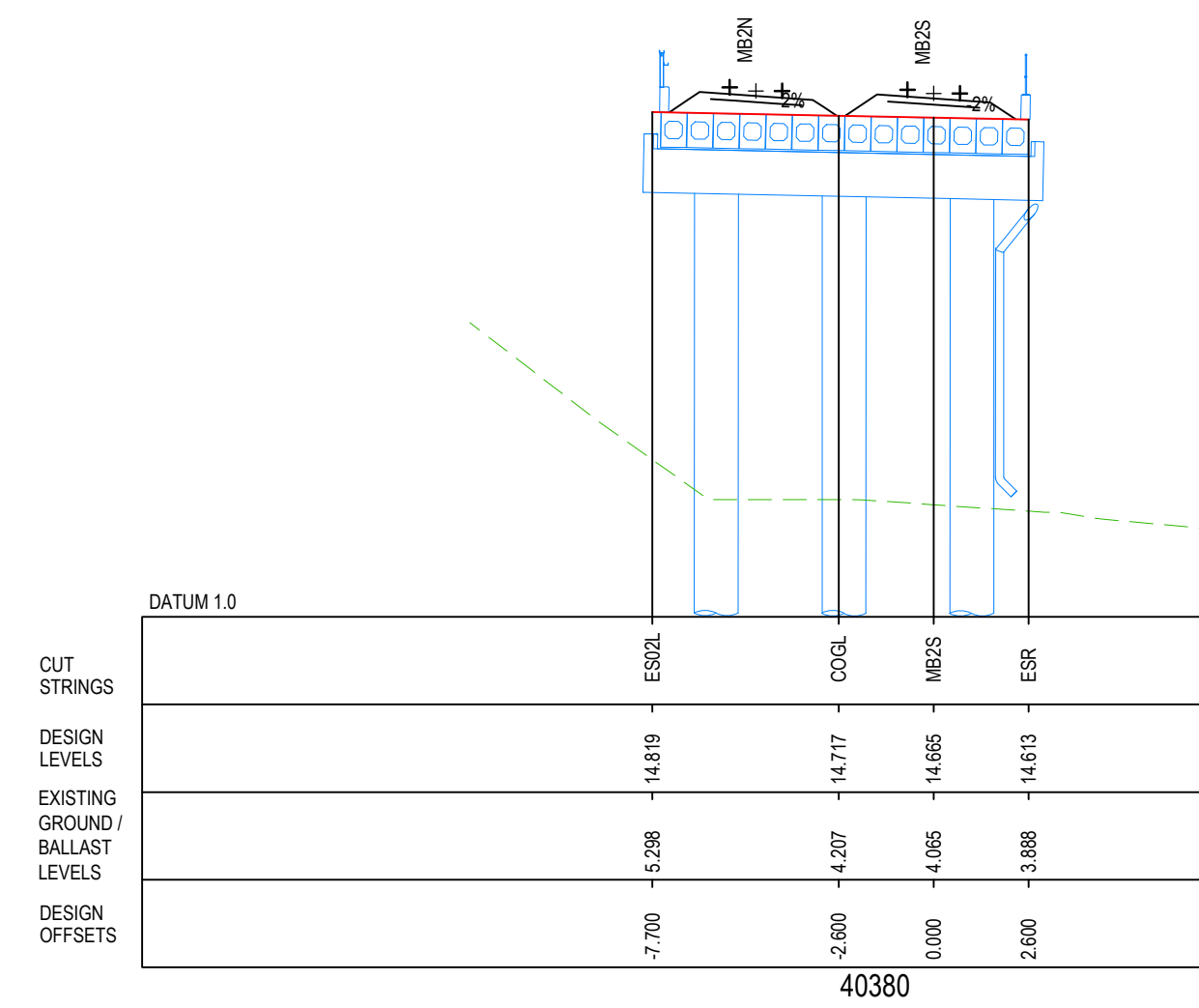
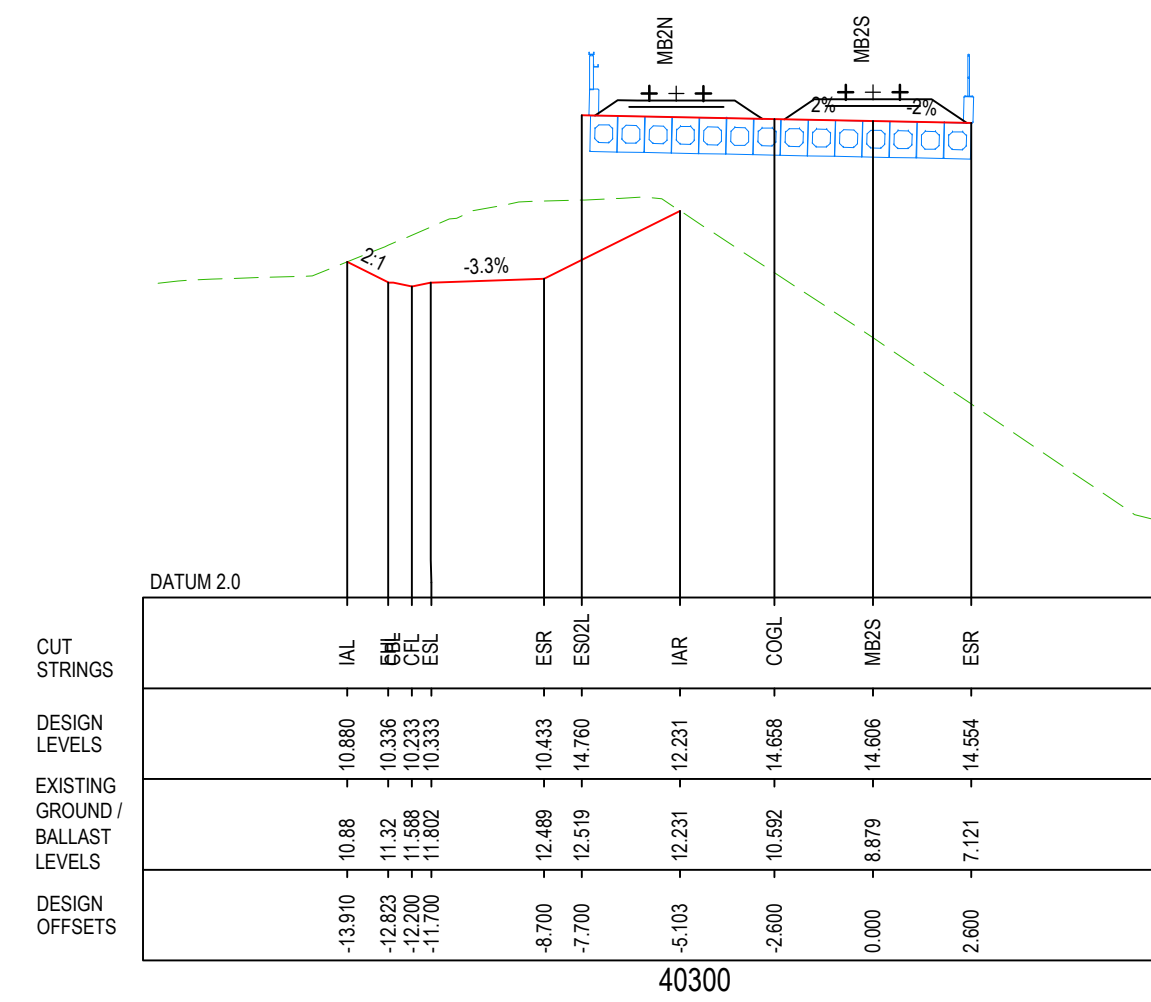
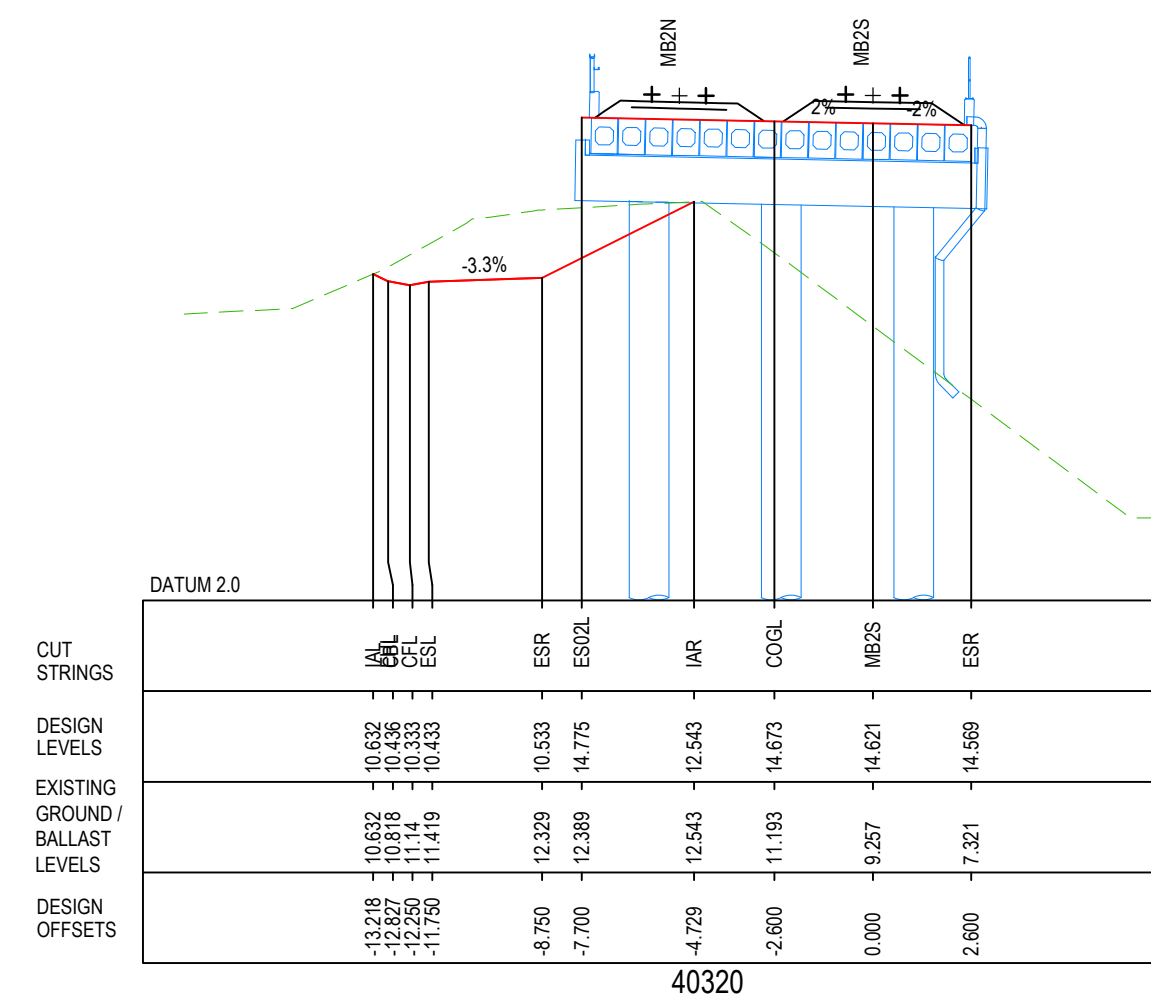
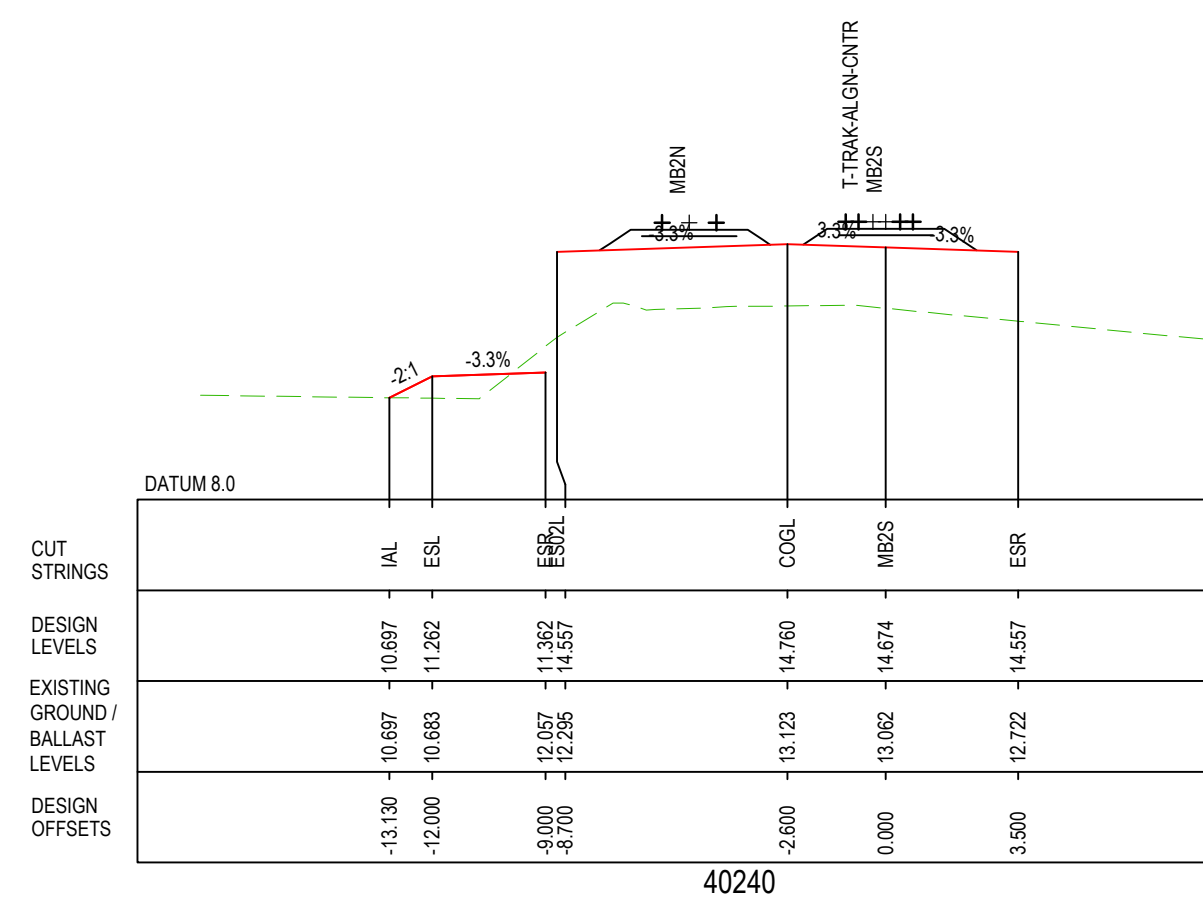
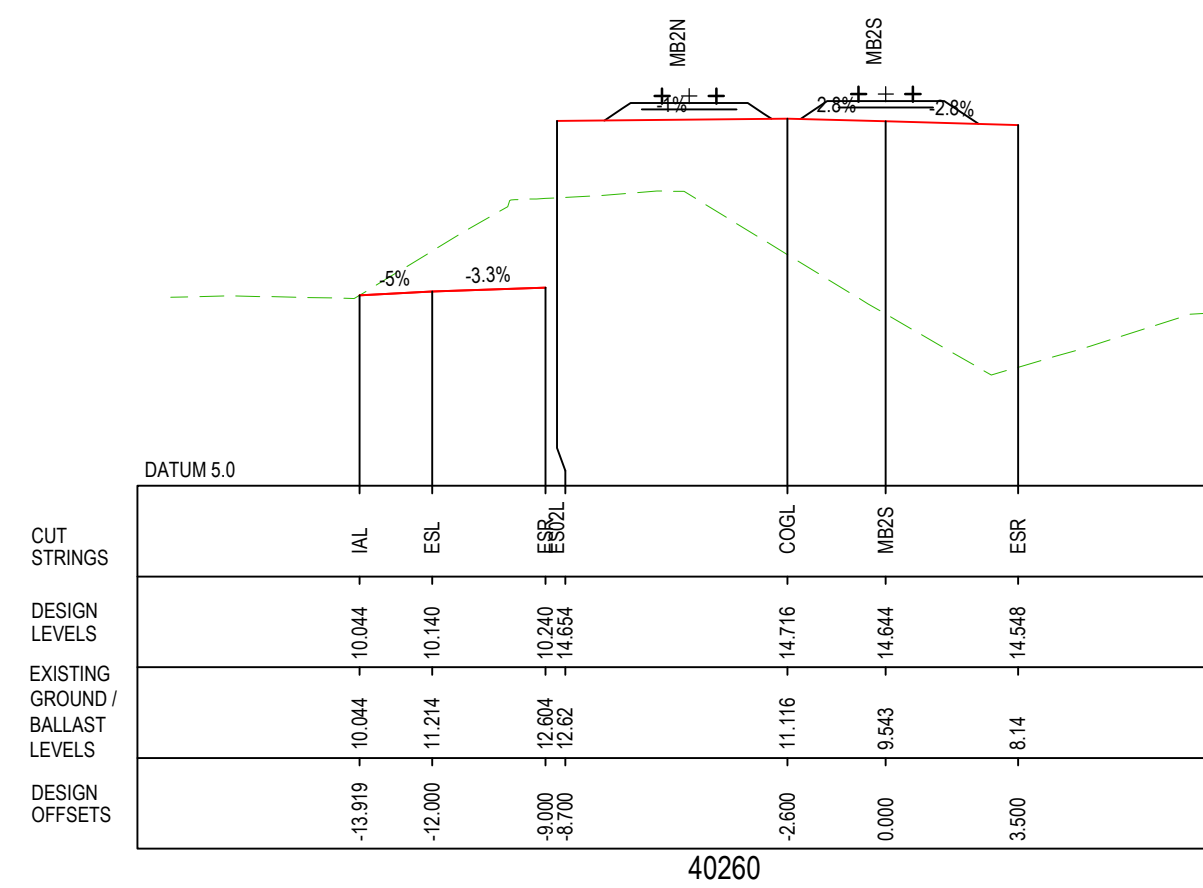
DESIGN SURFACE (TOP OF CAPPING)

EXISTING SURFACE / TOP OF SSFL BALLAST

ASSUMED TOP OF SSFL EXISTING CAPPING LAYER
(REFER NOTE 1)

BRIDGE STRUCTURE

PROPOSED RAIL DESIGN



ARTC DRAWING No		EDMS No			EDMS REV	
PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1					
TITLE	BULK EARTHWORKS SOUTHERN CONNECTION CROSS SECTIONS SHEET 8 OF 15					
DRAWING No.	PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV
	N01031	- PWD	- DRG	- GEN	0033	01

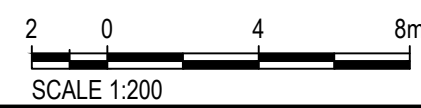
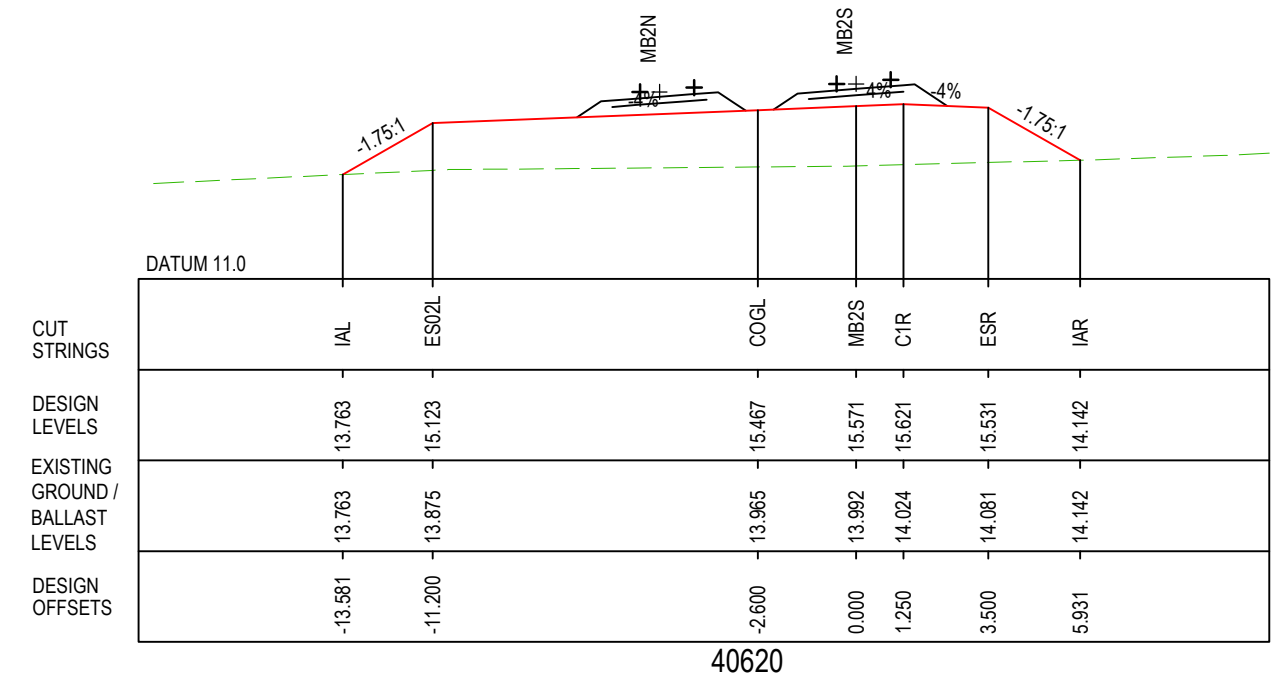
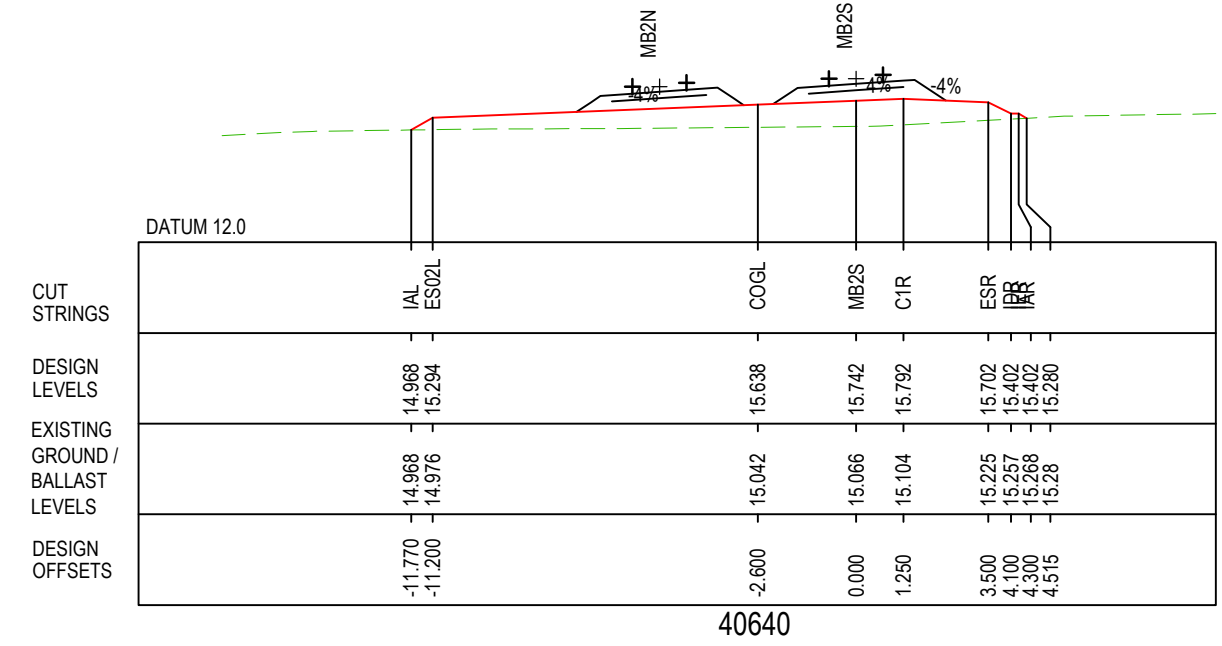
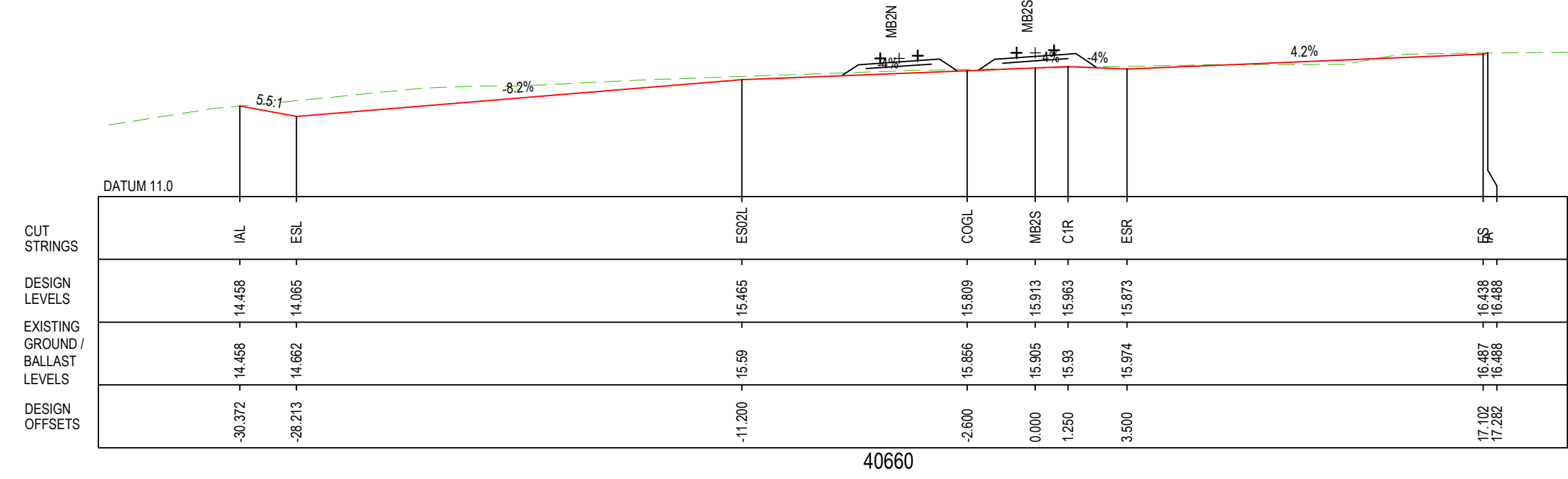
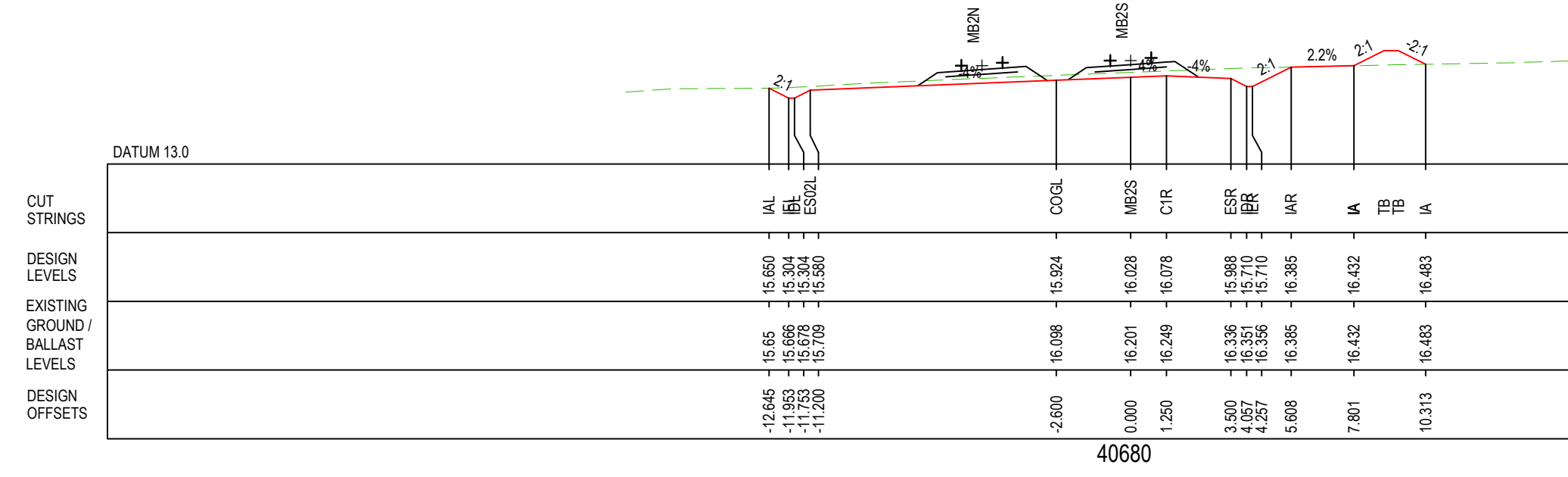
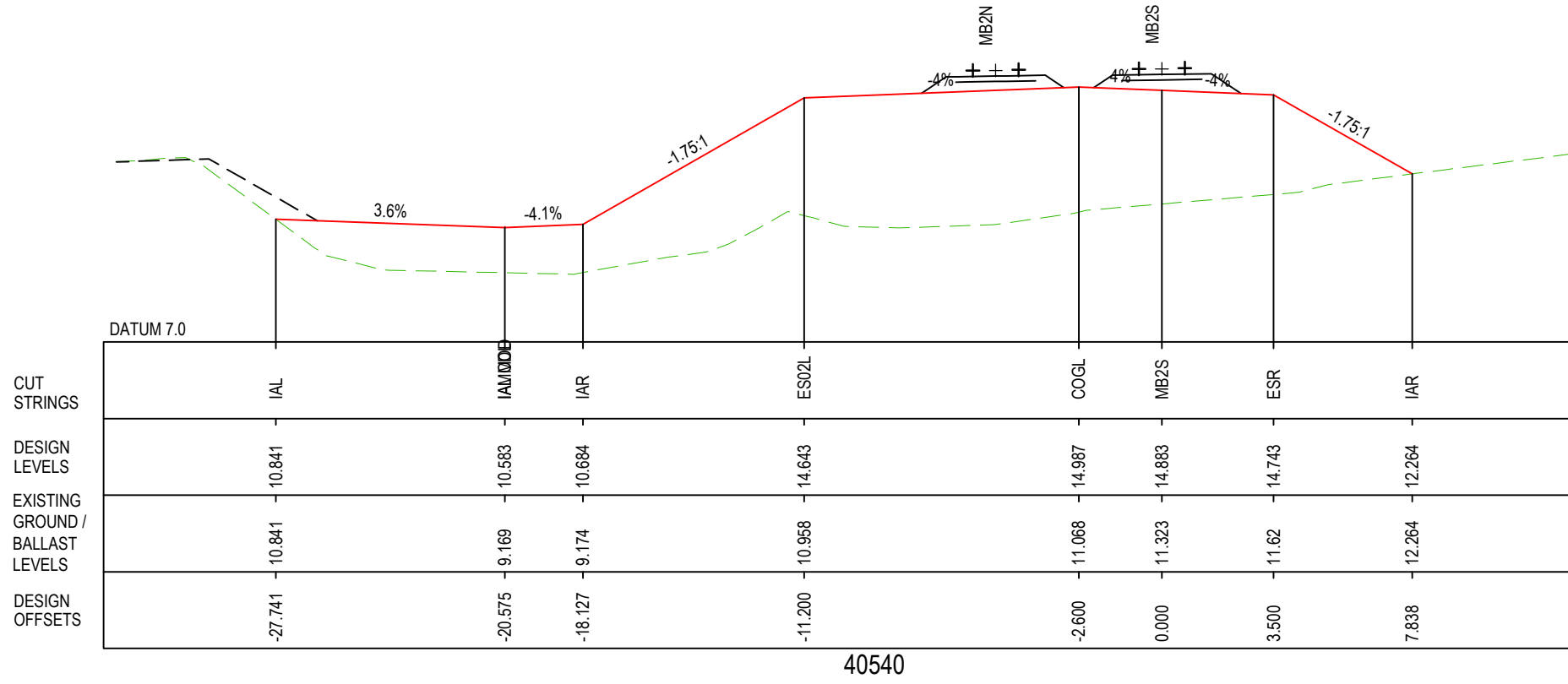
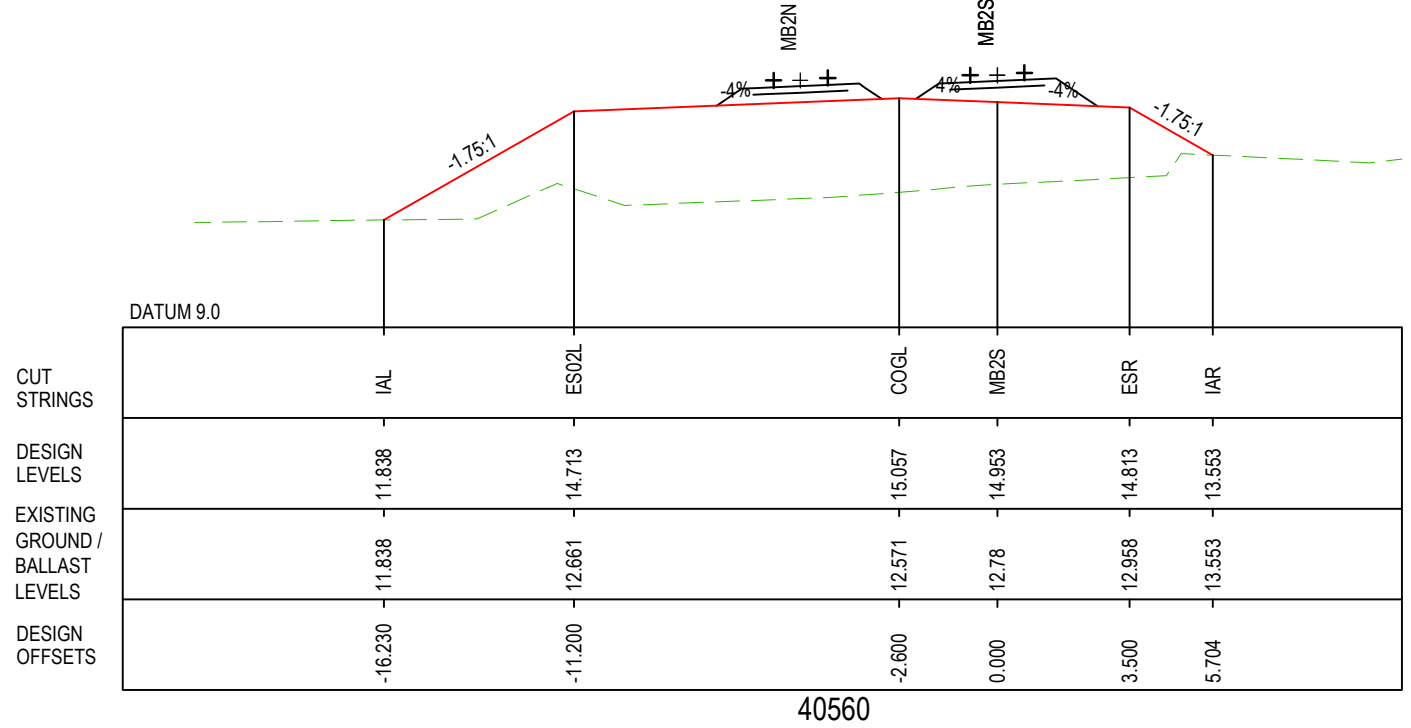
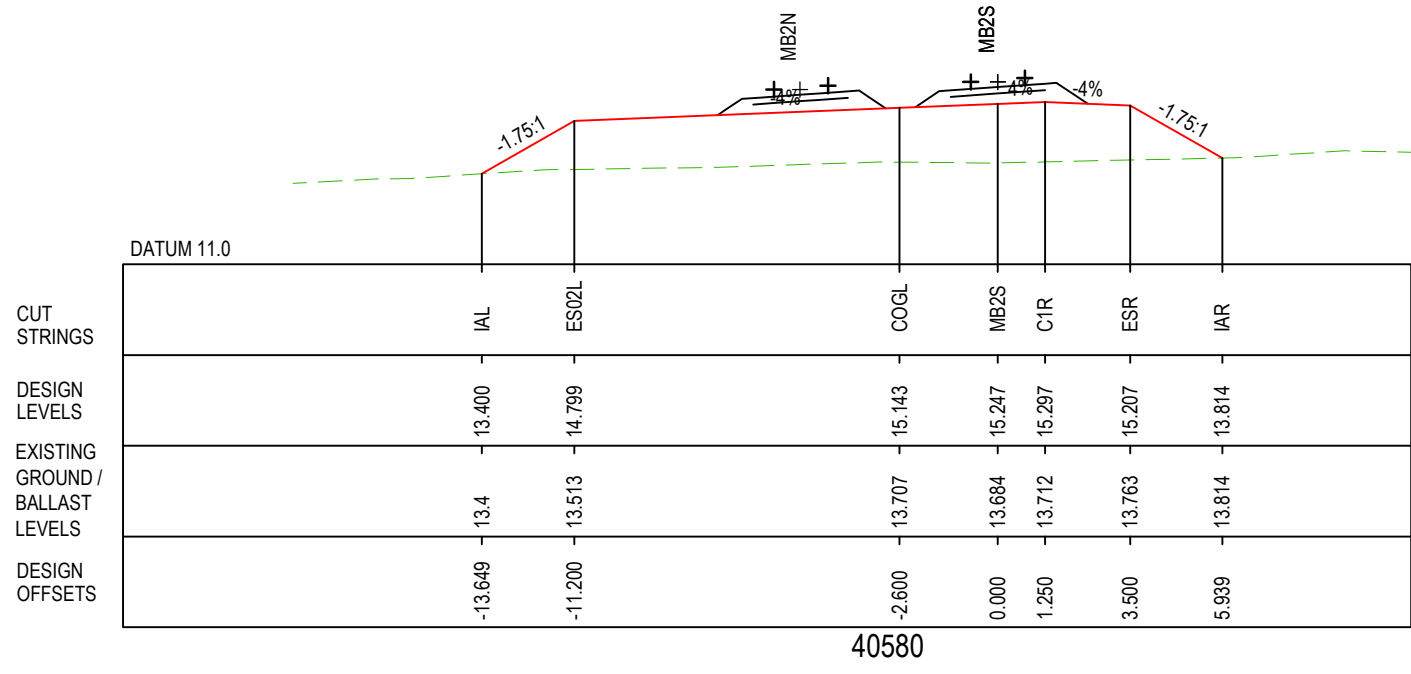
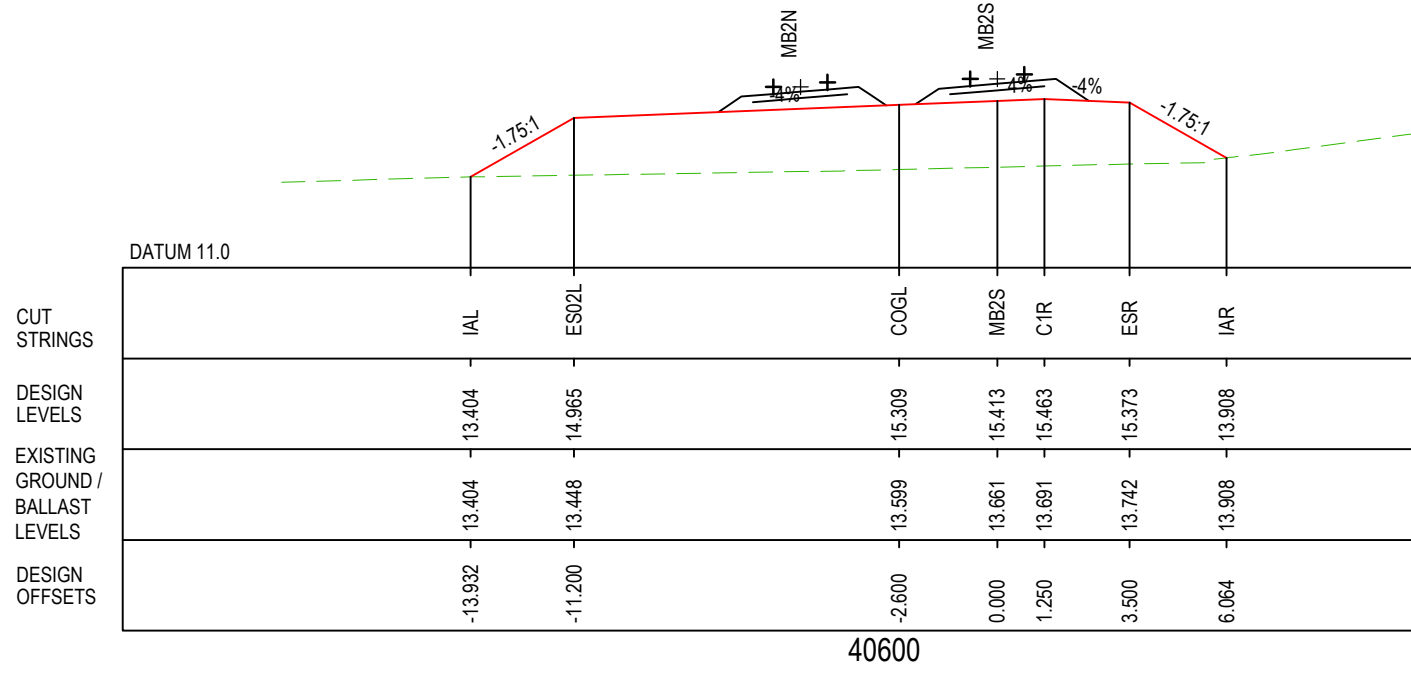
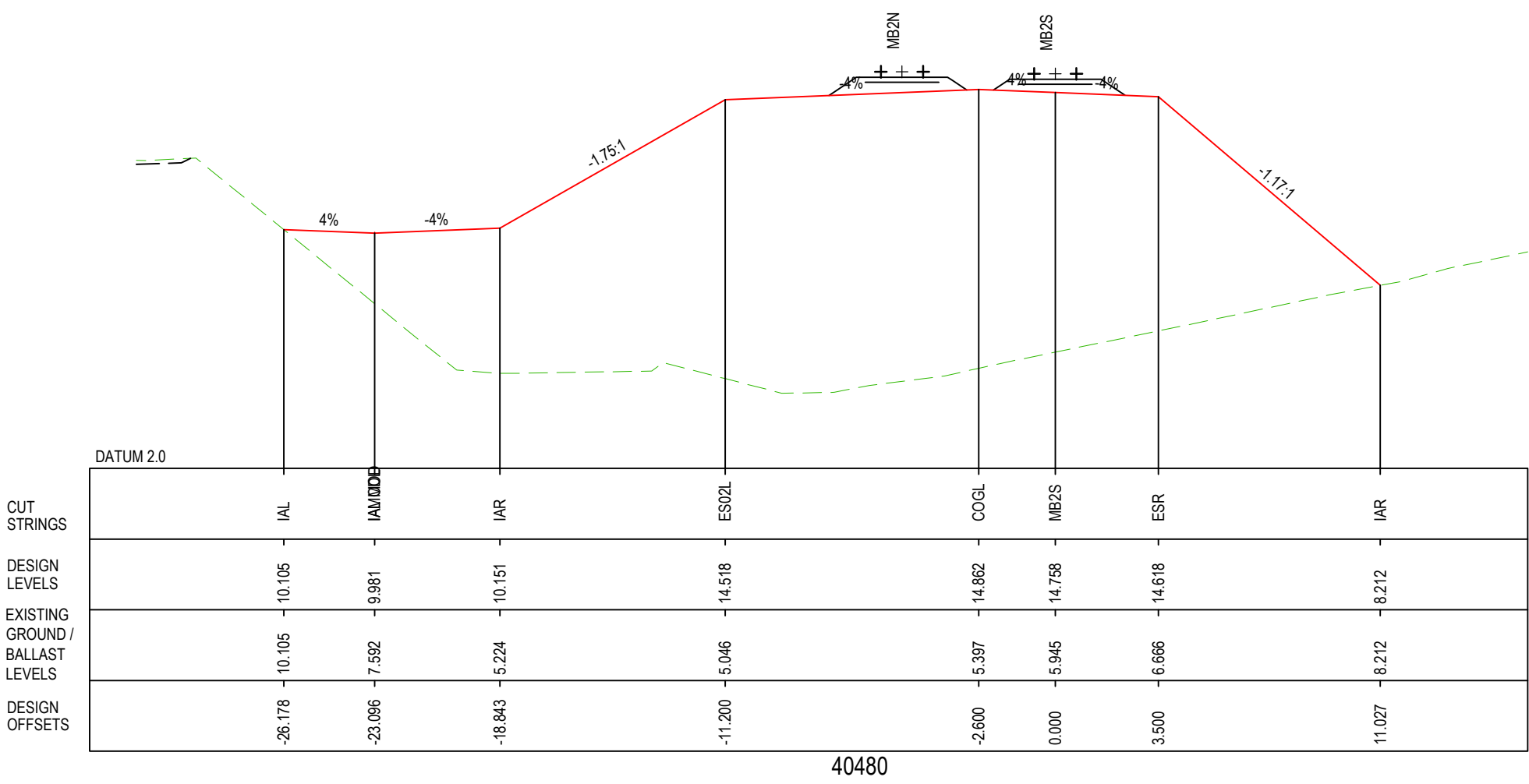
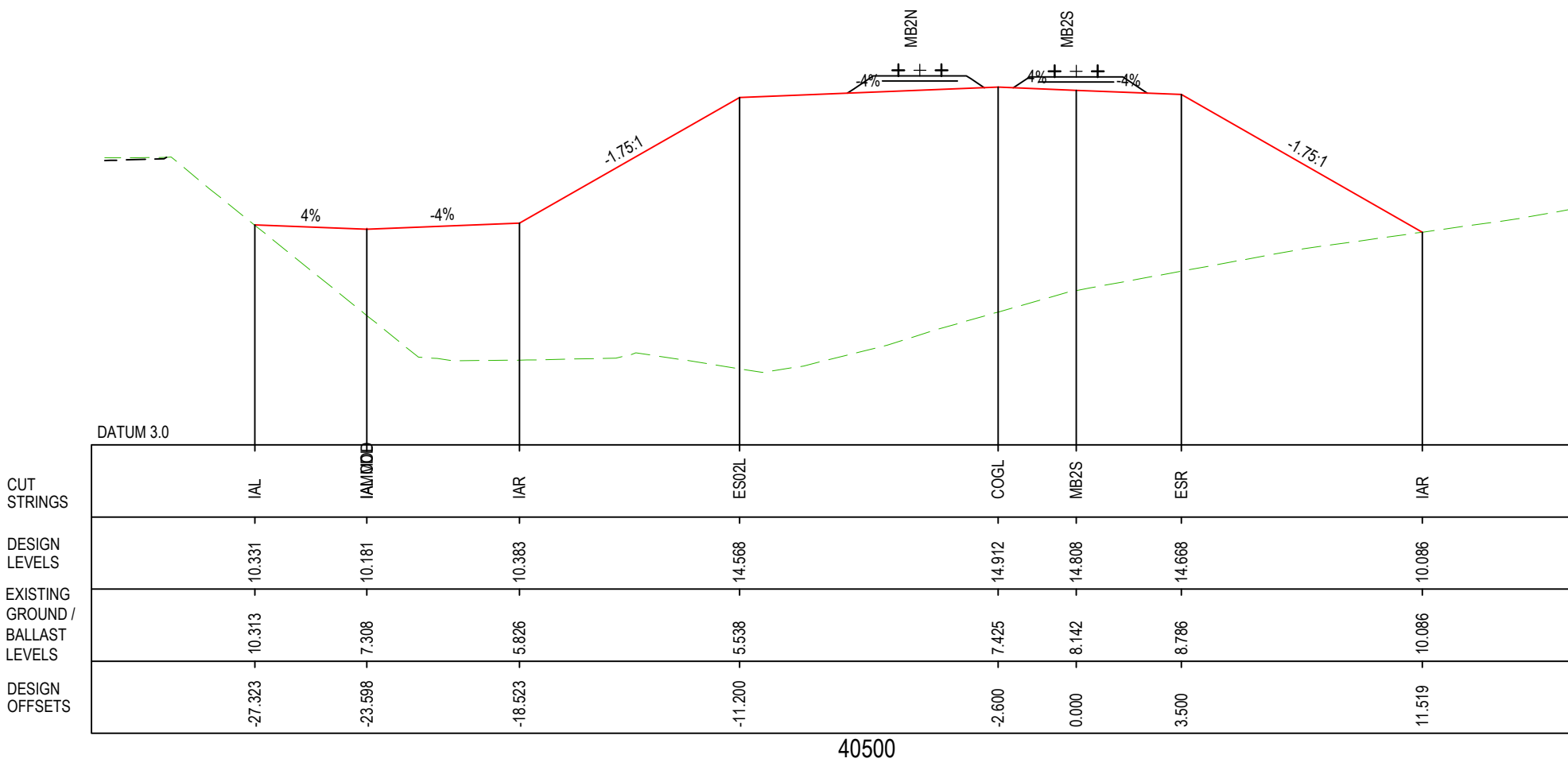
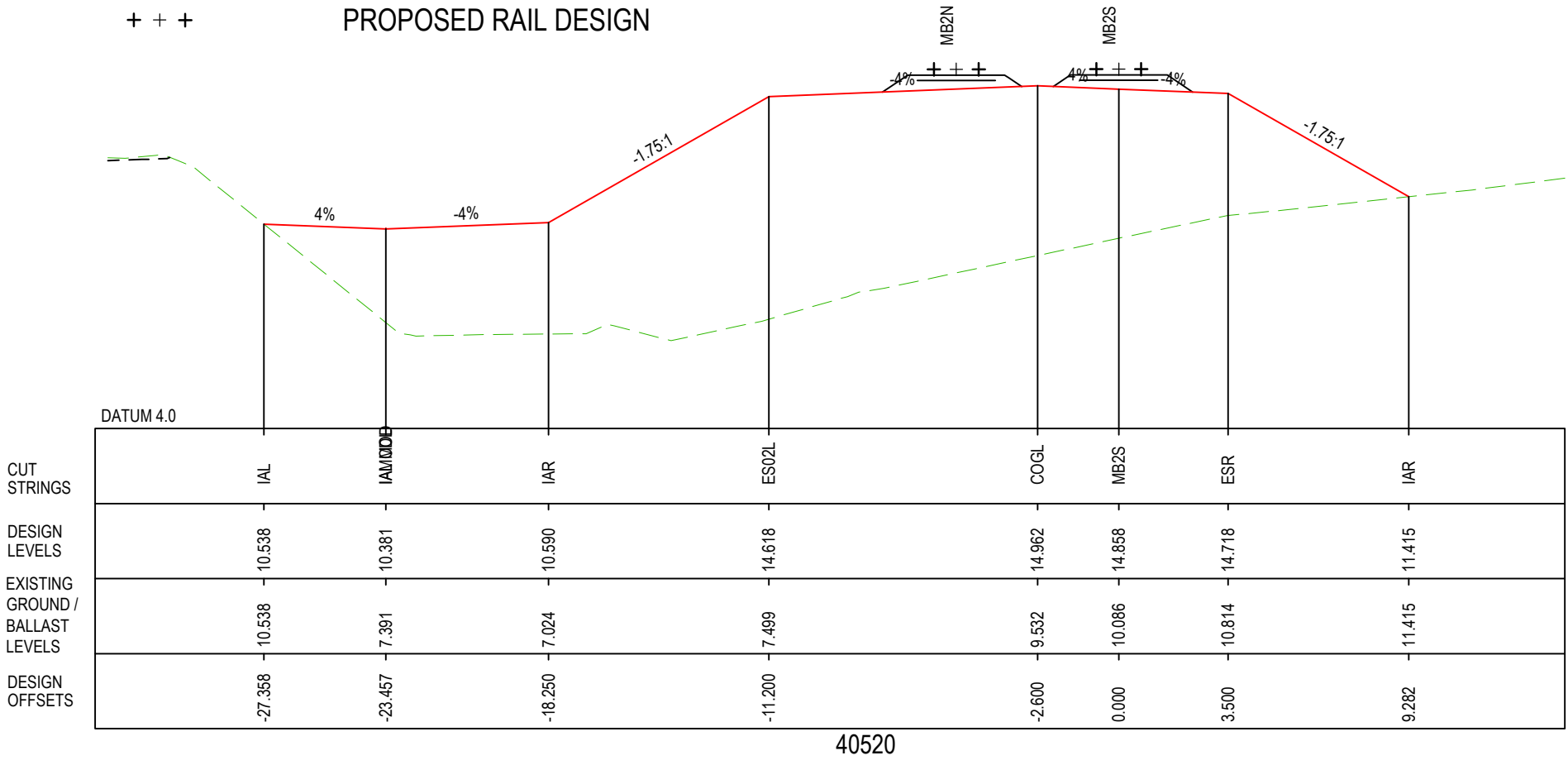
LEGEND

- DESIGN SURFACE (TOP OF CAPPING)
- EXISTING SURFACE / TOP OF SSFL BALLAST
- ASSUMED TOP OF SSFL EXISTING CAPPING LAYER
(REFER NOTE 1)
- BRIDGE STRUCTURE
- +

+

+

PROPOSED RAIL DESIGN



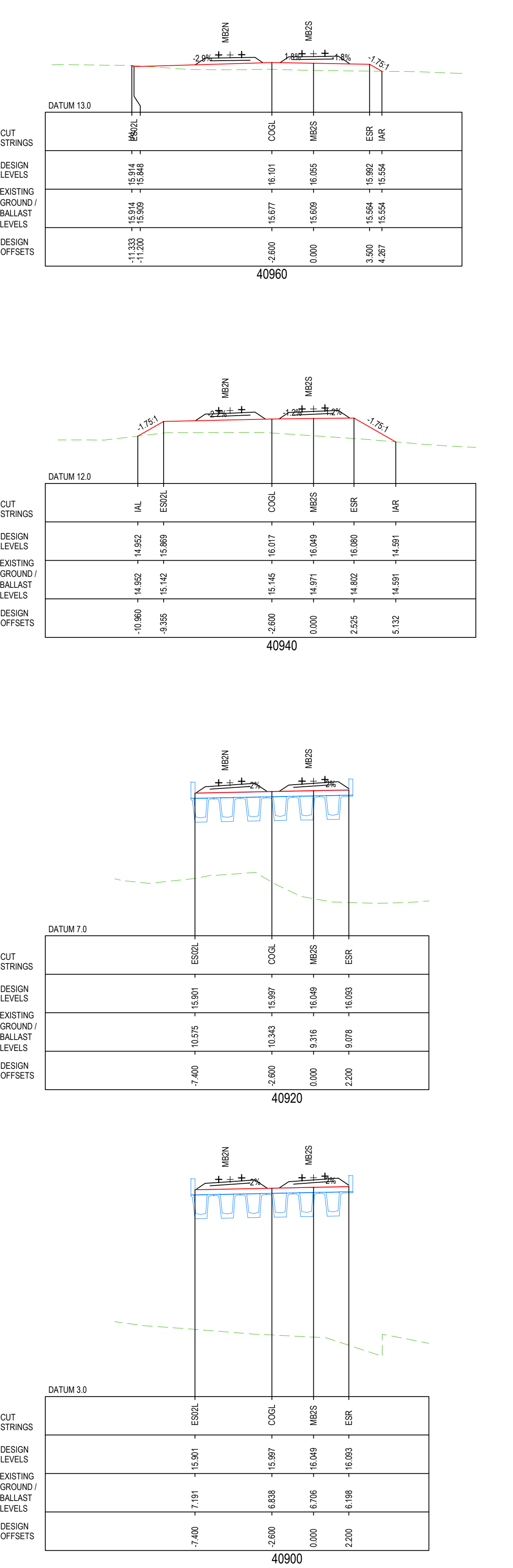
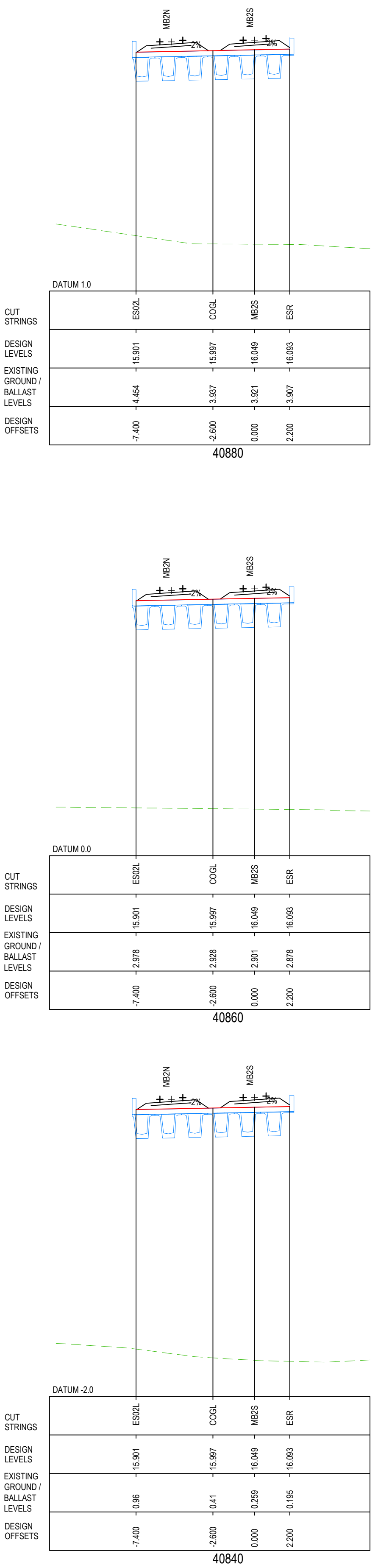
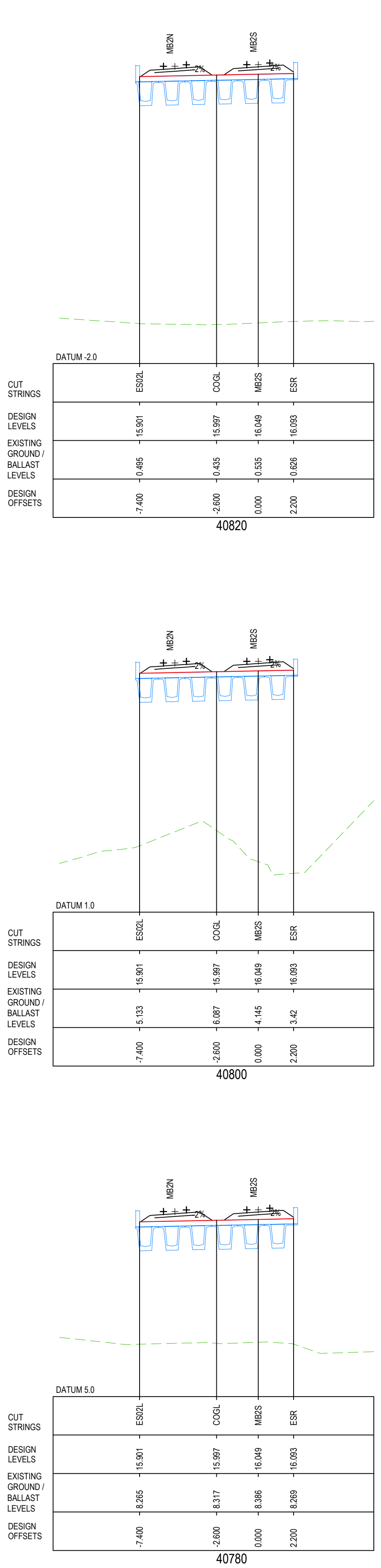
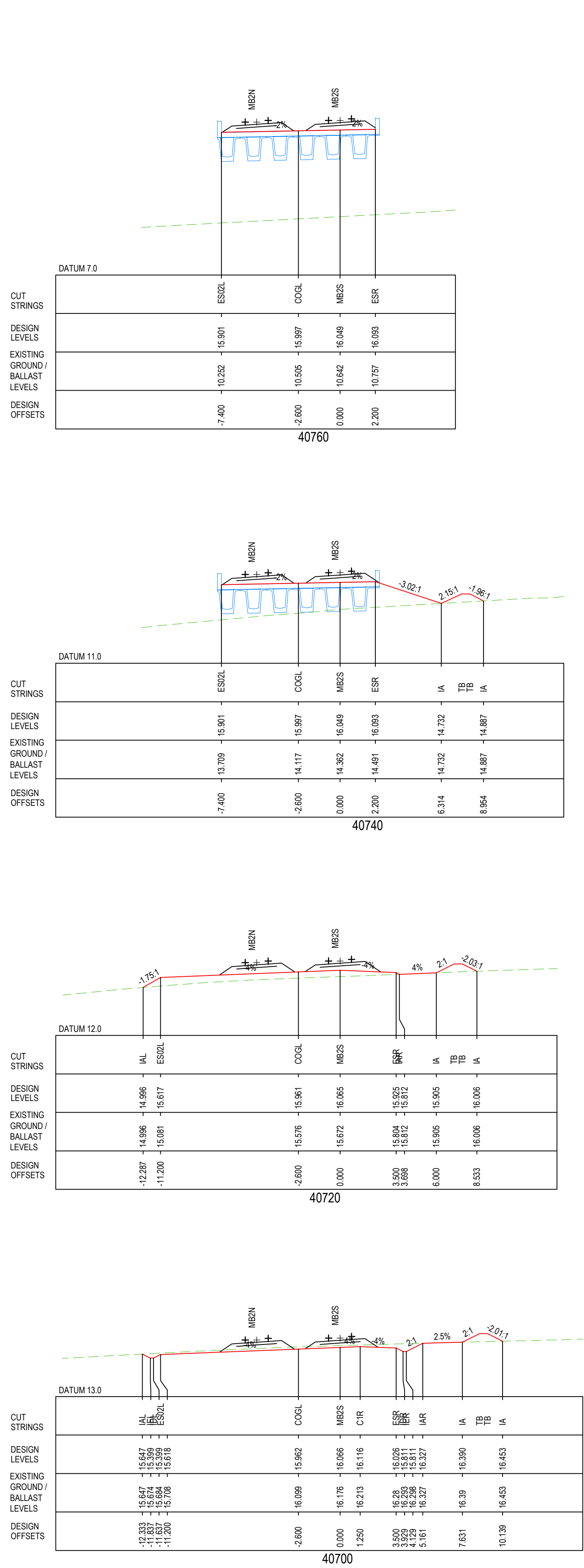
REV	DATE	REVISION DETAILS	APPROVED
01	20.01.17	ACCEPTED FOR CONSTRUCTION	

SCALE	SIZE
AS SHOWN	A1
DRAWN	

FOR CONSTRUCTION	APPROVED	DATE
		20.01.17

ARTC DRAWING No			EDMS No			EDMS REV		
PROJECT			MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1					
TITLE			BULK EARTHWORKS SOUTHERN CONNECTION CROSS SECTIONS SHEET 9 OF 15					
DRAWING No.			PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV
			N01031	PWD	DRG	GEN	0034	01

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LEGEND

- DESIGN SURFACE (TOP OF CAPPING)
- EXISTING SURFACE / TOP OF SSFL BALLAST
- ASSUMED TOP OF SSFL EXISTING CAPPING LAYER (REFER NOTE 1)
- BRIDGE STRUCTURE
- PROPOSED RAIL DESIGN



REV	DATE	REVISION DETAILS
01	20.01.17	ACCEPTED FOR CONSTRUCTION

APPROVED

SCALE
AS SHOWN

SIZE
A1

FOR CONSTRUCTION

DRAWN

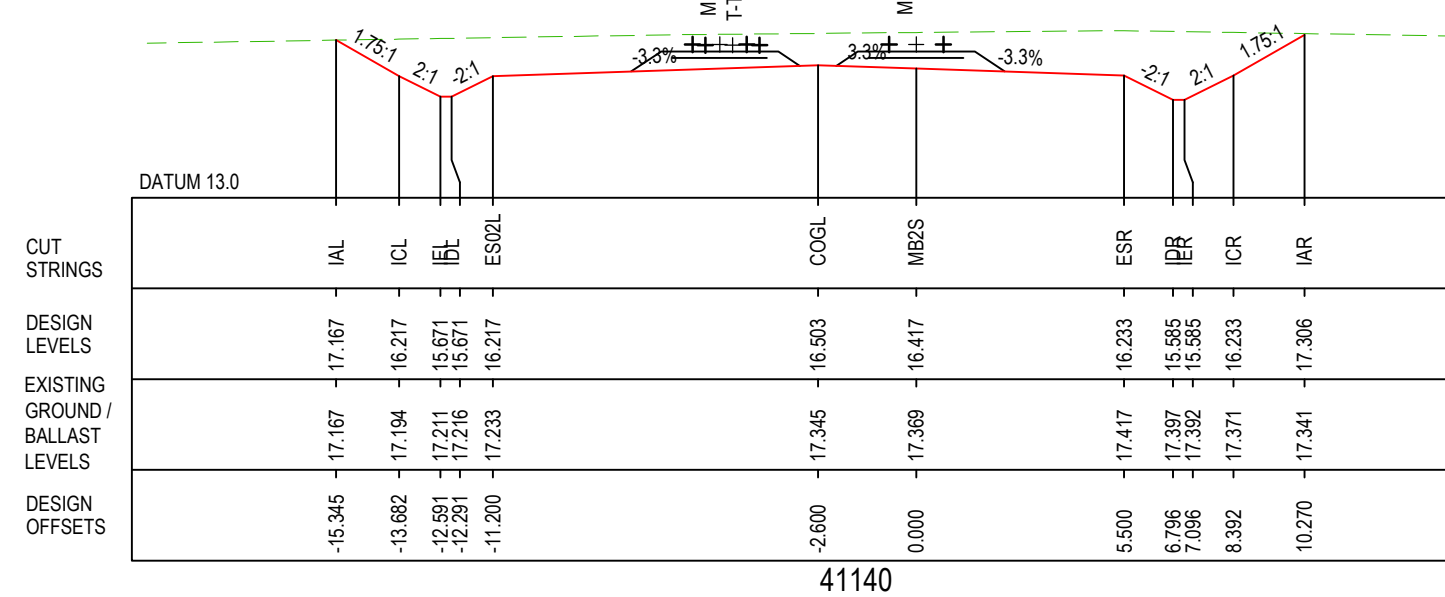
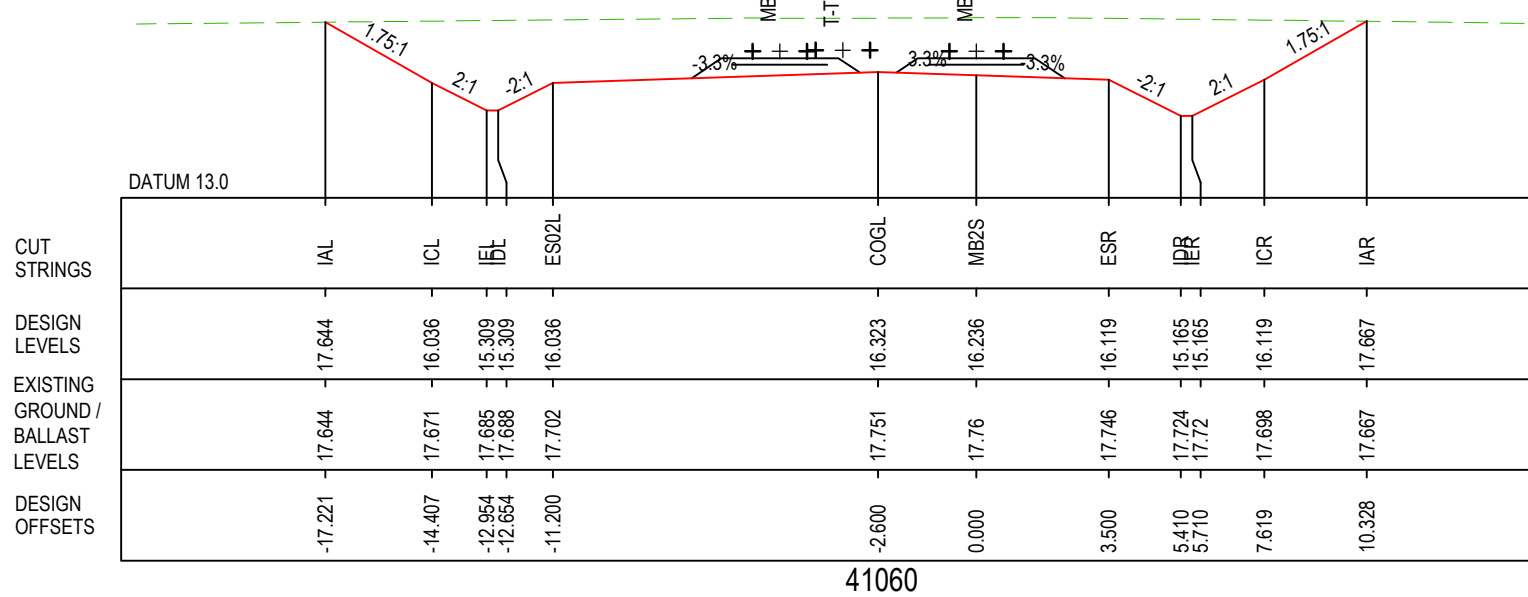
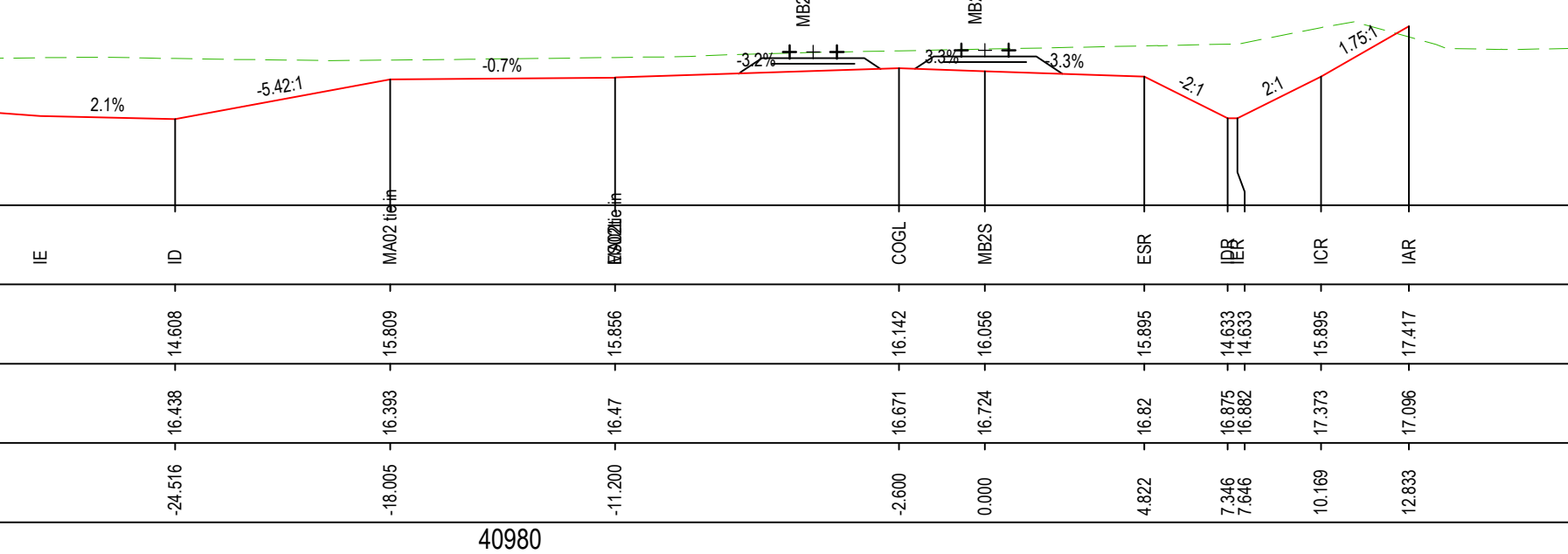
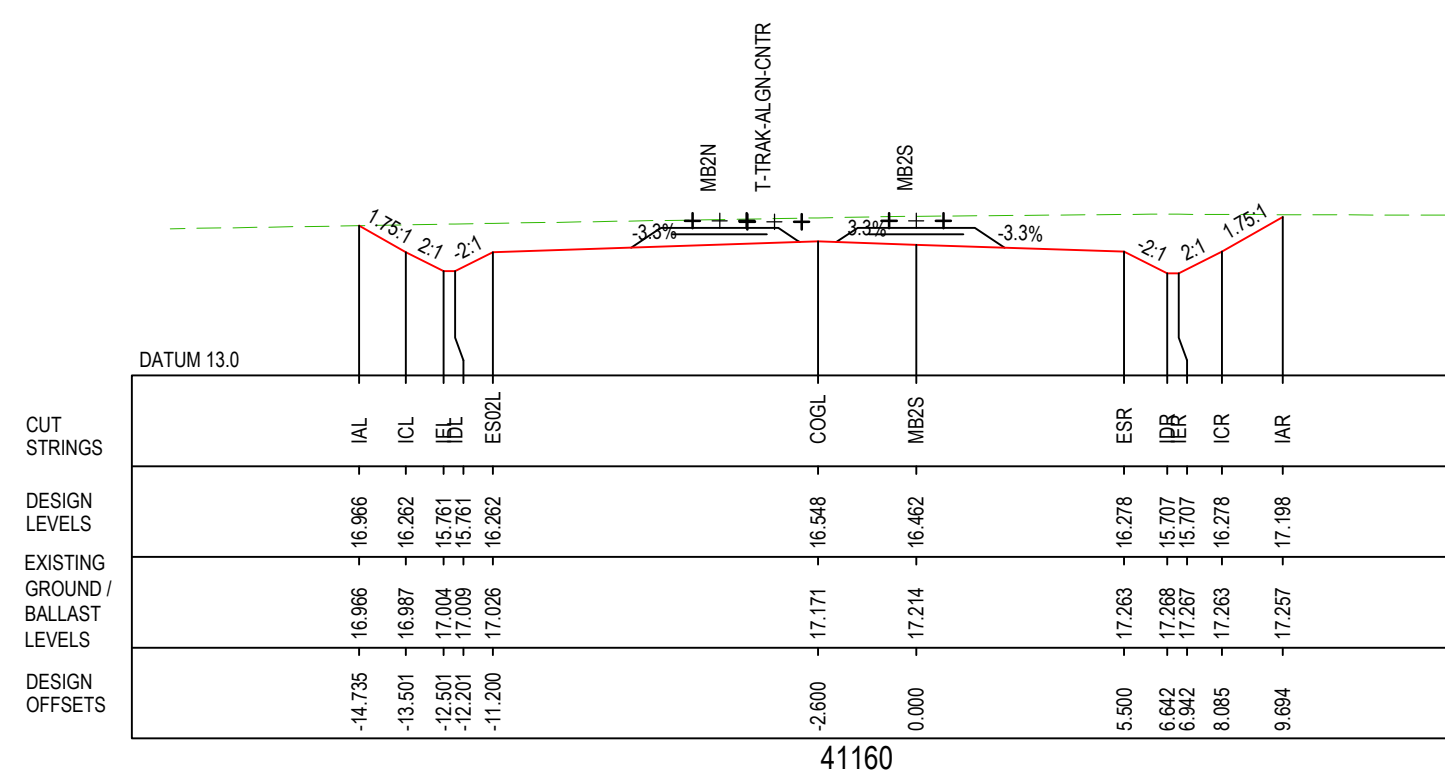
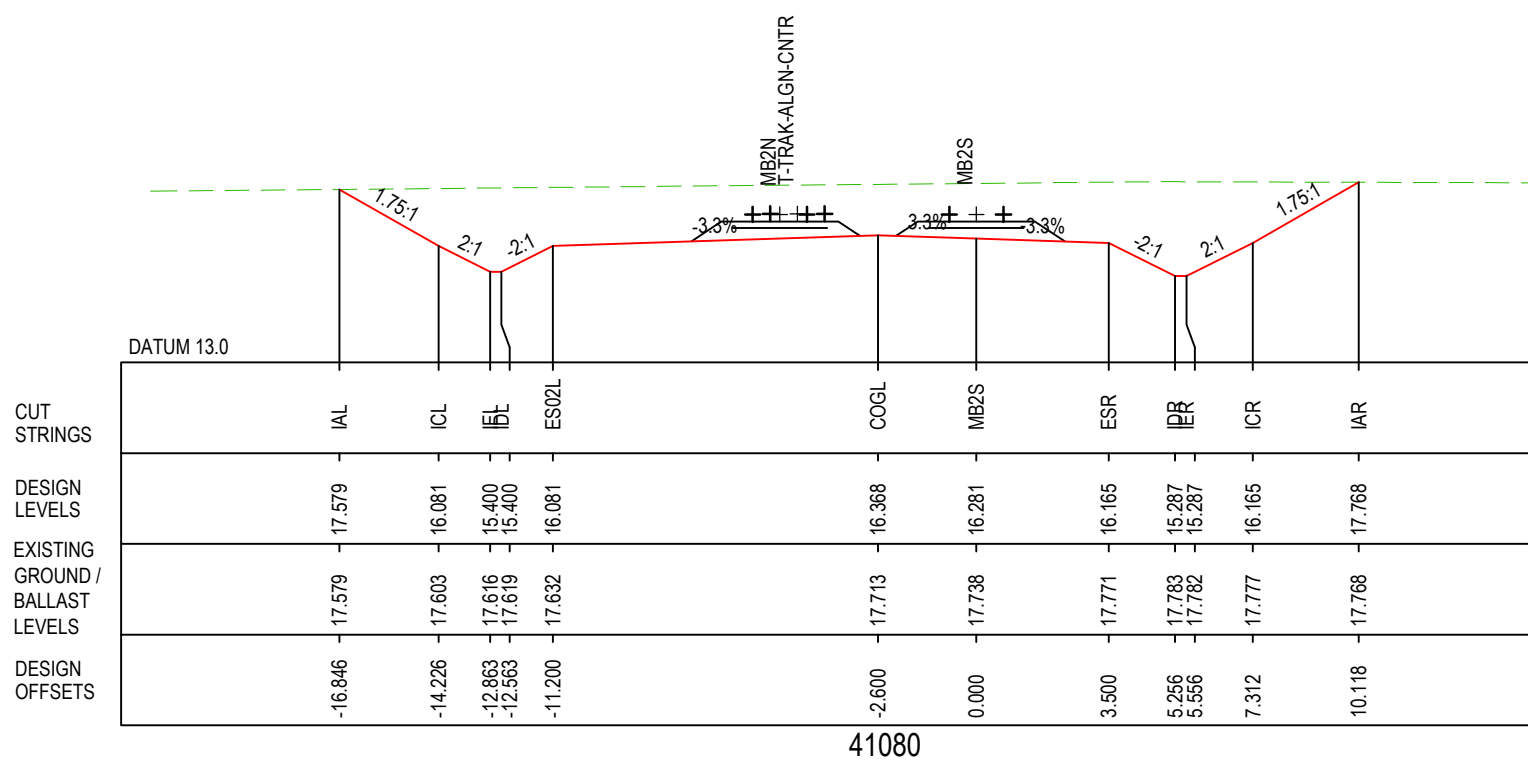
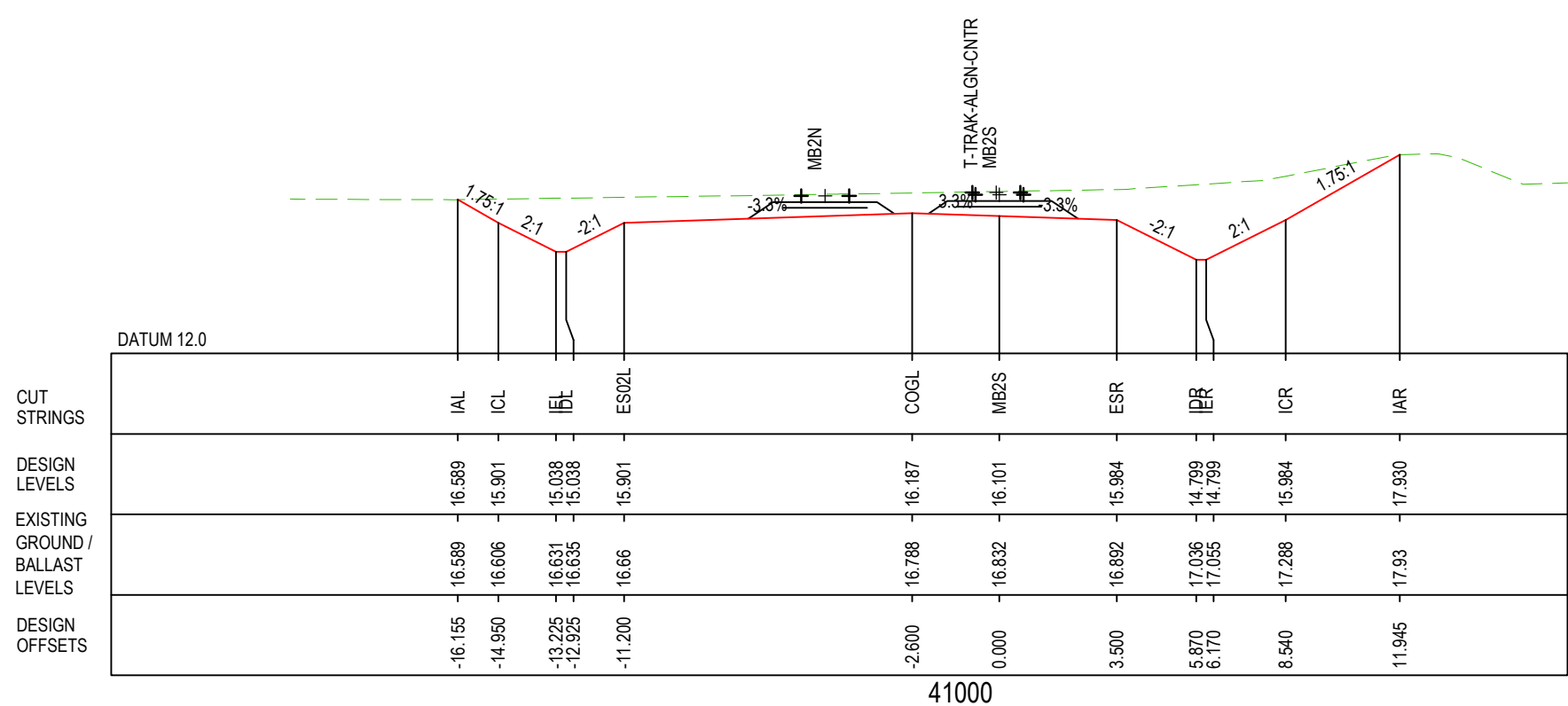
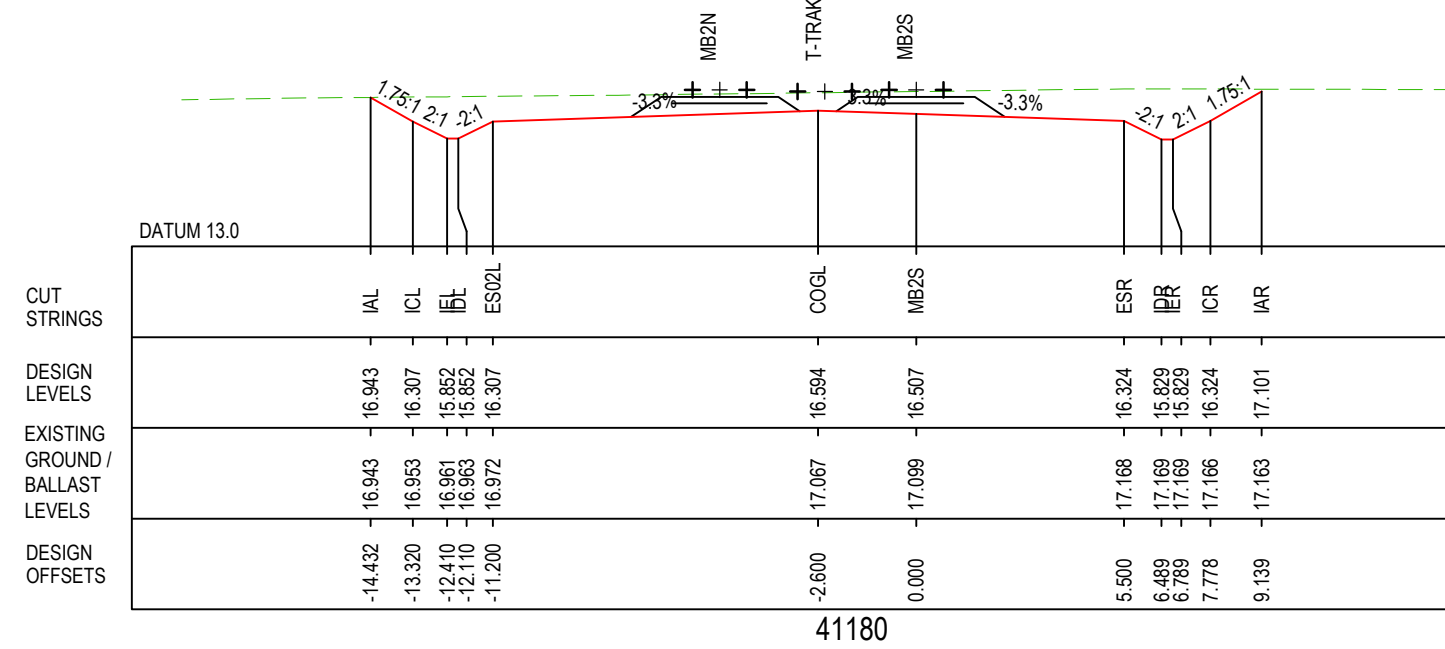
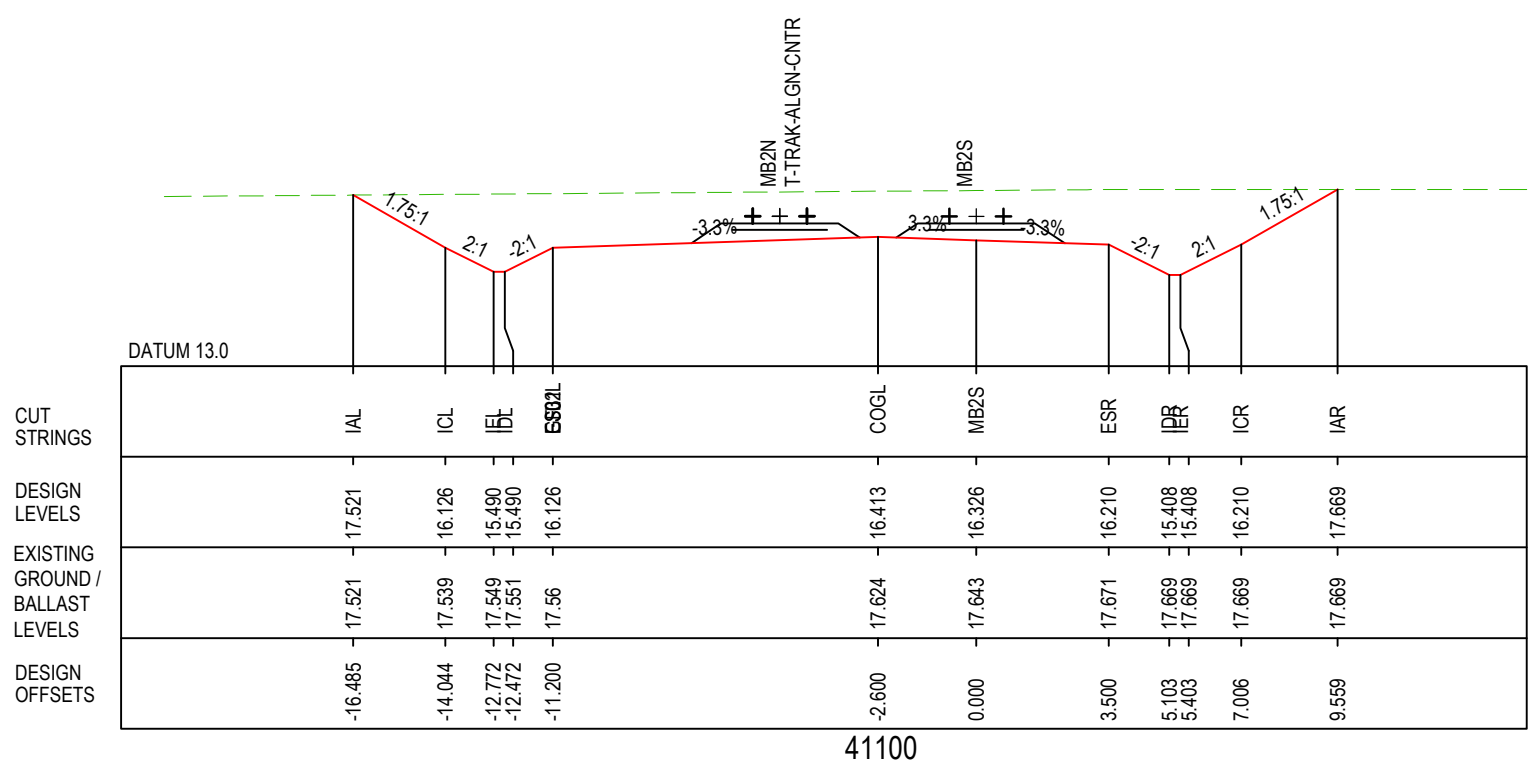
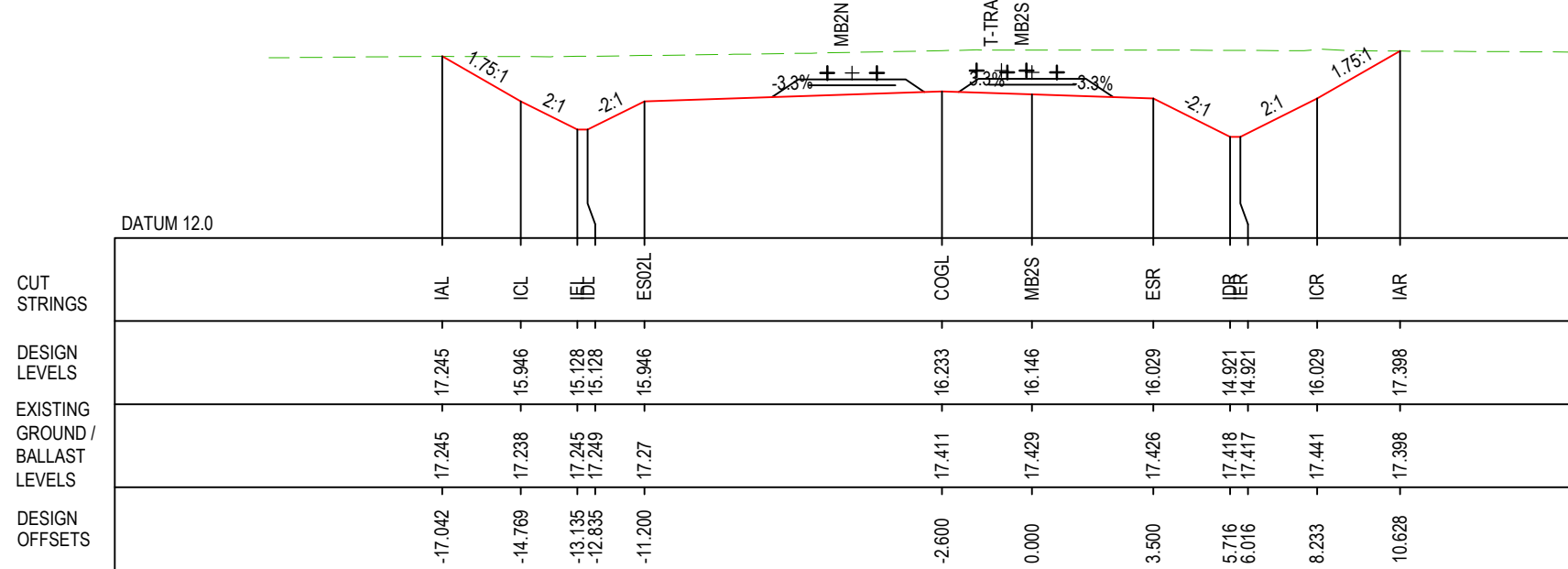
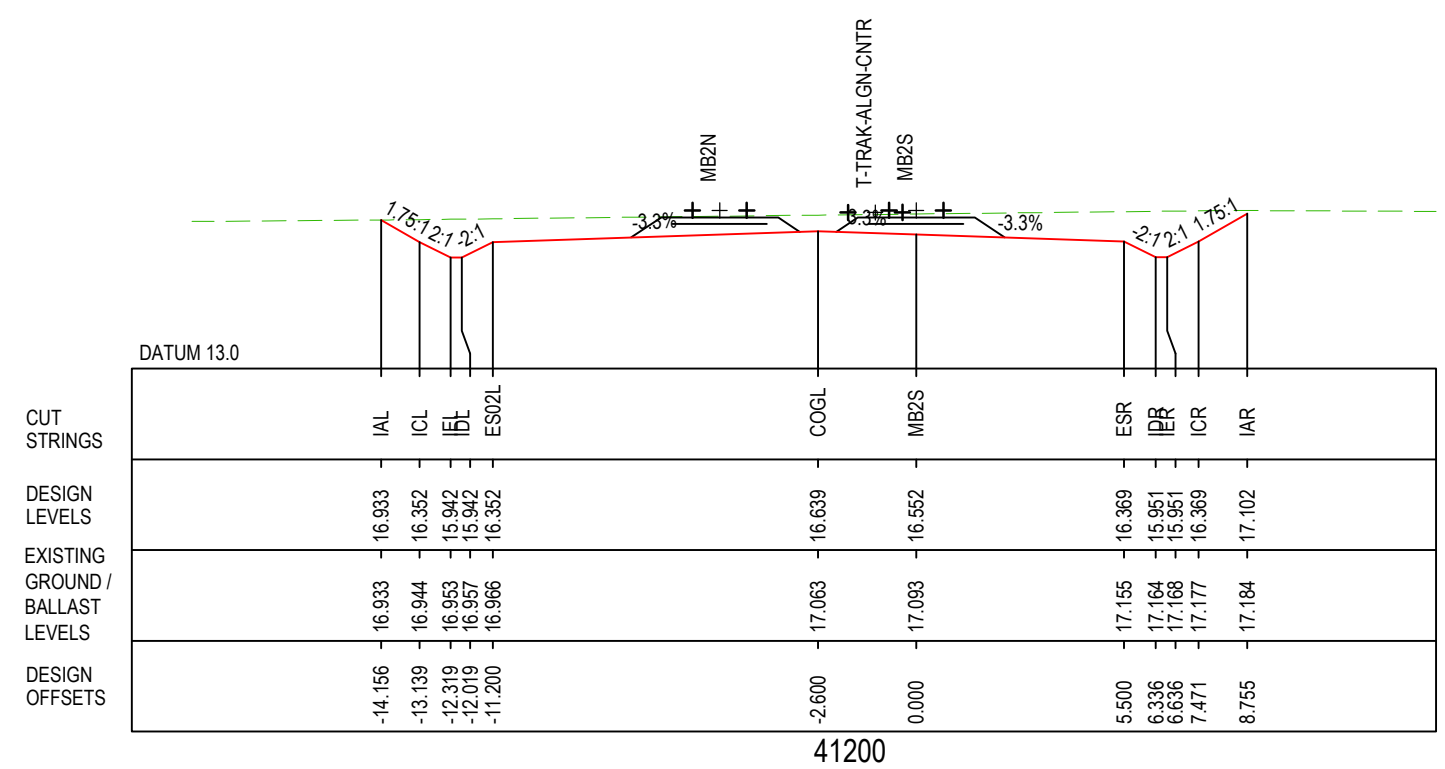
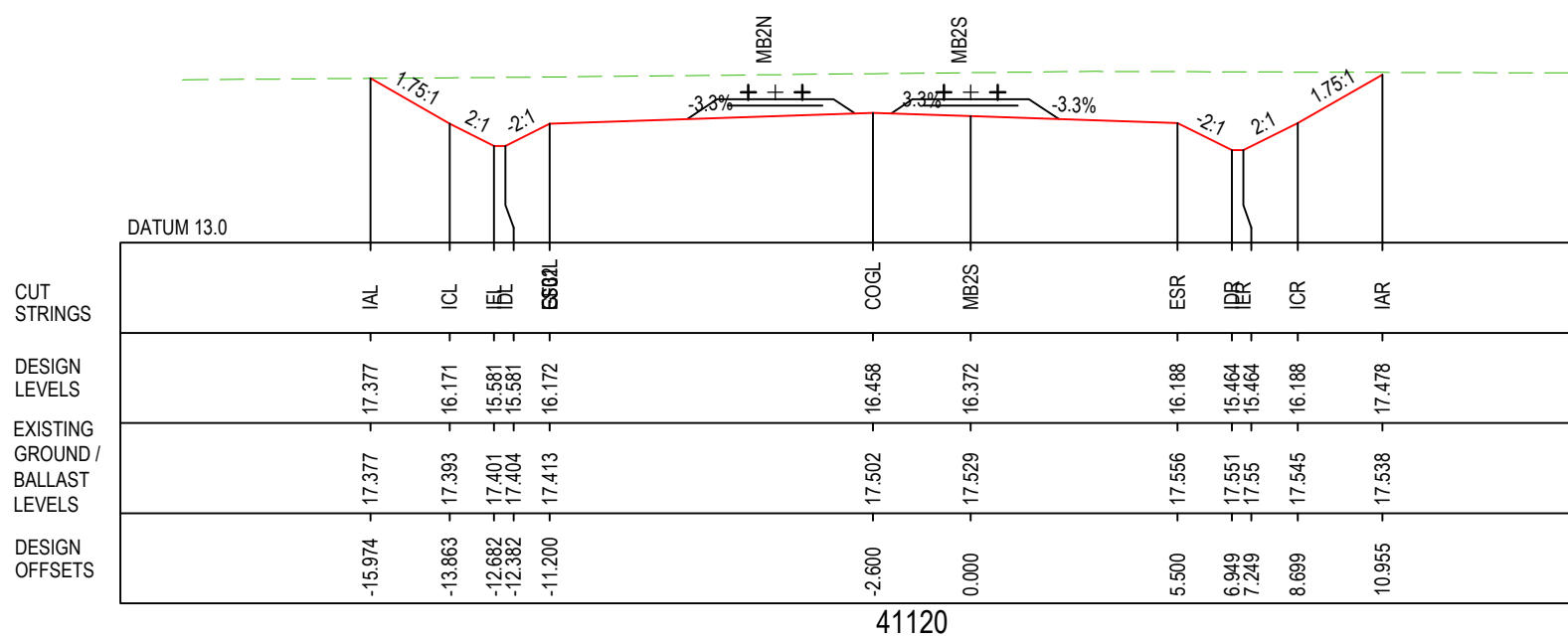
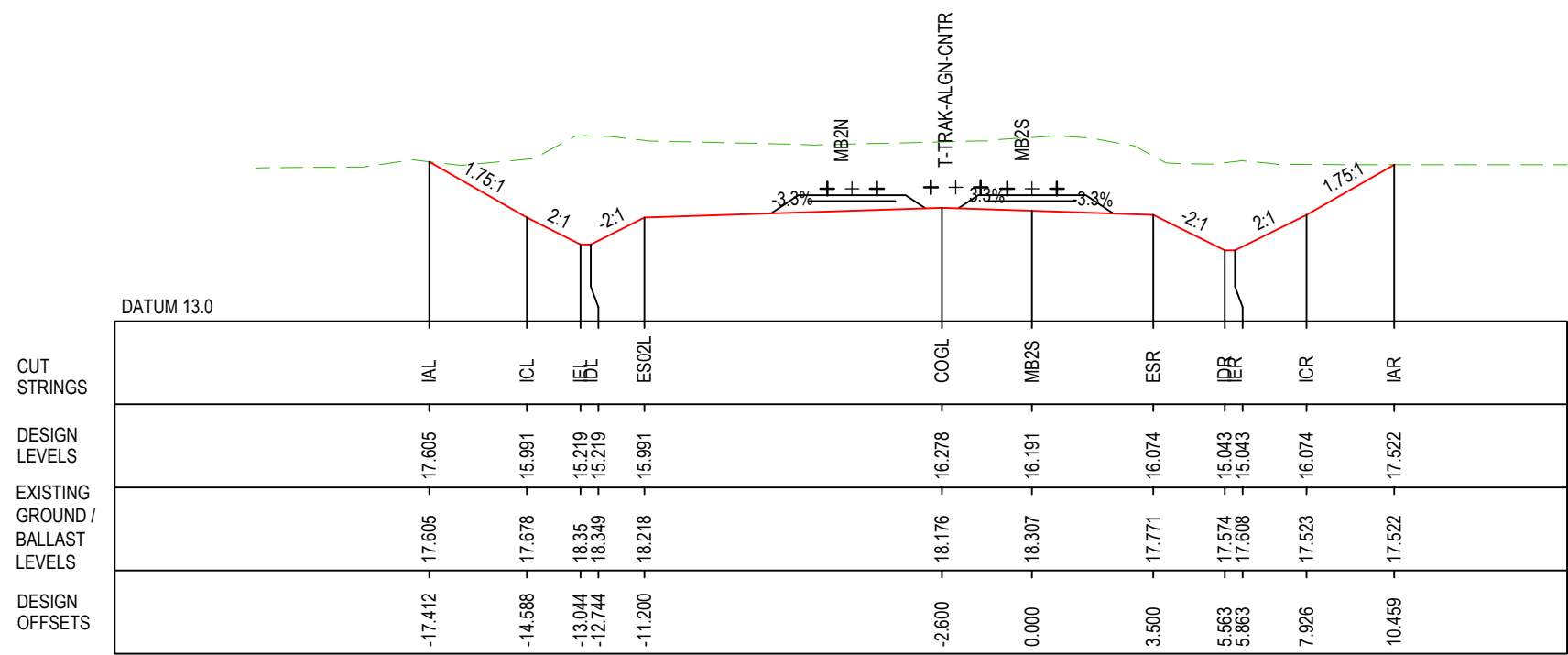
APPROVED

DATE
20.01.17

ARTC DRAWING No	EDMS No	EDMS REV
PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1	
TITLE	BULK EARTHWORKS SOUTHERN CONNECTION CROSS SECTIONS SHEET 10 OF 15	
DRAWING No.	PROJECT No.	ZONE
N01031	N01031	PWD
TYPE	DISC	NUMBER
DRG	GEN	0035
REV	 	

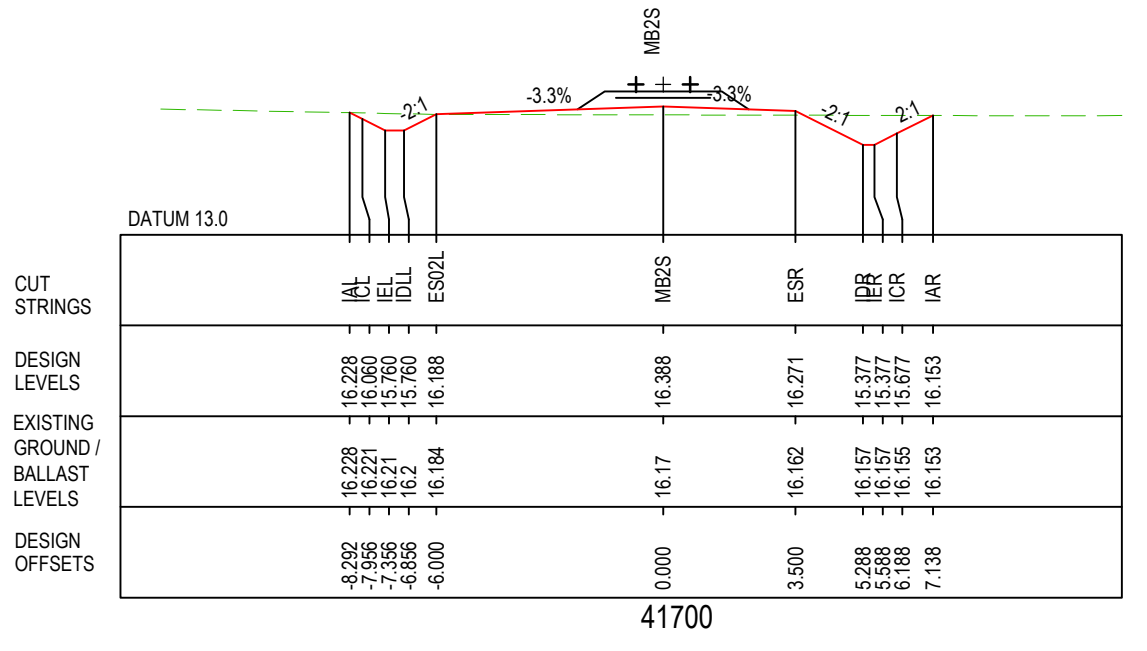
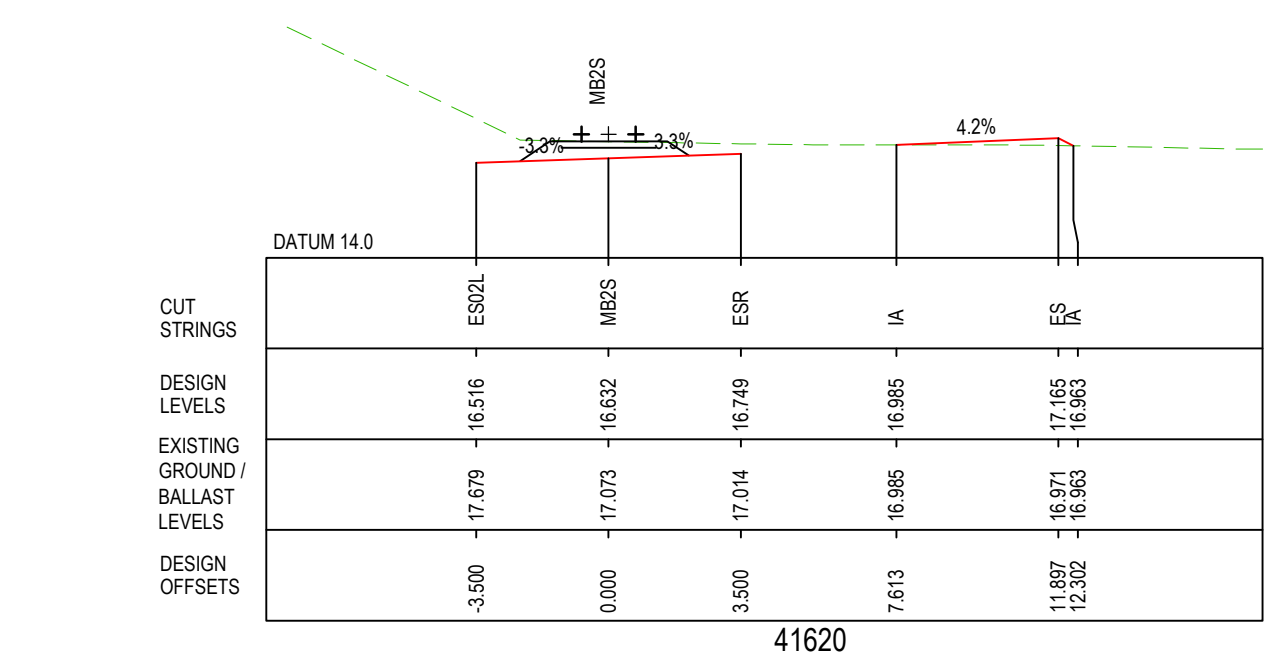
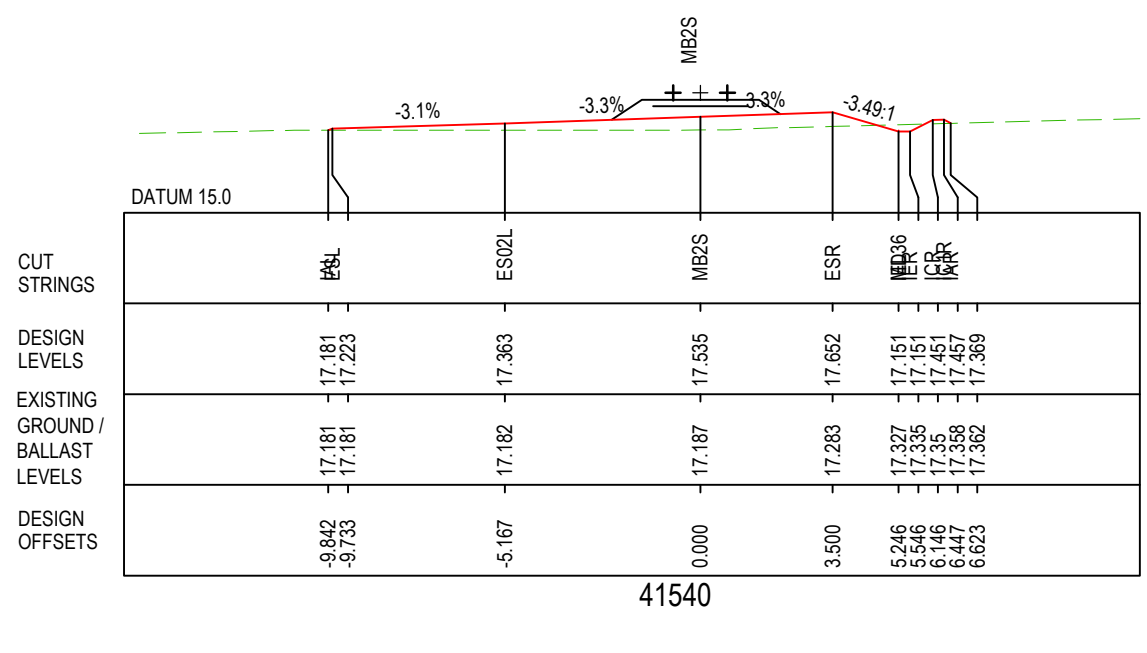
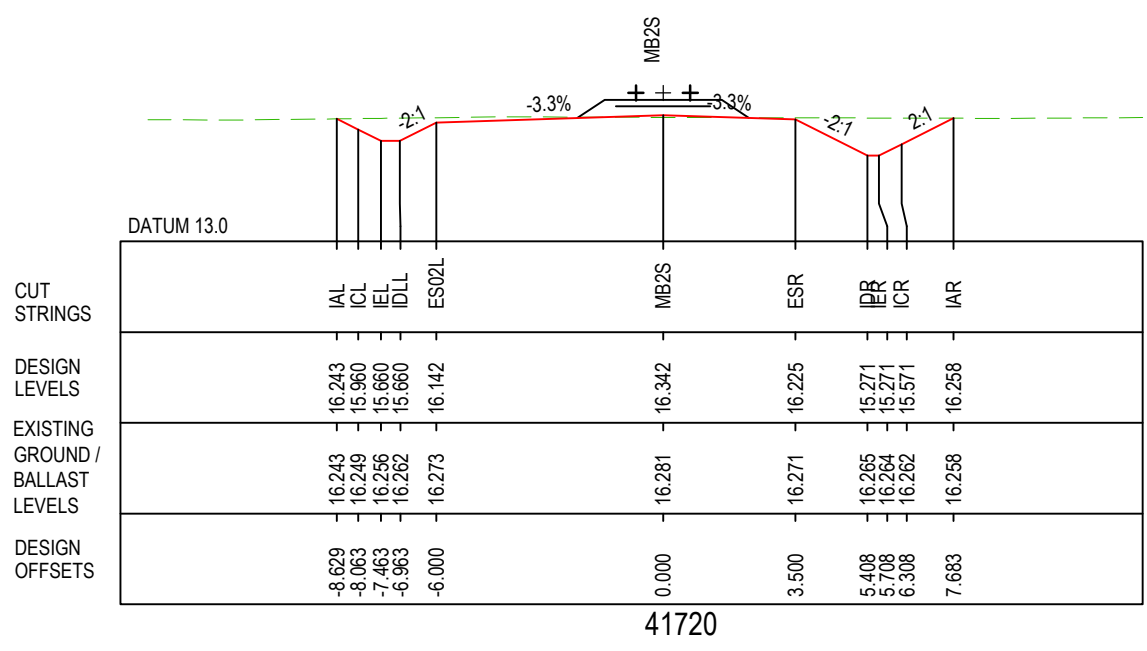
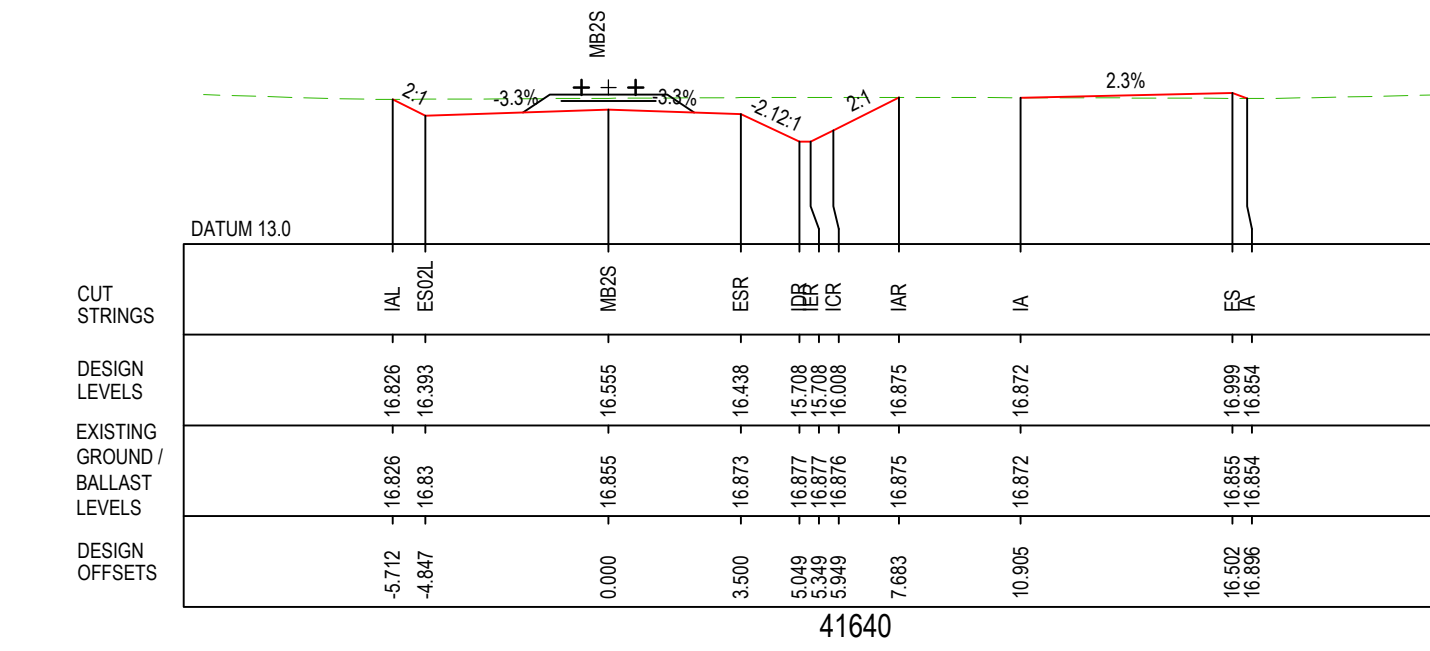
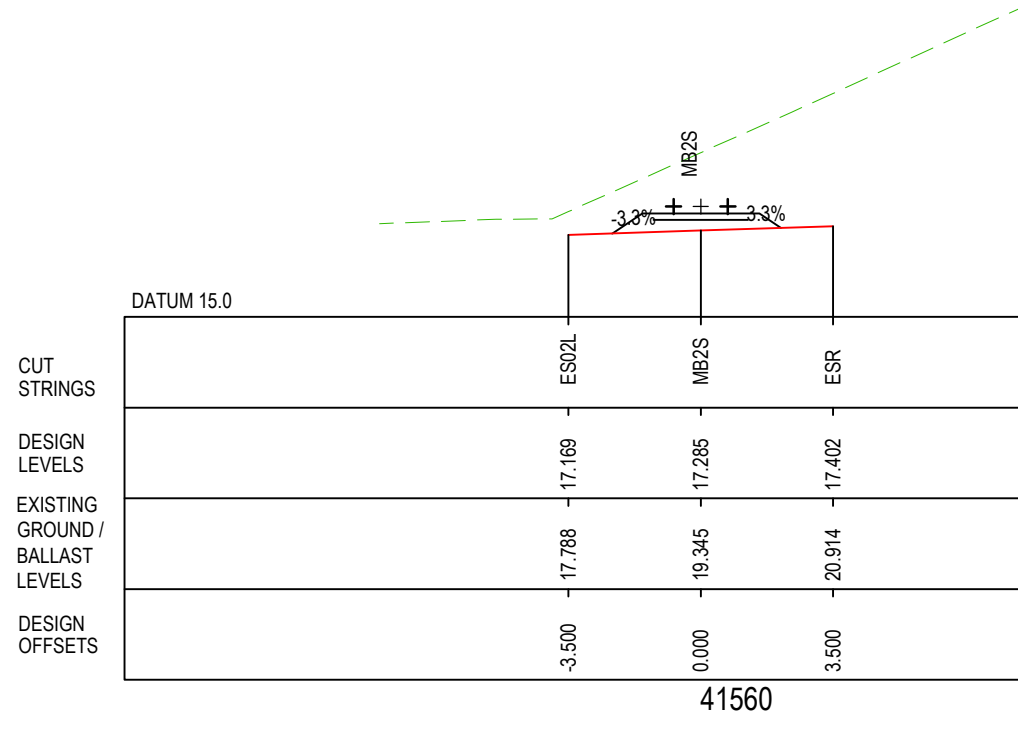
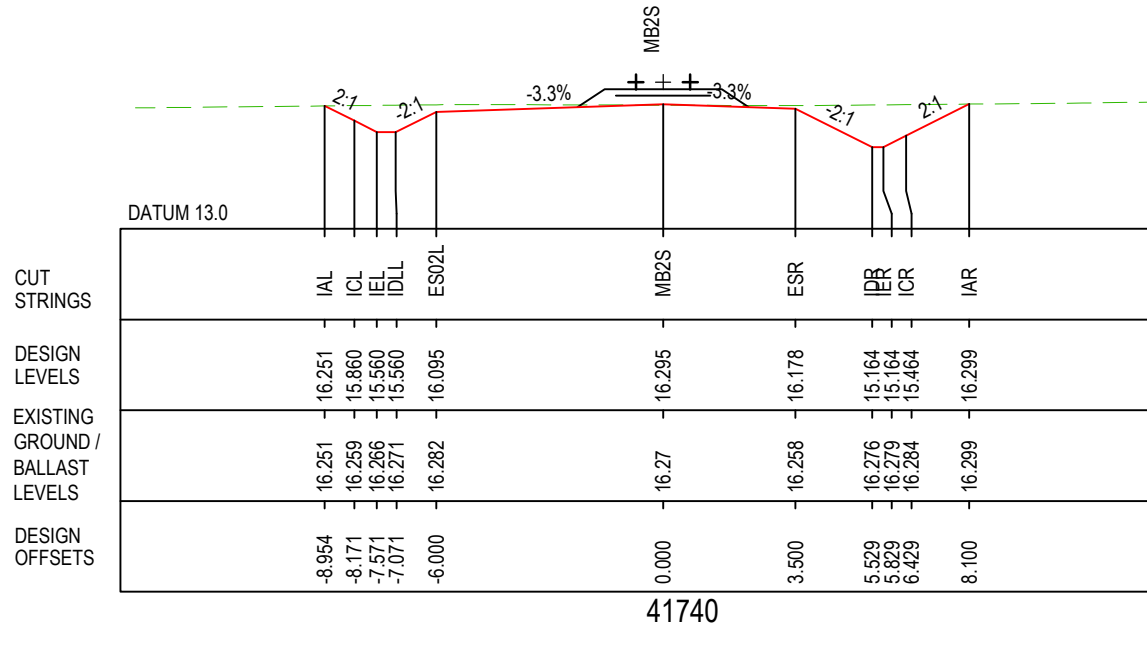
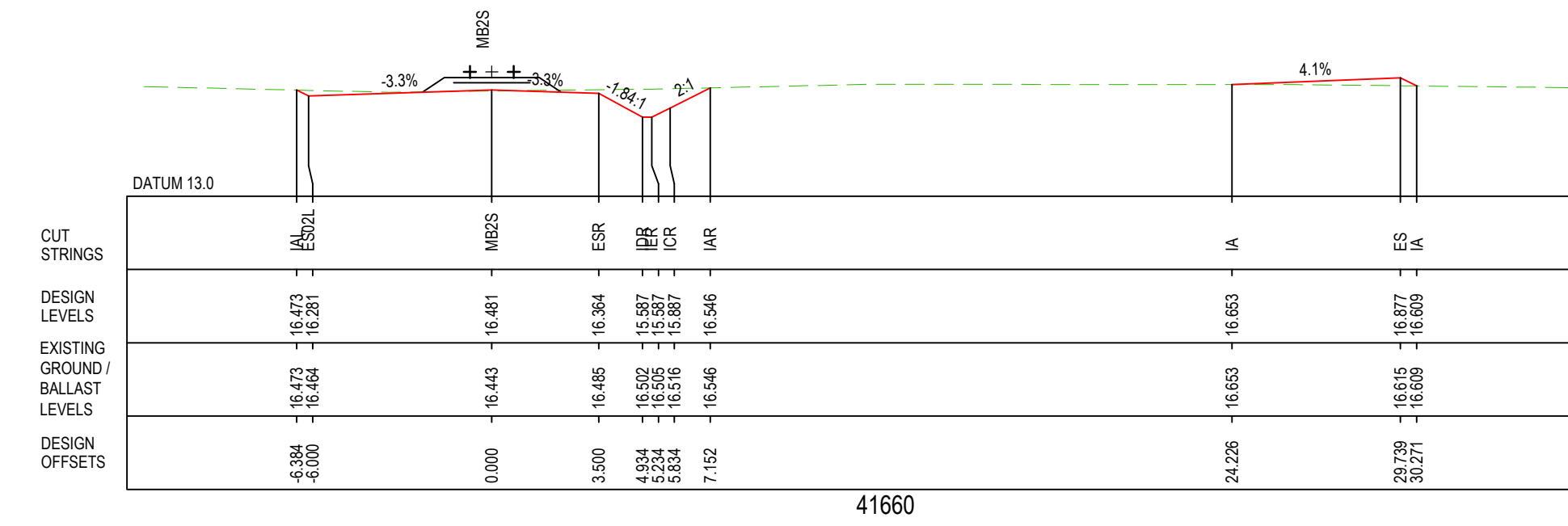
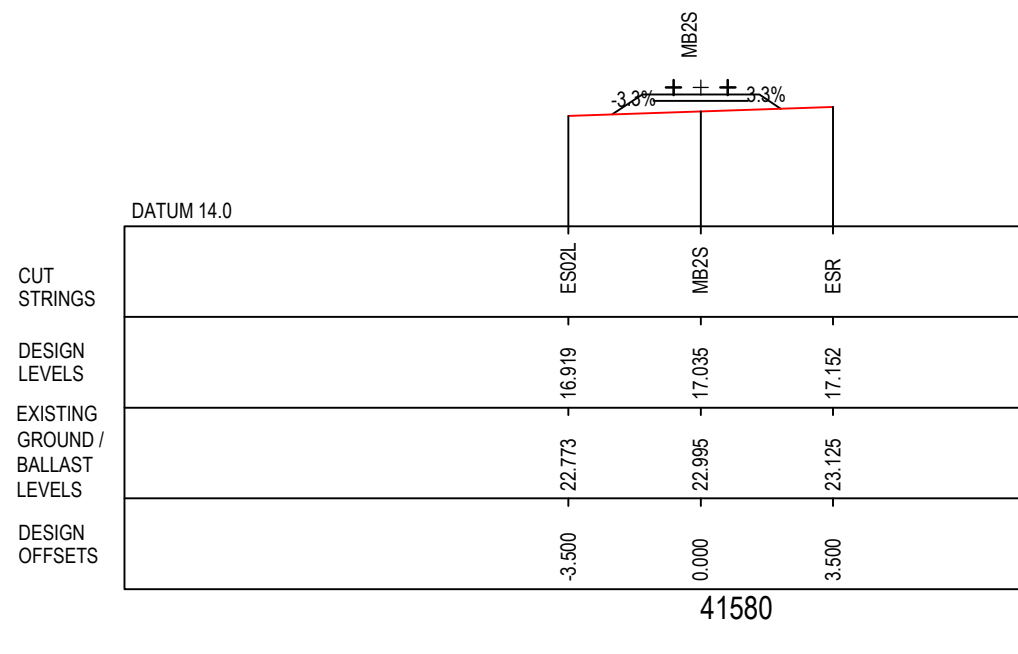
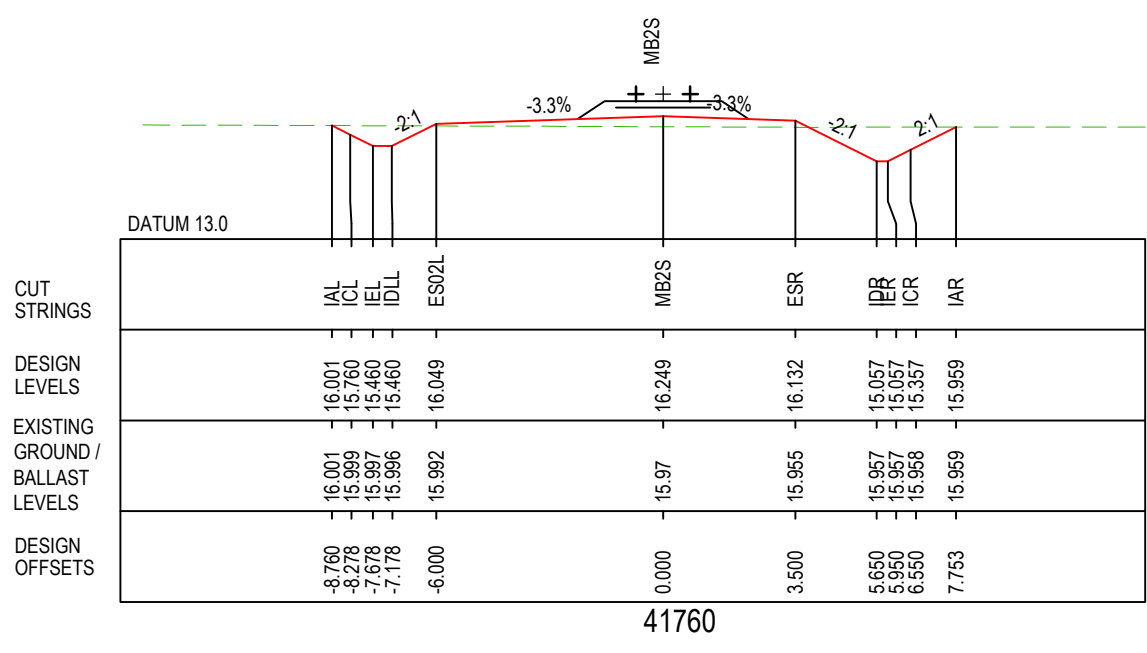
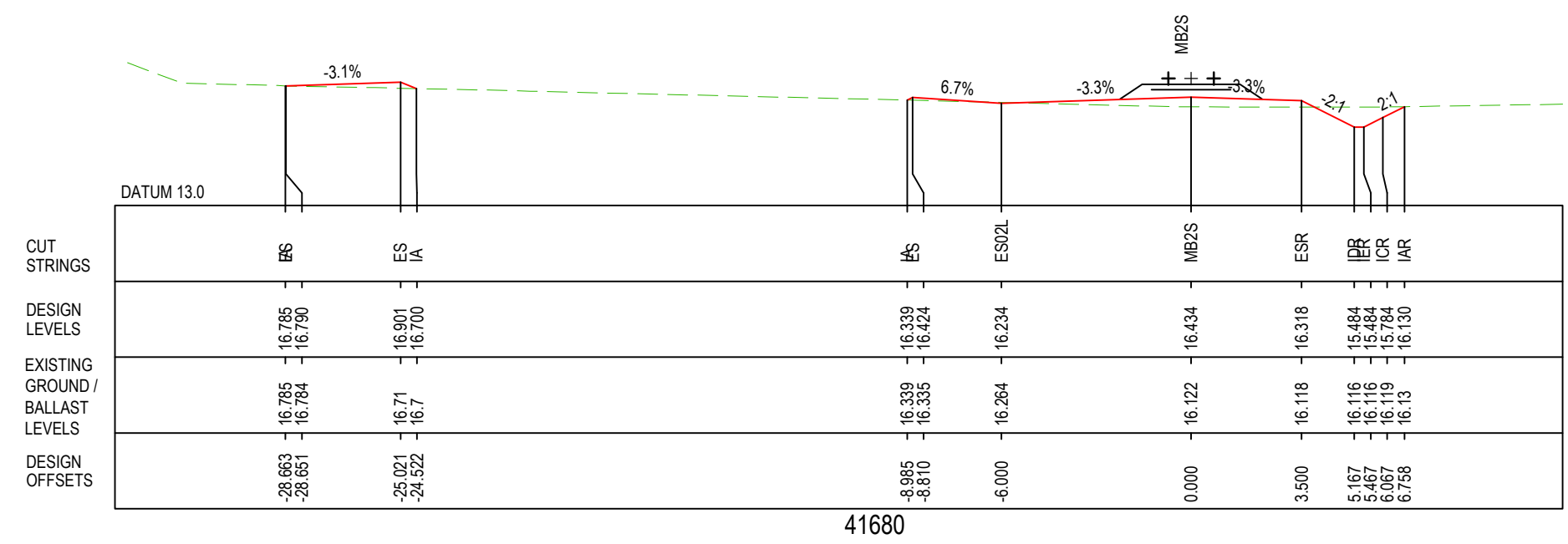
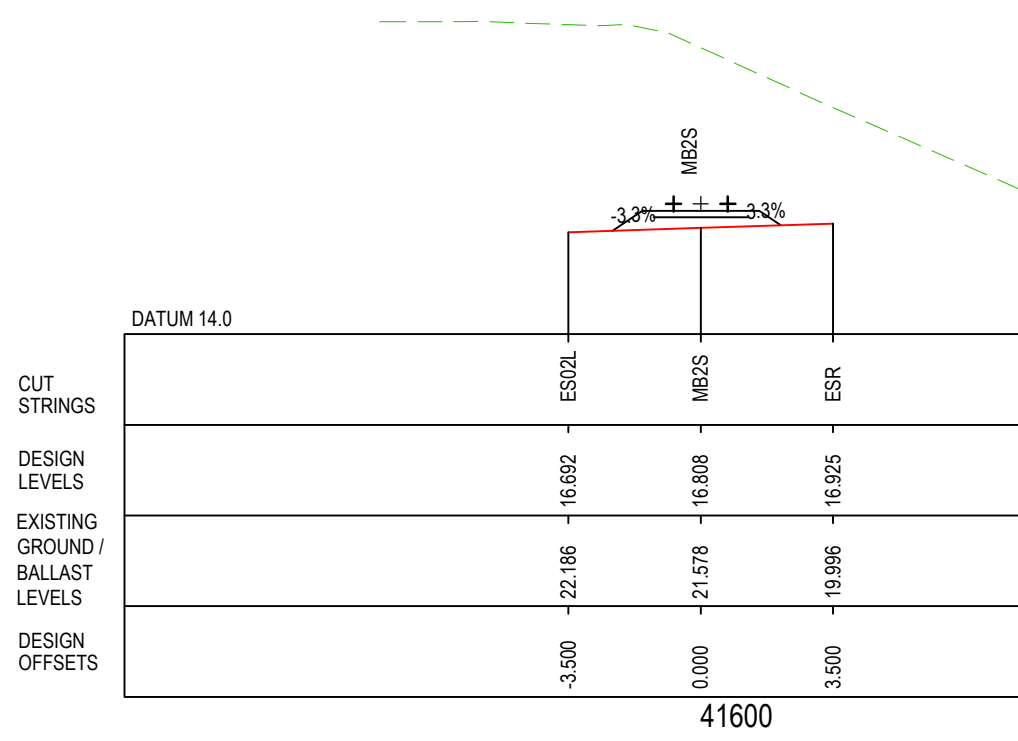
LEGEND

- DESIGN SURFACE (TOP OF CAPPING)
- EXISTING SURFACE / TOP OF SSFL BALLAST
- ASSUMED TOP OF SSFL EXISTING CAPPING LAYER (REFER NOTE 1)
- BRIDGE STRUCTURE
- PROPOSED RAIL DESIGN



LEGEND

- DESIGN SURFACE (TOP OF CAPPING)
EXISTING SURFACE / TOP OF SSFL BALLAST
ASSUMED TOP OF SSFL EXISTING CAPPING LAYER (REFER NOTE 1)
BRIDGE STRUCTURE
PROPOSED RAIL DESIGN

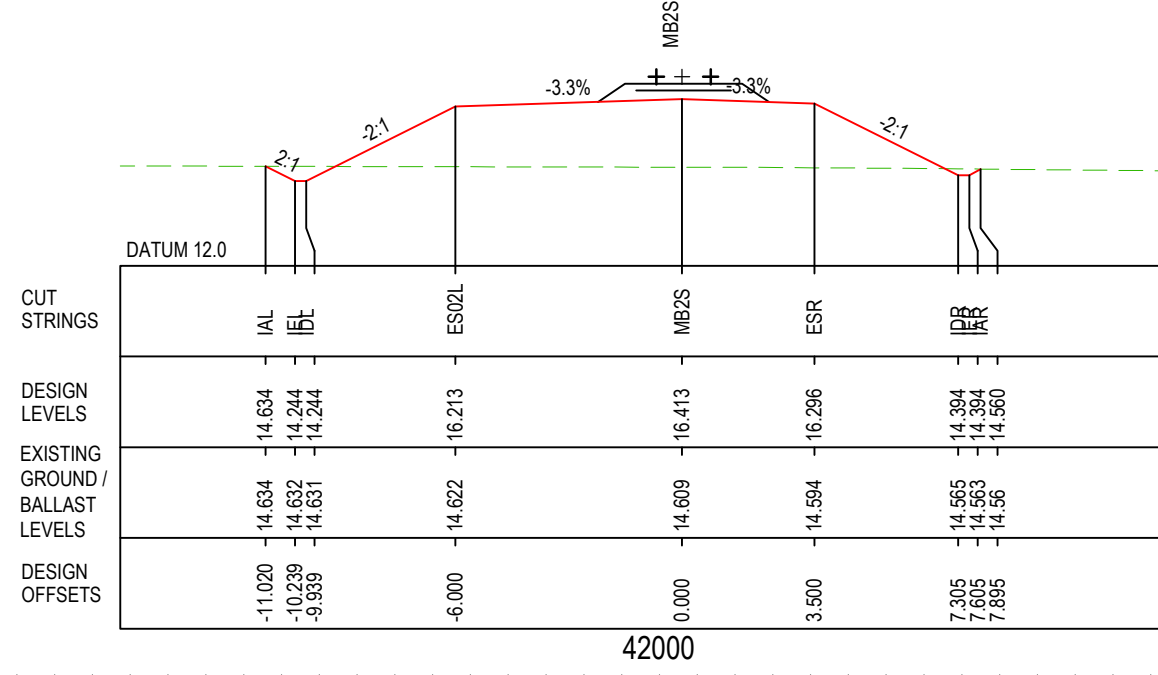
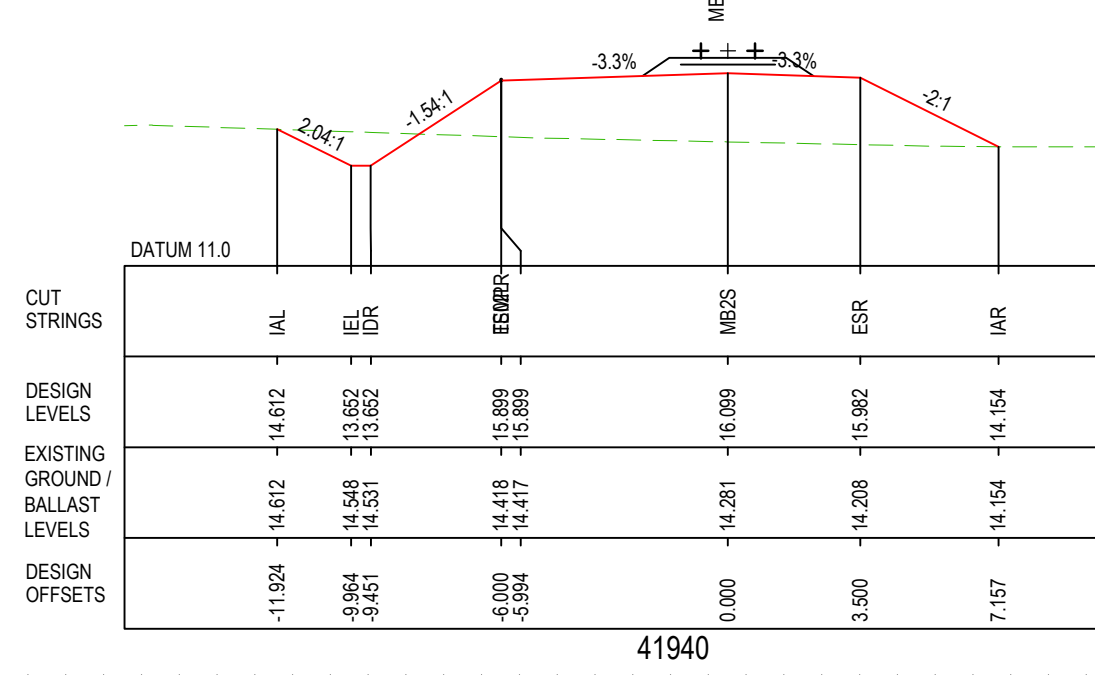
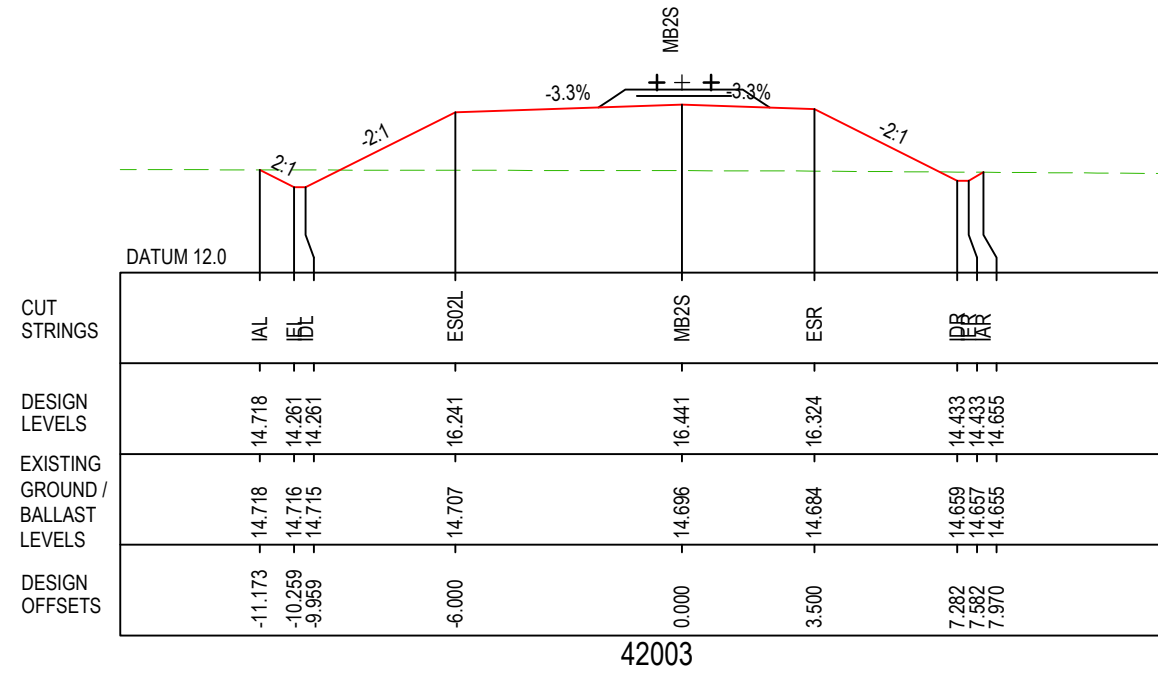
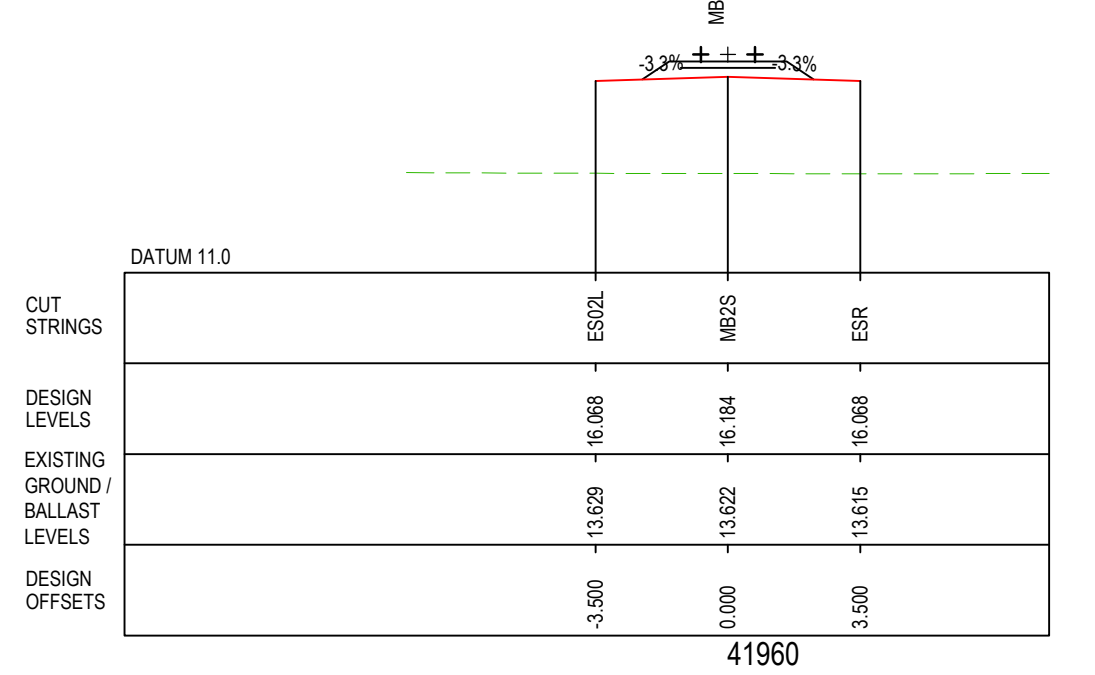
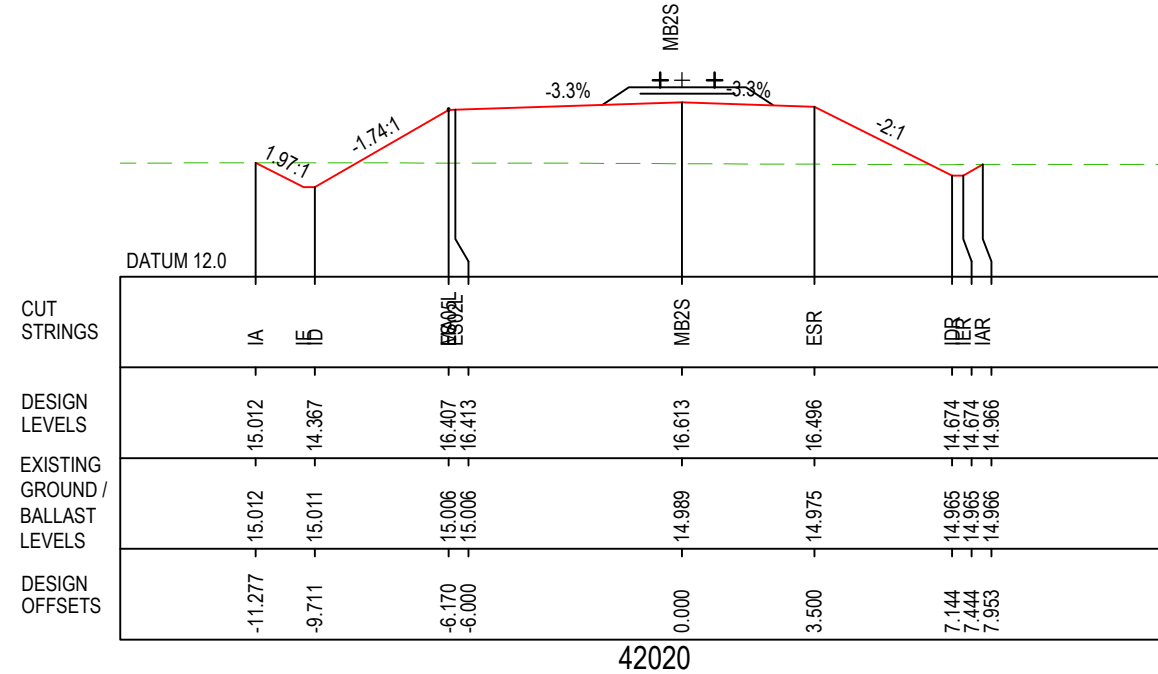
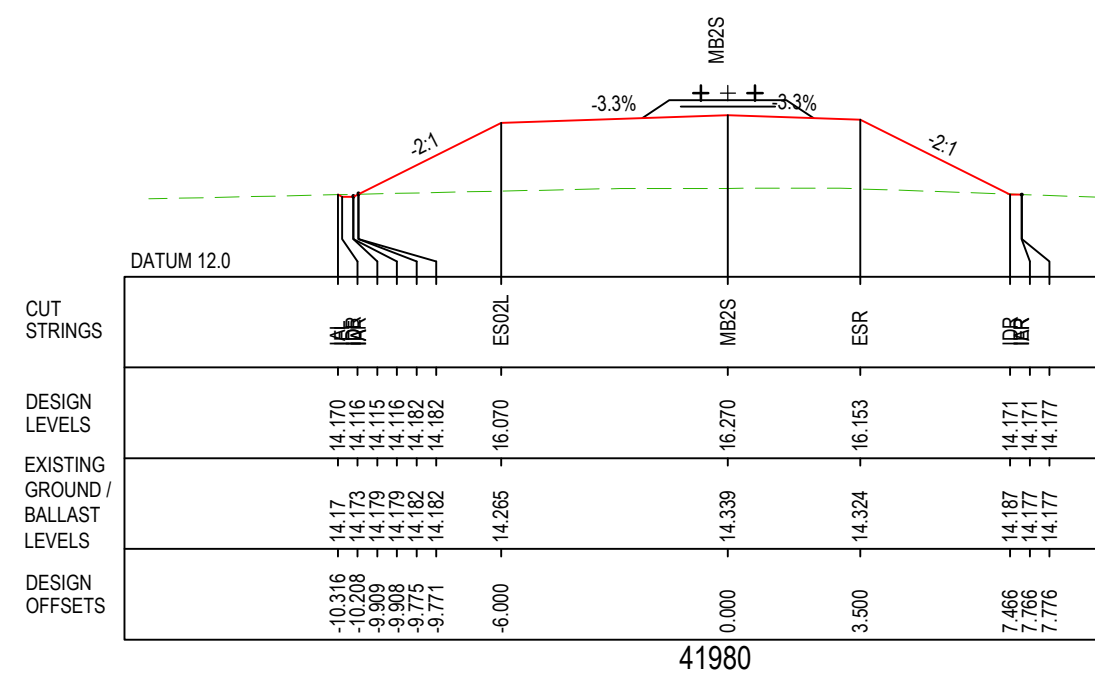
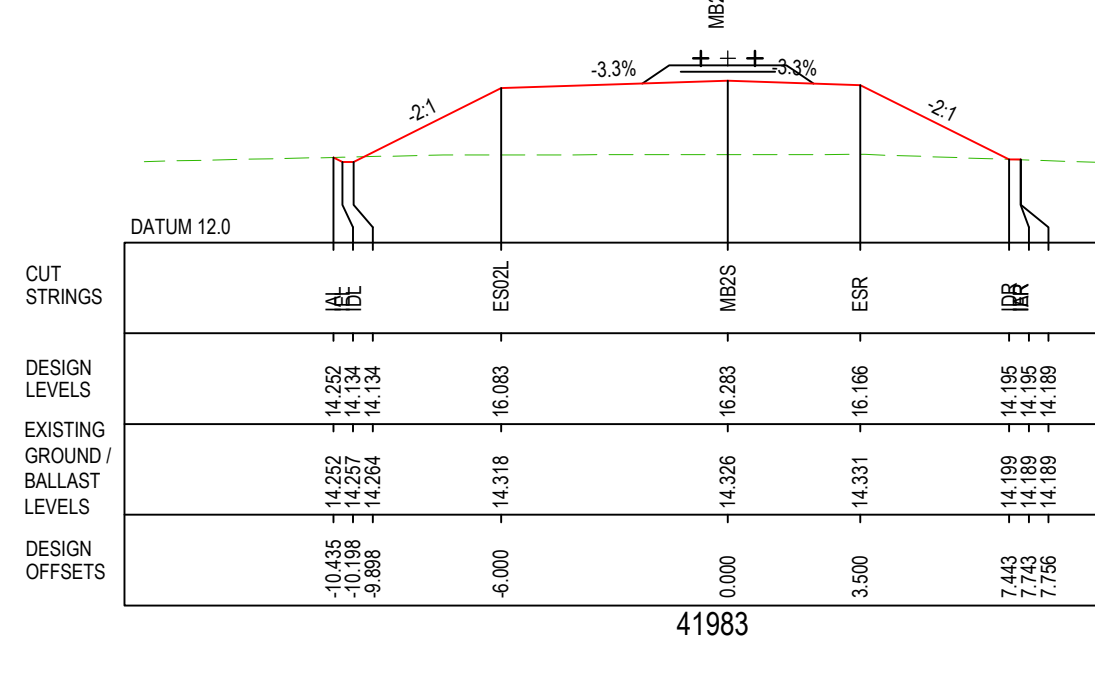
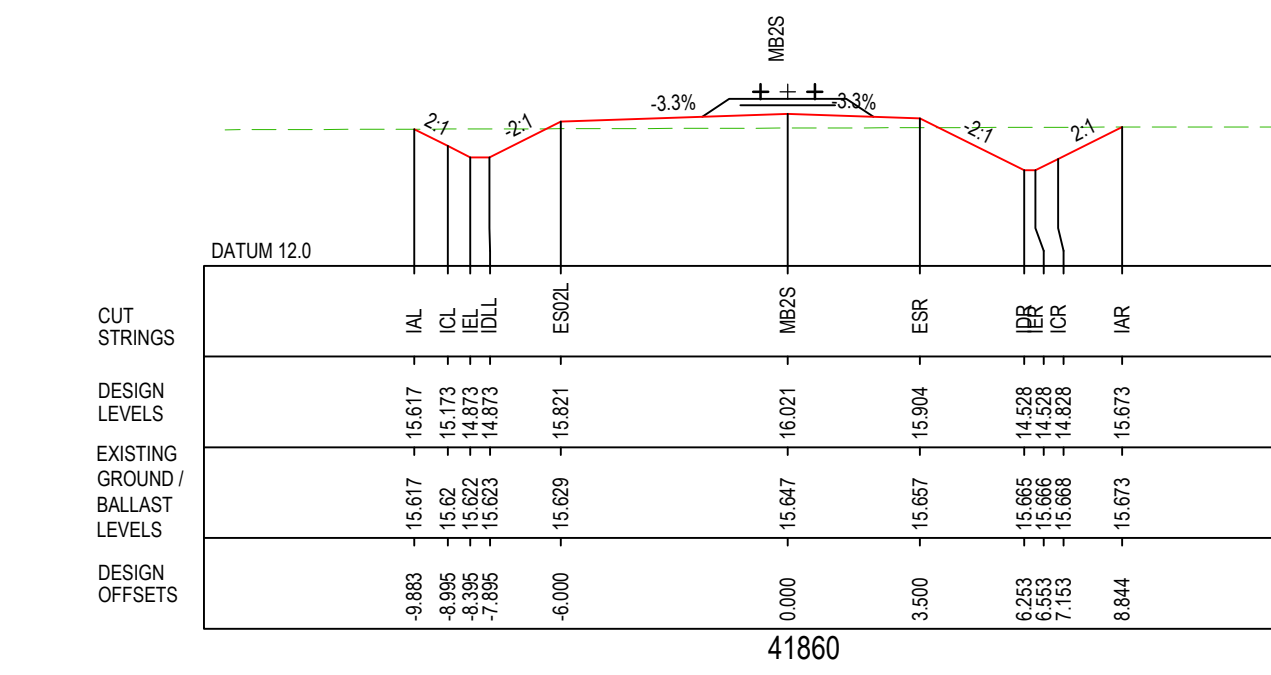
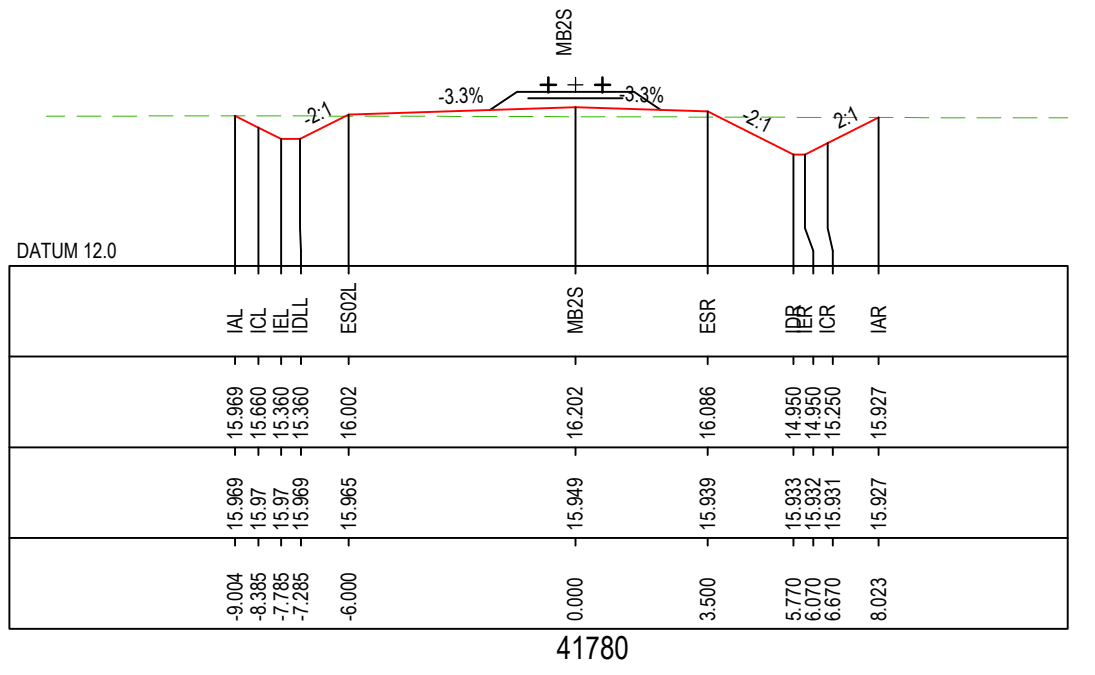
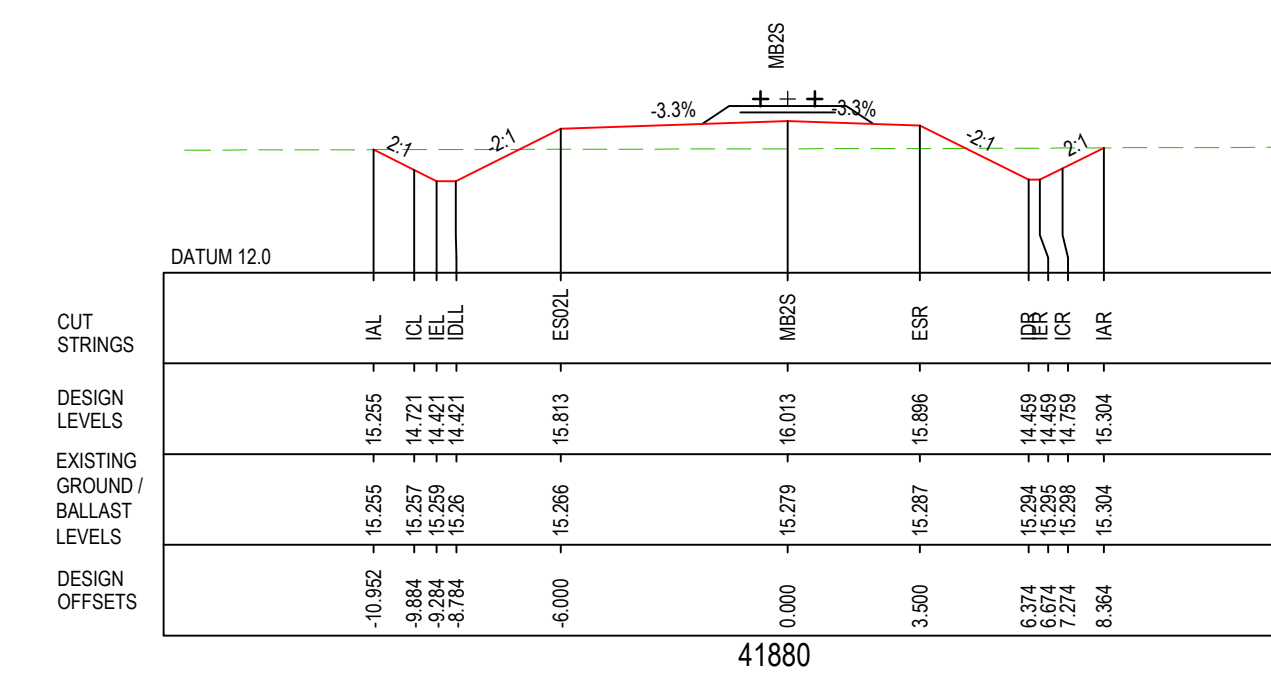
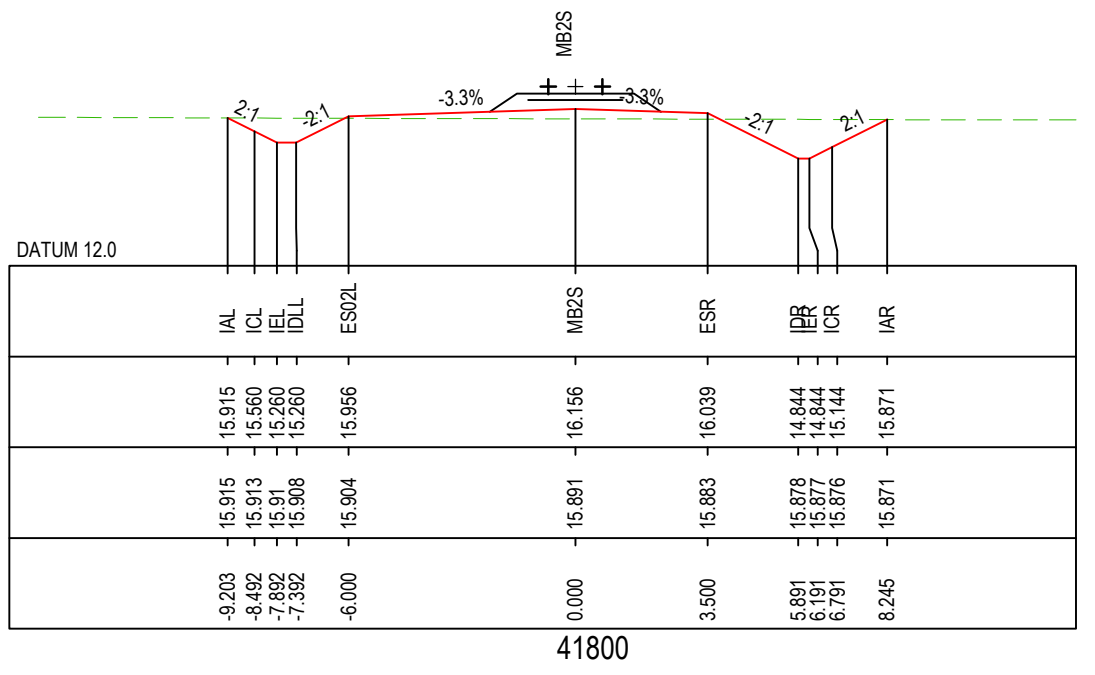
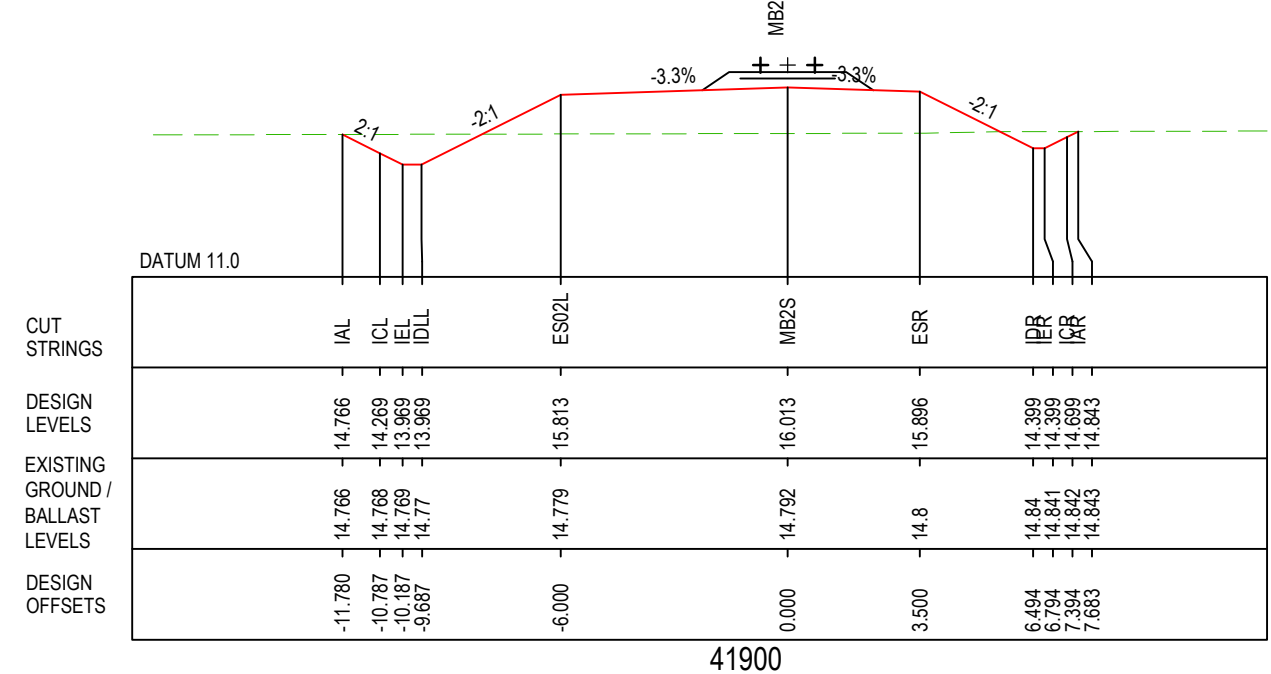
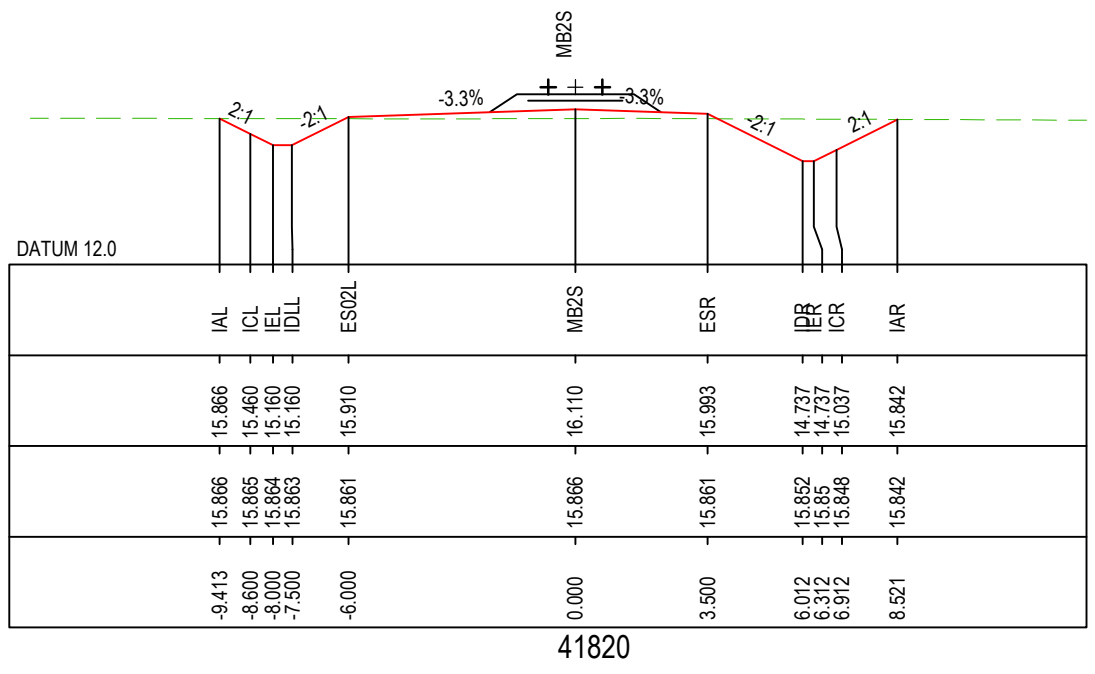
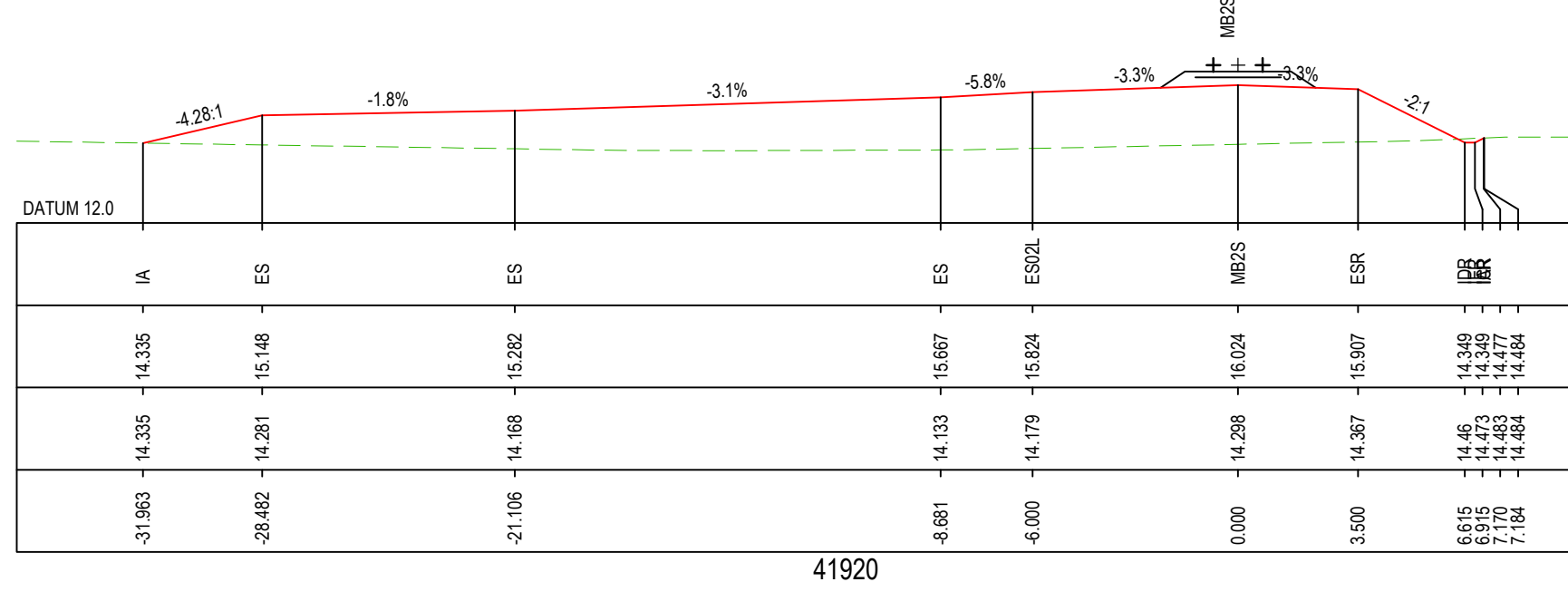


REV	DATE	REVISION DETAILS	APPROVED
01	20.01.17	ACCEPTED FOR CONSTRUCTION	

SCALE	SIZE
AS SHOWN	A1

FOR CONSTRUCTION
APPROVED
DATE 20.01.17

ARTC DRAWING No		EDMS No		EDMS REV		
PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1					
TITLE	BULK EARTHWORKS SOUTHERN CONNECTION CROSS SECTIONS SHEET 13 OF 15					
DRAWING No.	PROJECT No.	ZONE.	TYPE	DISC	NUMBER	REV
	N01031	- PWD	- DRG	- GEN	0038	- 01



LEGEND

- DESIGN SURFACE (TOP OF CAPPING)
- EXISTING SURFACE / TOP OF SSFL BALLAST
- ASSUMED TOP OF SSFL EXISTING CAPPING LAYER (REFER NOTE 1)
- BRIDGE STRUCTURE
- PROPOSED RAIL DESIGN



REV	DATE	REVISION DETAILS
01	20.01.17	ACCEPTED FOR CONSTRUCTION
02	09.06.17	ACCEPTED FOR CONSTRUCTION RE-SUBMISSION

APPROVED

SCALE	SIZE
AS SHOWN	A1

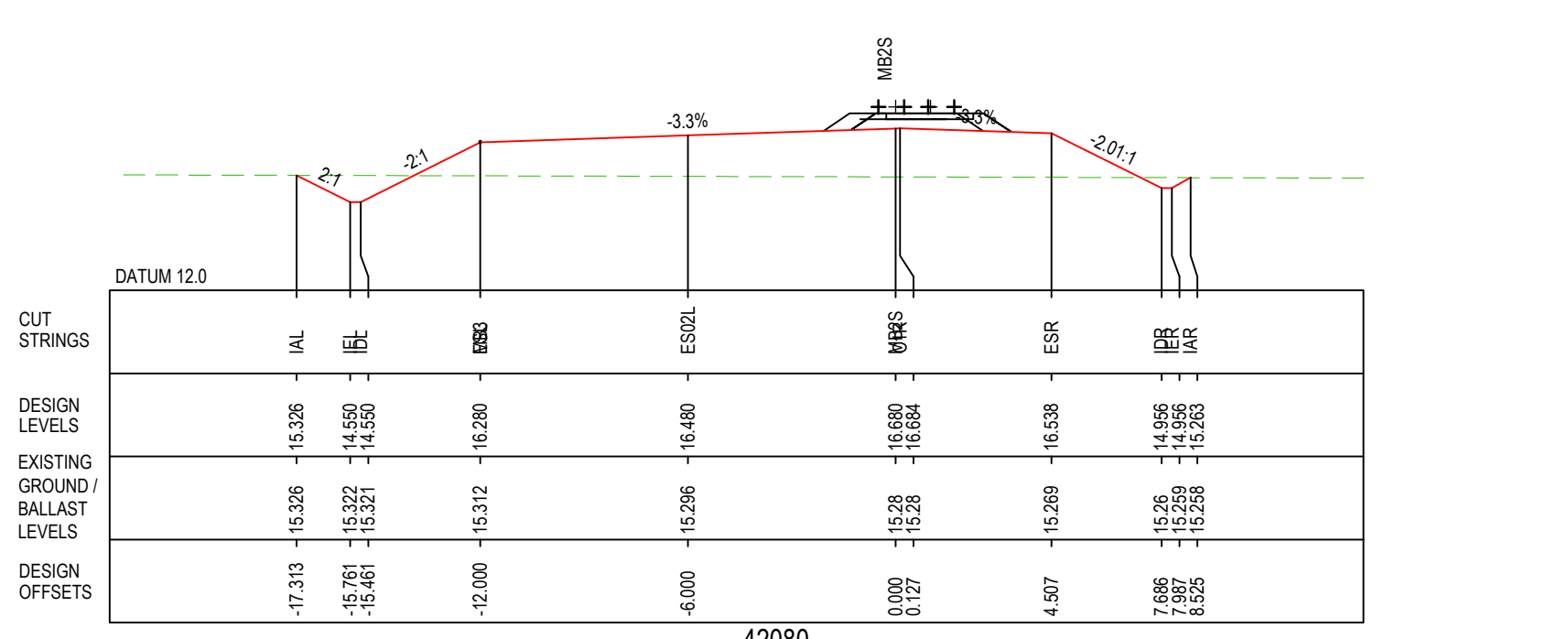
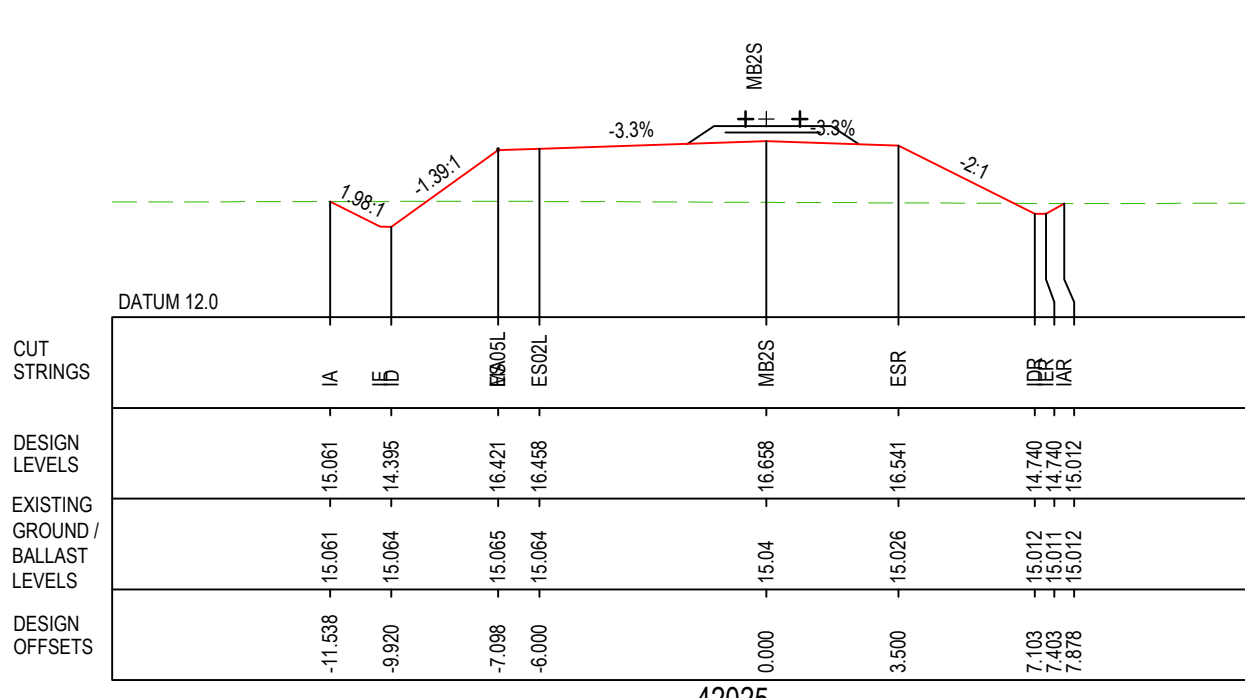
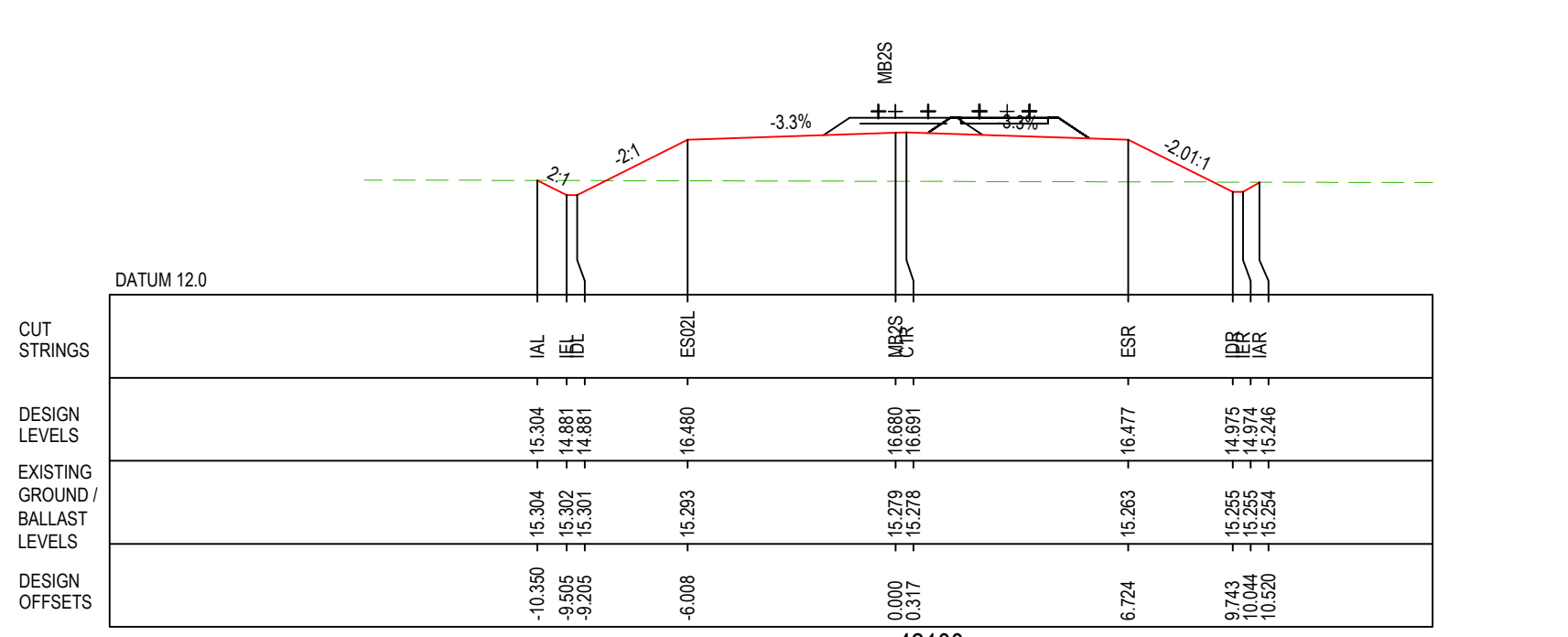
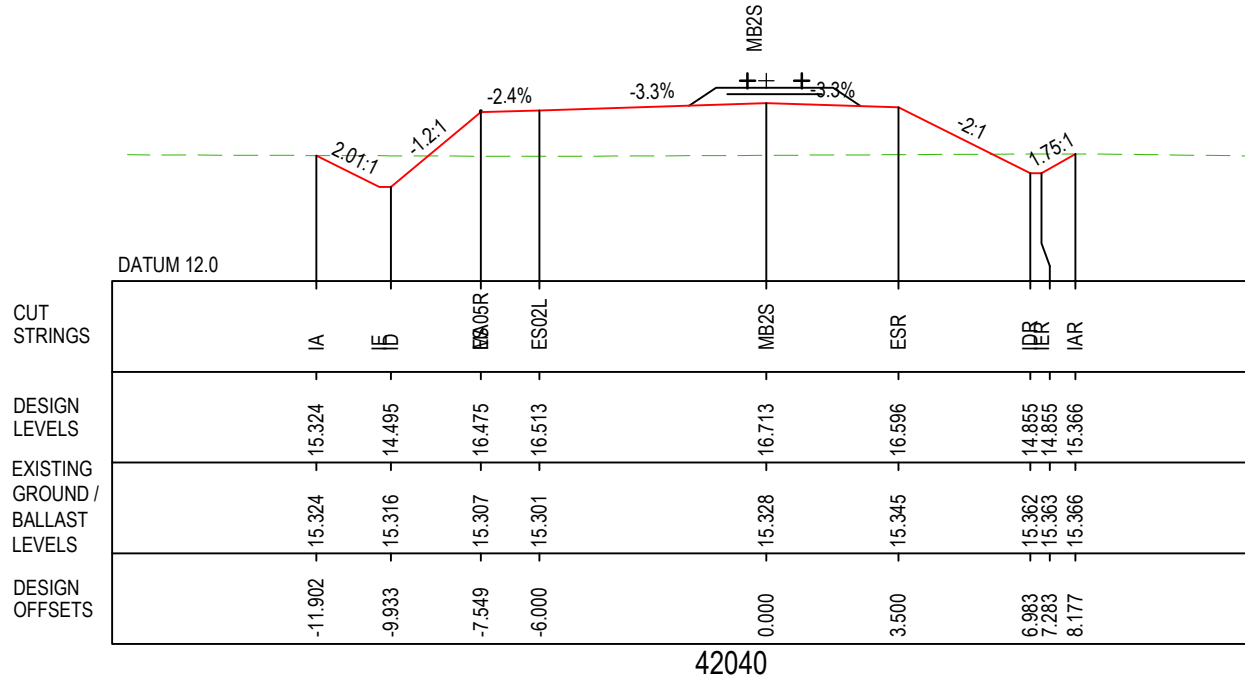
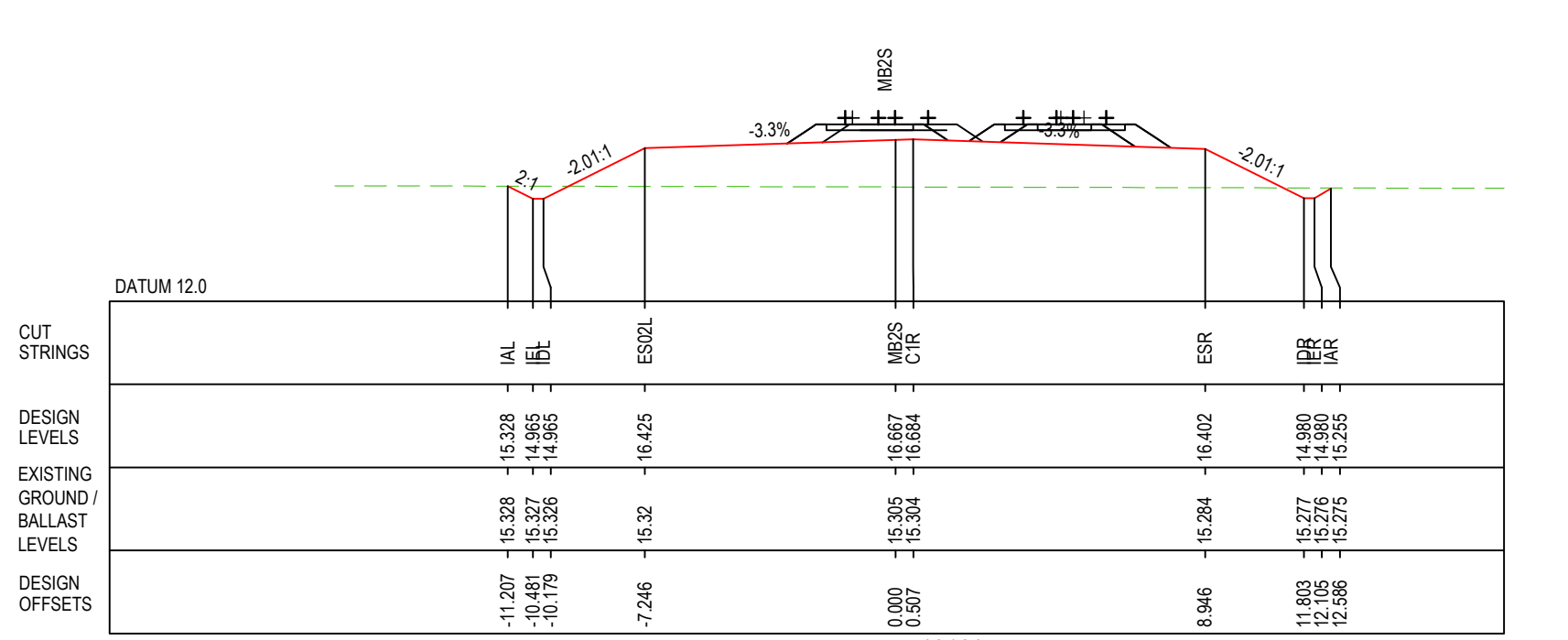
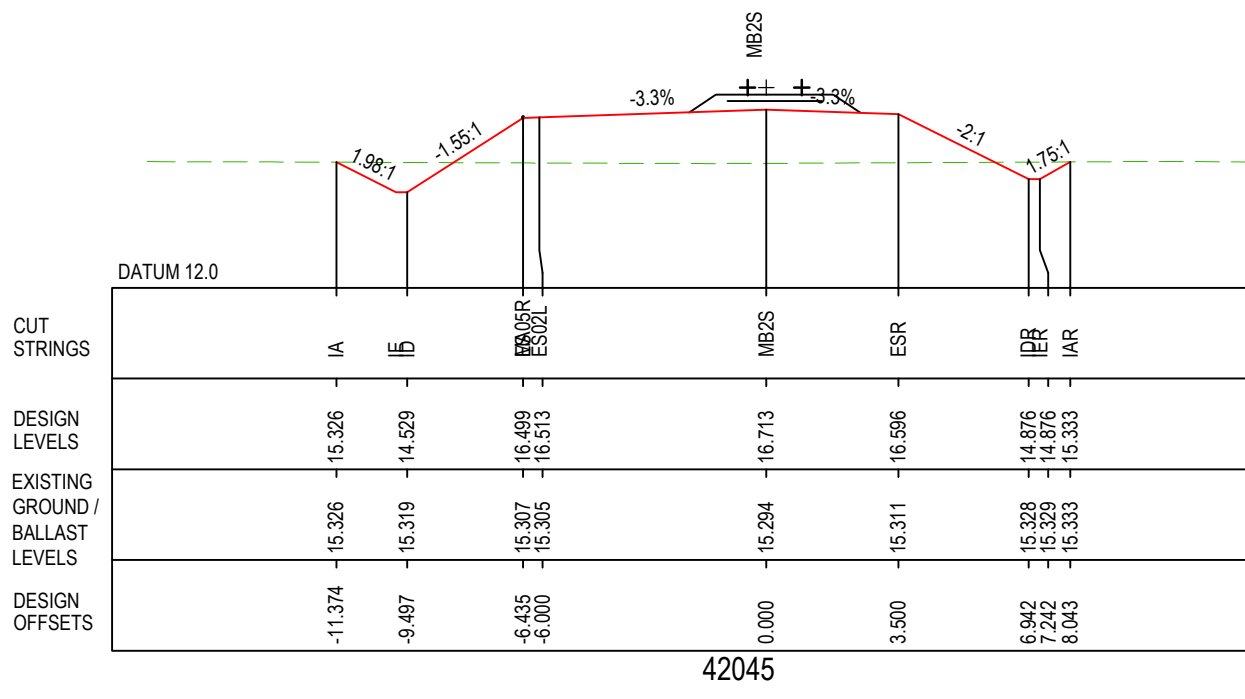
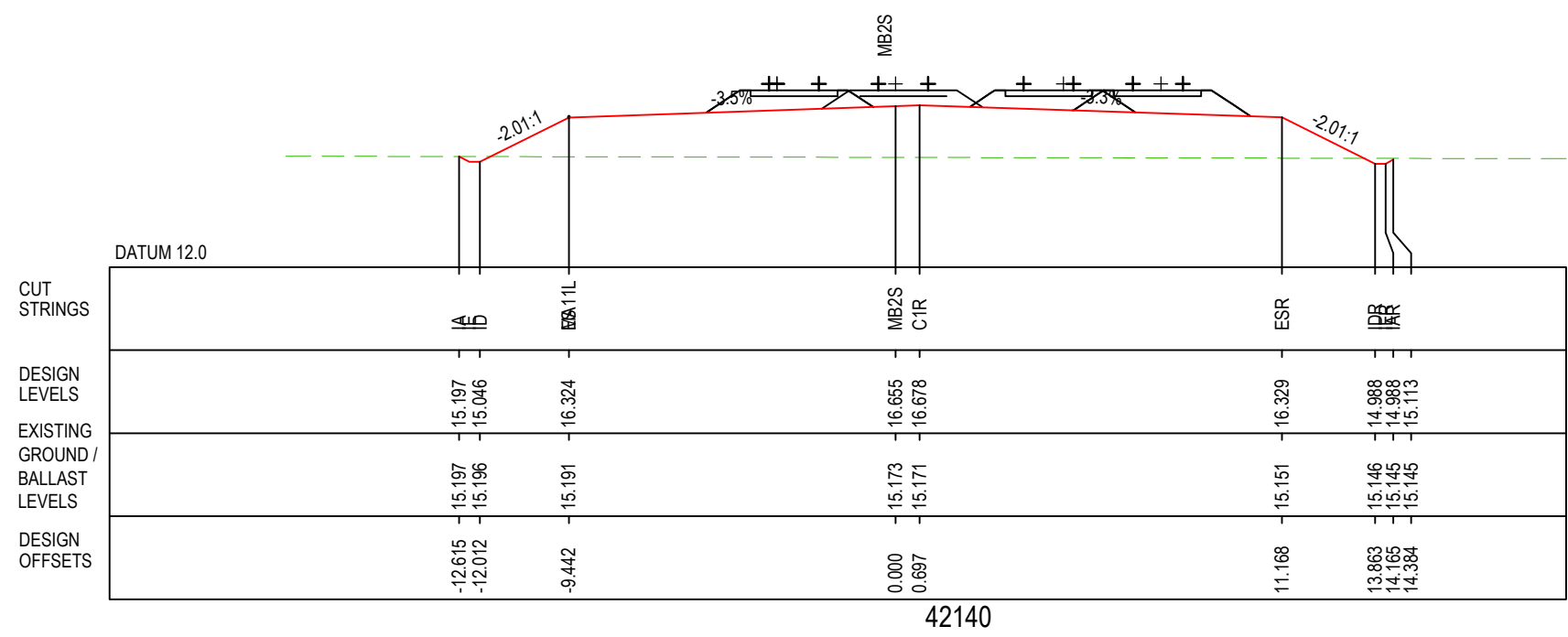
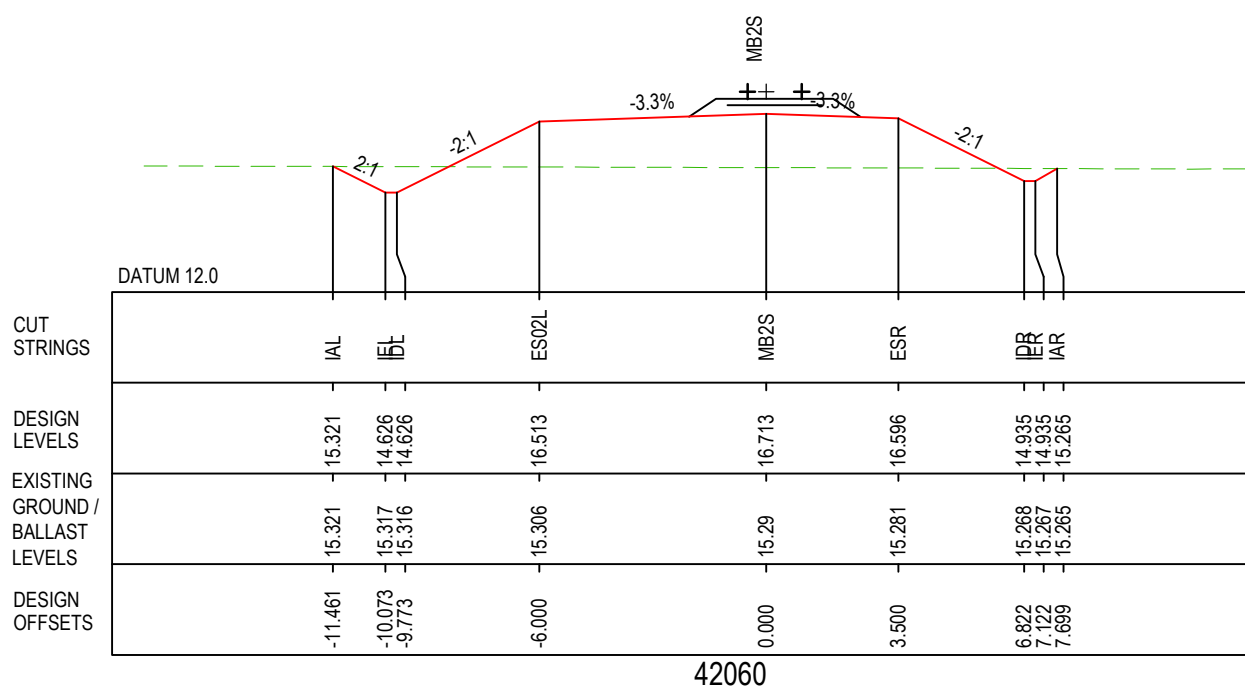
FOR CONSTRUCTION

ARTC DRAWING No		EDMS No		EDMS REV		
PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1					
TITLE	BULK EARTHWORKS SOUTHERN CONNECTION CROSS SECTIONS SHEET 14 OF 15					
DRAWING No.	PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV
	N01031	- PWD	- DRG	- GEN	0039	- 02

LEGEND

- DESIGN SURFACE (TOP OF CAPPING)
- EXISTING SURFACE / TOP OF SSFL BALLAST
- ASSUMED TOP OF SSFL EXISTING CAPPING LAYER (REFER NOTE 1)
- BRIDGE STRUCTURE
- PROPOSED RAIL DESIGN

02



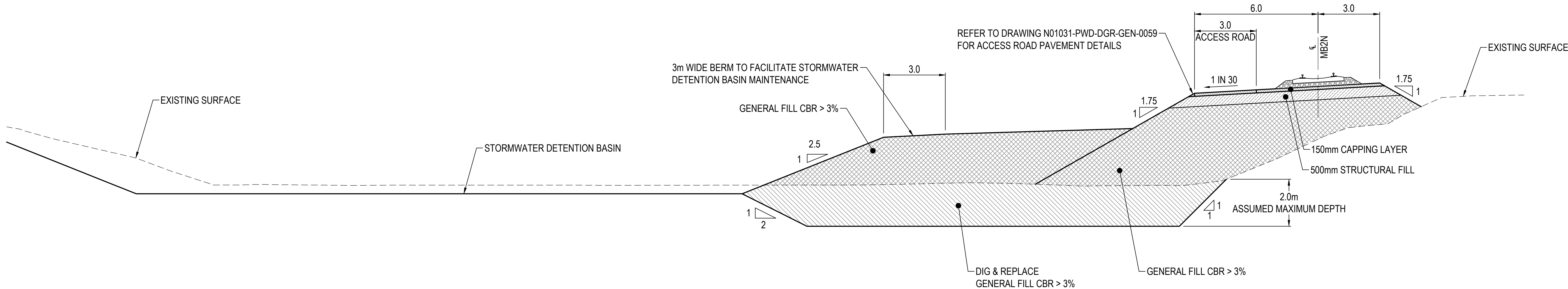
REV	DATE	REVISION DETAILS
01	20.01.17	ACCEPTED FOR CONSTRUCTION
02	09.06.17	ACCEPTED FOR CONSTRUCTION RE-SUBMISSION

SCALE	SIZE
AS SHOWN	A1

FOR CONSTRUCTION
APPROVED
DATE 20.01.17

ARTC DRAWING No	EDMS No	EDMS REV
PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1	
TITLE	BULK EARTHWORKS SOUTHERN CONNECTION CROSS SECTIONS SHEET 15 OF 15	
DRAWING No.	PROJECT No.	ZONE
	N01031	PWD
	TYPE	DISC
	DRG	GEN
	NUMBER	REV
	0040	02

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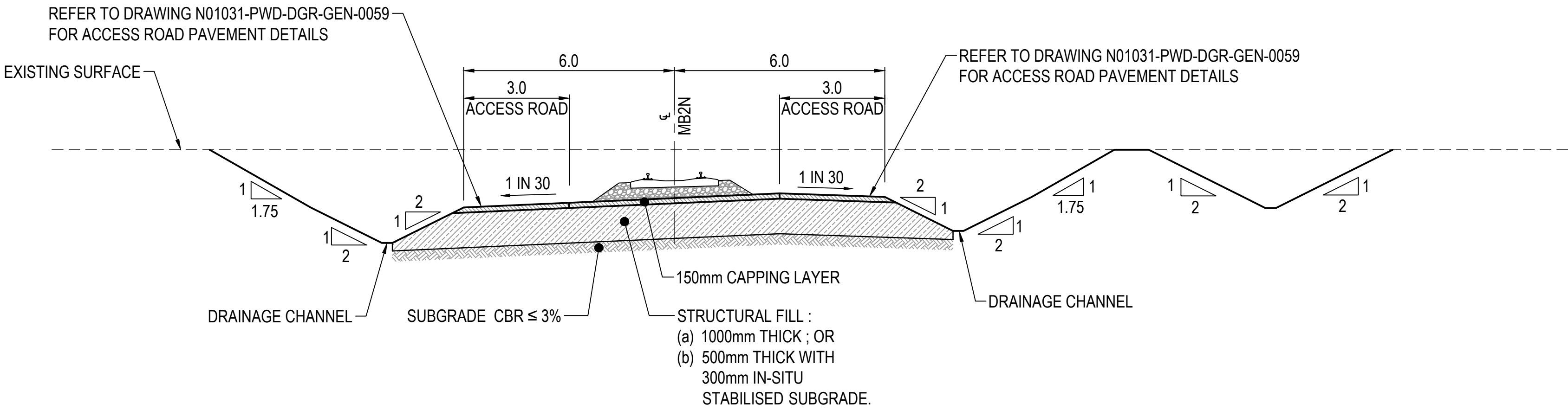


SECTION A
1:100
GEN-0011

TYPICAL SECTION - CONTROL LINE MB2N
CH 39560

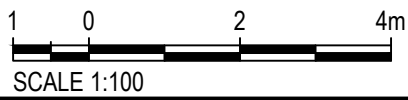
NOTES FOR TYPICAL CROSS SECTIONS

- THIS DRAWING IS IN TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER N01031-PWD-SPE-EWK-0001).
- REFER TO DRAWINGS N01031-PWD-SPE-EWK-0025 TO N01031-PWD-DRG-GEN-0040 FOR EARTHWORKS CROSS SECTIONS.
- REFER TO DRAWINGS N01031-PWD-DRG-GEN-0110 TO N01031-PWD-DRG-GEN-0126 FOR FOUNDATION TREATMENT PLANS.
- REFER TO DRAWINGS N01031-PWD-DRG-GEN-0150 TO N01031-PWD-DRG-GEN-0158 FOR FOUNDATION TREATMENT LONG SECTIONS.
- REFER TO DRAWING N01031-PWD-DRG-GEN-0160 FOR THE EARTHWORKS FOUNDATION TREATMENT SCHEDULE.
- C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.
- FOR PLACEMENT OF FILL ADJACENT TO STRUCTURES A MINIMUM 150mm THICK CAPPING LAYER IS TO BE PLACE OVER THE SELECT FILL WHICH IS TO BE PLACED OVER THE ENTIRE HEIGHT OF THE STRUCTURE. SEE FOUNDATION TREATMENT TYPE E8 IN THE PROJECT EARTHWORKS SPECIFICATION.
- FOUNDATION TREATMENT TYPES TO BE CONFIRMED BY GEOTECHNICAL ENGINEER ON SITE BASED ON OBSERVED GROUND CONDITIONS.
- LOCALISED POCKETS OF UNSUITABLE MATERIAL AT BASE OF PROPOSED FORMATION TO BE REMOVED AND REPLACED WITH SUITABLE MATERIAL IN ACCORDANCE WITH THE PROJECT EARTHWORKS SPECIFICATION AS DIRECTED BY THE GEOTECHNICAL ENGINEER.
- ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE.
- SUBSOILS MAY BE REQUIRED REFER TO N0131-PWD-GEN-0059 FOR ACCESS ROAD PAVEMENT FOUNDATION IF IN CUT OR SEEPAGE IS EVIDENT ON SITE. THE REQUIREMENT FOR SUBSOIL IS TO BE DECIDED ON SITE BY GEOTECHNICAL ENGINEER. REFER TO DRAWING N01031-PWD-DRG-GEN-0059 FOR ACCESS ROAD PAVEMENT (FOUNDATION) DETAILS.



SECTION B
1:100
GEN-0011

TYPICAL SECTION - CONTROL LINE MB2N
CH 39720

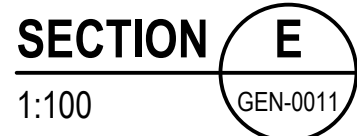
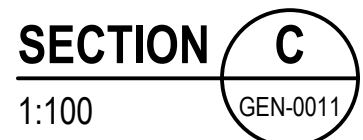


REV	DATE	REVISION DETAILS	APPROVED
01	20.01.17	ACCEPTED FOR CONSTRUCTION	A

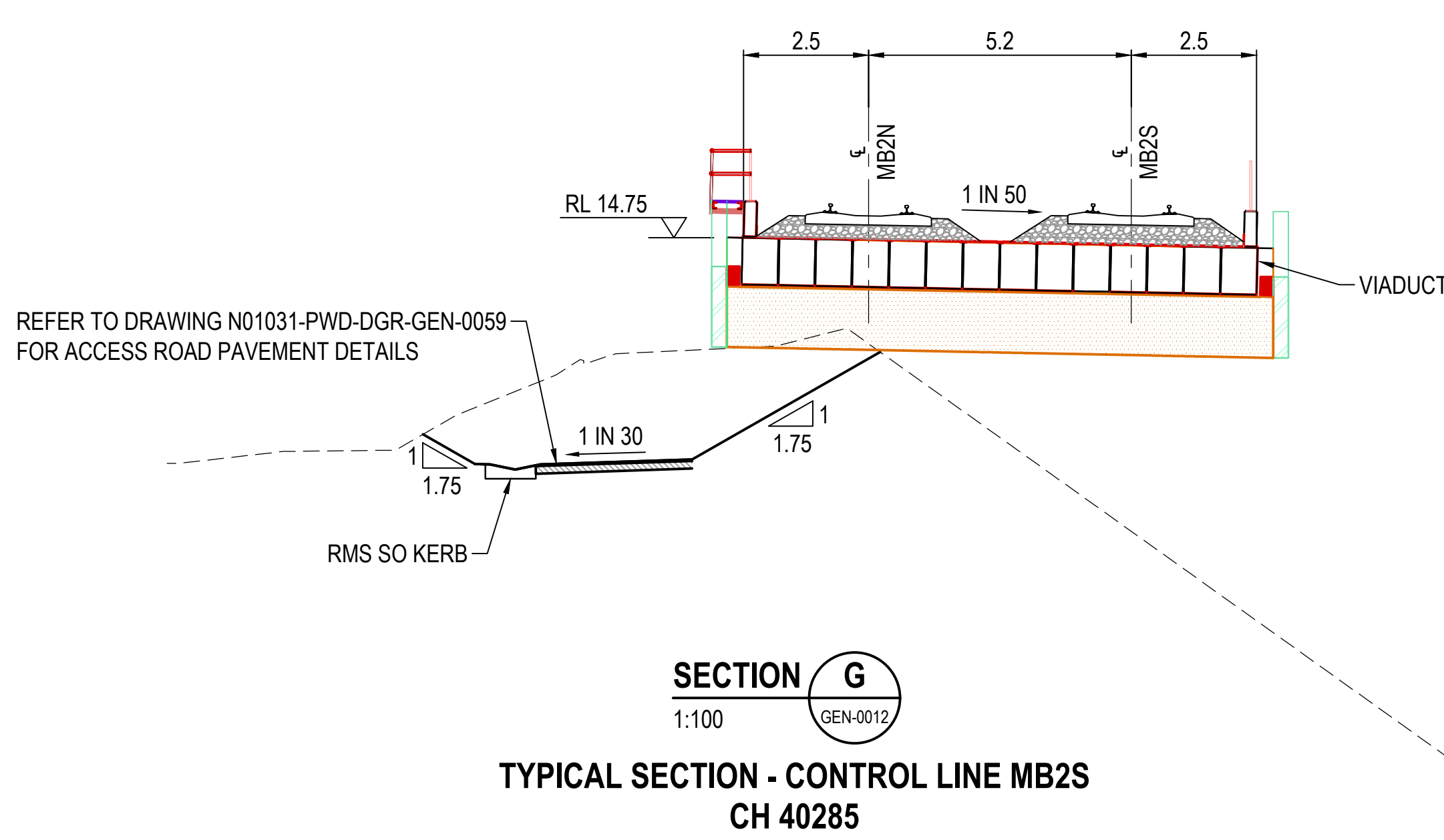
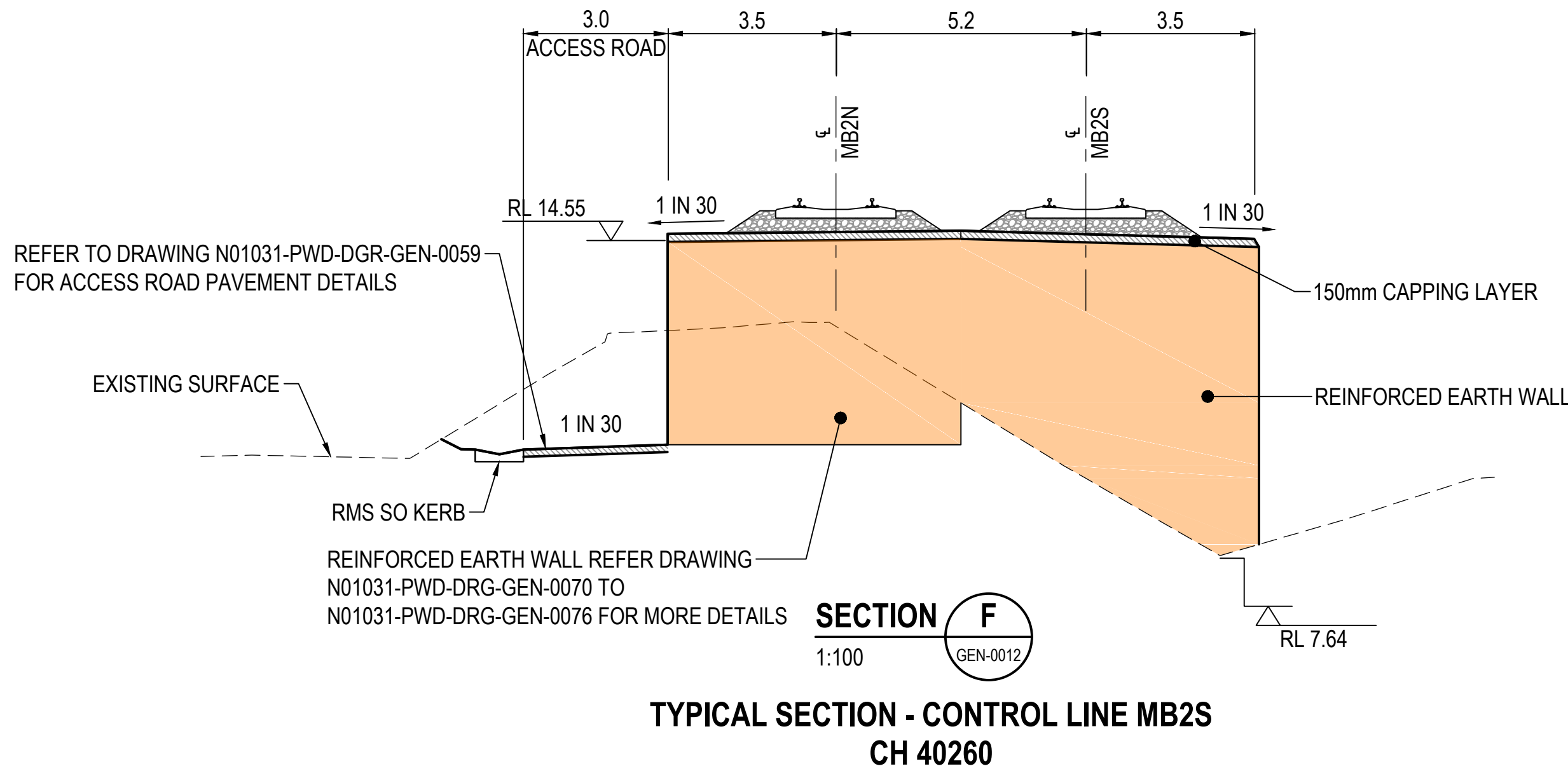
SCALE	SIZE
AS SHOWN	A1

FOR CONSTRUCTION

ARTC DRAWING No	EDMS No	EDMS REV
PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1	
TITLE	BULK EARTHWORKS TYPICAL CROSS SECTIONS SHEET 1 OF 9	
DRAWING No.	PROJECT No.	ZONE
N01031	-	PWD

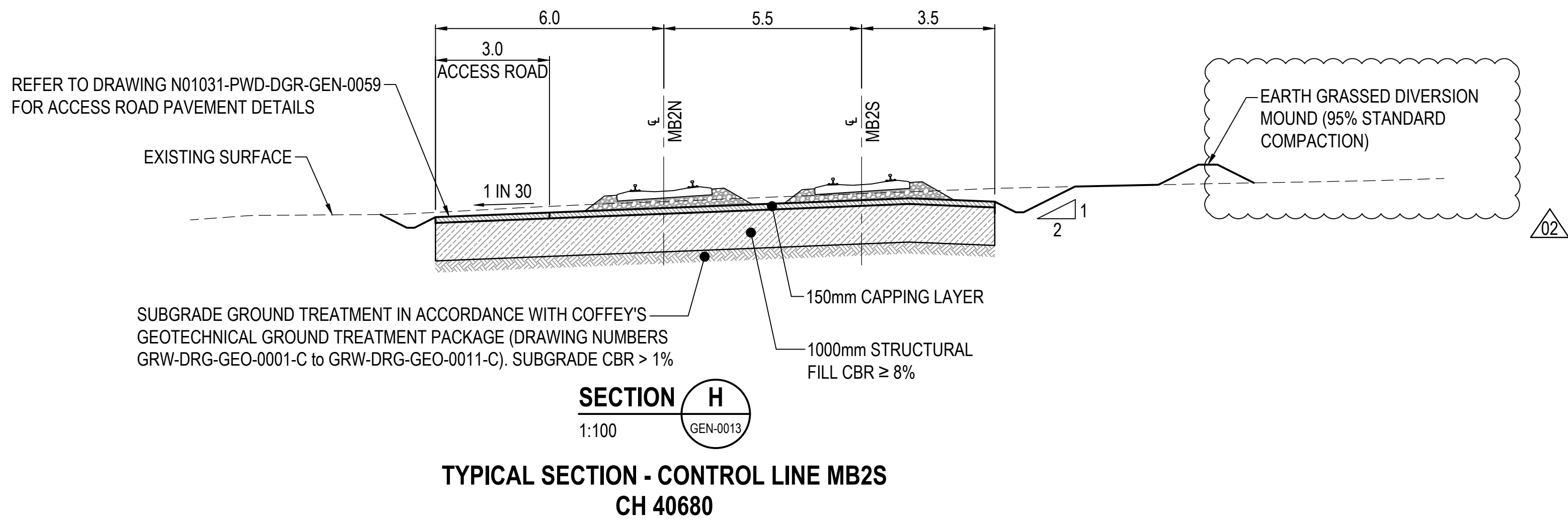


ARTC DRAWING No			EDMS No			EDMS REV	
PROJECT			MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1				
TITLE			BULK EARTHWORKS TYPICAL CROSS SECTIONS SHEET 2 OF 9				
DRAWING No.		PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV
N01031		-	PWD	-	DRG	-	GEN
						0051	-
							01



NOTES FOR TYPICAL CROSS SECTIONS

1. THIS DRAWING IS IN TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER N01031-PWD-SPE-EWK-0001).
2. REFER TO DRAWINGS N01031-PWD-SPE-EWK-0025 TO N01031-PWD-DRG-GEN-0040 FOR EARTHWORKS CROSS SECTIONS.
3. REFER TO DRAWINGS N01031-PWD-DRG-GEN-0110 TO N01031-PWD-DRG-GEN-0126 FOR FOUNDATION TREATMENT PLANS.
4. REFER TO DRAWINGS N01031-PWD-DRG-GEN-0150 TO N01031-PWD-DRG-GEN-0158 FOR FOUNDATION TREATMENT LONG SECTIONS.
5. REFER TO DRAWING N01031-PWD-DRG-GEN-0160 FOR THE EARTHWORKS FOUNDATION TREATMENT SCHEDULE.
6. C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.
7. FOR PLACEMENT OF FILL ADJACENT TO STRUCTURES A MINIMUM 150mm THICK CAPPING LAYER IS TO BE PLACE OVER THE SELECT FILL WHICH IS TO BE PLACED OVER THE ENTIRE HEIGHT OF THE STRUCTURE. SEE FOUNDATION TREATMENT TYPE E8 IN THE PROJECT EARTHWORKS SPECIFICATION.
8. FOUNDATION TREATMENT TYPES TO BE CONFIRMED BY GEOTECHNICAL ENGINEER ON SITE BASED ON OBSERVED GROUND CONDITIONS.
9. LOCALISED POCKETS OF UNSUITABLE MATERIAL AT BASE OF PROPOSED FORMATION TO BE REMOVED AND REPLACED WITH SUITABLE MATERIAL IN ACCORDANCE WITH THE PROJECT EARTHWORKS SPECIFICATION AS DIRECTED BY THE GEOTECHNICAL ENGINEER.
10. ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE.
11. SUBSOILS MAY BE REQUIRED REFER TO N0131-PWD-GEN-0059 FOR ACCESS ROAD PAVEMENT FOUNDATION IF IN CUT OR SEEPAGE IS EVIDENT ON SITE. THE REQUIREMENT FOR SUBSOIL IS TO BE DECIDED ON SITE BY GEOTECHNICAL ENGINEER. REFER TO DRAWING N01031-PWD-DRG-GEN-0059 FOR ACCESS ROAD PAVEMENT (FOUNDATION) DETAILS.



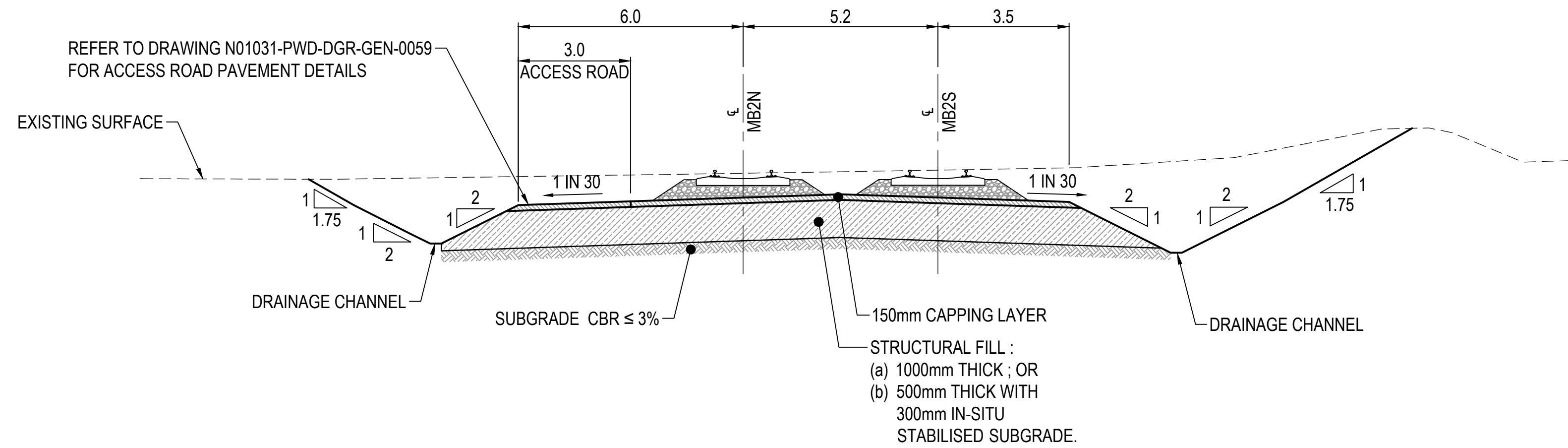
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REV	DATE	REVISION DETAILS	APPROVED
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02	09.06.17	ACCEPTED FOR CONSTRUCTION RE-SUBMISSION	

SCALE	SIZE
AS SHOWN	A1

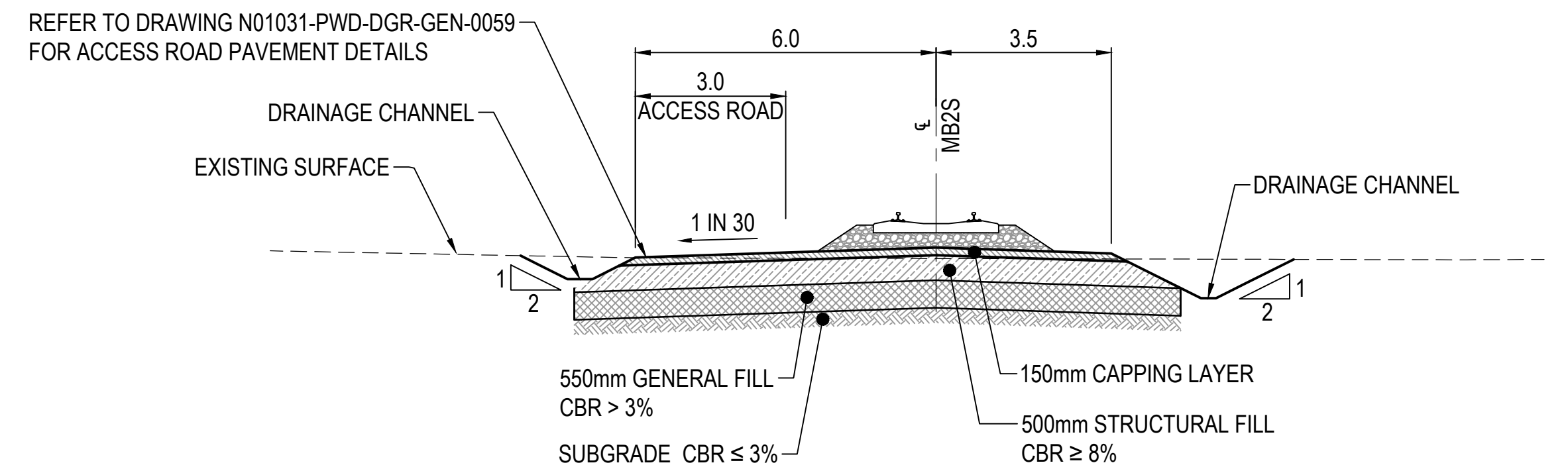
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FOR CONSTRUCTION
APPROVED
DATE 20.01.17

ARTC DRAWING No	EDMS No	EDMS REV
PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1	
TITLE	BULK EARTHWORKS TYPICAL CROSS SECTIONS SHEET 3 OF 9	
DRAWING No.	PROJECT No.	ZONE
N01031	PWD	DRG
	DISC	GEN
	NUMBER	REV
	0052	02



SECTION J
1:100
GEN-0014

**TYPICAL SECTION - CONTROL LINE MB2S
CH 41000**
CH 41740 (SIMILAR GROUND TREATMENT)

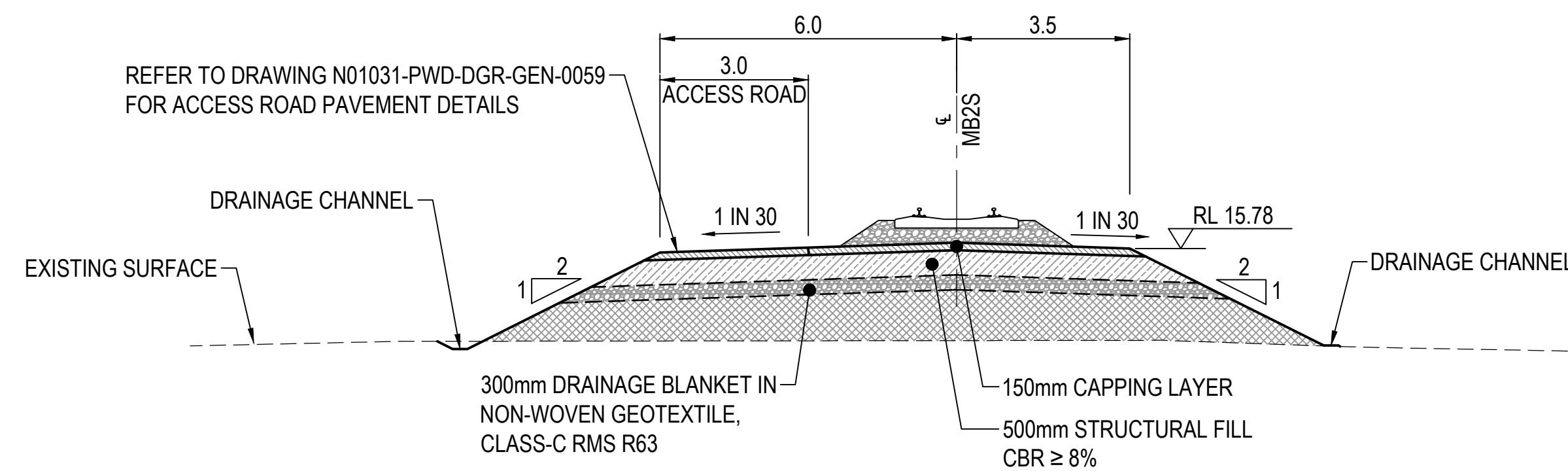


SECTION K
1:100
GEN-0016

**TYPICAL SECTION - CONTROL LINE MB2S
CH 41700**
CH 41800 (SIMILAR)

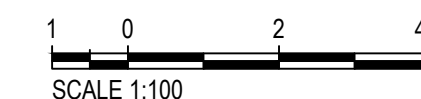
NOTES FOR TYPICAL CROSS SECTIONS

1. THIS DRAWING IS IN TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER N01031-PWD-SPE-EWK-0001).
2. REFER TO DRAWINGS N01031-PWD-SPE-EWK-0025 TO N01031-PWD-DRG-GEN-0040 FOR EARTHWORKS CROSS SECTIONS.
3. REFER TO DRAWINGS N01031-PWD-DRG-GEN-0110 TO N01031-PWD-DRG-GEN-0126 FOR FOUNDATION TREATMENT PLANS.
4. REFER TO DRAWINGS N01031-PWD-DRG-GEN-0150 TO N01031-PWD-DRG-GEN-0158 FOR FOUNDATION TREATMENT LONG SECTIONS.
5. REFER TO DRAWING N01031-PWD-DRG-GEN-0160 FOR THE EARTHWORKS FOUNDATION TREATMENT SCHEDULE.
6. C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.
7. FOR PLACEMENT OF FILL ADJACENT TO STRUCTURES A MINIMUM 150mm THICK CAPPING LAYER IS TO BE PLACE OVER THE SELECT FILL WHICH IS TO BE PLACED OVER THE ENTIRE HEIGHT OF THE STRUCTURE. SEE FOUNDATION TREATMENT TYPE E8 IN THE PROJECT EARTHWORKS SPECIFICATION.
8. FOUNDATION TREATMENT TYPES TO BE CONFIRMED BY GEOTECHNICAL ENGINEER ON SITE BASED ON OBSERVED GROUND CONDITIONS.
9. LOCALISED POCKETS OF UNSUITABLE MATERIAL AT BASE OF PROPOSED FORMATION TO BE REMOVED AND REPLACED WITH SUITABLE MATERIAL IN ACCORDANCE WITH THE PROJECT EARTHWORKS SPECIFICATION AS DIRECTED BY THE GEOTECHNICAL ENGINEER.
10. ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE.
11. SUBSOILS MAY BE REQUIRED REFER TO N0131-PWD-GEN-0059 FOR ACCESS ROAD PAVEMENT FOUNDATION IF IN CUT OR SEEPAGE IS EVIDENT ON SITE. THE REQUIREMENT FOR SUBSOIL IS TO BE DECIDED ON SITE BY GEOTECHNICAL ENGINEER. REFER TO DRAWING N01031-PWD-DRG-GEN-0059 FOR ACCESS ROAD PAVEMENT (FOUNDATION) DETAILS.



SECTION L
1:100
GEN-0017

**TYPICAL SECTION - CONTROL LINE MB2S
CH 41985**

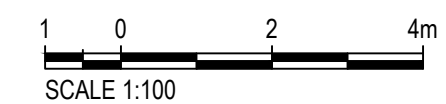
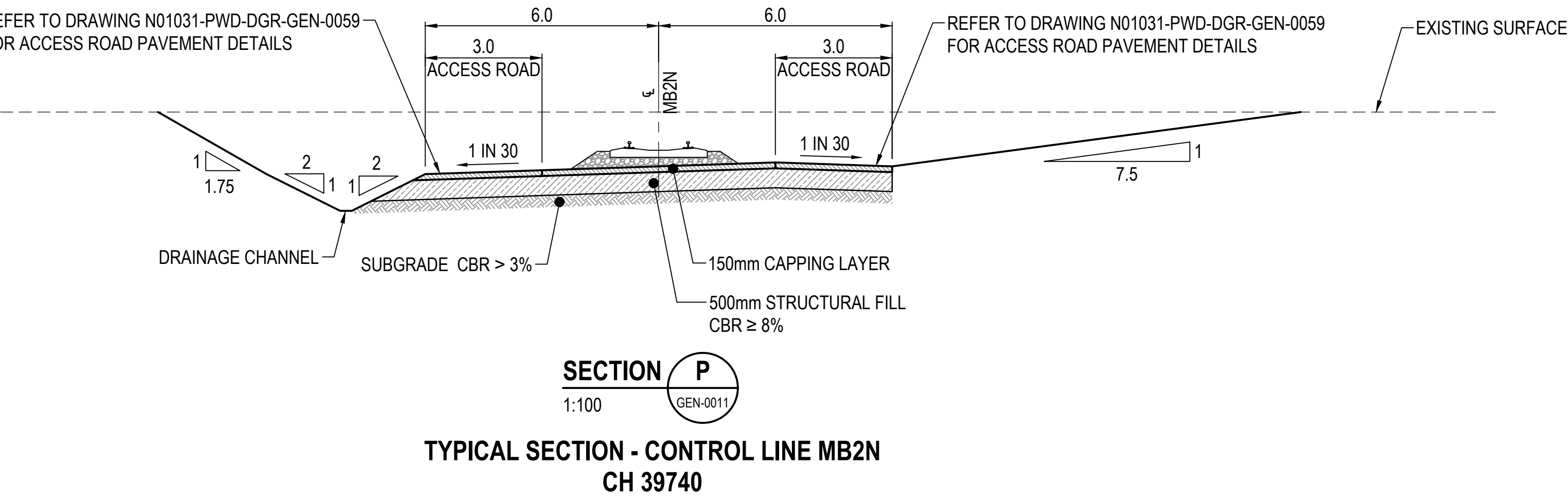


REV	DATE	REVISION DETAILS	APPROVED
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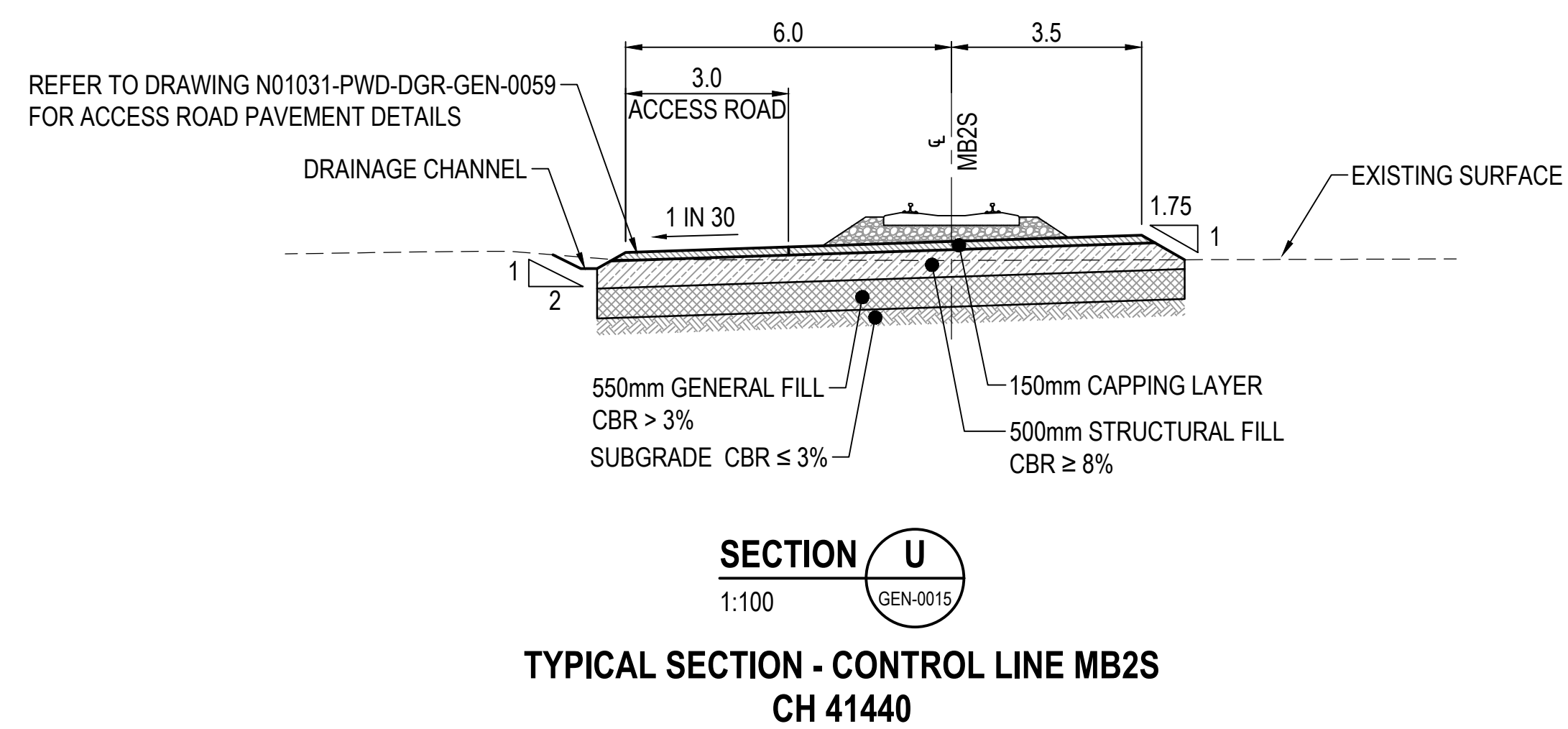
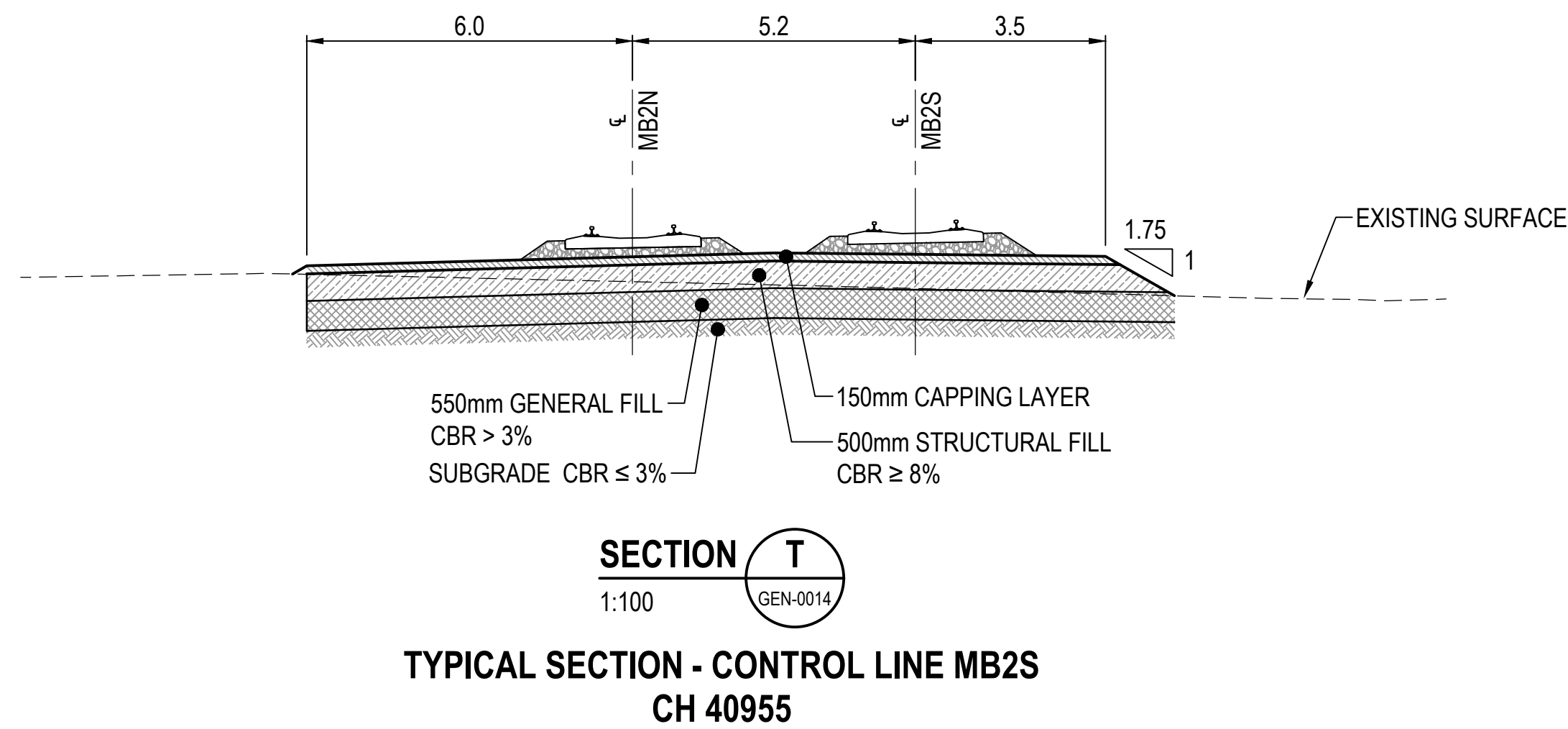
SCALE	SIZE
AS SHOWN	A1

FOR CONSTRUCTION	

ARTC DRAWING No		EDMS No		EDMS REV		
PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1					
TITLE	BULK EARTHWORKS TYPICAL CROSS SECTIONS SHEET 4 OF 9					
DRAWING No.	PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV
	N01031	- PWD	- DRG	- GEN	0053	- 01

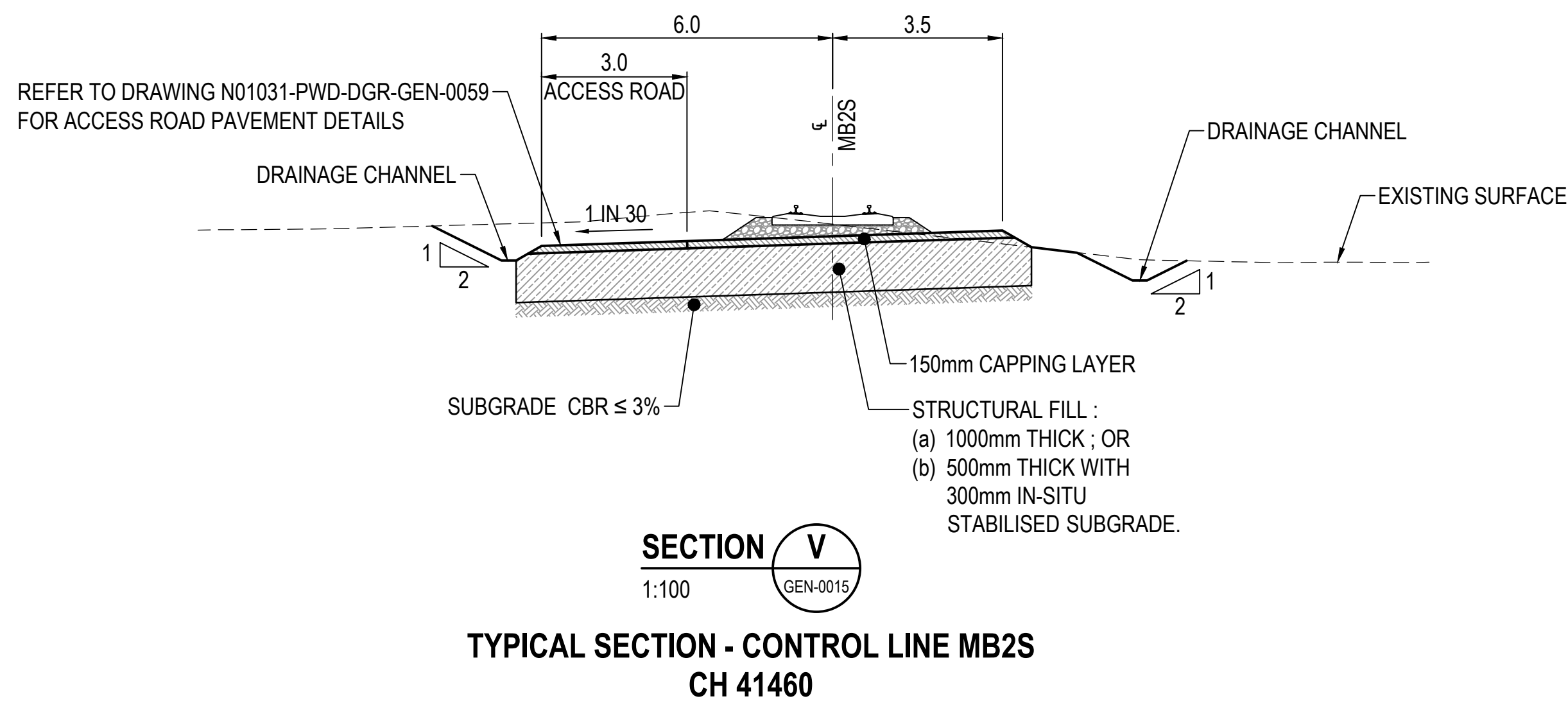






NOTES FOR TYPICAL CROSS SECTIONS

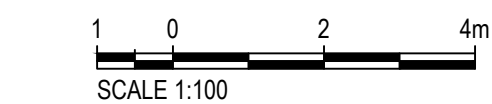
- THIS DRAWING IS IN TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER N01031-PWD-SPE-EWK-0001).
- REFER TO DRAWINGS N01031-PWD-SPE-EWK-0025 TO N01031-PWD-DRG-GEN-0040 FOR EARTHWORKS CROSS SECTIONS.
- REFER TO DRAWINGS N01031-PWD-DRG-GEN-0110 TO N01031-PWD-DRG-GEN-0126 FOR FOUNDATION TREATMENT PLANS.
- REFER TO DRAWINGS N01031-PWD-DRG-GEN-0150 TO N01031-PWD-DRG-GEN-0158 FOR FOUNDATION TREATMENT LONG SECTIONS.
- REFER TO DRAWING N01031-PWD-DRG-GEN-0160 FOR THE EARTHWORKS FOUNDATION TREATMENT SCHEDULE.
- C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.
- FOR PLACEMENT OF FILL ADJACENT TO STRUCTURES A MINIMUM 150mm THICK CAPPING LAYER IS TO BE PLACE OVER THE SELECT FILL WHICH IS TO BE PLACED OVER THE ENTIRE HEIGHT OF THE STRUCTURE. SEE FOUNDATION TREATMENT TYPE E8 IN THE PROJECT EARTHWORKS SPECIFICATION.
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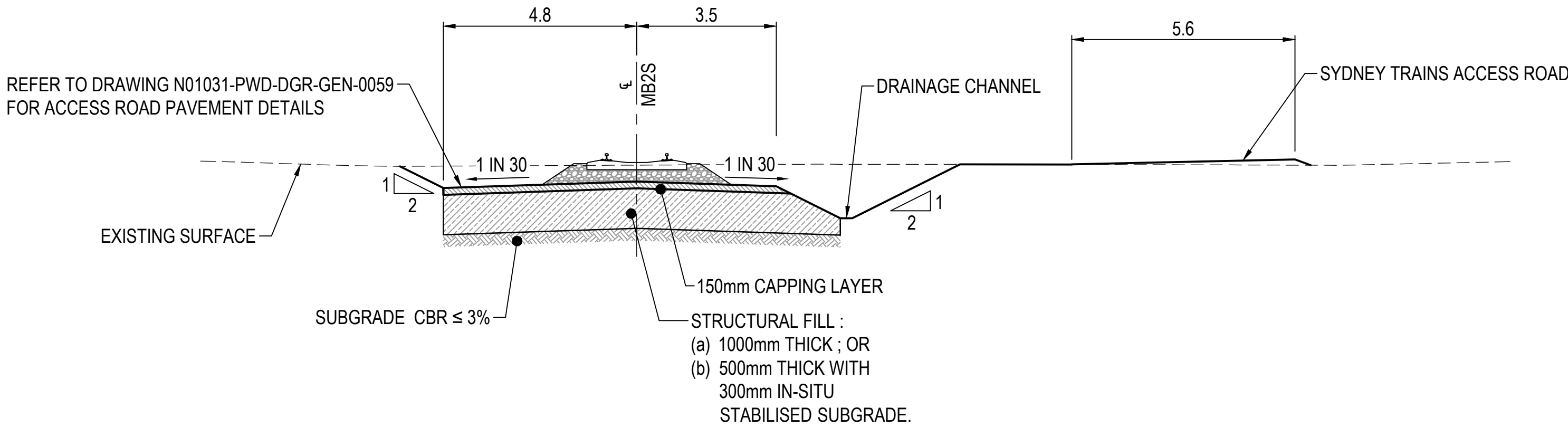
REV	DATE	REVISION DETAILS	APPROVED
01	20.01.17	ACCEPTED FOR CONSTRUCTION	

SCALE	SIZE
AS SHOWN	A1
DRAWN	



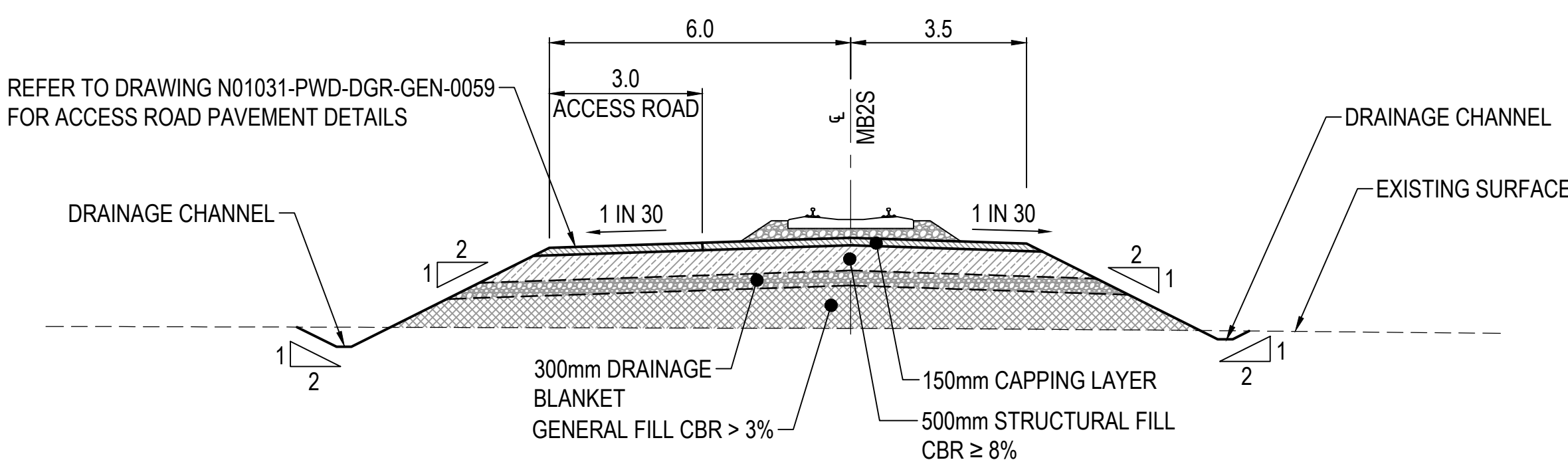
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TITLE	BULK EARTHWORKS TYPICAL CROSS SECTIONS SHEET 7 OF 9	
DRAWING No.	PROJECT No.	ZONE
N01031		PWD
	TYPE	DISC
	DRG	GEN
	NUMBER	REV
	0056	01



SECTION **W**
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GEN-0016

TYPICAL SECTION - CONTROL LINE MB2S
CH 41640

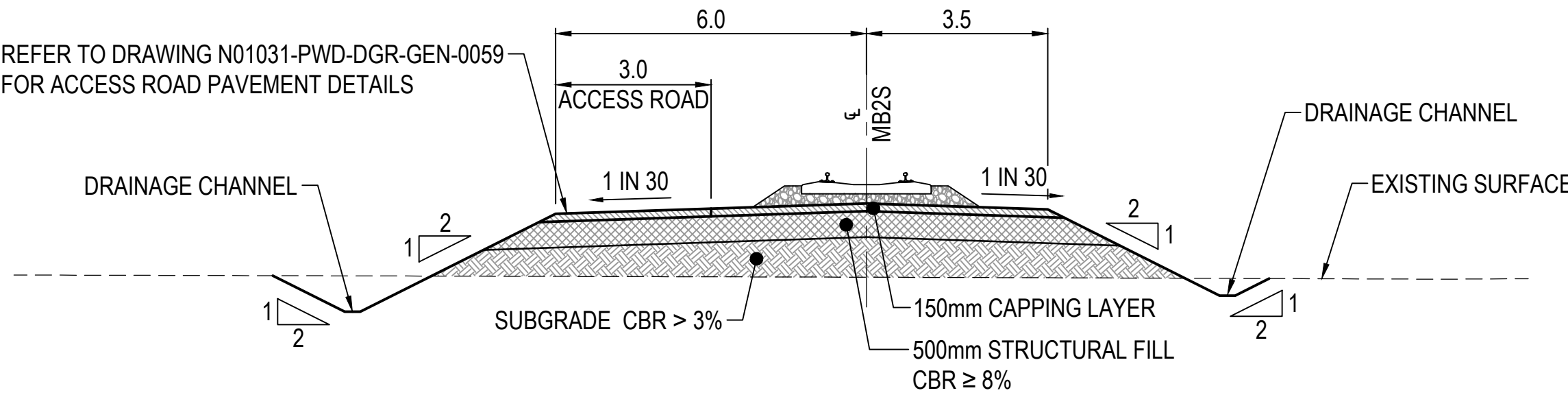


SECTION **X**
1:100
GEN-0017

TYPICAL SECTION - CONTROL LINE MB2S
CH 42000

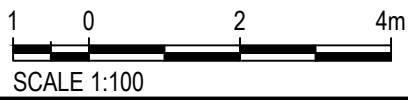
NOTES FOR TYPICAL CROSS SECTIONS

- THIS DRAWING IS IN TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER N01031-PWD-SPE-EWK-0001).
- REFER TO DRAWINGS N01031-PWD-SPE-EWK-0025 TO N01031-PWD-DRG-GEN-0040 FOR EARTHWORKS CROSS SECTIONS.
- REFER TO DRAWINGS N01031-PWD-DRG-GEN-0110 TO N01031-PWD-DRG-GEN-0126 FOR FOUNDATION TREATMENT PLANS.
- REFER TO DRAWINGS N01031-PWD-DRG-GEN-0150 TO N01031-PWD-DRG-GEN-0158 FOR FOUNDATION TREATMENT LONG SECTIONS.
- REFER TO DRAWING N01031-PWD-DRG-GEN-0160 FOR THE EARTHWORKS FOUNDATION TREATMENT SCHEDULE.
- C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.
- FOR PLACEMENT OF FILL ADJACENT TO STRUCTURES A MINIMUM 150mm THICK CAPPING LAYER IS TO BE PLACE OVER THE SELECT FILL WHICH IS TO BE PLACED OVER THE ENTIRE HEIGHT OF THE STRUCTURE. SEE FOUNDATION TREATMENT TYPE E8 IN THE PROJECT EARTHWORKS SPECIFICATION.
- FOUNDATION TREATMENT TYPES TO BE CONFIRMED BY GEOTECHNICAL ENGINEER ON SITE BASED ON OBSERVED GROUND CONDITIONS.
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- SUBSOILS MAY BE REQUIRED REFER TO N0131-PWD-GEN-0059 FOR ACCESS ROAD PAVEMENT FOUNDATION IF IN CUT OR SEEPAGE IS EVIDENT ON SITE. THE REQUIREMENT FOR SUBSOIL IS TO BE DECIDED ON SITE BY GEOTECHNICAL ENGINEER. REFER TO DRAWING N01031-PWD-DRG-GEN-0059 FOR ACCESS ROAD PAVEMENT (FOUNDATION) DETAILS.



SECTION **Y**
1:100
GEN-0017

TYPICAL SECTION - CONTROL LINE MB2S
CH 42060



REV	DATE	REVISION DETAILS
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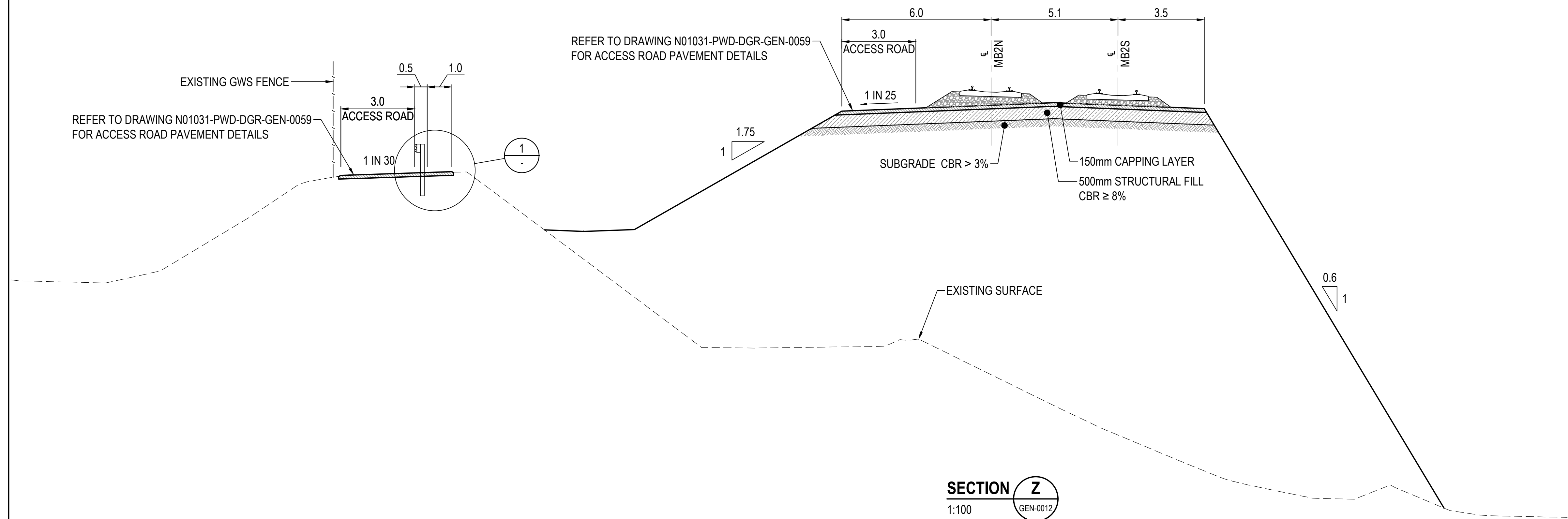
APPROVED

SCALE	SIZE
AS SHOWN	A1

FOR CONSTRUCTION

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PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1								
TITLE	BULK EARTHWORKS TYPICAL CROSS SECTIONS SHEET 8 OF 9								
DRAWING No.	PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV			
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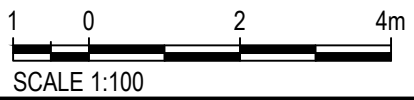
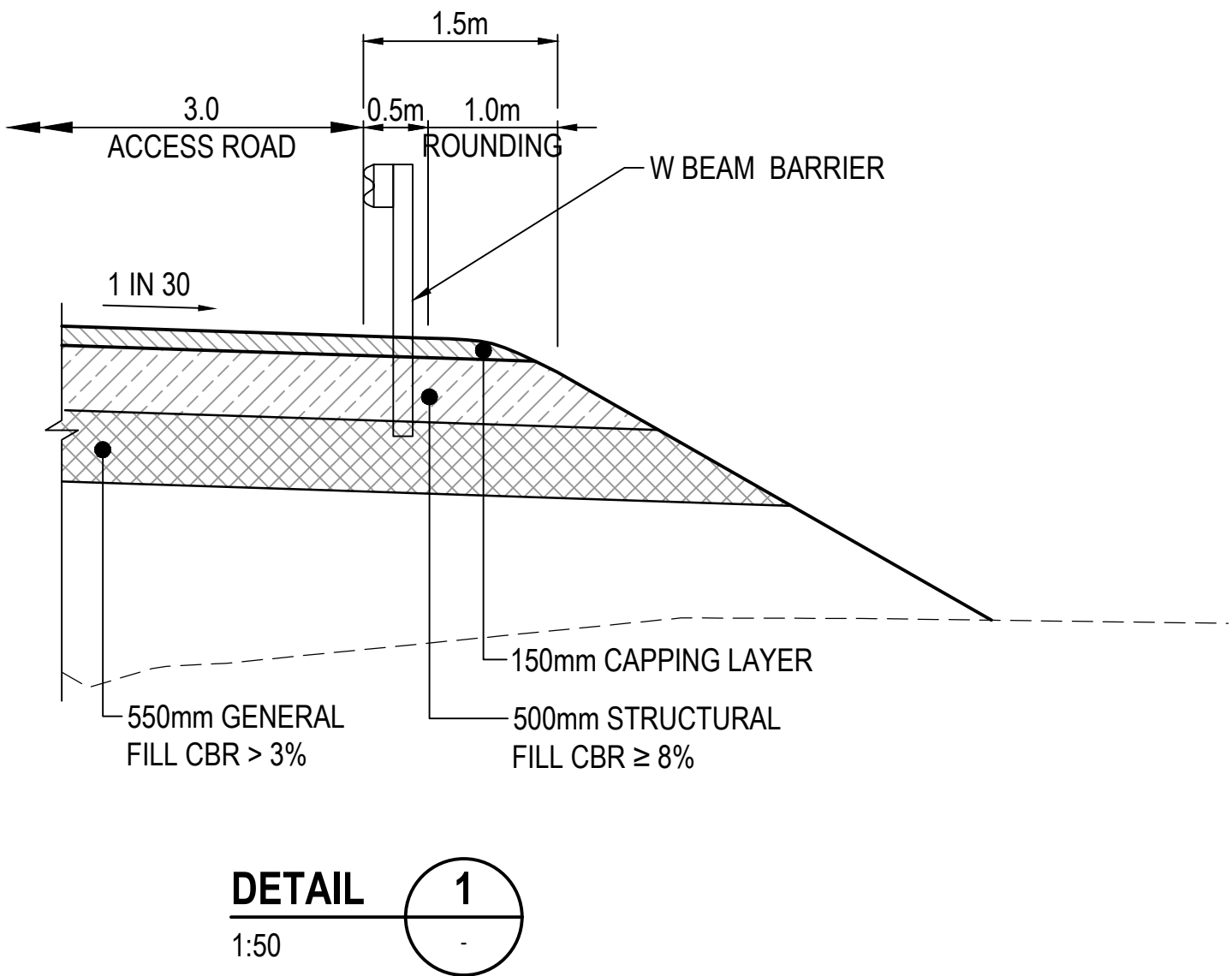
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SECTION Z
1:100
**TYPICAL SECTION - CONTROL LINE MB2S
CH 40440**

NOTES FOR TYPICAL CROSS SECTIONS

1. THIS DRAWING IS IN TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER N01031-PWD-SPE-EWK-0001).
2. REFER TO DRAWINGS N01031-PWD-SPE-EWK-0025 TO N01031-PWD-DRG-GEN-0040 FOR EARTHWORKS CROSS SECTIONS.
3. REFER TO DRAWINGS N01031-PWD-DRG-GEN-0110 TO N01031-PWD-DRG-GEN-0126 FOR FOUNDATION TREATMENT PLANS.
4. REFER TO DRAWINGS N01031-PWD-DRG-GEN-0150 TO N01031-PWD-DRG-GEN-0158 FOR FOUNDATION TREATMENT LONG SECTIONS.
5. REFER TO DRAWING N01031-PWD-DRG-GEN-0160 FOR THE EARTHWORKS FOUNDATION TREATMENT SCHEDULE.
6. C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.
7. FOR PLACEMENT OF FILL ADJACENT TO STRUCTURES A MINIMUM 150mm THICK CAPPING LAYER IS TO BE PLACE OVER THE SELECT FILL WHICH IS TO BE PLACED OVER THE ENTIRE HEIGHT OF THE STRUCTURE. SEE FOUNDATION TREATMENT TYPE E8 IN THE PROJECT EARTHWORKS SPECIFICATION.
8. FOUNDATION TREATMENT TYPES TO BE CONFIRMED BY GEOTECHNICAL ENGINEER ON SITE BASED ON OBSERVED GROUND CONDITIONS.
9. LOCALISED POCKETS OF UNSUITABLE MATERIAL AT BASE OF PROPOSED FORMATION TO BE REMOVED AND REPLACED WITH SUITABLE MATERIAL IN ACCORDANCE WITH THE PROJECT EARTHWORKS SPECIFICATION AS DIRECTED BY THE GEOTECHNICAL ENGINEER.
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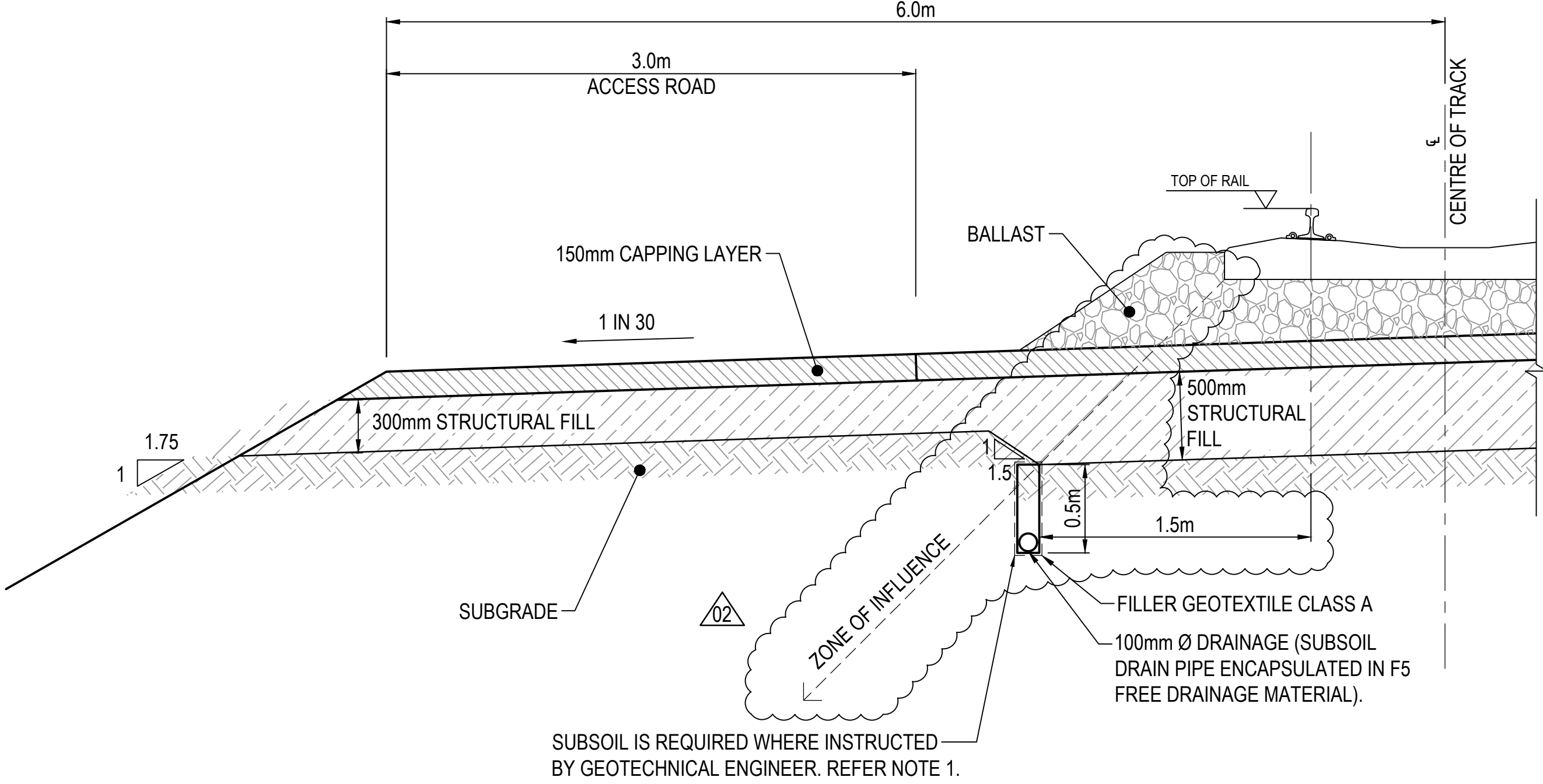


REV	DATE	REVISION DETAILS
01	20.01.17	ACCEPTED FOR CONSTRUCTION

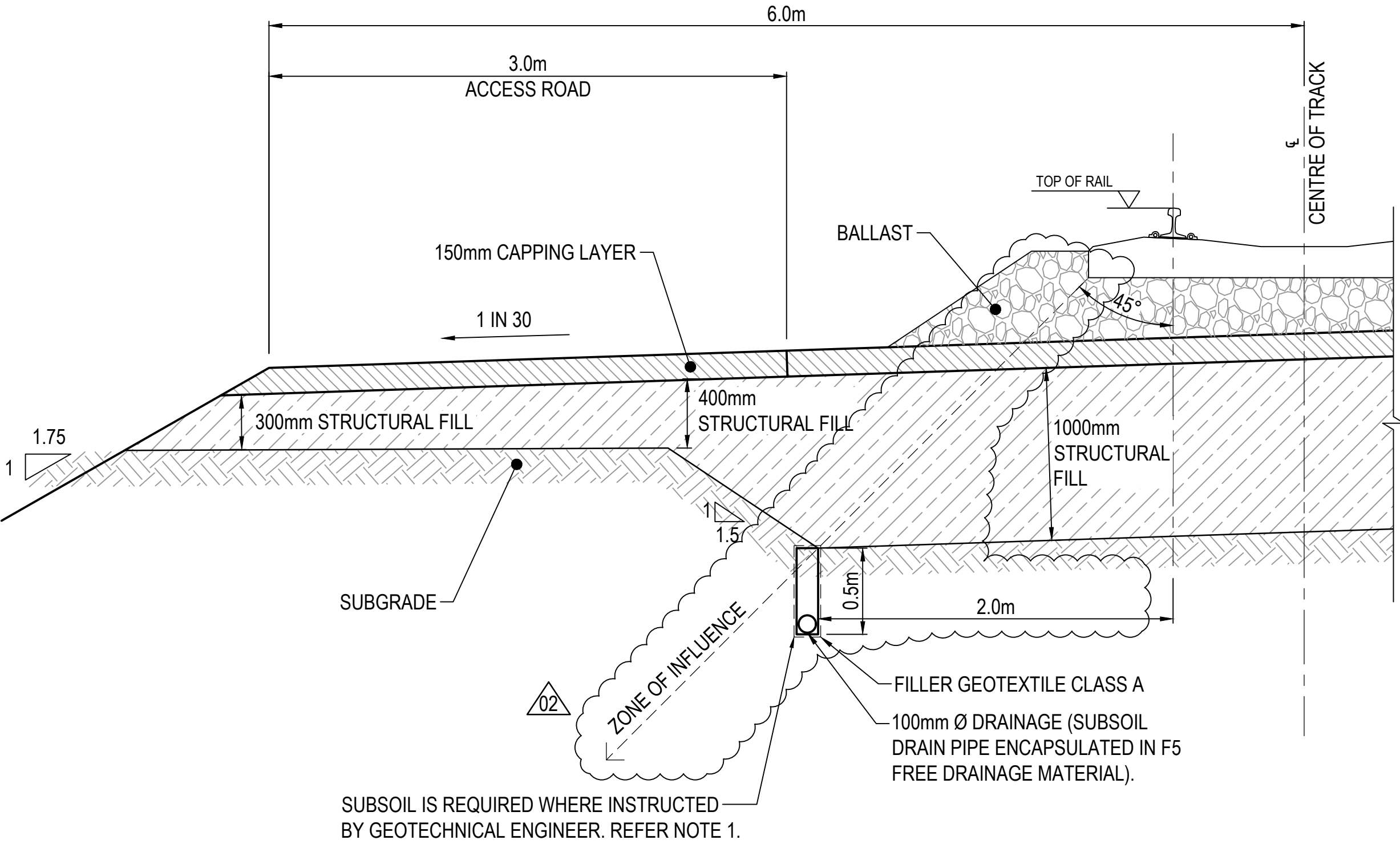
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AS SHOWN	A1

FOR CONSTRUCTION

ARTC DRAWING No			EDMS No			EDMS REV	
PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1						
TITLE	BULK EARTHWORKS TYPICAL CROSS SECTIONS SHEET 9 OF 9						
DRAWING No.	PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV	
	N01031	- PWD	- DRG	- GEN	0058	- 01	



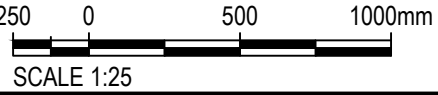
OPTION 1 : SUBGRADE CBR ≥ 3%
1:25



OPTION 2 : SUBGRADE CBR < 3%
1:25

NOTES FOR TYPICAL DETAILS

1. SUBSOILS MAY BE REQUIRED IF IN CUT OR SEEPAGE IS EVIDENT ON SITE.
THE REQUIREMENT FOR SUBSOIL IS TO BE DECIDED ON SITE BY GEOTECHNICAL ENGINEER.

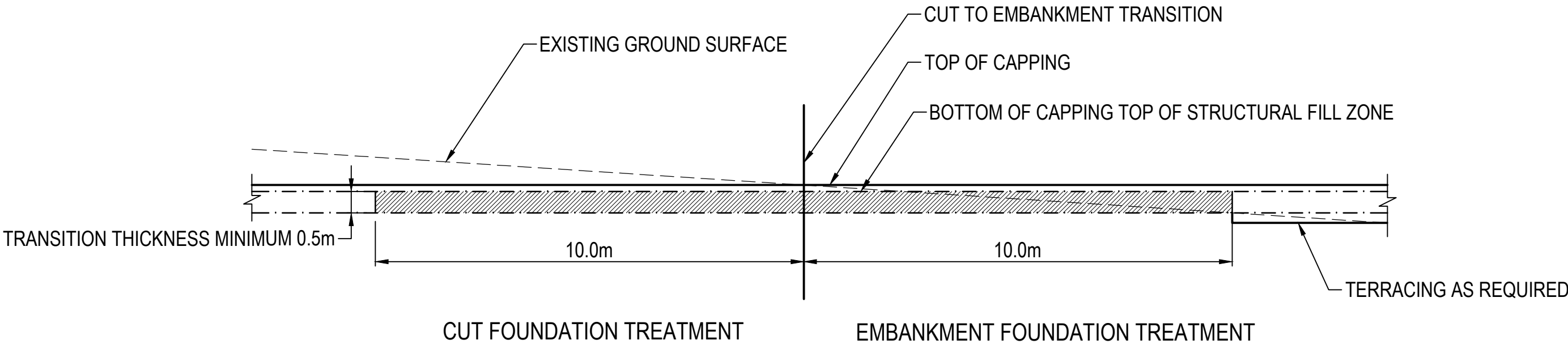


REV	DATE	REVISION DETAILS	APPROVED
01	20.01.17	ACCEPTED FOR CONSTRUCTION	
02	09.06.17	ACCEPTED FOR CONSTRUCTION RE-SUBMISSION	

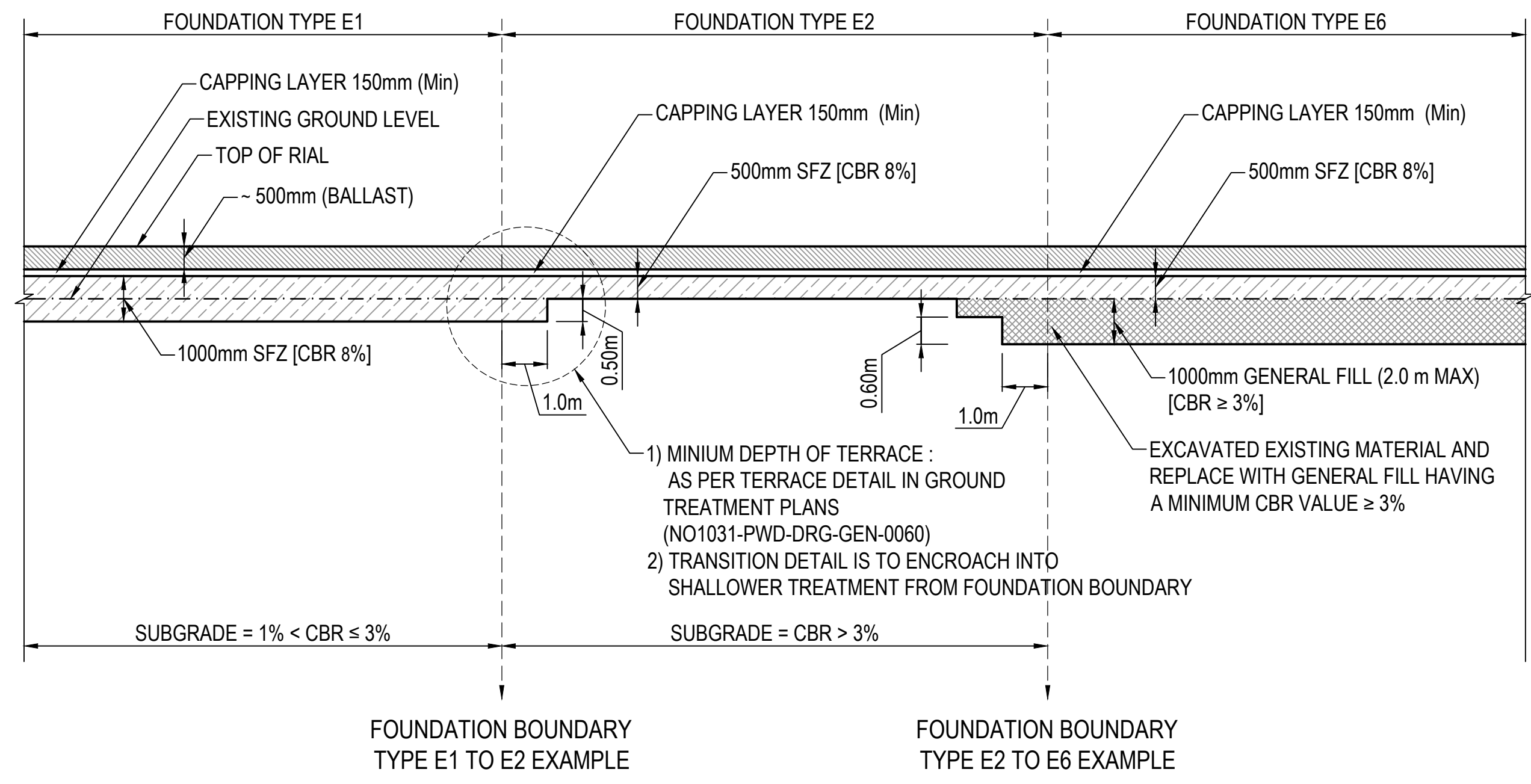
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FOR CONSTRUCTION

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TITLE	BULK EARTHWORKS TYPICAL DETAILS SHEET 1 OF 2	
DRAWING No.	PROJECT No.	ZONE
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		GEN
		NUMBER
		0059
		REV
		02



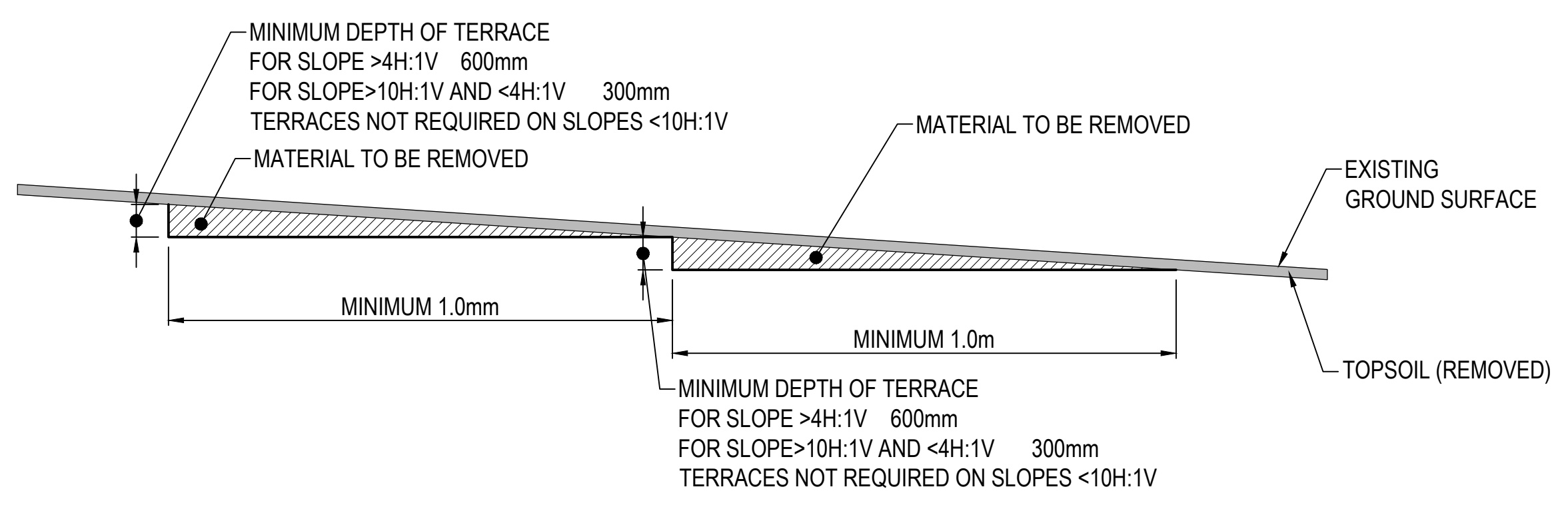
CUT TO EMBANKMENT FOUNDATION TREATMENT TRANSITION
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FOUNDATION TRANSITION DETAILED EXAMPLE
1:100

LEGEND

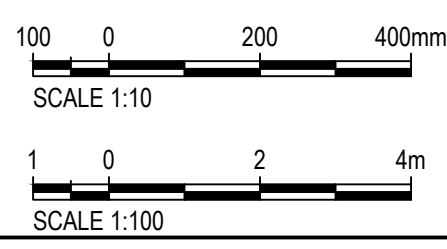
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- CAPPING LAYER
- STRUCTURAL FILL ZONE (SFZ)
- GENERAL FILL
- EXISTING GROUND LEVEL



EXISTING SLOPE TREATMENT
1:10

NOTES FOR TYPICAL DETAILS

- SUBSOILS MAY BE REQUIRED IF IN CUT OR SEEPAGE IS EVIDENT ON SITE. THE REQUIREMENT FOR SUBSOIL IS TO BE DECIDED ON SITE BY GEOTECHNICAL ENGINEER.

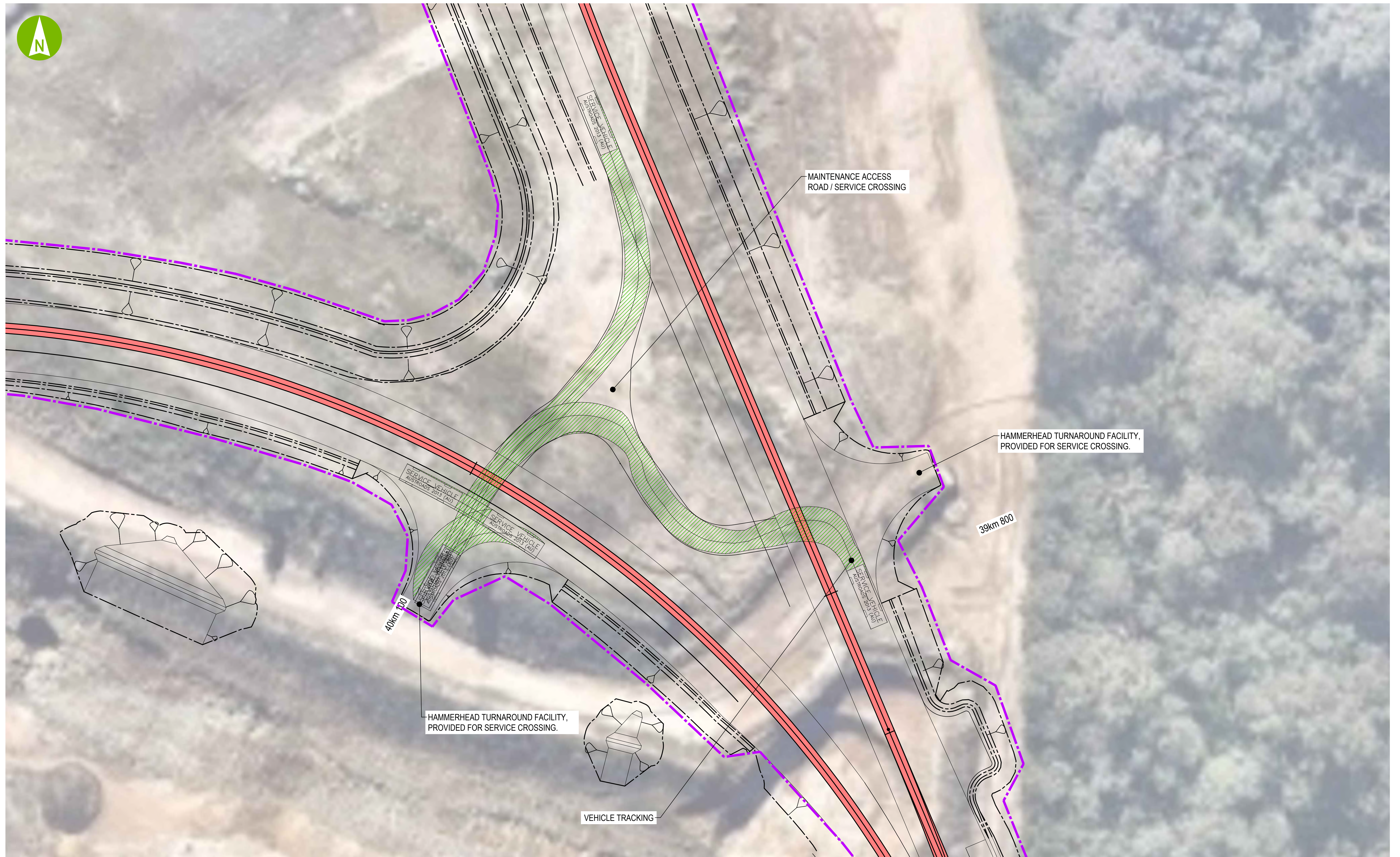


REV	DATE	REVISION DETAILS	APPROVED
01	20.01.17	ACCEPTED FOR CONSTRUCTION	

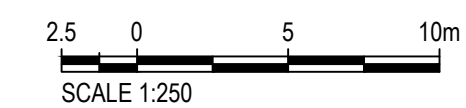
SCALE	SIZE
AS SHOWN	A1
DRAWN	

FOR CONSTRUCTION	APPROVED

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PROJECT			MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1								
TITLE			BULK EARTHWORKS TYPICAL DETAILS SHEET 2 OF 2								
DRAWING No.		PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV				
N01031		-	PWD	-	DRG	-	GEN	-	0060	-	01



PLAN
1:250



CLIENT



SYDNEY
INTERMODAL
TERMINAL
ALLIANCE

REV	DATE	REVISION DETAILS	APPROVED
01	20.01.17	ACCEPTED FOR CONSTRUCTION	

SCALE
AS SHOWN

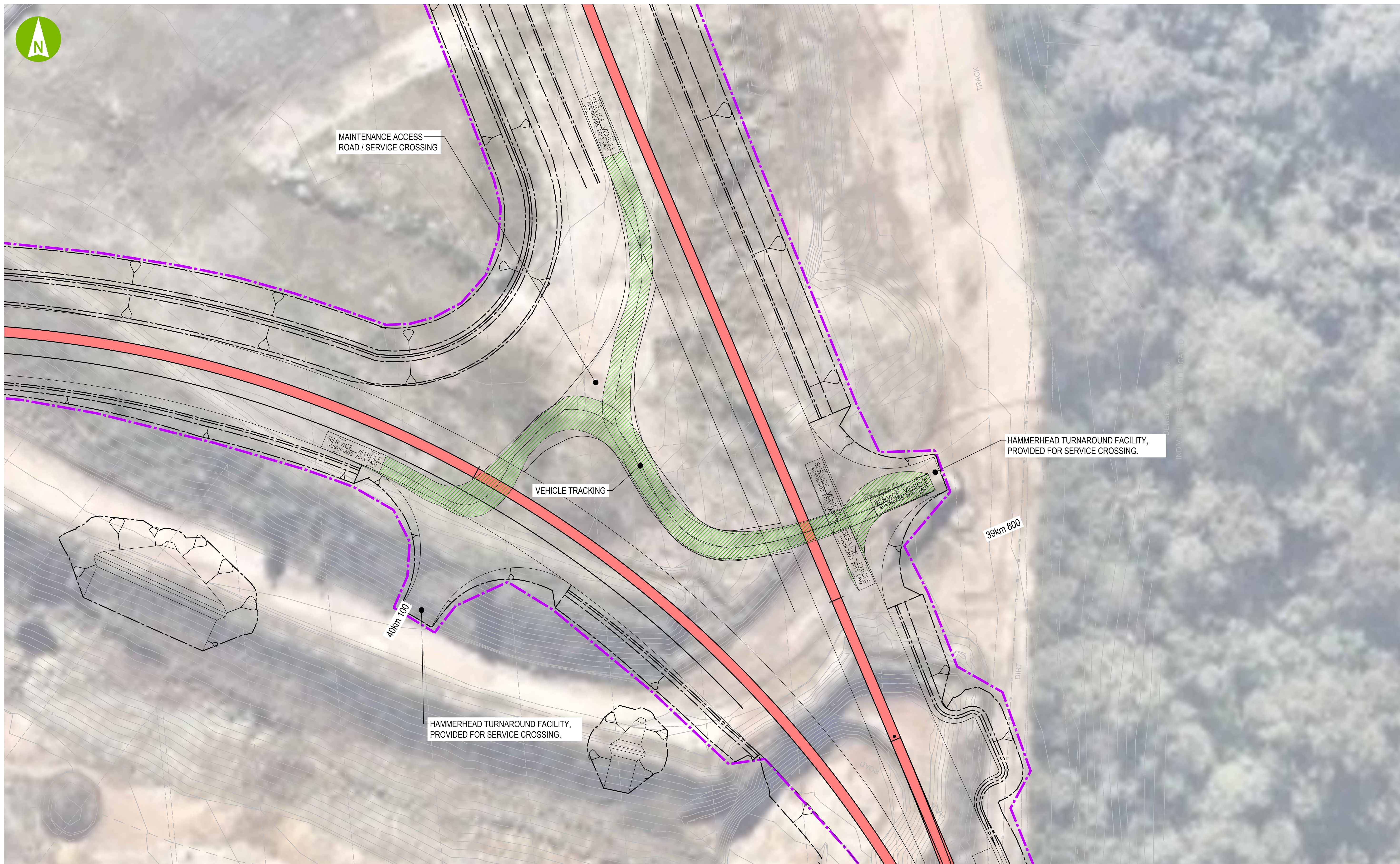
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DRAWN

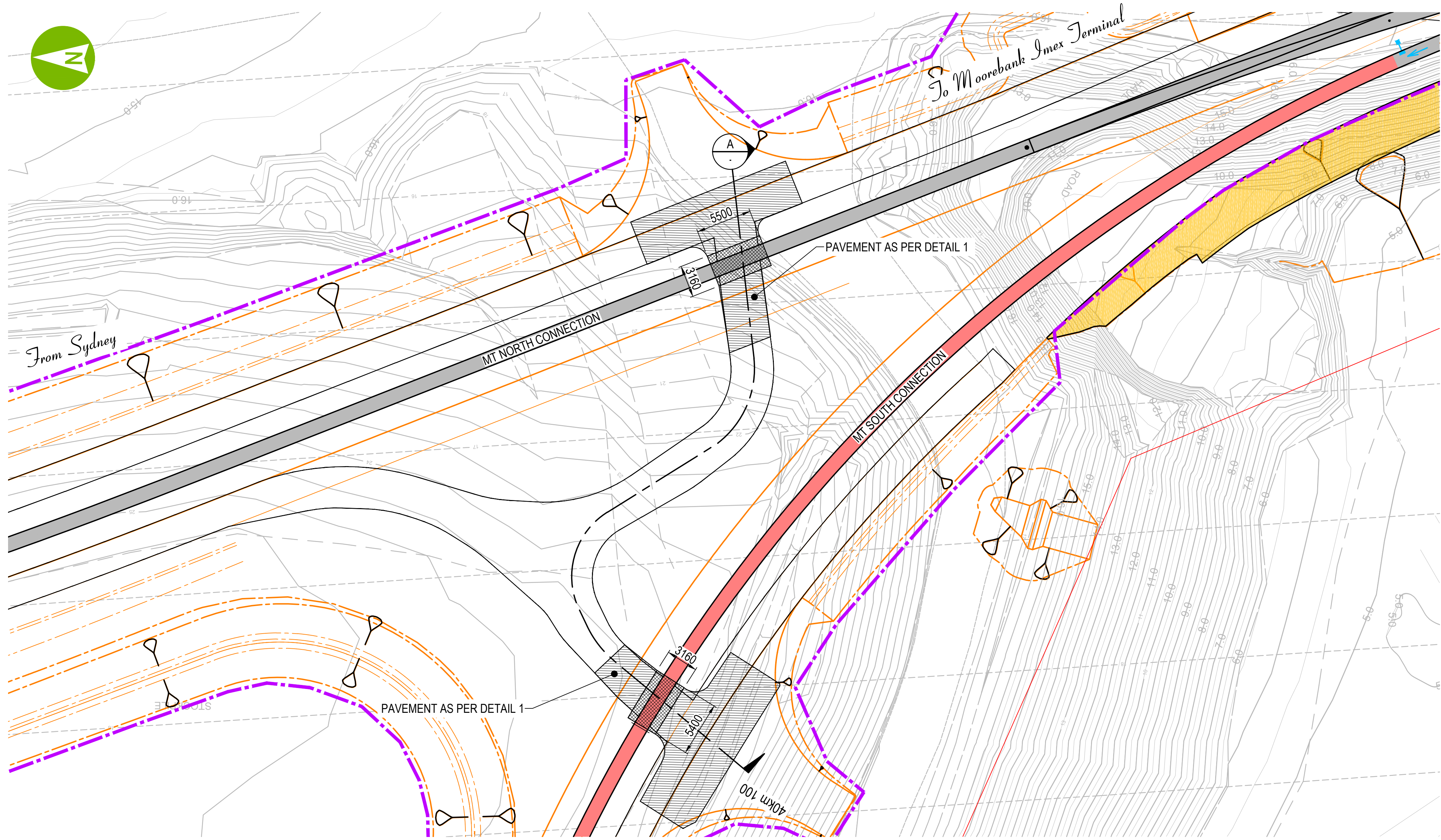
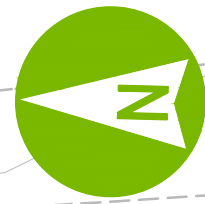
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APPROVED

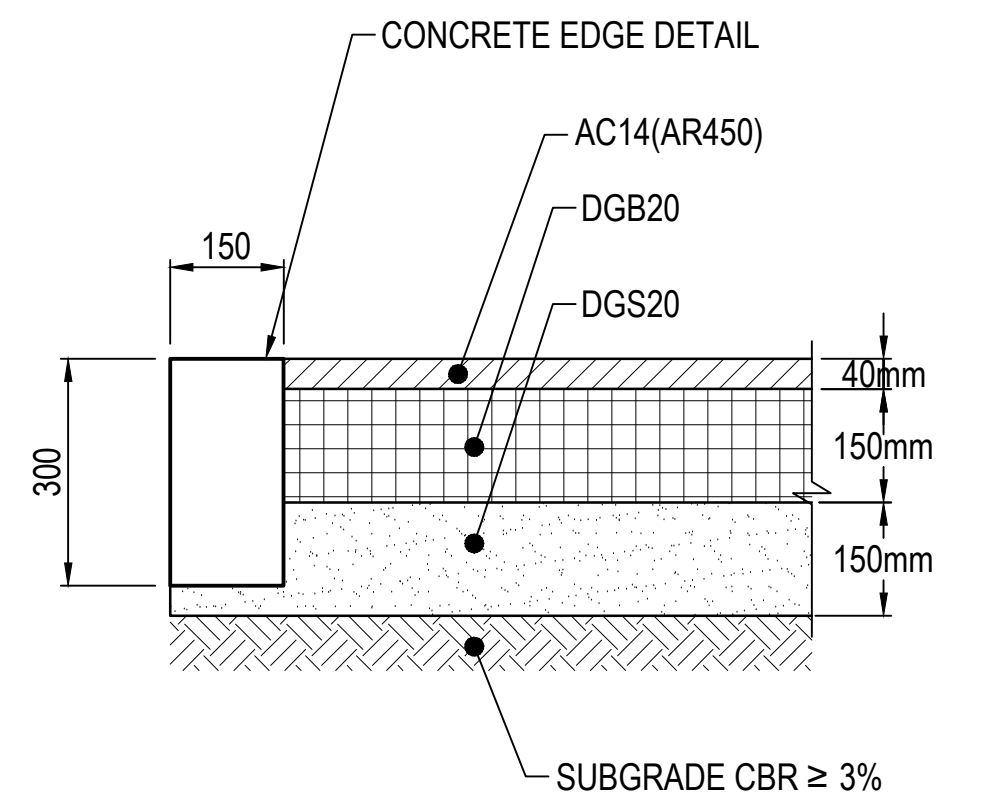
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PROJECT			MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1					
TITLE			BULK EARTHWORKS SERVICE CROSSING - NORTHERN-SOUTHERN CONNECTION SHEET 1 OF 2					
DRAWING No.			PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV
N01031			- PWD	- DRG	- GEN	- 0061	- 01	



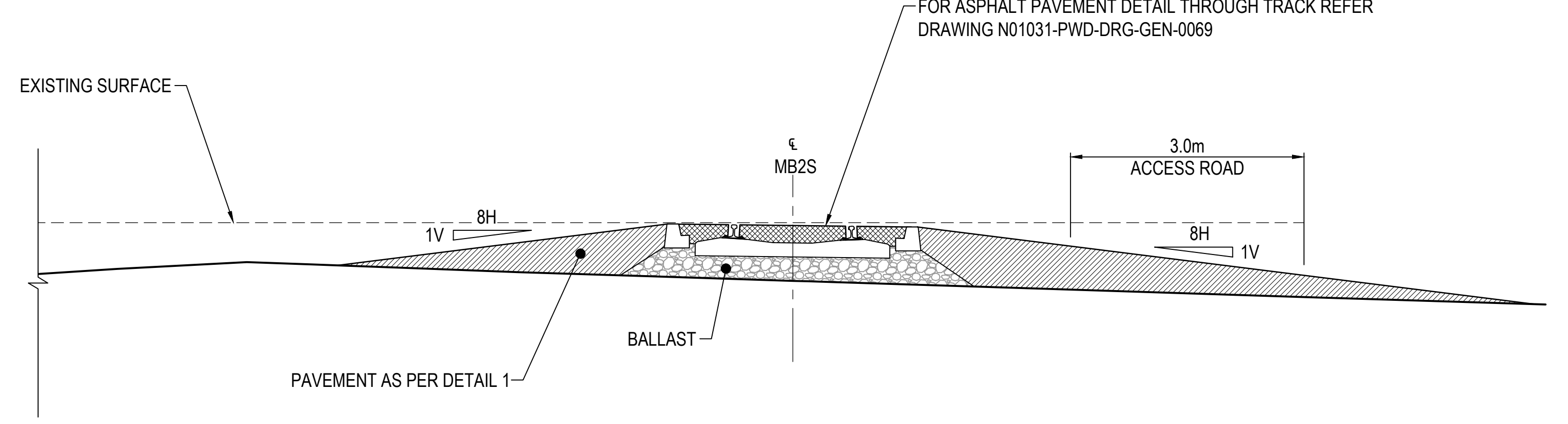
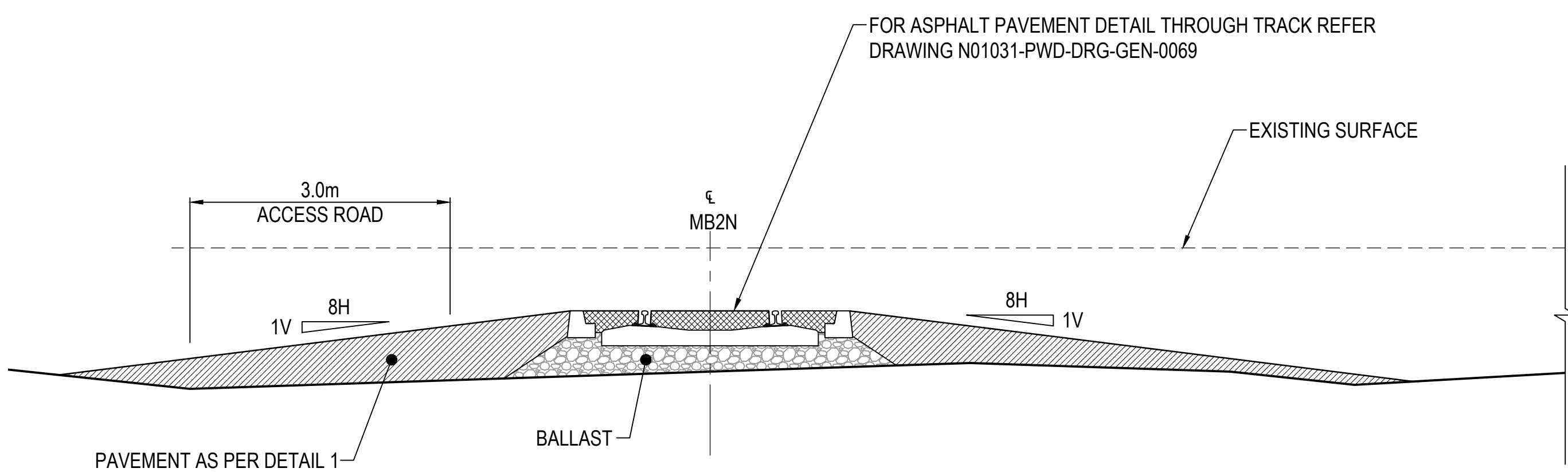
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									N01031	-	PWD	-	DRG	-	GEN	-	0062	-	01



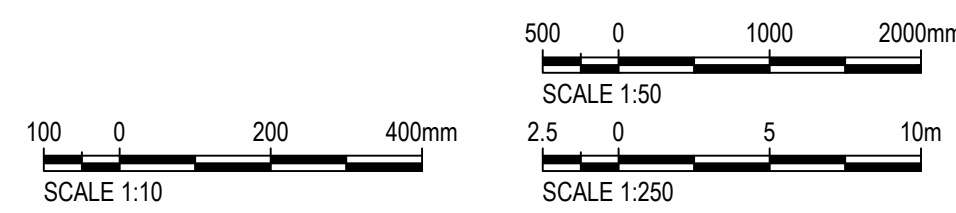
PLAN
1:250



DETAIL 1
1:10



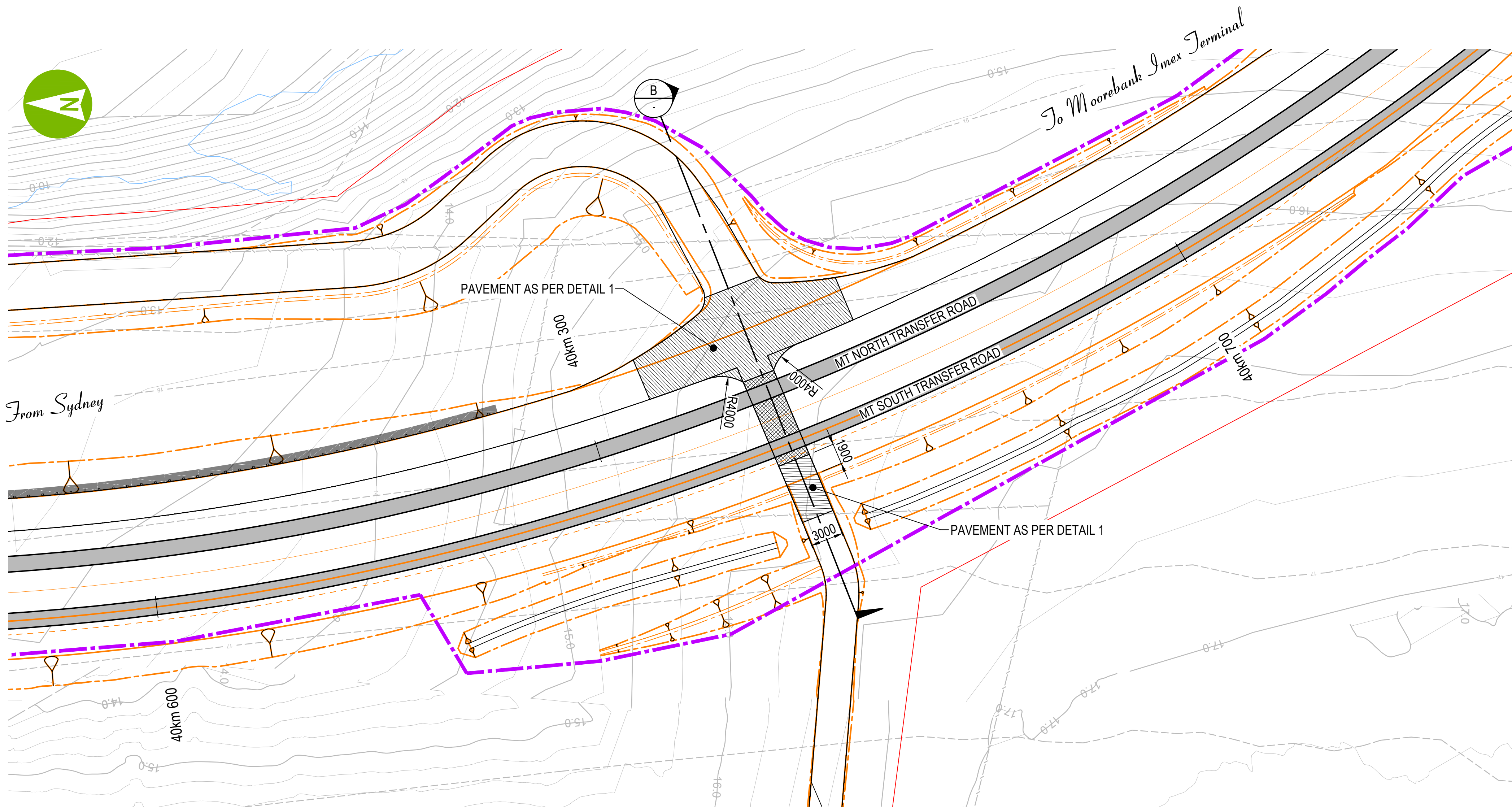
SECTION A
1:50



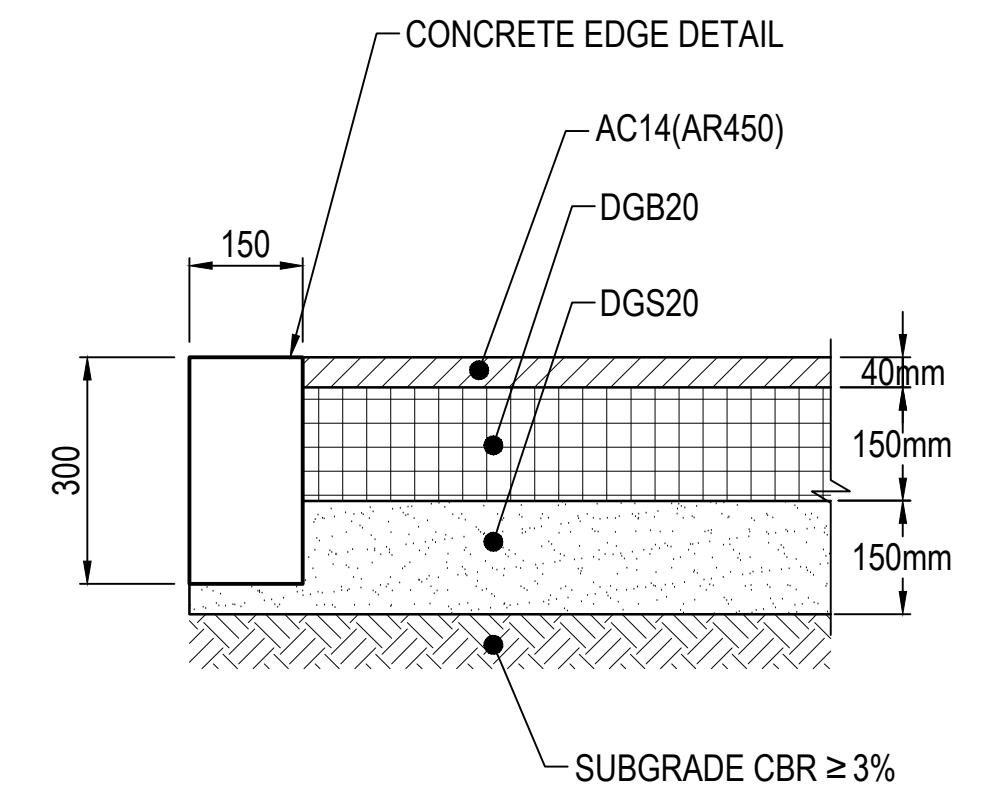
REV	DATE	REVISION DETAILS
01	20.01.17	ACCEPTED FOR CONSTRUCTION

SCALE	SIZE
AS SHOWN	A1
FOR CONSTRUCTION	
APPROVED	

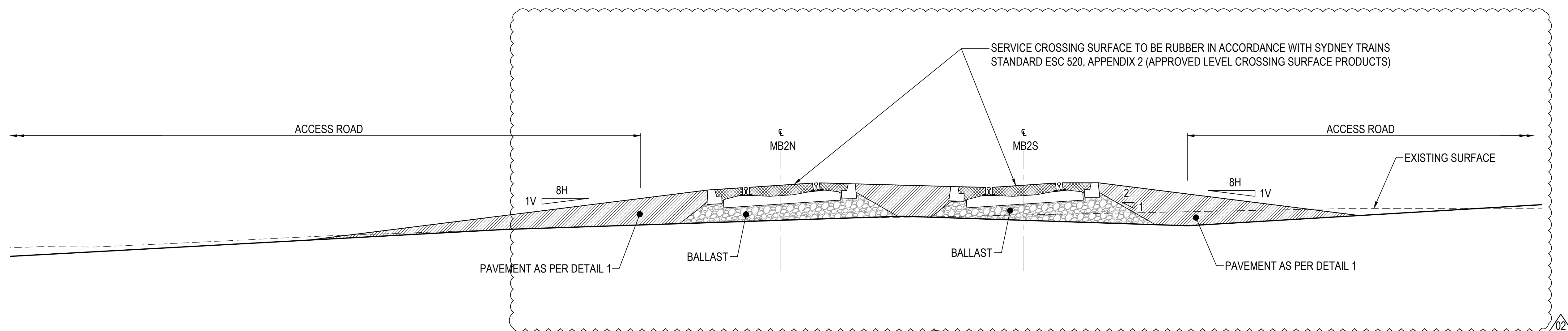
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PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1					
TITLE	BULK EARTHWORKS SERVICE CROSSING DETAIL SHEET 1 OF 3					
DRAWING No.	PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV
	N01031	- PWD	- DRG	- GEN	- 0065	- 01



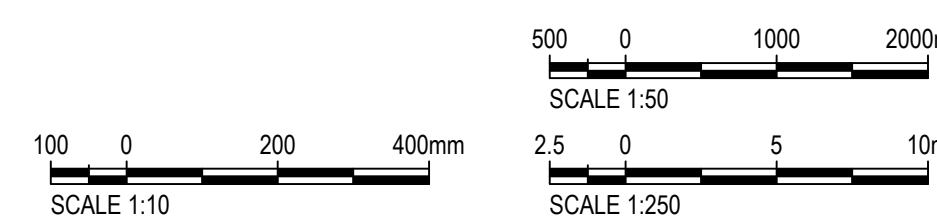
PLAN
1:250



DETAIL 1
1:10



SECTION B
1:50

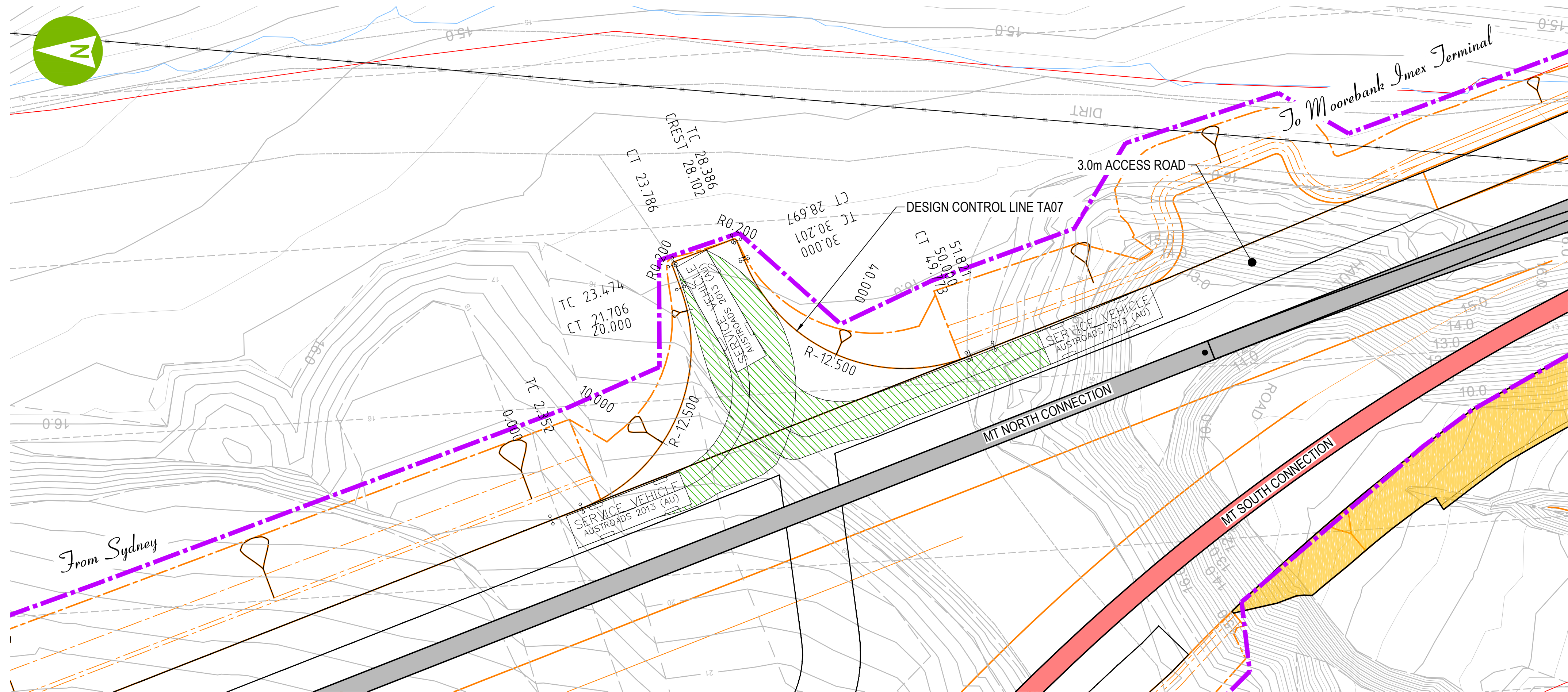


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02	09.06.17	ACCEPTED FOR CONSTRUCTION RE-SUBMISSION

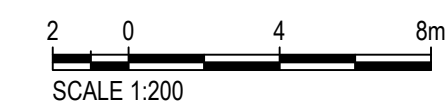
SCALE	SIZE
AS SHOWN	A1

FOR CONSTRUCTION

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PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1					
TITLE	BULK EARTHWORKS SERVICE CROSSING DETAIL SHEET 2 OF 3					
PROJECT No.		ZONE	TYPE	DISC	NUMBER	REV
DRAWING No.	N01031	PWD	DRG	GEN	0066	02



PLAN
1:200

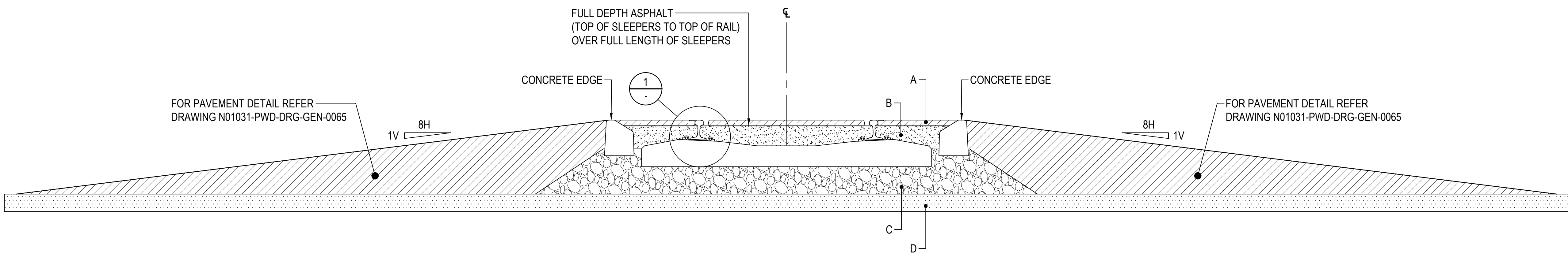


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SCALE	SIZE
AS SHOWN	A1
DRAWN	

FOR CONSTRUCTION

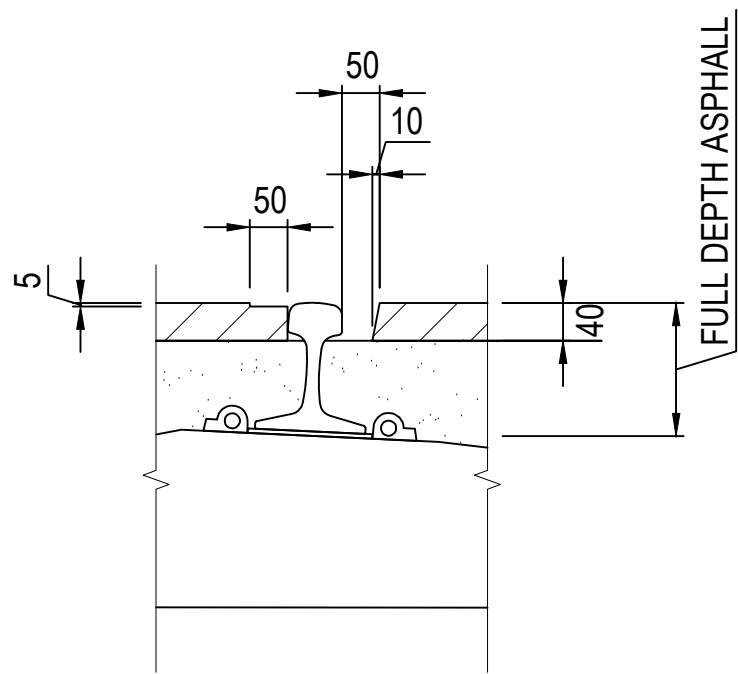
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PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1	
TITLE	BULK EARTHWORKS TURNAROUND FACILITY DETAIL SHEET 1 OF 1	
DRAWING No.	PROJECT No.	ZONE
N01031	PWD	DRG
	TYPE	DISC
	GEN	
	NUMBER	REV
	0068	01



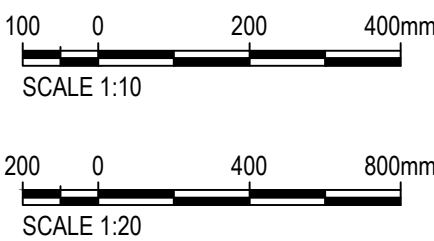
PAVEMENT DETAIL CROSS SECTION AT SERVICE CROSSING
1:20

TRACK FOUNDATION DETAIL

A	ASPHALT WEARING COURSE 40mm SIZE 14 AR450 BINDER ASPHALT TYPE Hm
B	INTERMEDIATE LAYER ASPHALT 60mm SIZE 20 TYPE T (CLASS 320) BASE LAYER ASPHALT 90mm SIZE 20 TYPE T (CLASS 320)
C	COMPACTED BALLAST 250mm (MIN)
D	CAPPING LAYER



DETAIL 1
1:10



NOTES

- ALL DIMENSIONS IN MILLIMETERS.
- REFER TO TYPICAL CROSS-SECTIONS, GROUND TREATMENT PLANS AND LONGSECTIONS FOR FOUNDATION TREATMENT UNDERNEATH CAPPING LAYER.

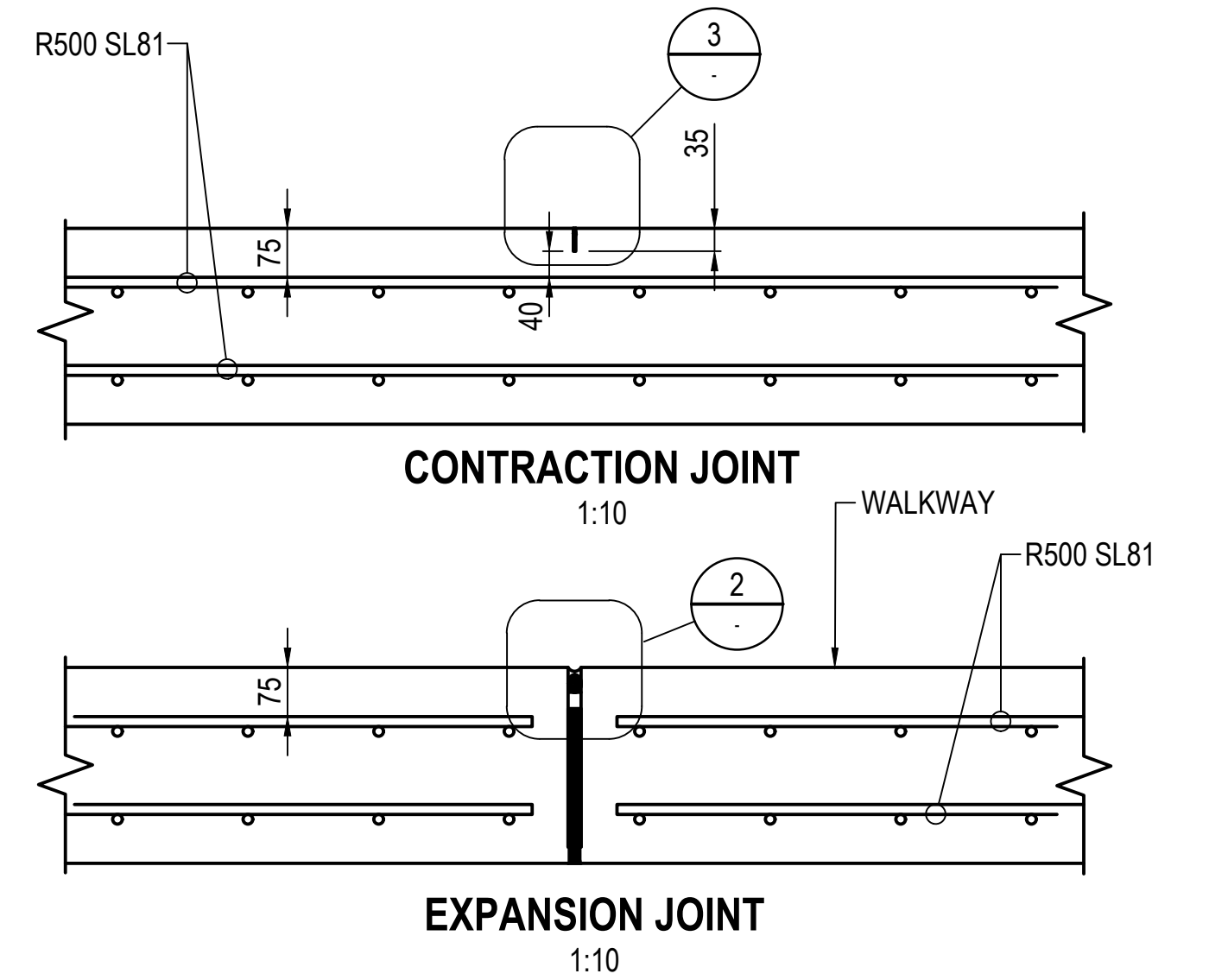
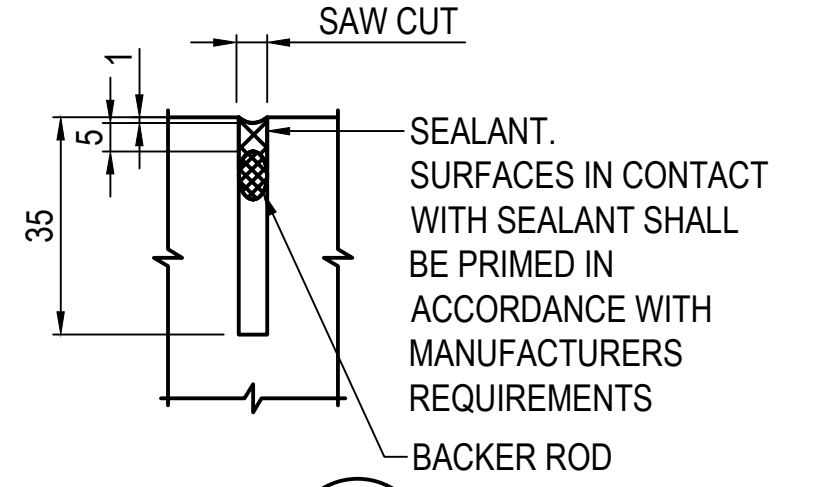
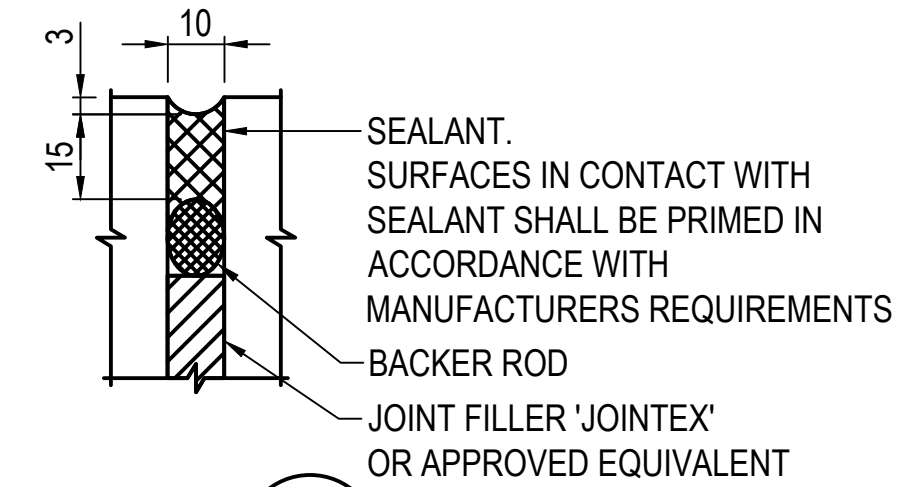
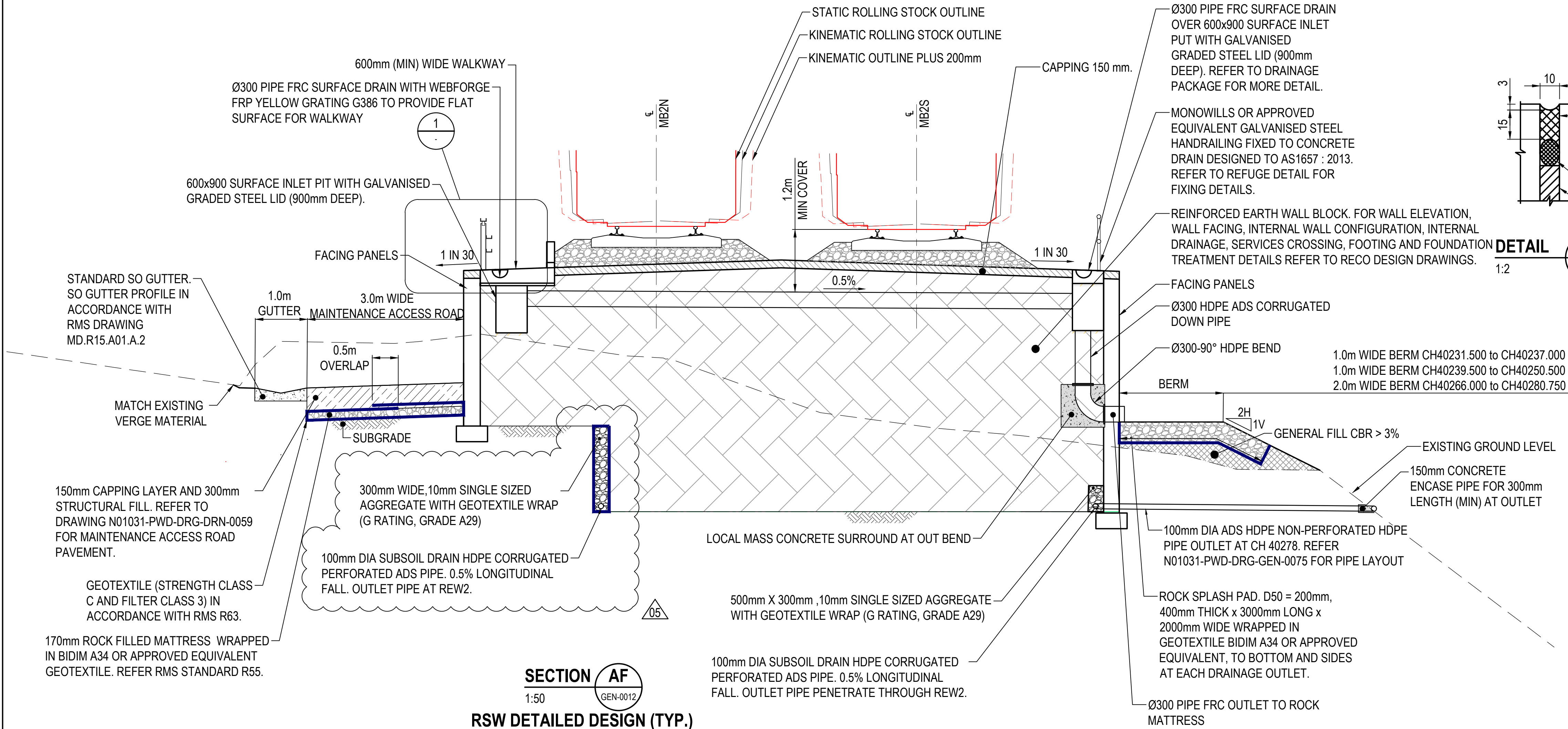
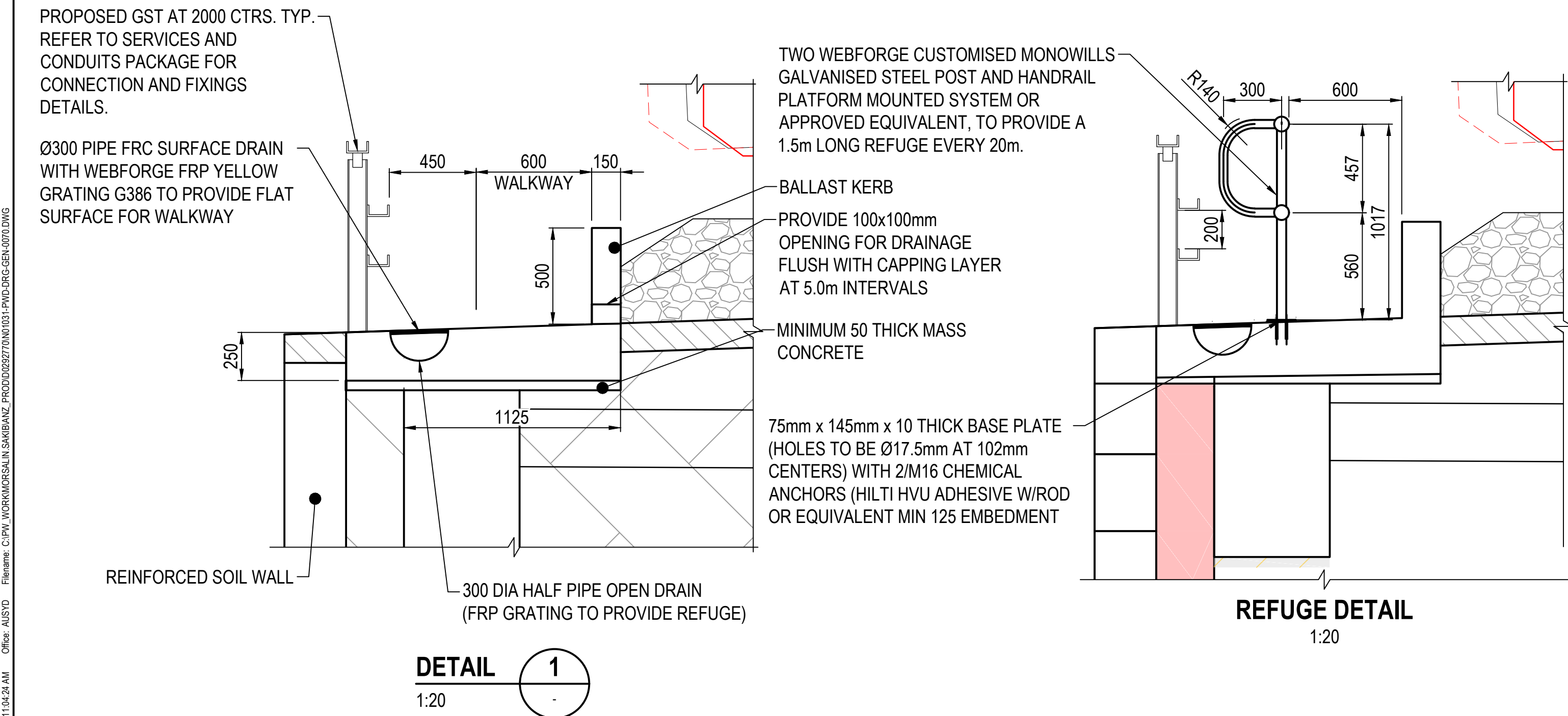
REV	DATE	REVISION DETAILS	APPROVED
01	20.01.17	ACCEPTED FOR CONSTRUCTION	

SCALE	SIZE
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DRAWN	

FOR CONSTRUCTION
APPROVED

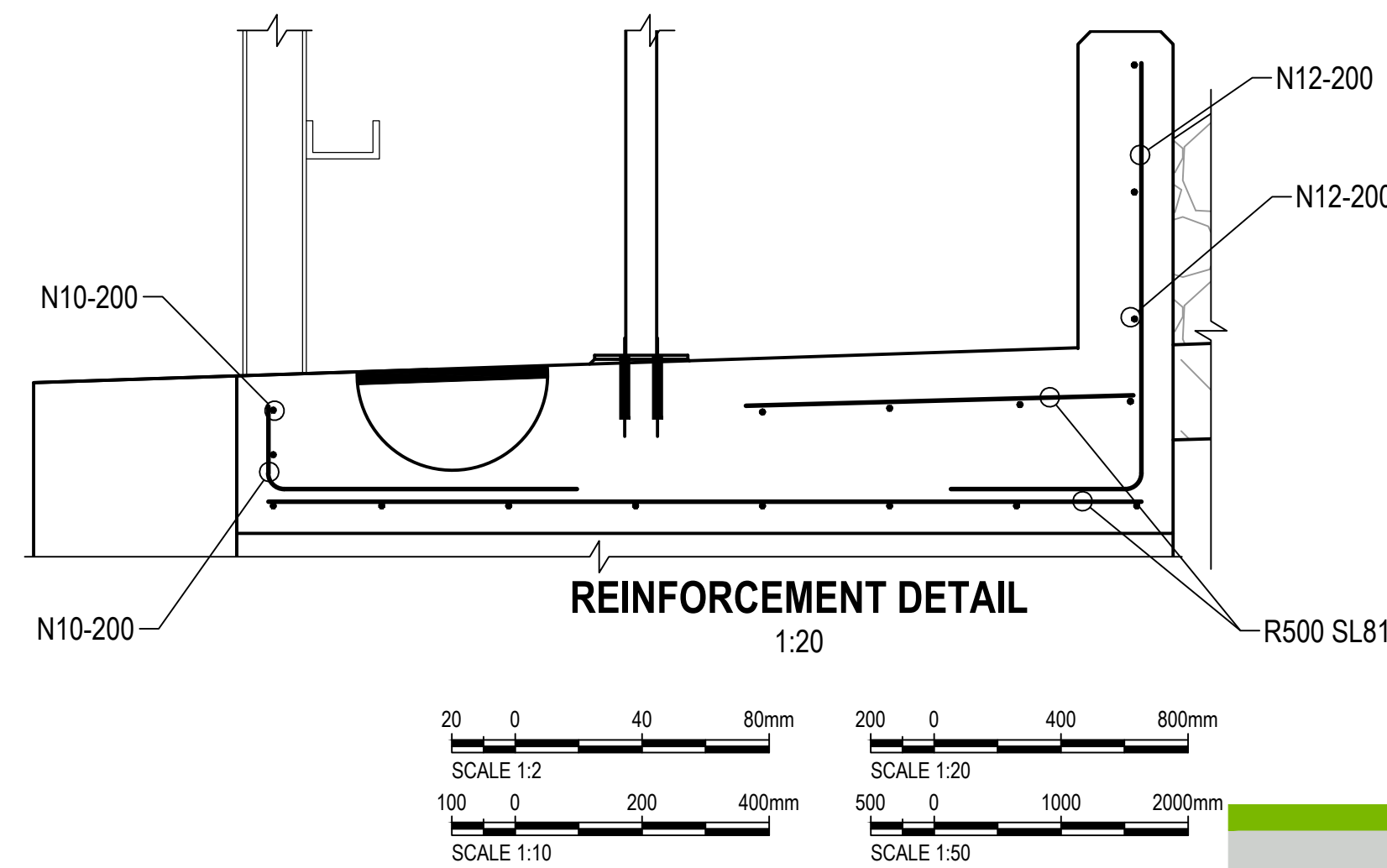
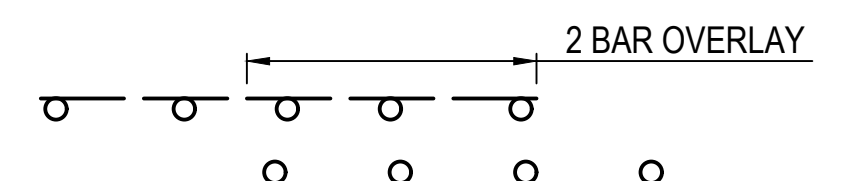
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PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1							
TITLE	BULK EARTHWORKS LEVEL CROSSING DETAILS							
DRAWING No.	PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV		
	N01031	- PWD	- DRG	- GEN	- 0069	- 01		

Rev Date: 31/10/17 11:04:24 AM
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P:\DWG\AUS\GEN-007.DWG



NOTES

1. SCALES AS SHOWN.
2. EXPOSURE CLASSIFICATION: B1.
3. NOMINAL COVER TO REINFORCEMENT NEAREST TO THE CONCRETE SURFACE, UNLESS SPECIFIED OTHERWISE, SHALL BE 40mm.
4. EDGES SHALL BE CHAMFERED 20 x 20 AND RE-ENTRANT ANGLES FILLED 20 x 20 UNLESS SPECIFIED OTHERWISE.
5. MINIMUM 28 DAY COMPRESSIVE STRENGTH OF CONCRETE SHALL BE 32MPa.
6. MINIMUM 28 DAY COMPRESSIVE STRENGTH OF MASS CONCRETE SHALL BE 20MPa.
8. DESIGN (BY RSW SUPPLIER) OF RSW TO BE IN ACCORDANCE WITH RMS SPEC 57.
9. CJ DENOTES CONTRACTION JOINT.
10. EXPANSION JOINTS SHALL BE EVERY 12 m.
11. CONTRACTION JOINTS SHALL BE EVERY 1200mm
12. FOR WALL ELEVATION, WALL FACING, INTERNAL WALL CONFIGURATION, INTERNAL DRAINAGE, FOOTING AND FOUNDATION TREATMENT DETAILS REFER TO RECO DESIGN DRAWINGS.
13. FOUNDATION TREATMENT INVOLVES UNDER THE RSW BLOCK THE REPLACEMENT OF 0.5m THICK INSITU MATERIAL WITH THE SELECT GRANULAR FILL MATERIAL SPECIFIED IN SECTION 3.2.1 OF THE PROJECT EARTHWORKS SPECIFICATION REF N01031-PWD-SPE-EWK-0001 (HOWEVER, WITH A MODIFIED CBR REQUIREMENT OF 20%), WRAPPED IN HIGH STRENGTH GEOTEXTILE OF 30kN/m AT 5% STRAIN.
14. REINFORCEMENT FABRIC LAPPED SPLICE SHALL BE AS FOLLOW:



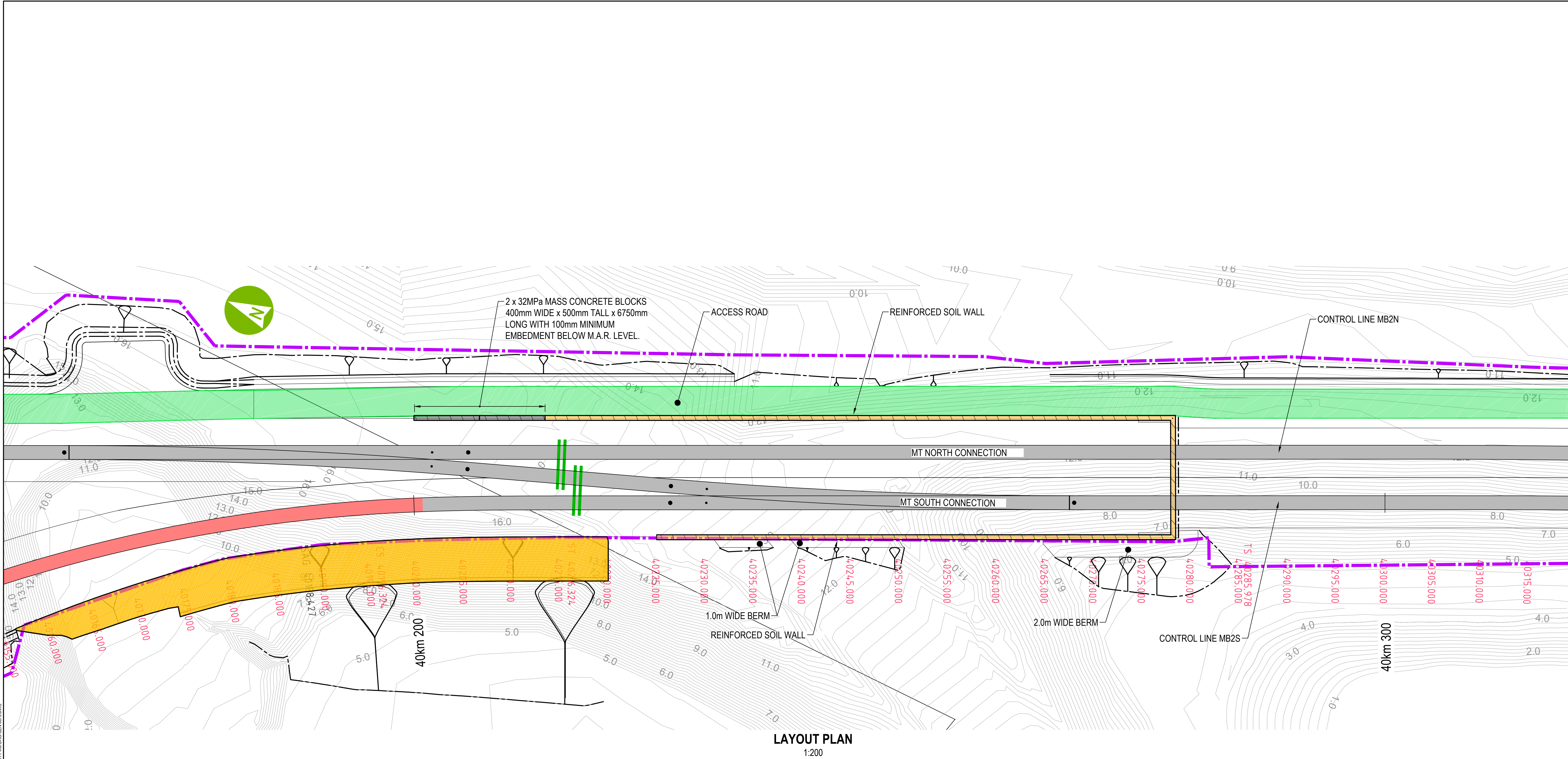
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01	20.01.17	ACCEPTED FOR CONSTRUCTION
02	24.07.17	ACCEPTED FOR CONSTRUCTION RESUBMISSION
03	08.09.17	ACCEPTED FOR CONSTRUCTION RESUBMISSION
04	23.09.17	ACCEPTED FOR CONSTRUCTION RESUBMISSION
05	03.10.17	ACCEPTED FOR CONSTRUCTION RESUBMISSION

APPROVED

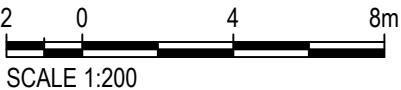
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FOR CONSTRUCTION
APPROVED
DATE

PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1
TITLE	BULK EARTHWORKS REINFORCED SOIL WALL - TYPICAL CROSS SECTIONS SHEET 1 OF 1
DRAWING No.	PROJECT No. N01031 - ZONE PWD - TYPE DRG - DISC GEN - NUMBER 0070 - REV 05



LAYOUT PLAN
1:200



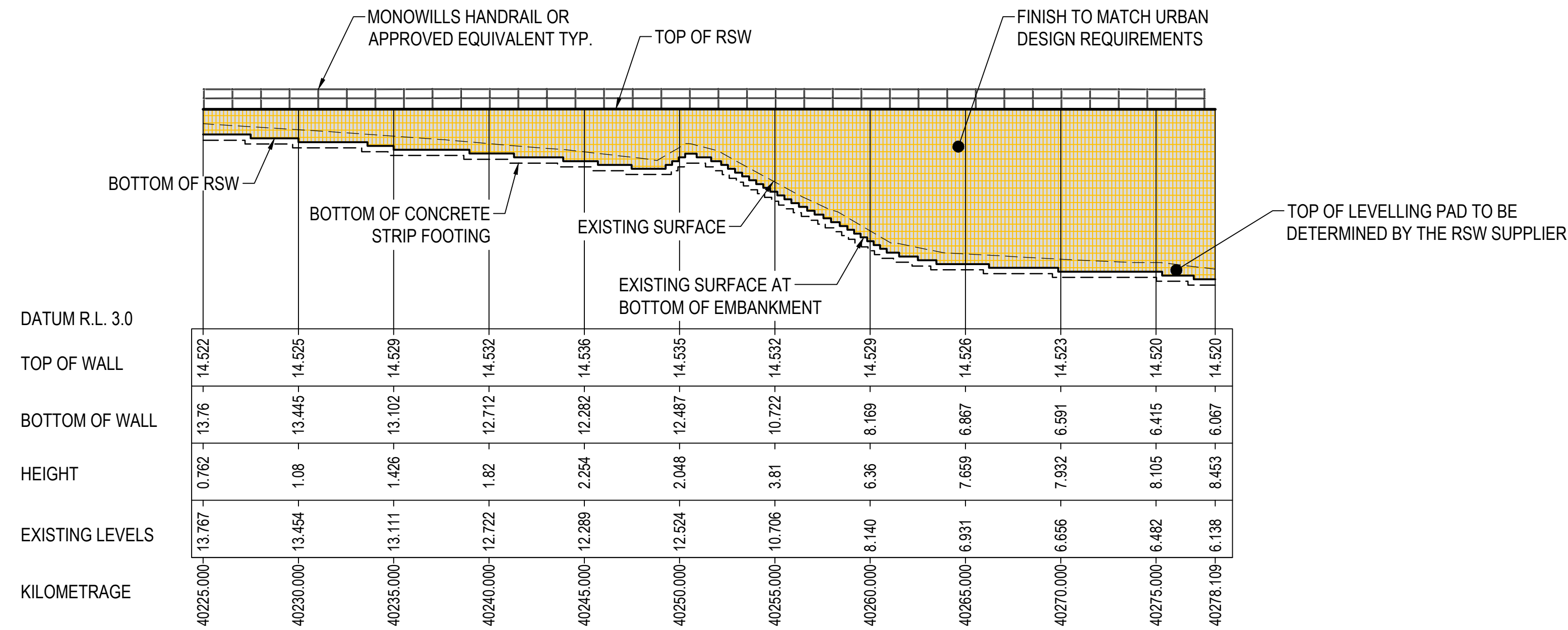
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01	20.01.17	ACCEPTED FOR CONSTRUCTION	
02	24.07.17	ACCEPTED FOR CONSTRUCTION RESUBMISSION	

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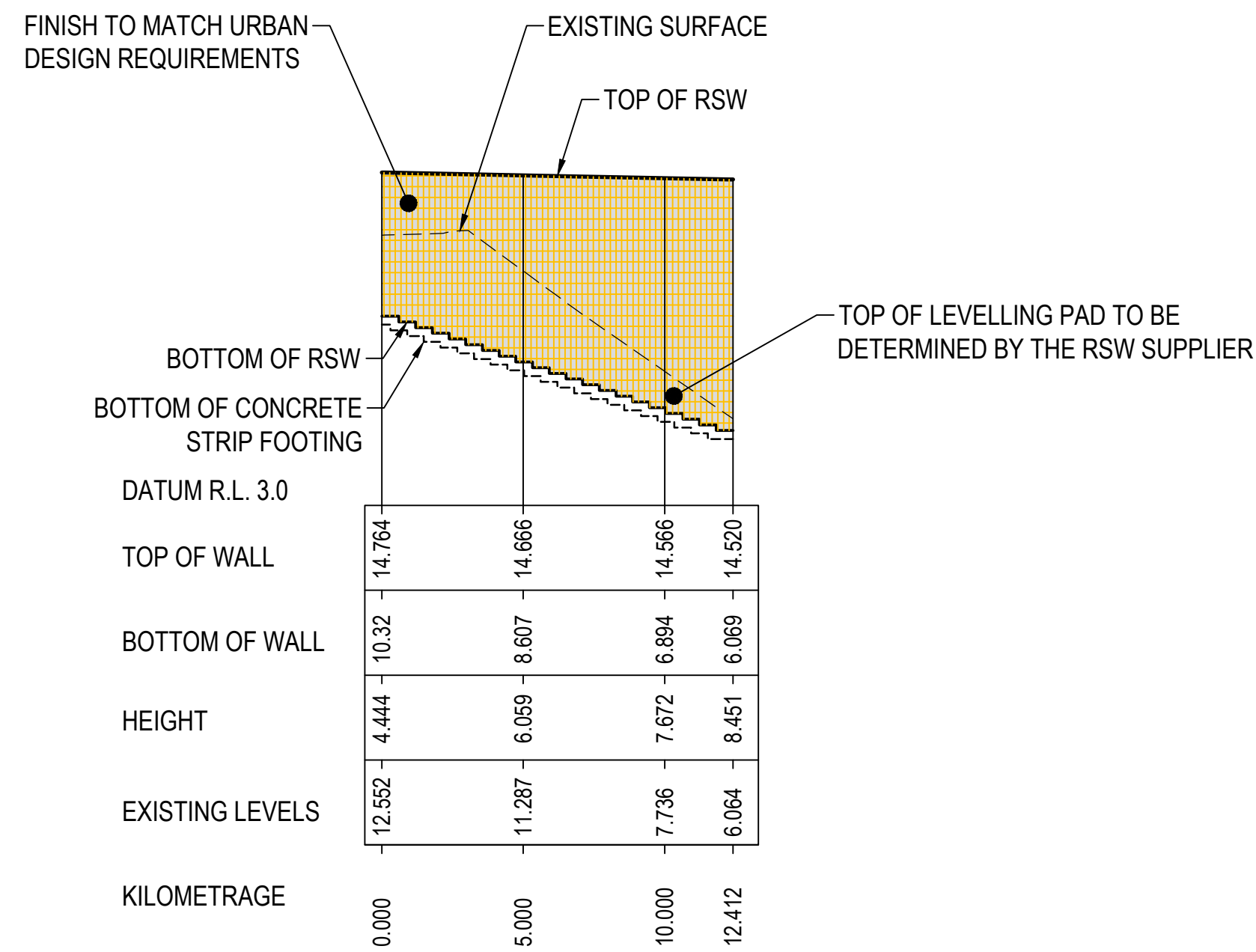
FOR CONSTRUCTION

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PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1					
TITLE	BULK EARTHWORKS REINFORCED SOIL WALL - LONGITUDINAL SECTION SHEET 1 OF 2					
DRAWING No.	PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV
	N01031	- PWD	- DRG	- GEN	- 0075	- 02

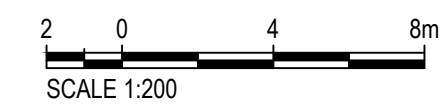
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SECTION B
1:200
GEN-0075



SECTION C
1:200
GEN-0075

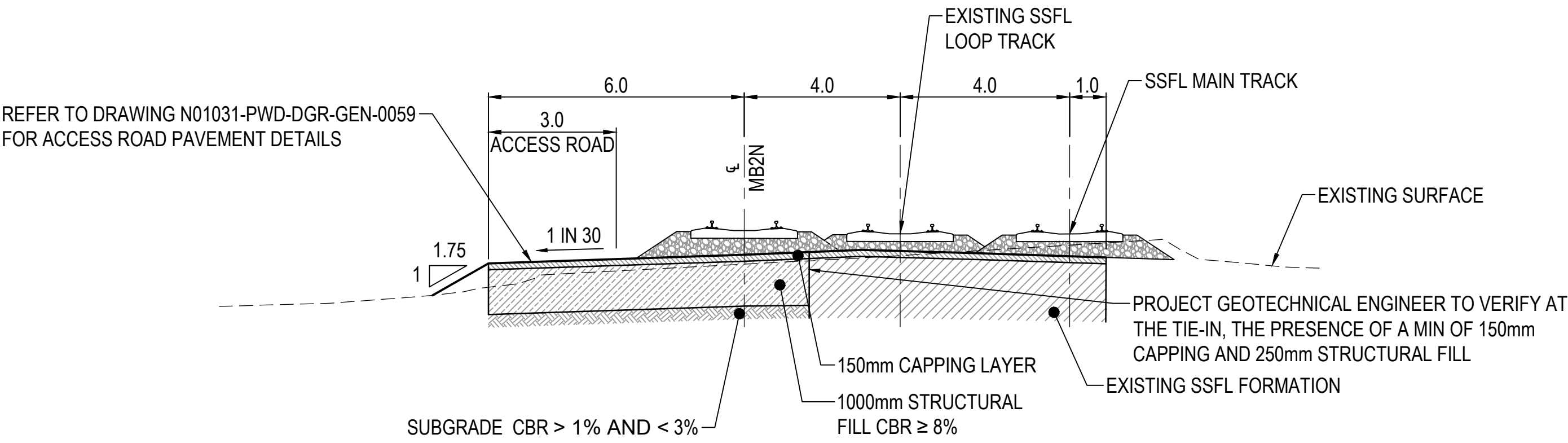


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01	20.01.17	ACCEPTED FOR CONSTRUCTION	

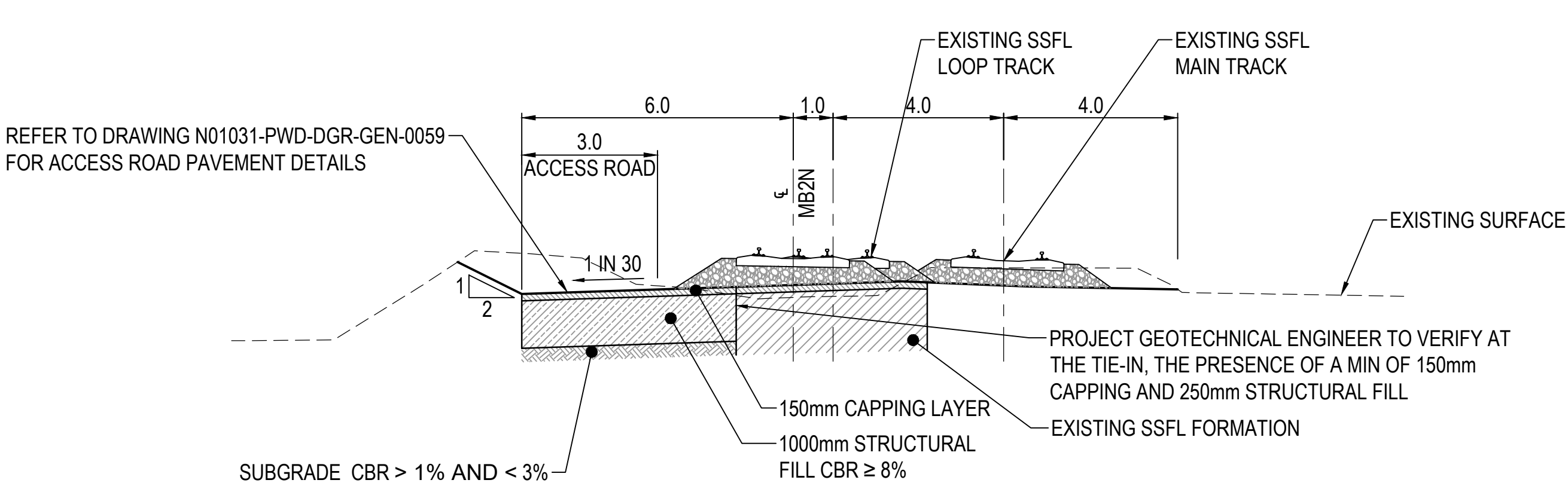
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DRAWN	

FOR CONSTRUCTION

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PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1	
TITLE	BULK EARTHWORKS REINFORCED SOIL WALL - LONGITUDINAL SECTION SHEET 2 OF 2	
DRAWING No.	PROJECT No.	ZONE
N01031		PWD
	TYPE	DISC
	DRG	GEN
	NUMBER	REV
	0076	01



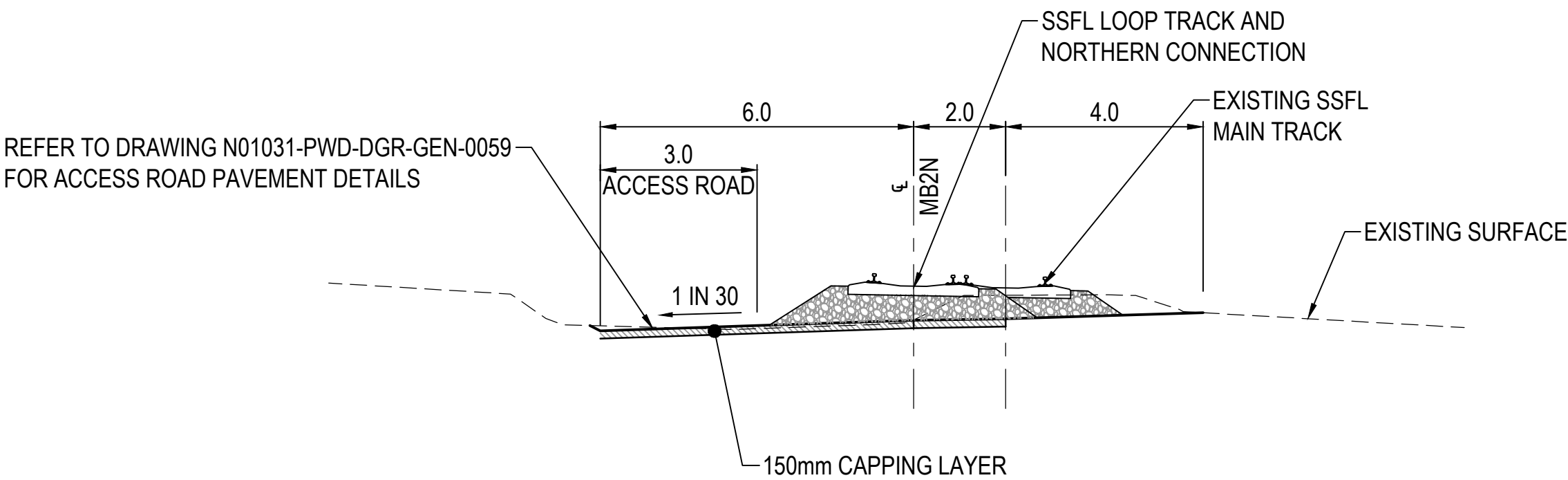
SECTION AA
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GEN-0010
TYPICAL SECTION - CONTROL LINE MB2N
CH 39485



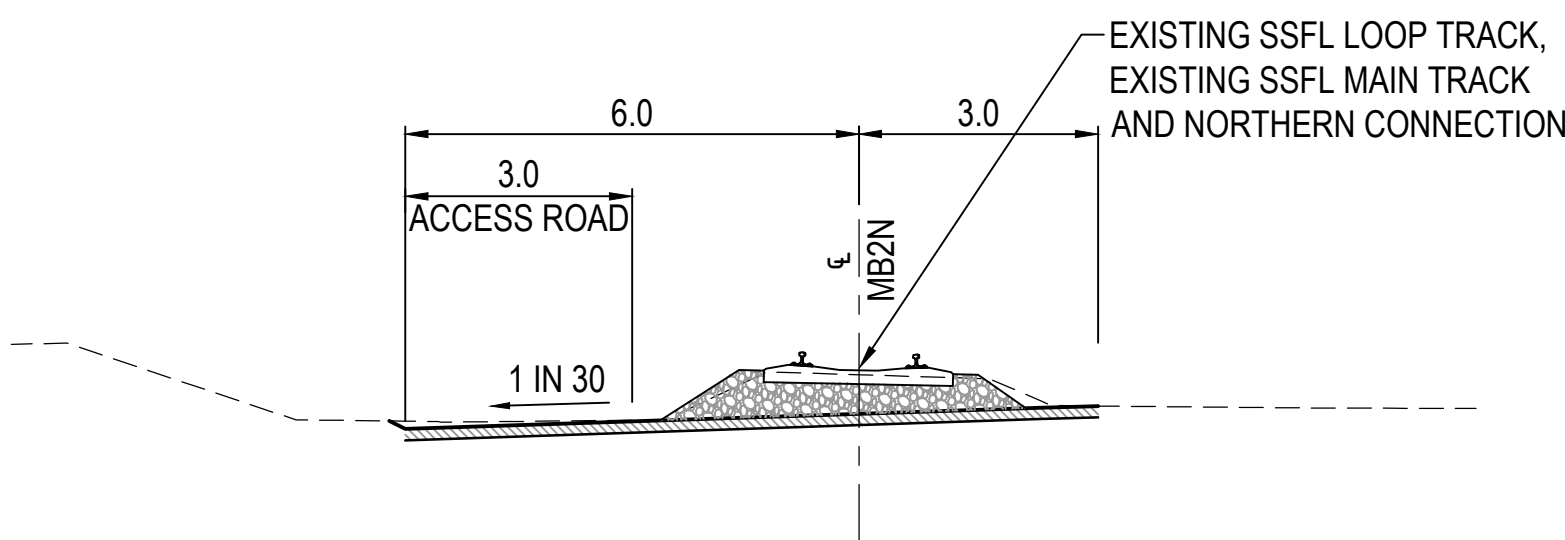
SECTION AB
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GEN-0010
TYPICAL SECTION - CONTROL LINE MB2N
CH 39450

NOTES FOR TYPICAL CROSS SECTIONS

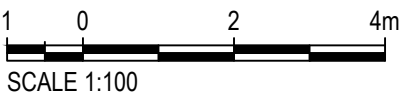
- THIS DRAWING IS IN TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER N01031-PWD-SPE-EWK-0001).
- REFER TO DRAWINGS N01031-PWD-SPE-EWK-0025 TO N01031-PWD-DRG-GEN-0040 FOR EARTHWORKS CROSS SECTIONS.
- REFER TO DRAWINGS N01031-PWD-DRG-GEN-0110 TO N01031-PWD-DRG-GEN-0126 FOR FOUNDATION TREATMENT PLANS.
- REFER TO DRAWINGS N01031-PWD-DRG-GEN-0150 TO N01031-PWD-DRG-GEN-0158 FOR FOUNDATION TREATMENT LONG SECTIONS.
- REFER TO DRAWING N01031-PWD-DRG-GEN-0160 FOR THE EARTHWORKS FOUNDATION TREATMENT SCHEDULE.
- C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.
- FOR PLACEMENT OF FILL ADJACENT TO STRUCTURES A MINIMUM 150mm THICK CAPPING LAYER IS TO BE PLACE OVER THE SELECT FILL WHICH IS TO BE PLACED OVER THE ENTIRE HEIGHT OF THE STRUCTURE. SEE FOUNDATION TREATMENT TYPE E8 IN THE PROJECT EARTHWORKS SPECIFICATION.
- FOUNDATION TREATMENT TYPES TO BE CONFIRMED BY GEOTECHNICAL ENGINEER ON SITE BASED ON OBSERVED GROUND CONDITIONS.
- LOCALISED POCKETS OF UNSUITABLE MATERIAL AT BASE OF PROPOSED FORMATION TO BE REMOVED AND REPLACED WITH SUITABLE MATERIAL IN ACCORDANCE WITH THE PROJECT EARTHWORKS SPECIFICATION AS DIRECTED BY THE GEOTECHNICAL ENGINEER.
- ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE.
- SUBSOILS MAY BE REQUIRED REFER TO N0131-PWD-GEN-0059 FOR ACCESS ROAD PAVEMENT FOUNDATION IF IN CUT OR SEEPAGE IS EVIDENT ON SITE. THE REQUIREMENT FOR SUBSOIL IS TO BE DECIDED ON SITE BY GEOTECHNICAL ENGINEER. REFER TO DRAWING N01031-PWD-DRG-GEN-0059 FOR ACCESS ROAD PAVEMENT (FOUNDATION) DETAILS.
- REFER TO DRAWING N01031-PWD-DRG-GEN-0081 FOR FOUNDATION TRANSITION DETAIL BETWEEN EXISTING SSFL FOUNDATION AND PROPOSED FOUNDATION TREATMENT.



SECTION AC
1:100
GEN-0010
TURNOUT TYPICAL SECTION - CONTROL LINE MB2N
CH 39400



SECTION AD
1:100
GEN-0010
TURNOUT TYPICAL SECTION - CONTROL LINE MB2N
CH 39350



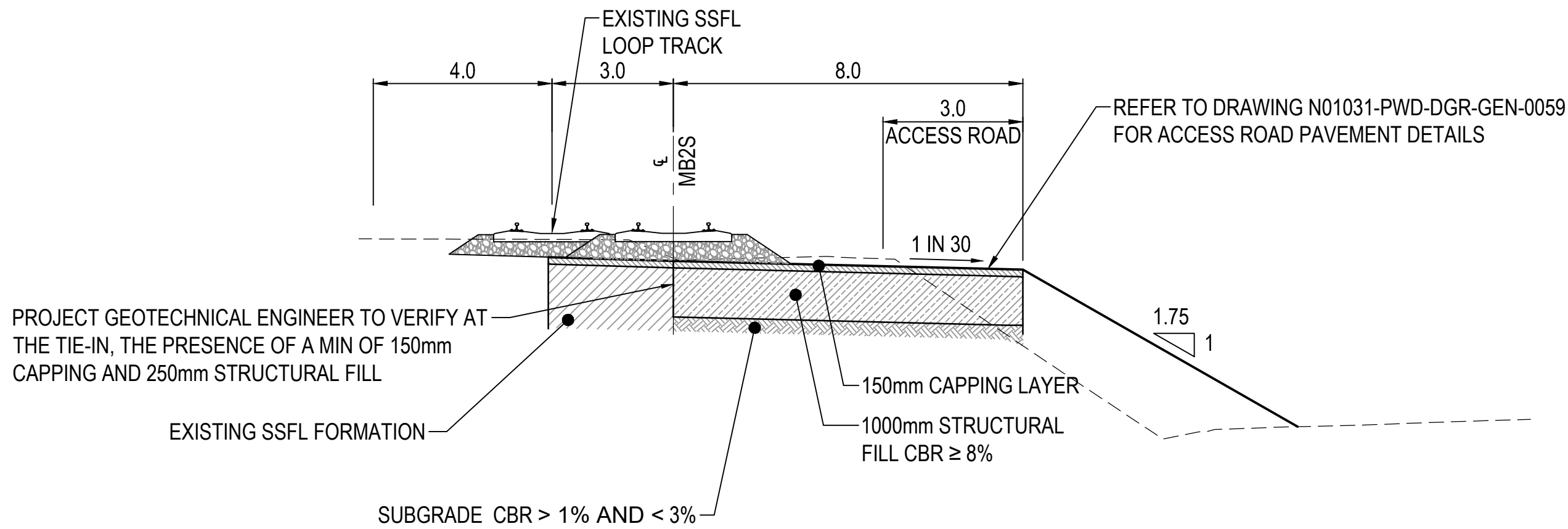
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01	20.01.17	ACCEPTED FOR CONSTRUCTION	

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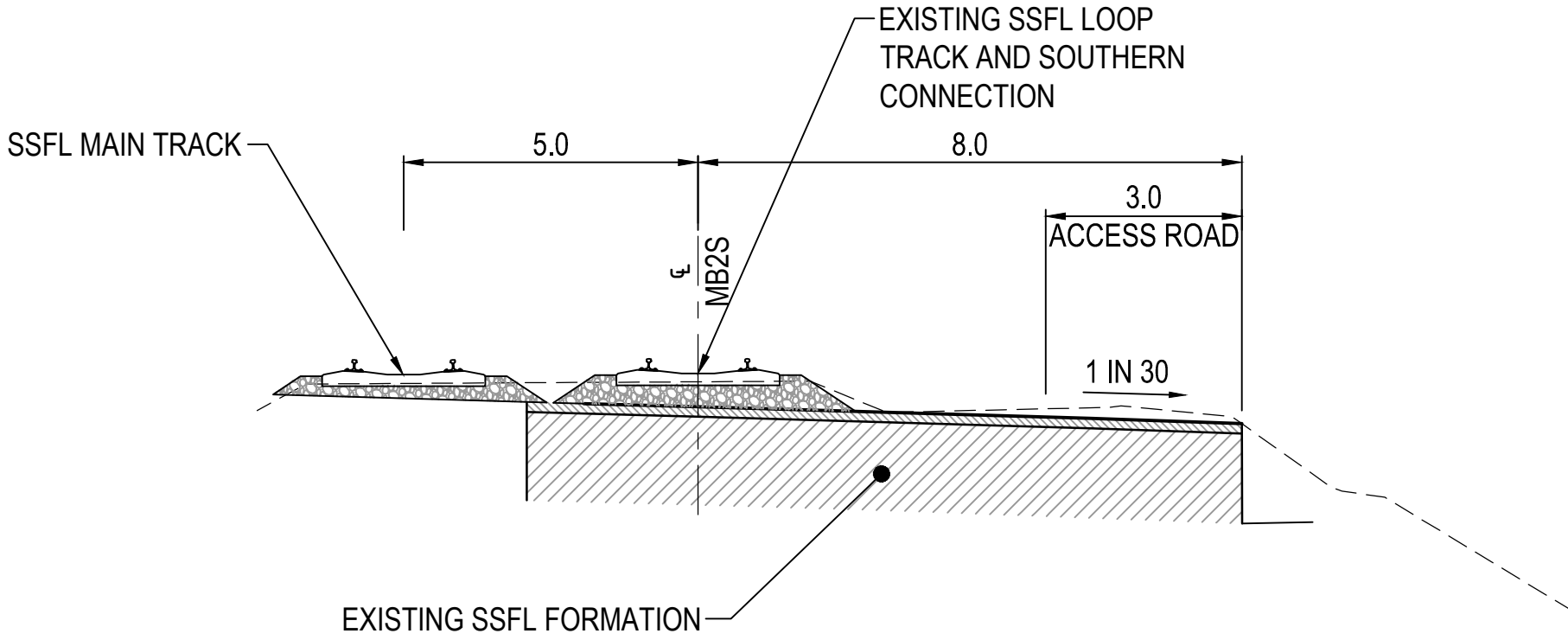
FOR CONSTRUCTION

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PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1					
TITLE	BULK EARTHWORKS NORTH CONNECTION TYPICAL CROSS SECTIONS SHEET 1 OF 2					
DRAWING No.	PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV
	N01031	- PWD	- DRG	- GEN	0080	- 01





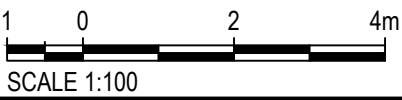
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GEN-0018
**TYPICAL SECTION - CONTROL LINE MB2S
CH 39910**



SECTION **AF**
1:100
GEN-0018
**TYPICAL SECTION - CONTROL LINE MB2S
CH 39880**

NOTES FOR TYPICAL CROSS SECTIONS

- THIS DRAWING IS IN TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER N01031-PWD-SPE-EWK-0001).
- REFER TO DRAWINGS N01031-PWD-SPE-EWK-0025 TO N01031-PWD-DRG-GEN-0040 FOR EARTHWORKS CROSS SECTIONS.
- REFER TO DRAWINGS N01031-PWD-DRG-GEN-0110 TO N01031-PWD-DRG-GEN-0126 FOR FOUNDATION TREATMENT PLANS.
- REFER TO DRAWINGS N01031-PWD-DRG-GEN-0150 TO N01031-PWD-DRG-GEN-0158 FOR FOUNDATION TREATMENT LONG SECTIONS.
- REFER TO DRAWING N01031-PWD-DRG-GEN-0160 FOR THE EARTHWORKS FOUNDATION TREATMENT SCHEDULE.
- C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.
- FOR PLACEMENT OF FILL ADJACENT TO STRUCTURES A MINIMUM 150mm THICK CAPPING LAYER IS TO BE PLACE OVER THE SELECT FILL WHICH IS TO BE PLACED OVER THE ENTIRE HEIGHT OF THE STRUCTURE. SEE FOUNDATION TREATMENT TYPE E8 IN THE PROJECT EARTHWORKS SPECIFICATION.
- FOUNDATION TREATMENT TYPES TO BE CONFIRMED BY GEOTECHNICAL ENGINEER ON SITE BASED ON OBSERVED GROUND CONDITIONS.
- LOCALISED POCKETS OF UNSUITABLE MATERIAL AT BASE OF PROPOSED FORMATION TO BE REMOVED AND REPLACED WITH SUITABLE MATERIAL IN ACCORDANCE WITH THE PROJECT EARTHWORKS SPECIFICATION AS DIRECTED BY THE GEOTECHNICAL ENGINEER.
- ALL DIMENSIONS ARE IN METERS UNLESS NOTED OTHERWISE.
- SUBSOILS MAY BE REQUIRED REFER TO N0131-PWD-GEN-0059 FOR ACCESS ROAD PAVEMENT FOUNDATION IF IN CUT OR SEEPAGE IS EVIDENT ON SITE. THE REQUIREMENT FOR SUBSOIL IS TO BE DECIDED ON SITE BY GEOTECHNICAL ENGINEER. REFER TO DRAWING N01031-PWD-DRG-GEN-0059 FOR ACCESS ROAD PAVEMENT (FOUNDATION) DETAILS.
- REFER TO DRAWING N01031-PWD-DRG-GEN-0081 FOR FOUNDATION TRANSITION DETAIL BETWEEN EXISTING SSFL FOUNDATION AND PROPOSED FOUNDATION TREATMENT.

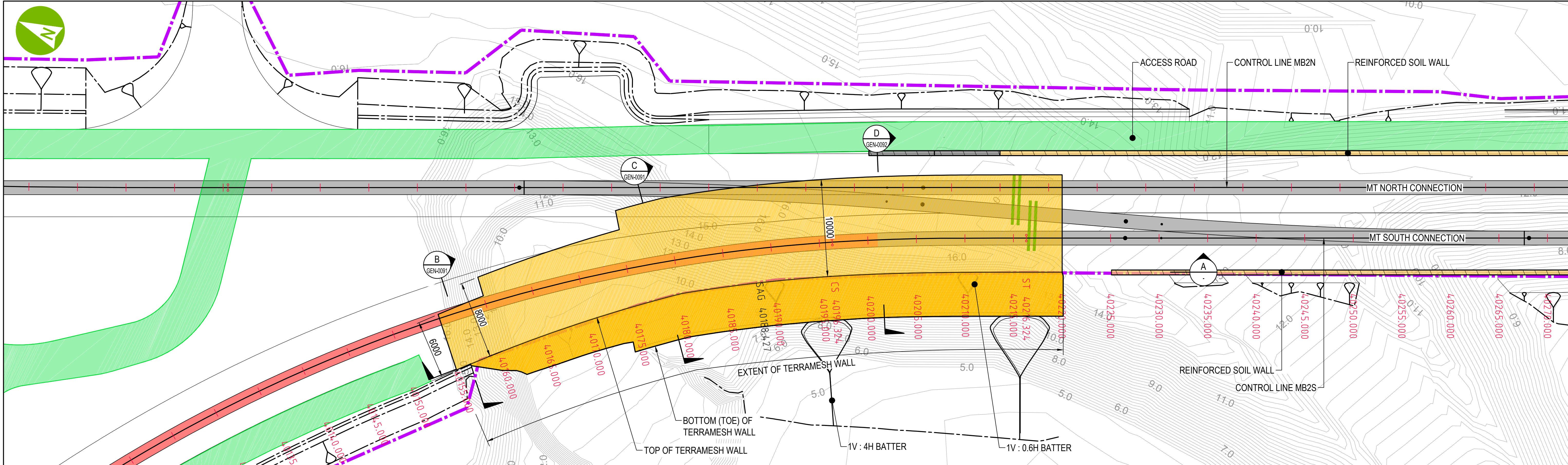


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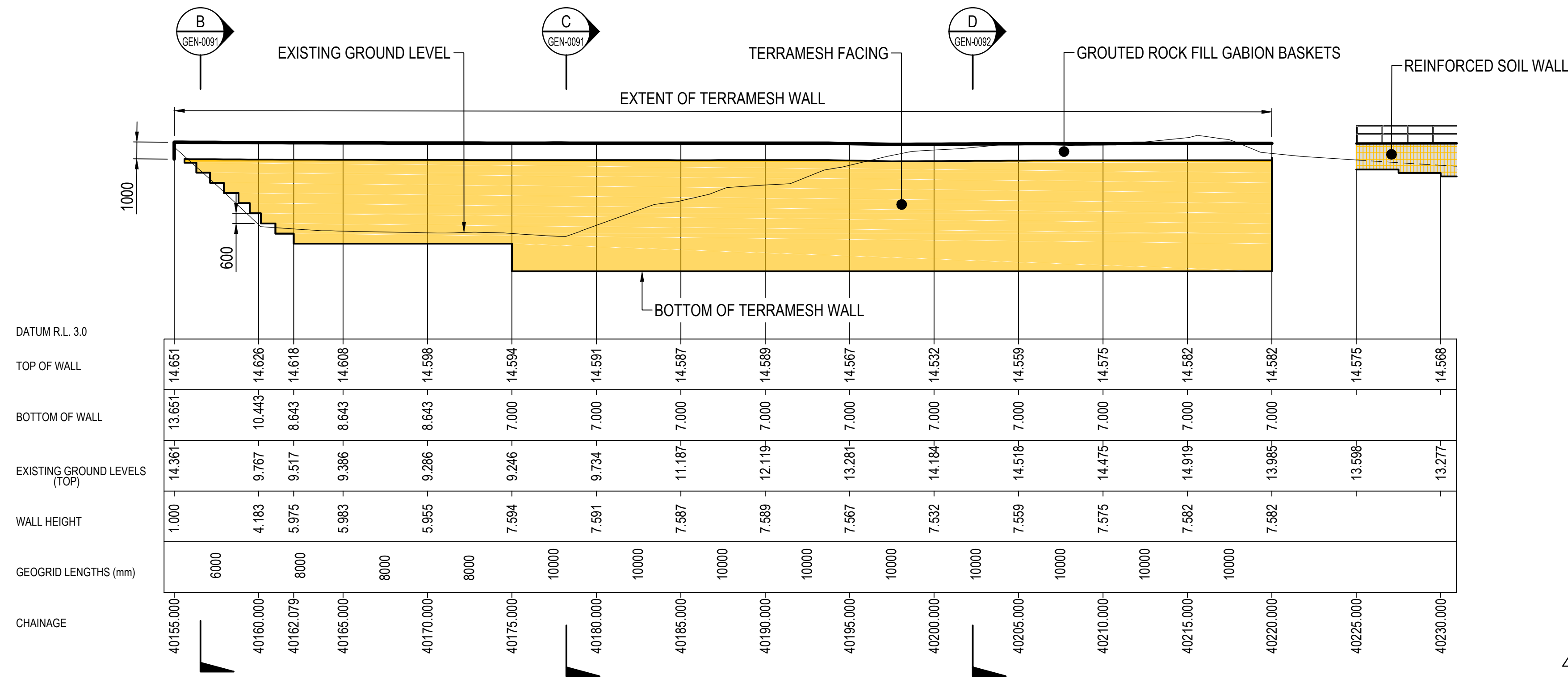
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FOR CONSTRUCTION

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TITLE	BULK EARTHWORKS SOUTH CONNECTION TYPICAL CROSS SECTIONS SHEET 1 OF 1		
DRAWING No.	PROJECT No.	ZONE	TYPE
N01031	-	PWD	- DRG - GEN
NUMBER		REV	
0082		-	01



LAYOUT PLAN
1:200



SECTION A
1:200

02

- NOTES:
- FURTHER GEOTECHNICAL INVESTIGATIONS TO BE UNDERTAKEN TO VERIFY GROUND CONDITIONS AND OPTIMISE THE DESIGN.

2 0 4 8m
SCALE 1:200

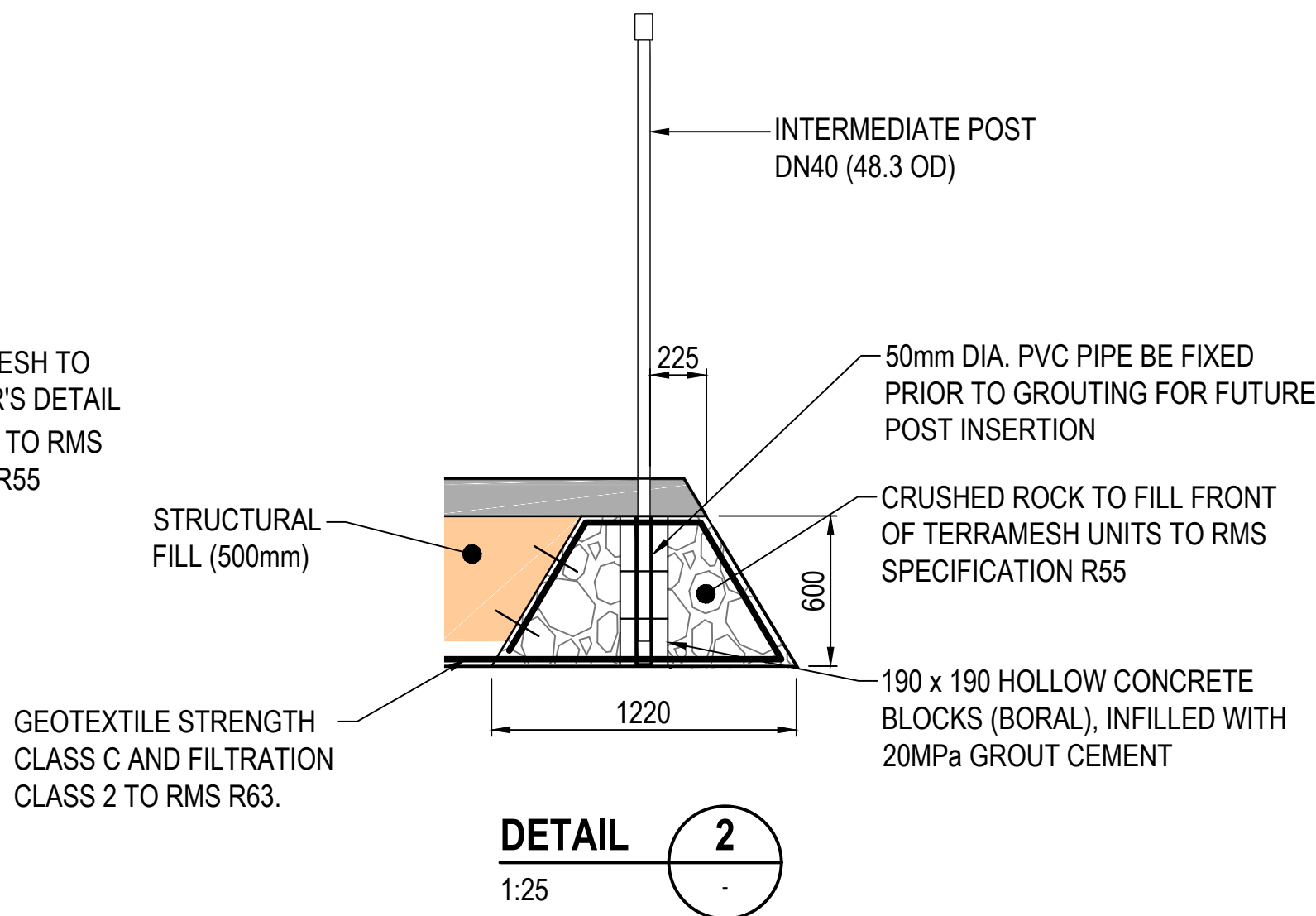
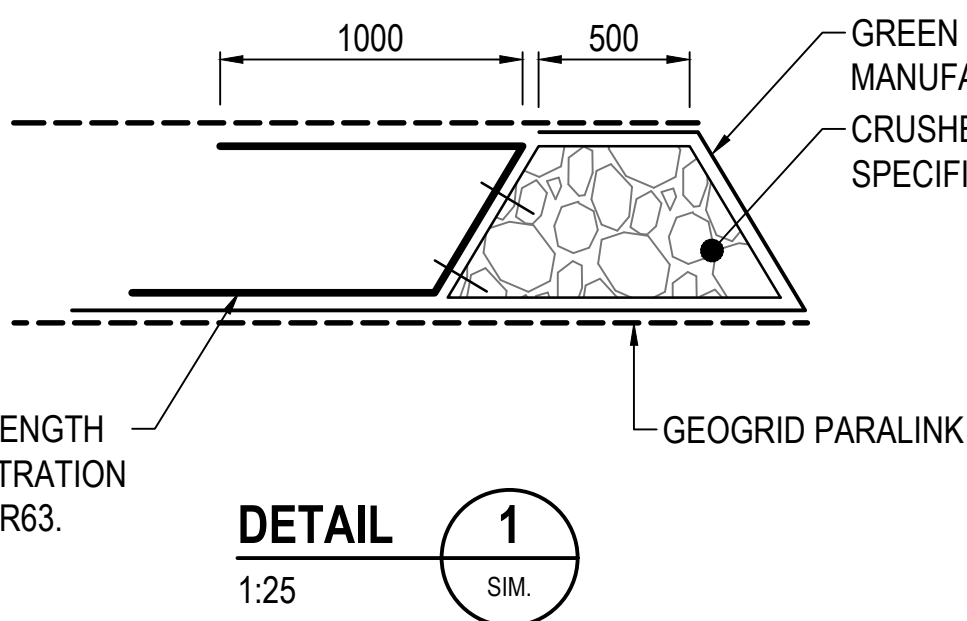
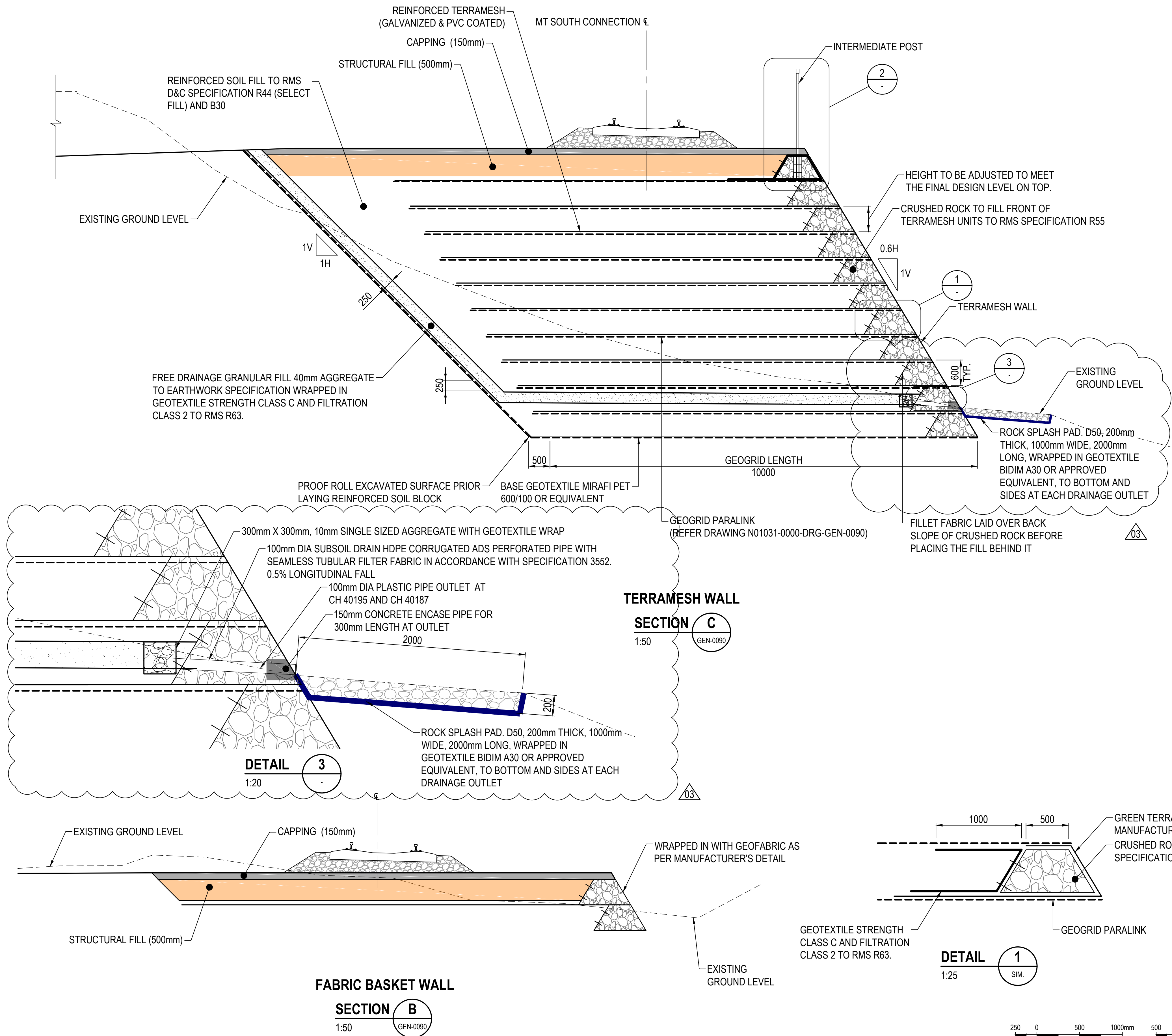
REV	DATE	REVISION DETAILS
01	20.01.17	ACCEPTED FOR CONSTRUCTION
02	09.06.17	ACCEPTED FOR CONSTRUCTION RE-SUBMISSION

SCALE	SIZE
AS SHOWN	A1
FOR CONSTRUCTION	
APPROVED	

ARTC DRAWING No	EDMS No	EDMS REV
PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1	
TITLE	BULK EARTHWORKS TERRAMESH WALL PLAN AND CROSS SECTION SHEET 1 OF 3	
DRAWING No.	PROJECT No. N01031	ZONE PWD
	TYPE DRG	DISC GEN
	NUMBER 0090	REV 02

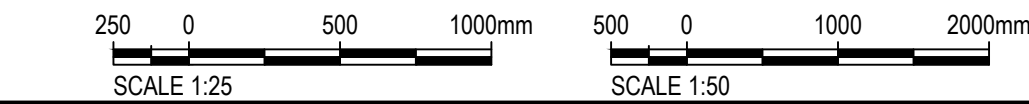
NOTES:

- GREEN TERRAMESH AND GABION BLOCK TO STANDARD MACCAFERRI OR APPORVED EQUIVALENT WITH 100 YEARS DESIGN LIFE.
- GEOGRIDS ARE TO BE PARALINK 200/30 GEOFABRICS U.N.O OR APPROVED EQUIVALENT.
- REINFORCE SOIL MATERIAL SHALL BE IN ACCORDANCE WITH RMS D&C SPECIFICATION R44 AND B30 WITH A MINIMUM FRICTION ANGLE OF 34 DEGREES. ANGLE OF FRICTION CONFORMITY TESTING SHALL BE IN ACCORDANCE WITH RMS QA SPECIFICATION R58 ANNEXURE R58/L.
 - CPB WILL CARRY OUT GEOTECHNICAL TESTING ON SITE-WON EXCESS MATERIAL TO DETERMINE THE SOIL PROPERTIES. IF THE SITE-WON MATERIAL SATISFIES GENERAL EMBANKMENT FILL PROPERTIES (AS PER RMS D&C R44) OR BETTER, CPB RESERVE THE RIGHT TO REDESIGN THE REINFORCED EMBANKMENT USING SITE-WON MATERIAL.
 - SHOULD SITE-WON MATERIAL NOT SATISFY GENERAL EMBANKMENT FILL PROPERTIES (AS PER RMS D&C R44), CPB WILL CARRY OUT GEOTECHNICAL TESTING ON OFF-SITE SOURCED MATERIAL TO DETERMINE THE SOIL PROPERTIES. IF THE OFF-SITE SOURCED MATERIAL SATISFIES GENERAL EMBANKMENT FILL PROPERTIES (AS PER RMS D&C R44) OR BETTER, CPB RESERVE THE RIGHT TO REDESIGN THE REINFORCED EMBANKMENT USING OFF-SITE SOURCED MATERIAL.
- DESIGN LIVE LOADS: RAIL 300 LA, ALL OTHER AREAS = 5 kPa
- RETAINED FILL SHALL BE GENERAL FILL WITH A MINIMUM FRICTION ANGLE OF 30 DEGREES UNLESS OTHERWISE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO CONSTRUCTION.
- COMPACTION SHALL START FROM THE WALL FACE AND WORK BACK. TRACKED CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY ON THE GEOGRID AND A MINIMUM THICKNESS OF 150mm OF FILL SHALL BE PLACED OVER GEOGRIDS PRIOR TO THE OPERATION OF TRACKED CONSTRUCTION EQUIPMENT.
- CONSTRUCTION PLANT AND ALL OTHER VEHICLES HAVING A MASS EXCEEDING 1000 kg SHALL BE KEPT AT LEAST 1000mm FROM THE BACK OF THE GABION UNITS. WITHIN 1000mm OF THE BACK OF THE GABION UNITS COMPACTION EQUIPMENT SHALL BE RESTRICTED TO:
 - VIBRATING ROLLERS WITH A MASS = 1000 kg
 - VIBRATING PLATE COMPACTORS WITH A MASS = 1000 kg
- CRANES AND CRANE OUTRIGGERS ARE TO BE KEPT AT LEAST 5000mm FROM THE BACK OF THE GABION UNITS. CONSTRUCTION LOADING SHOULD BE KEPT TO A MAXIMUM OF 10kPa.
- MINIMUM BEARING CAPACITY AT THE WALL BASE SHALL BE 200 kPa AND SHALL BE CONFIRMED BY GEOTECHNICAL ENGINEER.
- FURTHER GEOTECHNICAL INVESTIGATIONS TO BE UNDERTAKEN TO VERIFY GROUND CONDITIONS AND OPTIMISE THE DESIGN.



Plot Date: 8/28/2017 12:02:24 PM, Client: AUS/0, Project: CPB WORKS/KEY LITTLE/ANZ PROJ/002/07/001/031/PWD DRG GEN/001.DWG

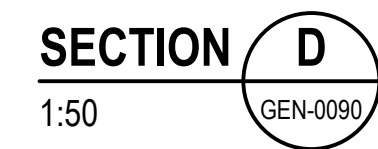
REV	DATE	REVISION DETAILS	APPROVED
01	20.01.17	ACCEPTED FOR CONSTRUCTION	
02	09.06.17	ACCEPTED FOR CONSTRUCTION RE-SUBMISSION	
03	08.09.17	ACCEPTED FOR CONSTRUCTION RE-SUBMISSION	

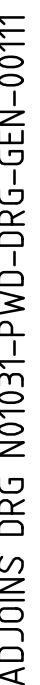


SCALE	SIZE
AS SHOWN	A1

ARTC DRAWING No			EDMS No			EDMS REV	
PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1						
TITLE	BULK EARTHWORKS TERRAMESH WALL CROSS SECTION SHEET 2 OF 3						
DRAWING No.	PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV	
	N01031	- PWD	- DRG	- GEN	- 0091	- 03	

1. SEE DRAWING N01031-PWD-DRG-GEN-0091.

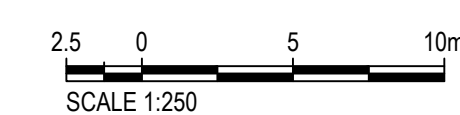
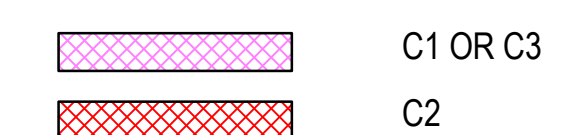




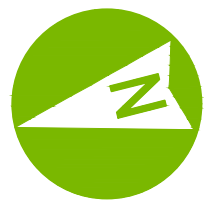
1. THIS DRAWING IS IN TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER NO1031-PWD-SPE-EWK-0001[A3]).
2. REFER TO THE EARTHWORKS SPECIFICATION FOR A DESCRIPTION OF EMBANKMENT AND CUT FOUNDATION TREATMENTS.
3. REFER TO DRAWINGS NO1031-PWD-SPE-EWK-0025 TO NO1031-PWD-DRG-GEN-0039 FOR EARTHWORKS CROSS SECTIONS.
4. REFER TO DRAWINGS NO1031-PWD-DRG-GEN-0050 TO NO1031-PWD-DRG-GEN-0057 FOR TYPICAL CROSS SECTIONS.
5. REFER TO DRAWINGS NO1031-PWD-DRG-GEN-0110 TO NO1031-PWD-DRG-GEN-0126 FOR GROUND TREATMENT PLANS.
6. REFER TO DRAWING NO1031-PWD-DRG-GEN-0160 FOR THE EARTHWORKS FOUNDATION TREATMENT SCHEDULE.
7. C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.
8. THE EXTENT OF EACH FOUNDATION TREATMENT ZONE AS SHOWN HAS BEEN DETERMINED WITH REFERENCE TO EACH RAIL CONTROL LINE AND WHETHER IT IS IN CUT OR FILL. EXACT FOUNDATION TREATMENT ZONE EXTENTS AND TRANSITION FROM CUT FILL (AND VICE VERSA) TO BE DETERMINED ON SITE.



EMBANKMENTS



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NOTES FOR GROUND TREATMENT PLANS

1.

THIS DRAWING IS IN TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER N01031-PWD-SPE-EWK-0001[A3]).
2.

REFER TO THE EARTHWORKS SPECIFICATION FOR A DESCRIPTION OF EMBANKMENT AND CUT FOUNDATION TREATMENTS.
3.

REFER TO DRAWINGS N01031-PWD-SPE-EWK-0025 TO N01031-PWD-DRG-GEN-0039 FOR EARTHWORKS CROSS SECTIONS.
4.

REFER TO DRAWINGS N01031-PWD-DRG-GEN-0050 TO N01031-PWD-DRG-GEN-0057 FOR TYPICAL CROSS SECTIONS.
5.

REFER TO DRAWINGS N01031-PWD-DRG-GEN-0110 TO N01031-PWD-DRG-GEN-0126 FOR GROUND TREATMENT PLANS.
6.

REFER TO DRAWING N01031-PWD-DRG-GEN-0160 FOR THE EARTHWORKS FOUNDATION TREATMENT SCHEDULE.
7.

C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.
8.

THE EXTENT OF EACH FOUNDATION TREATMENT ZONE AS SHOWN HAS BEEN DETERMINED WITH REFERENCE TO EACH RAIL CONTROL LINE AND WHETHER IT IS IN CUT OR FILL. EXACT FOUNDATION TREATMENT ZONE EXTENTS AND TRANSITION FROM CUT FILL (AND VICE VERSA) TO BE DETERMINED ON SITE.

FOUNDATION TREATMENT LEGEND

EMBANKMENTS

E1

E5

E2

E6

E3

E7

E4

E8

CUTS

C1 OR C3

C2

AD JOINS DRG N01031-PWD-DRG-GEN-000110

AD JOINS DRG N01031-PWD-DRG-GEN-00112

From Sydney

To Moorebank Imex Terminal

DENSE VEGETATION
INDIVIDUAL TREES NOT LOCATED

MIT NORTH CONNECTION
SSFL LOOF
SSFL MAIN

KEY PLAN
N.T.S.

PLAN
1:250

ARTC DRAWING No		EDMS No		EDMS REV			
PROJECT		MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1					
TITLE		BULK EARTHWORKS GROUND TREATMENT PLAN SHEET 2 OF 17					
DRAWING No.	PROJECT No.	ZONE	TYPE	DISC	NUMBER		
N01031		PWD	DRG	GEN	0111		

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CPB
CONTRACTORS

SIMTA | SYDNEY
INTERMODAL
TERMINAL
ALLIANCE

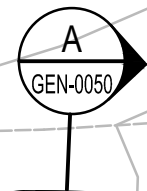
REV	DATE	REVISION DETAILS	ED
01	20.01.17	ACCEPTED FOR CONSTRUCTION	

SCALE AS SHOWN	SIZE A1

FOR CONSTRUCTION

APPROVED

Plot Date: 28/01/2017 11:08:54 AM Client: AUS/0 Project: CPB WORKS/KEY LITTLE/ANZ PROJ/002/07/001/031-PWD-DRG-GEN-0111.DWG



NOTES FOR GROUND TREATMENT PLANS

1. THIS DRAWING IS IN TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER N01031-PWD-SPE-EWK-0001[A3]).
2. REFER TO THE EARTHWORKS SPECIFICATION FOR A DESCRIPTION OF EMBANKMENT AND CUT FOUNDATION TREATMENTS.
3. REFER TO DRAWINGS N01031-PWD-SPE-EWK-0025 TO N01031-PWD-DRG-GEN-0039 FOR EARTHWORKS CROSS SECTIONS.
4. REFER TO DRAWINGS N01031-PWD-DRG-GEN-0050 TO N01031-PWD-DRG-GEN-0057 FOR TYPICAL CROSS SECTIONS.
5. REFER TO DRAWINGS N01031-PWD-DRG-GEN-0110 TO N01031-PWD-DRG-GEN-0126 FOR GROUND TREATMENT PLANS.
6. REFER TO DRAWING N01031-PWD-DRG-GEN-0160 FOR THE EARTHWORKS FOUNDATION TREATMENT SCHEDULE.
7. C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.
8. THE EXTENT OF EACH FOUNDATION TREATMENT ZONE AS SHOWN HAS BEEN DETERMINED WITH REFERENCE TO EACH RAIL CONTROL LINE AND WHETHER IT IS IN CUT OR FILL. EXACT FOUNDATION TREATMENT ZONE EXTENTS AND TRANSITION FROM CUT FILL (AND VICE VERSA) TO BE DETERMINED ON SITE.

To Moorebank Imex Terminal

From Sydney

MIT NORTH CONNECTION

FOUNDATION TREATMENT LEGEND

EMBANKMENTS

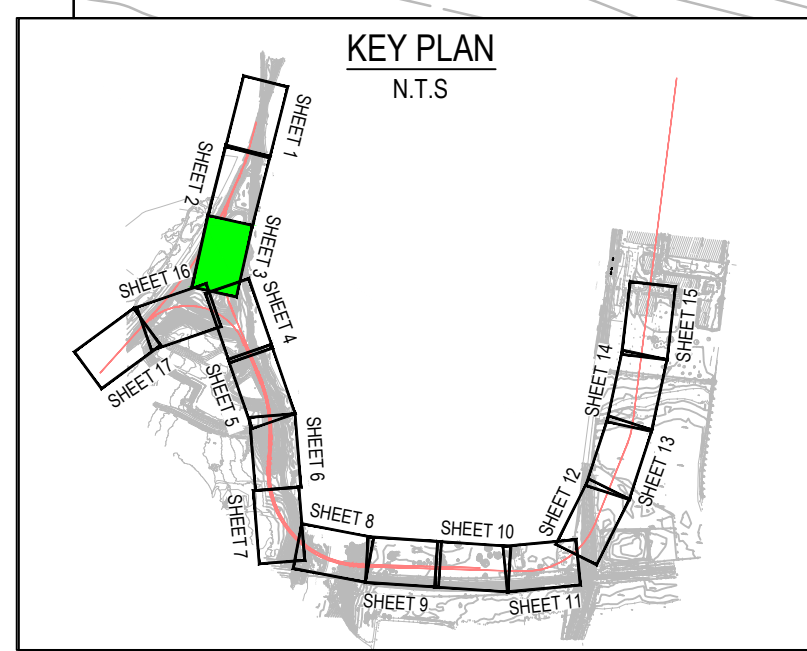
	E1		E5
	E2		E6
	E3		E7
	E4		E8

CUTS

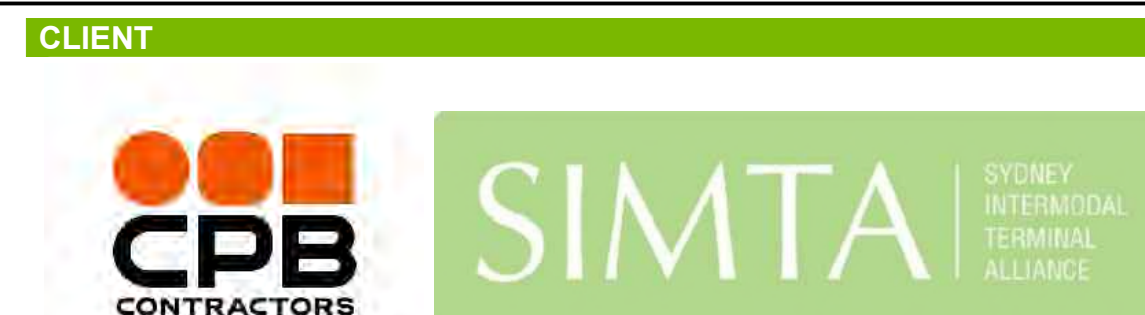
	C1 OR C3
	C2

PLAN
1:250

2.5 0 5 10m
SCALE 1:250



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REV	DATE	REVISION DETAILS
01	20.01.17	ACCEPTED FOR CONSTRUCTION

SCALE AS SHOWN	SIZE A1	FOR CONSTRUCTION

ARTC DRAWING No		EDMS No		EDMS REV		
PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1					
TITLE	BULK EARTHWORKS GROUND TREATMENT PLAN SHEET 3 OF 17					
DRAWING No.	PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV
	N01031	- PWD	- DRG	- GEN	0112	01

NOTES FOR GROUND TREATMENT PLANS

1.

THIS DRAWING IS IN TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER N01031-PWD-SPE-EWK-0001[A3]).
2.

REFER TO THE EARTHWORKS SPECIFICATION FOR A DESCRIPTION OF EMBANKMENT AND CUT FOUNDATION TREATMENTS.
3.

REFER TO DRAWINGS N01031-PWD-SPE-EWK-0025 TO N01031-PWD-DRG-GEN-0039 FOR EARTHWORKS CROSS SECTIONS.
4.

REFER TO DRAWINGS N01031-PWD-DRG-GEN-0050 TO N01031-PWD-DRG-GEN-0057 FOR TYPICAL CROSS SECTIONS.
5.

REFER TO DRAWINGS N01031-PWD-DRG-GEN-0110 TO N01031-PWD-DRG-GEN-0126 FOR GROUND TREATMENT PLANS.
6.

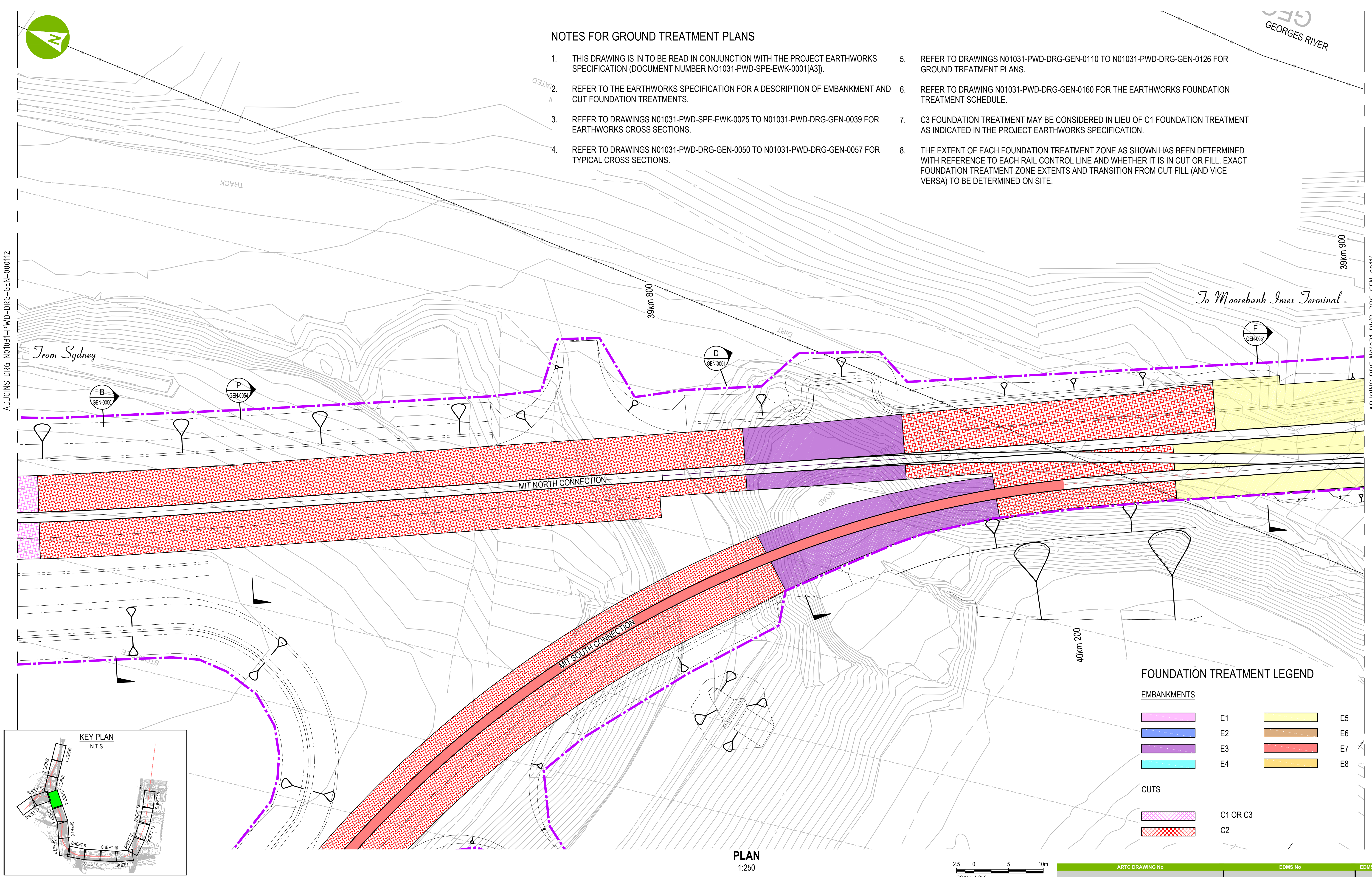
REFER TO DRAWING N01031-PWD-DRG-GEN-0160 FOR THE EARTHWORKS FOUNDATION TREATMENT SCHEDULE.
7.

C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.
8.

THE EXTENT OF EACH FOUNDATION TREATMENT ZONE AS SHOWN HAS BEEN DETERMINED WITH REFERENCE TO EACH RAIL CONTROL LINE AND WHETHER IT IS IN CUT OR FILL. EXACT FOUNDATION TREATMENT ZONE EXTENTS AND TRANSITION FROM CUT FILL (AND VICE VERSA) TO BE DETERMINED ON SITE.

ADJOINS DRG N01031-PWD-DRG-GEN-000112

ADJOINS DRG N01031-PWD-DRG-GEN-00114



FOUNDATION TREATMENT LEGEND

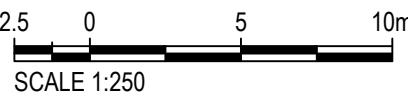
EMBANKMENTS

	E1		E5
	E2		E6
	E3		E7
	E4		E8

CUTS

	C1 OR C3
	C2

PLAN
1:250



ARTC DRAWING No. EDMS No. EDMS REV.

PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1				
TITLE	BULK EARTHWORKS GROUND TREATMENT PLAN SHEET 4 OF 17				
DRAWING No.	PROJECT No.	ZONE	TYPE	DISC	NUMBER
N01031	PWD	DRG	GEN	0113	01

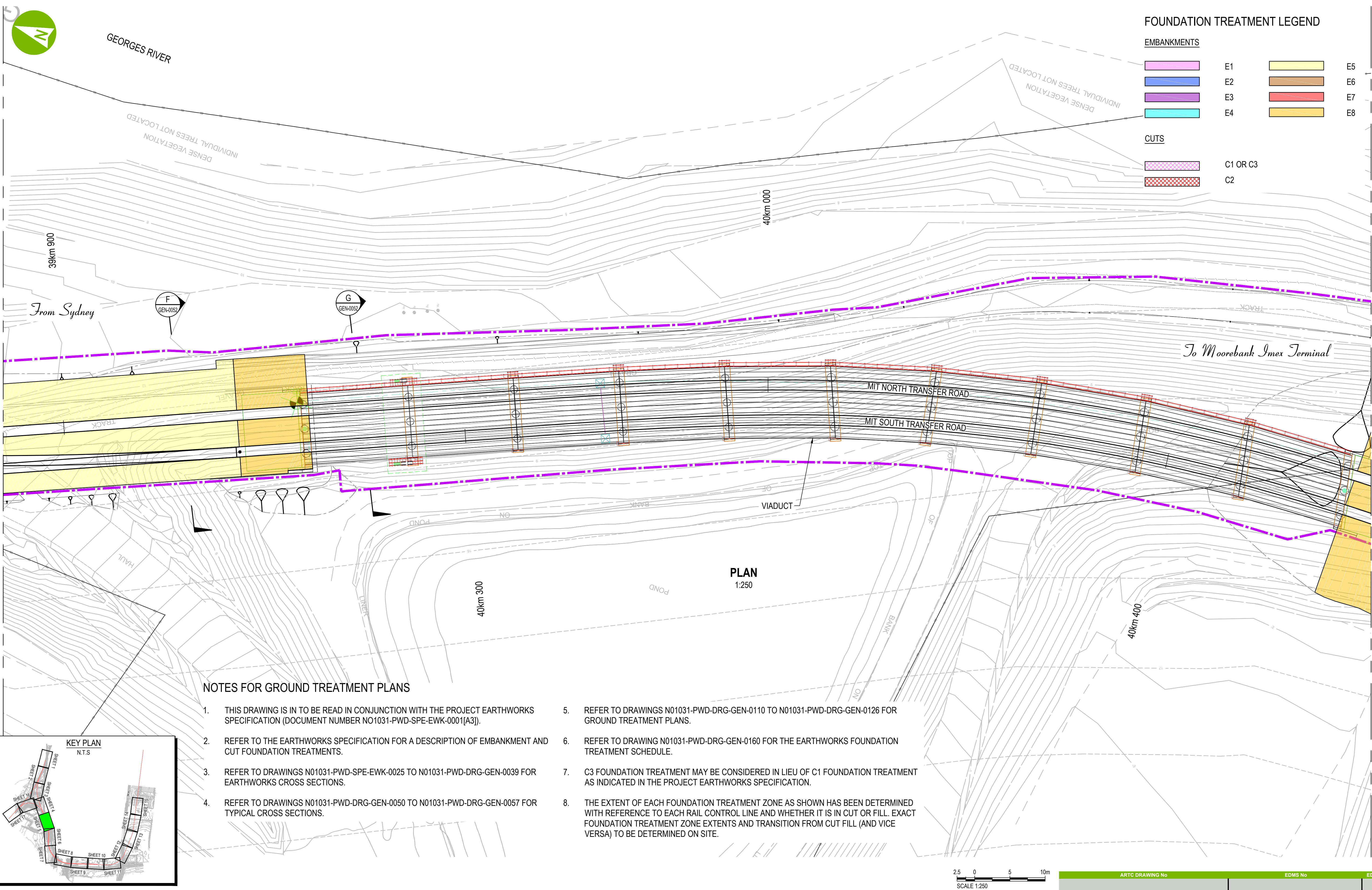
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www.aurecongroup.com

CPB
CONTRACTORS

SIMTA
SYDNEY INTERMODAL TERMINAL ALLIANCE

REV	DATE	REVISION DETAILS	APPROVED
01	20.01.17	ACCEPTED FOR CONSTRUCTION	

SCALE	SIZE	FOR CONSTRUCTION
AS SHOWN	A1	

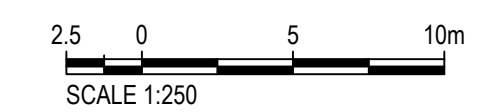
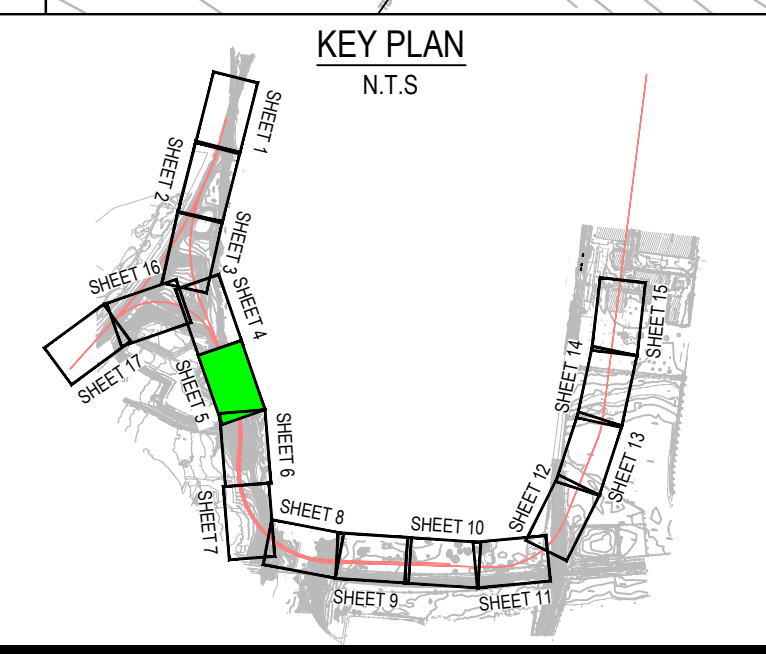


FOUNDATION TREATMENT LEGEND

EMBANKMENTS			
	E1		E5
	E2		E6
	E3		E7
	E4		E8
CUTS			
	C1 OR C3		
	C2		

NOTES FOR GROUND TREATMENT PLANS

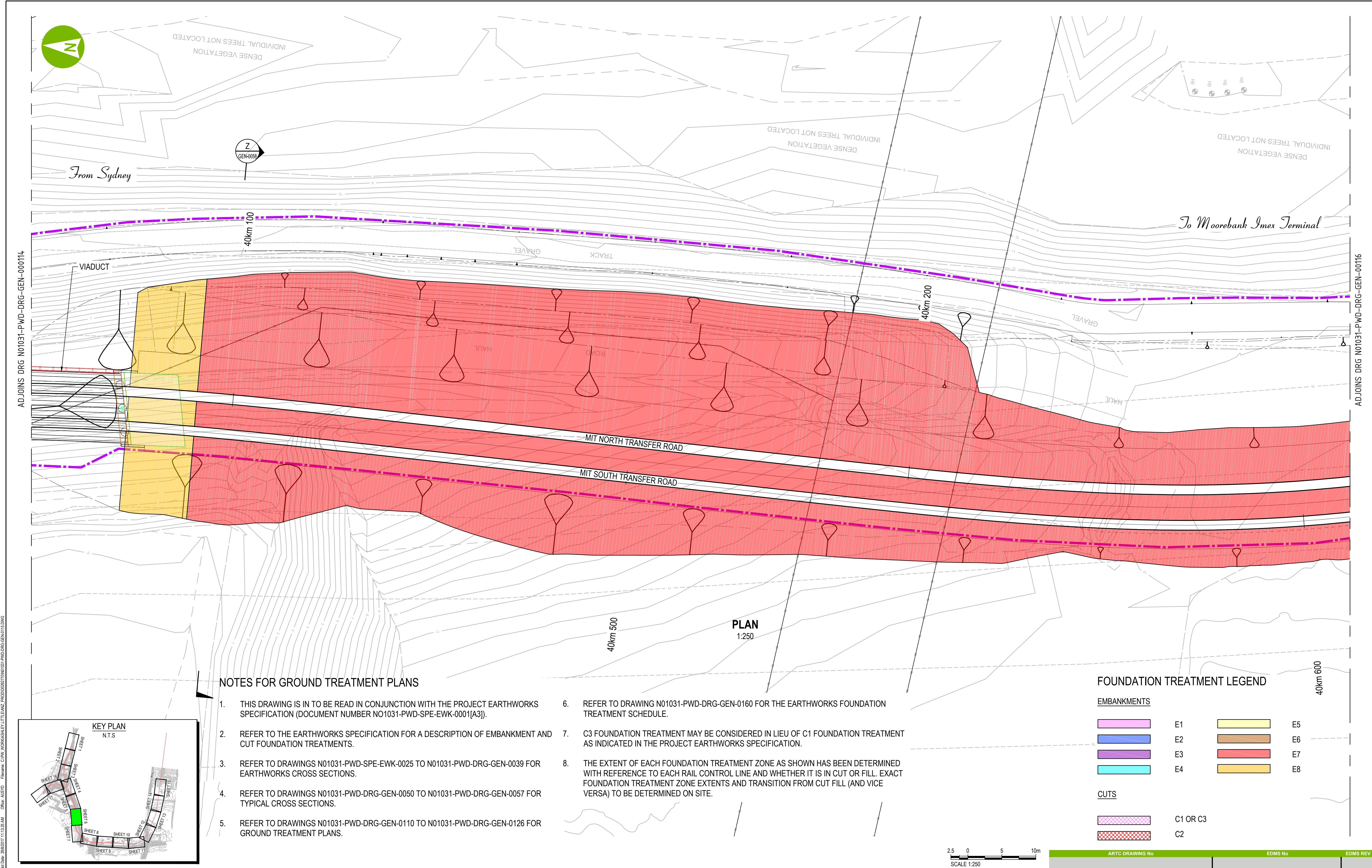
1. THIS DRAWING IS IN TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER N01031-PWD-SPE-EWK-0001[A3]).
2. REFER TO THE EARTHWORKS SPECIFICATION FOR A DESCRIPTION OF EMBANKMENT AND CUT FOUNDATION TREATMENTS.
3. REFER TO DRAWINGS N01031-PWD-SPE-EWK-0025 TO N01031-PWD-DRG-GEN-0039 FOR EARTHWORKS CROSS SECTIONS.
4. REFER TO DRAWINGS N01031-PWD-DRG-GEN-0050 TO N01031-PWD-DRG-GEN-0057 FOR TYPICAL CROSS SECTIONS.
5. REFER TO DRAWINGS N01031-PWD-DRG-GEN-0110 TO N01031-PWD-DRG-GEN-0126 FOR GROUND TREATMENT PLANS.
6. REFER TO DRAWING N01031-PWD-DRG-GEN-0160 FOR THE EARTHWORKS FOUNDATION TREATMENT SCHEDULE.
7. C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.
8. THE EXTENT OF EACH FOUNDATION TREATMENT ZONE AS SHOWN HAS BEEN DETERMINED WITH REFERENCE TO EACH RAIL CONTROL LINE AND WHETHER IT IS IN CUT OR FILL. EXACT FOUNDATION TREATMENT ZONE EXTENTS AND TRANSITION FROM CUT FILL (AND VICE VERSA) TO BE DETERMINED ON SITE.



REV	DATE	REVISION DETAILS	APPROVED
01	20.01.17	ACCEPTED FOR CONSTRUCTION	

SCALE	SIZE	FOR CONSTRUCTION
AS SHOWN	A1	

ARTC DRAWING No			EDMS No			EDMS REV		
PROJECT			MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1					
TITLE			BULK EARTHWORKS GROUND TREATMENT PLAN SHEET 5 OF 17					
DRAWING No.			PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV
			N01031	- PWD	- DRG	- GEN	- 0114	- 01



NOTES FOR GROUND TREATMENT PLANS



1. THIS DRAWING IS IN TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER N01031-PWD-SPE-EWK-0001(A3)).
2. REFER TO THE EARTHWORKS SPECIFICATION FOR A DESCRIPTION OF EMBANKMENT AND CUT FOUNDATION TREATMENTS.
3. REFER TO DRAWINGS N01031-PWD-SPE-EWK-0025 TO N01031-PWD-DRG-GEN-0039 FOR EARTHWORKS CROSS SECTIONS.
4. REFER TO DRAWINGS N01031-PWD-DRG-GEN-0050 TO N01031-PWD-DRG-GEN-0057 FOR TYPICAL CROSS SECTIONS.
5. REFER TO DRAWINGS N01031-PWD-DRG-GEN-0110 TO N01031-PWD-DRG-GEN-0126 FOR GROUND TREATMENT PLANS.
6. REFER TO DRAWING N01031-PWD-DRG-GEN-0160 FOR THE EARTHWORKS FOUNDATION TREATMENT SCHEDULE.
7. C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.
8. THE EXTENT OF EACH FOUNDATION TREATMENT ZONE AS SHOWN HAS BEEN DETERMINED WITH REFERENCE TO EACH RAIL CONTROL LINE AND WHETHER IT IS IN CUT OR FILL. EXACT FOUNDATION TREATMENT ZONE EXTENTS AND TRANSITION FROM CUT FILL (AND VICE VERSA) TO BE DETERMINED ON SITE.

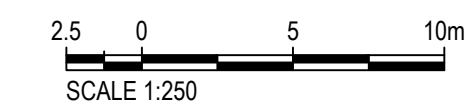
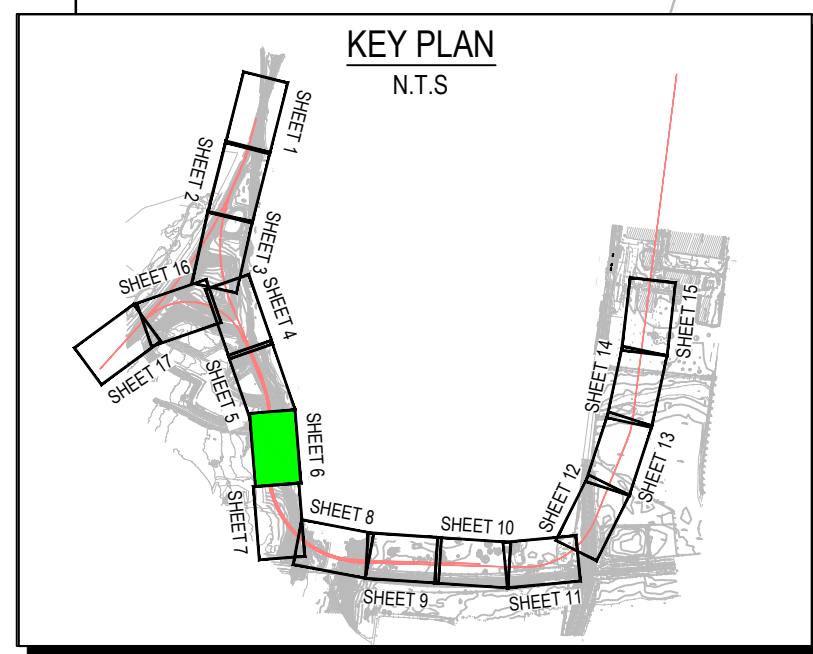
FOUNDATION TREATMENT LEGEND

EMBANKMENTS

	E1		E5
	E2		E6
	E3		E7
	E4		E8


CUTS

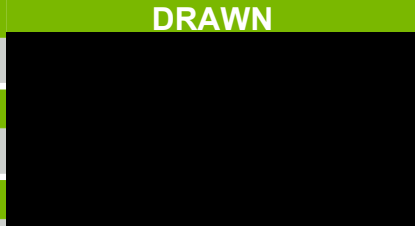
	C1 OR C3
	C2




CLIENT

REV	DATE	REVISION DETAILS
01	20.01.17	ACCEPTED FOR CONSTRUCTION

APPROVED


SCALE	SIZE
AS SHOWN	A1
DRAWN	
	

FOR CONSTRUCTION
APPROVED


ARTC DRAWING No	EDMS No	EDMS REV
PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1	
TITLE	BULK EARTHWORKS GROUND TREATMENT PLAN SHEET 6 OF 17	
DRAWING No.	PROJECT No.	ZONE
N01031	N01031	PWD
	TYPE	DISC
	DRG	GEN
	NUMBER	REV
	0115	01



NOTES FOR GROUND TREATMENT PLANS

1.

THIS DRAWING IS IN TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER NO1031-PWD-SPE-EWK-0001[A3]).
2.

REFER TO THE EARTHWORKS SPECIFICATION FOR A DESCRIPTION OF EMBANKMENT AND CUT FOUNDATION TREATMENTS.
3.

REFER TO DRAWINGS NO1031-PWD-SPE-EWK-0025 TO NO1031-PWD-DRG-GEN-0039 FOR EARTHWORKS CROSS SECTIONS.
4.

REFER TO DRAWINGS NO1031-PWD-DRG-GEN-0050 TO NO1031-PWD-DRG-GEN-0057 FOR TYPICAL CROSS SECTIONS.
5.

REFER TO DRAWINGS NO1031-PWD-DRG-GEN-0110 TO NO1031-PWD-DRG-GEN-0126 FOR GROUND TREATMENT PLANS.
6.

REFER TO DRAWING NO1031-PWD-DRG-GEN-0160 FOR THE EARTHWORKS FOUNDATION TREATMENT SCHEDULE.
7.

C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.
8.

THE EXTENT OF EACH FOUNDATION TREATMENT ZONE AS SHOWN HAS BEEN DETERMINED WITH REFERENCE TO EACH RAIL CONTROL LINE AND WHETHER IT IS IN CUT OR FILL. EXACT FOUNDATION TREATMENT ZONE EXTENTS AND TRANSITION FROM CUT FILL (AND VICE VERSA) TO BE DETERMINED ON SITE.

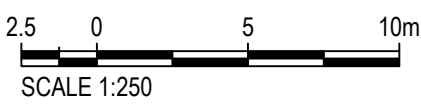
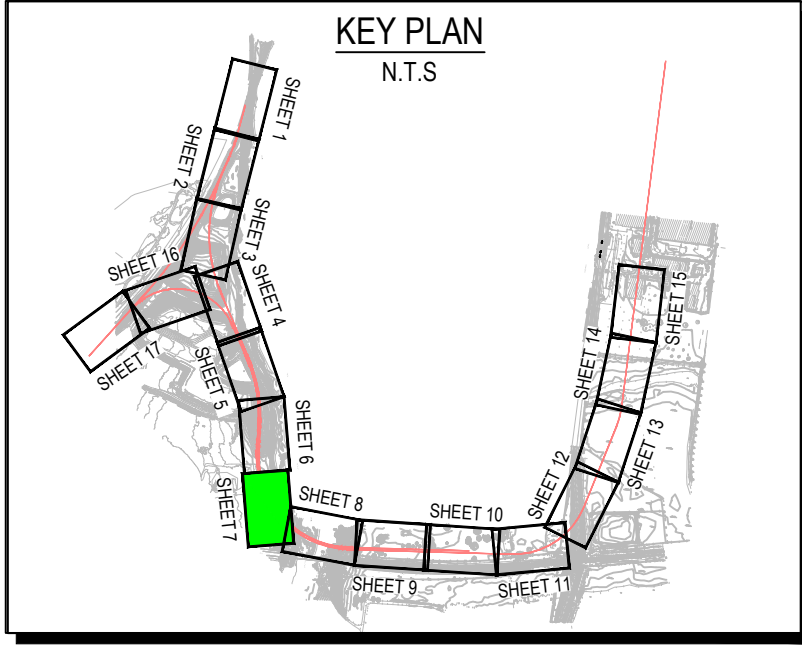
FOUNDATION TREATMENT LEGEND

EMBANKMENTS

	E1		E5
	E2		E6
	E3		E7
	E4		E8

CUTS

	C1 OR C3
	C2



REV	DATE	REVISION DETAILS	APPROVED
01	20.01.17	ACCEPTED FOR CONSTRUCTION	

SCALE
AS SHOWN

SIZE
A1

FOR CONSTRUCTION

ARTC DRAWING No		EDMS No			EDMS REV	
PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1					
TITLE	BULK EARTHWORKS GROUND TREATMENT PLAN SHEET 7 OF 17					
DRAWING No.	PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV
	N01031	PWD	DRG	GEN	0116	01



NOTES FOR GROUND TREATMENT PLANS

1. THIS DRAWING IS IN TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER N01031-PWD-SPE-EWK-0001[A3]).
2. REFER TO THE EARTHWORKS SPECIFICATION FOR A DESCRIPTION OF EMBANKMENT AND CUT FOUNDATION TREATMENTS.
3. REFER TO DRAWINGS N01031-PWD-SPE-EWK-0025 TO N01031-PWD-DRG-GEN-0039 FOR EARTHWORKS CROSS SECTIONS.
4. REFER TO DRAWINGS N01031-PWD-DRG-GEN-0050 TO N01031-PWD-DRG-GEN-0057 FOR TYPICAL CROSS SECTIONS.
5. REFER TO DRAWINGS N01031-PWD-DRG-GEN-0110 TO N01031-PWD-DRG-GEN-0126 FOR GROUND TREATMENT PLANS.
6. REFER TO DRAWING N01031-PWD-DRG-GEN-0160 FOR THE EARTHWORKS FOUNDATION TREATMENT SCHEDULE.
7. C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.
8. THE EXTENT OF EACH FOUNDATION TREATMENT ZONE AS SHOWN HAS BEEN DETERMINED WITH REFERENCE TO EACH RAIL CONTROL LINE AND WHETHER IT IS IN CUT OR FILL. EXACT FOUNDATION TREATMENT ZONE EXTENTS AND TRANSITION FROM CUT FILL (AND VICE VERSA) TO BE DETERMINED ON SITE.

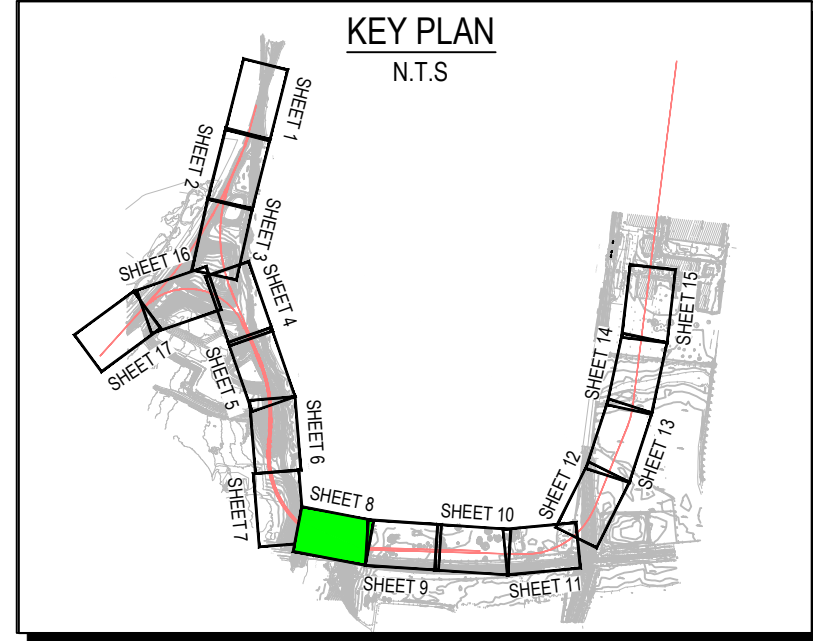
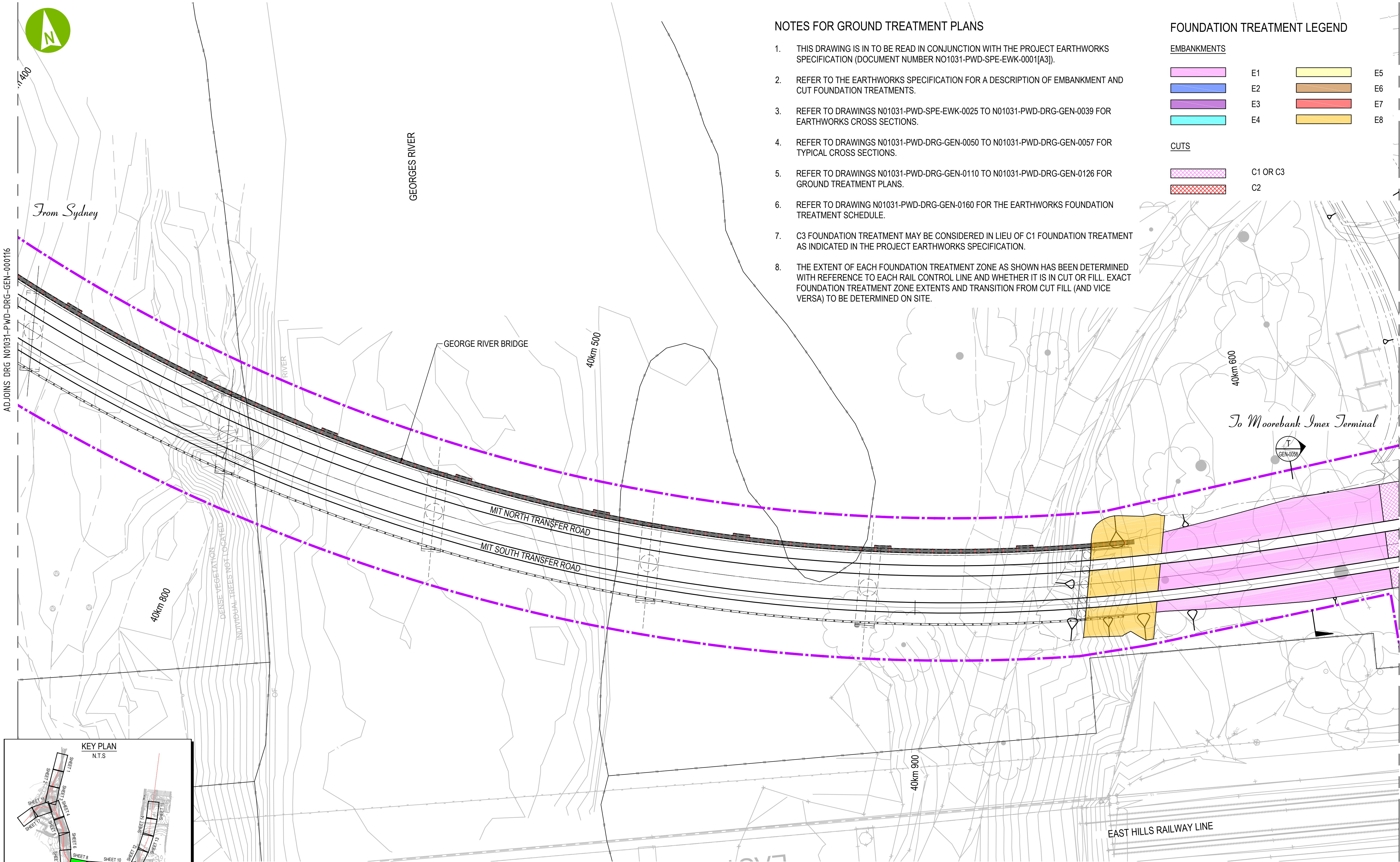
FOUNDATION TREATMENT LEGEND

EMBANKMENTS

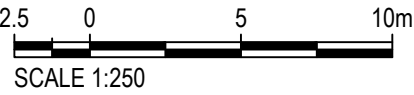
	E1		E5
	E2		E6
	E3		E7
	E4		E8

CUTS

	C1 OR C3
	C2



PLAN
1:250



ARTC DRAWING No			EDMS No			EDMS REV		
PROJECT			MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1					
TITLE			BULK EARTHWORKS GROUND TREATMENT PLAN SHEET 8 OF 17					
DRAWING No.			PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV
			N01031	PWD	DRG	GEN	0117	01

REV	DATE	REVISION DETAILS	APPROVED
01	20.01.17	ACCEPTED FOR CONSTRUCTION	

SCALE	SIZE	FOR CONSTRUCTION
AS SHOWN	A1	



NOTES FOR GROUND TREATMENT PLANS

1.

THIS DRAWING IS IN TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER N01031-PWD-SPE-EWK-0001[A3]).
2.

REFER TO THE EARTHWORKS SPECIFICATION FOR A DESCRIPTION OF EMBANKMENT AND CUT FOUNDATION TREATMENTS.
3.

REFER TO DRAWINGS N01031-PWD-SPE-EWK-0025 TO N01031-PWD-DRG-GEN-0039 FOR EARTHWORKS CROSS SECTIONS.
4.

REFER TO DRAWINGS N01031-PWD-DRG-GEN-0050 TO N01031-PWD-DRG-GEN-0057 FOR TYPICAL CROSS SECTIONS.
5.

REFER TO DRAWINGS N01031-PWD-DRG-GEN-0110 TO N01031-PWD-DRG-GEN-0126 FOR GROUND TREATMENT PLANS.
6.

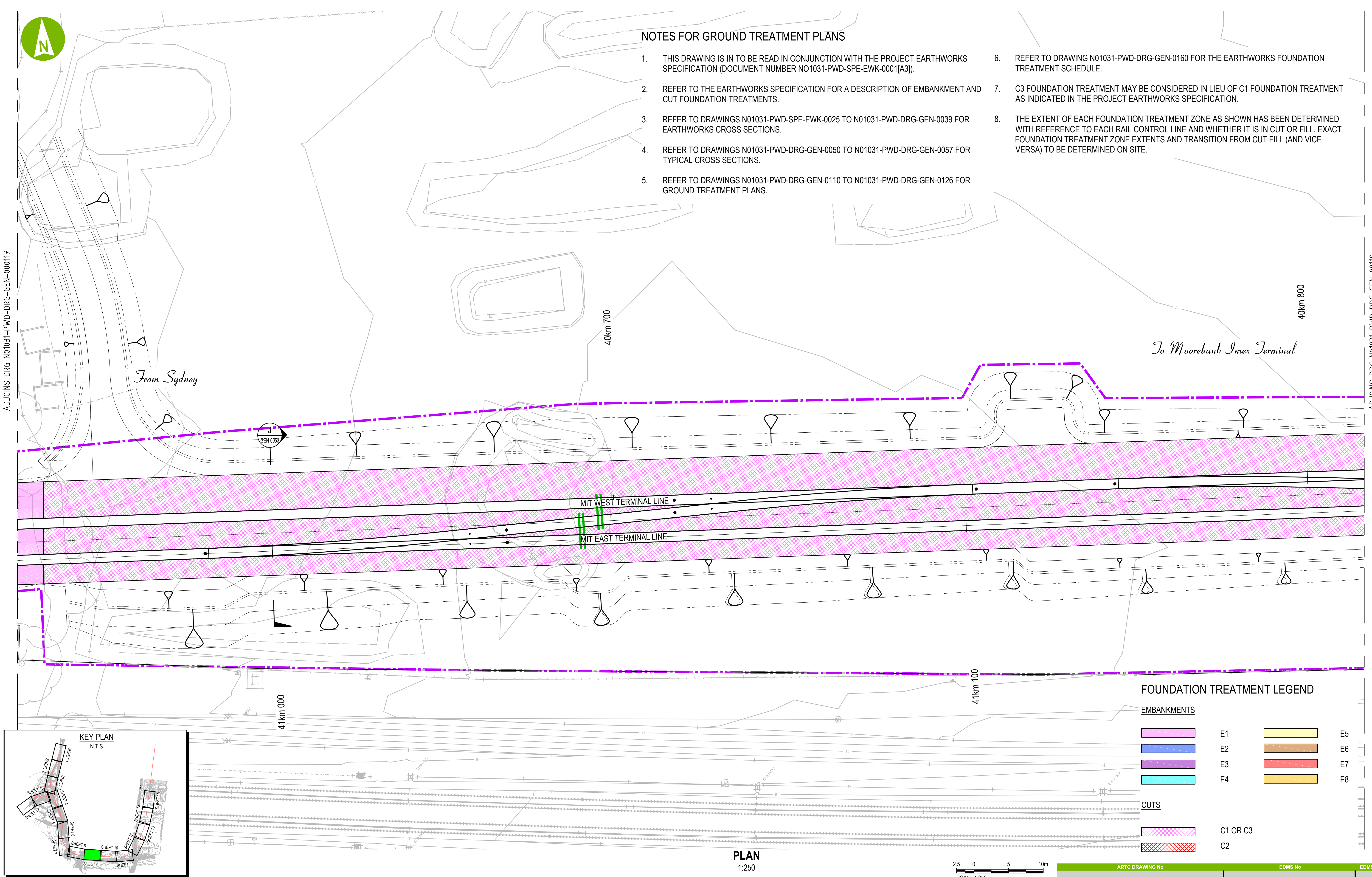
REFER TO DRAWING N01031-PWD-DRG-GEN-0160 FOR THE EARTHWORKS FOUNDATION TREATMENT SCHEDULE.
7.

C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.
8.

THE EXTENT OF EACH FOUNDATION TREATMENT ZONE AS SHOWN HAS BEEN DETERMINED WITH REFERENCE TO EACH RAIL CONTROL LINE AND WHETHER IT IS IN CUT OR FILL. EXACT FOUNDATION TREATMENT ZONE EXTENTS AND TRANSITION FROM CUT FILL (AND VICE VERSA) TO BE DETERMINED ON SITE.

ADJOINS DRG N01031-PWD-DRG-GEN-000117

ADJOINS DRG N01031-PWD-DRG-GEN-00119



FOUNDATION TREATMENT LEGEND

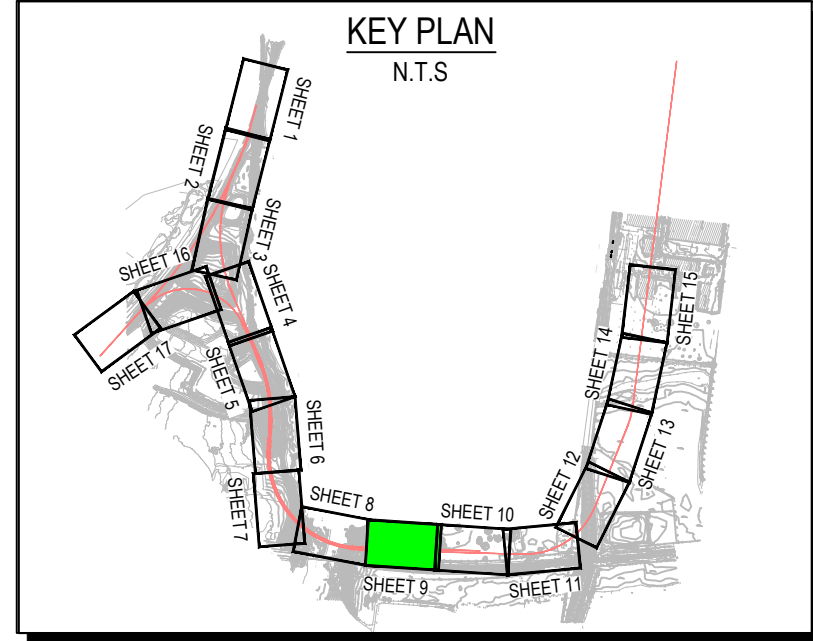
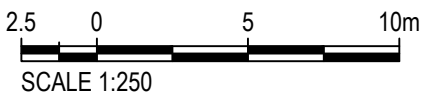
EMBANKMENTS

	E1		E5
	E2		E6
	E3		E7
	E4		E8

CUTS

	C1 OR C3
	C2

PLAN
1:250



Proj Date: 28/01/17 11:15:59 AM Client: CPB WORKS/SEV LITTLE/ANZ Project: D020270N01031-PWD-DRG-GEN-0118.DWG

REV	DATE	REVISION DETAILS	D
01	20.01.17	ACCEPTED FOR CONSTRUCTION	

SCALE AS SHOWN	SIZE A1	FOR CONSTRUCTION

ARTC DRAWING No	EDMS No	EDMS REV
PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1	
TITLE	BULK EARTHWORKS GROUND TREATMENT PLAN SHEET 9 OF 17	
DRAWING No.	PROJECT No.	ZONE
	N01031	PWD
		DRG
		GEN
		NUMBER
		0118
		REV
		01

40km 800

40km 900

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER NO1031-PWD-SPE-EWK-0001[A3]).
2. REFER TO THE EARTHWORKS SPECIFICATION FOR A DESCRIPTION OF EMBANKMENT AND CUT FOUNDATION TREATMENTS.
3. REFER TO DRAWINGS NO1031-PWD-SPE-EWK-0025 TO NO1031-PWD-DRG-GEN-0039 FOR EARTHWORKS CROSS SECTIONS.
4. REFER TO DRAWINGS NO1031-PWD-DRG-GEN-0050 TO NO1031-PWD-DRG-GEN-0057 FOR TYPICAL CROSS SECTIONS.
5. REFER TO DRAWINGS NO1031-PWD-DRG-GEN-0110 TO NO1031-PWD-DRG-GEN-0126 FOR GROUND TREATMENT PLANS.
6. REFER TO DRAWING NO1031-PWD-DRG-GEN-0160 FOR THE EARTHWORKS FOUNDATION TREATMENT SCHEDULE.
7. C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.
8. THE EXTENT OF EACH FOUNDATION TREATMENT ZONE AS SHOWN HAS BEEN DETERMINED WITH REFERENCE TO EACH RAIL CONTROL LINE AND WHETHER IT IS IN CUT OR FILL. EXACT FOUNDATION TREATMENT ZONE EXTENTS AND TRANSITION FROM CUT FILL (AND VICE VERSA) TO BE DETERMINED ON SITE.

EMBANKMENTS

CUTS

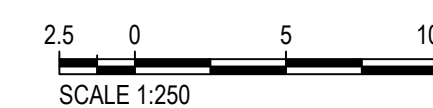
ADJOINS DRG N01031-PWD-DRG-GEN-00120

To Moorebank Imex Terminal

MIT FAST TERMINAL LINE

EAST HILLS RAILWAY LINE

PLAN
1:250



CLIENT

APPROVED

SCALE
AS SHOWN

	SIZ
	A1

FOR CONSTRUCTION

ARTC DRAWING No

EDMS No

EDMS REV

PROJECT

MOOREBANK INTERMODAL TERMINAL DEVELOPMENT
PACKAGE 1- RALP No.1

TITLE

BULK EARTHWORKS
GROUND TREATMENT PLAN
SHEET 10 OF 17

DRAWING No.

PROJECT No.
N01031

PW

TYPE
DR

– DISC GEN

011

REV
- 01

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SIMTA | SYDNEY
INTERMODAL
TERMINAL
ALLIANCE



NOTES FOR GROUND TREATMENT PLANS

1. THIS DRAWING IS IN TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER N01031-PWD-SPE-EWK-0001[A3]).

2. REFER TO THE EARTHWORKS SPECIFICATION FOR A DESCRIPTION OF EMBANKMENT AND CUT FOUNDATION TREATMENTS.

3. REFER TO DRAWINGS N01031-PWD-SPE-EWK-0025 TO N01031-PWD-DRG-GEN-0039 FOR EARTHWORKS CROSS SECTIONS.

4. REFER TO DRAWINGS N01031-PWD-DRG-GEN-0050 TO N01031-PWD-DRG-GEN-0057 FOR TYPICAL CROSS SECTIONS.
5. REFER TO DRAWINGS N01031-PWD-DRG-GEN-0110 TO N01031-PWD-DRG-GEN-0126 FOR GROUND TREATMENT PLANS.

6. REFER TO DRAWING N01031-PWD-DRG-GEN-0160 FOR THE EARTHWORKS FOUNDATION TREATMENT SCHEDULE.

7. C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.

8. THE EXTENT OF EACH FOUNDATION TREATMENT ZONE AS SHOWN HAS BEEN DETERMINED WITH REFERENCE TO EACH RAIL CONTROL LINE AND WHETHER IT IS IN CUT OR FILL. EXACT FOUNDATION TREATMENT ZONE EXTENTS AND TRANSITION FROM CUT FILL (AND VICE VERSA) TO BE DETERMINED ON SITE.

AD JOINS DRG N01031-PWD-DRG-GEN-000119

From Sydney

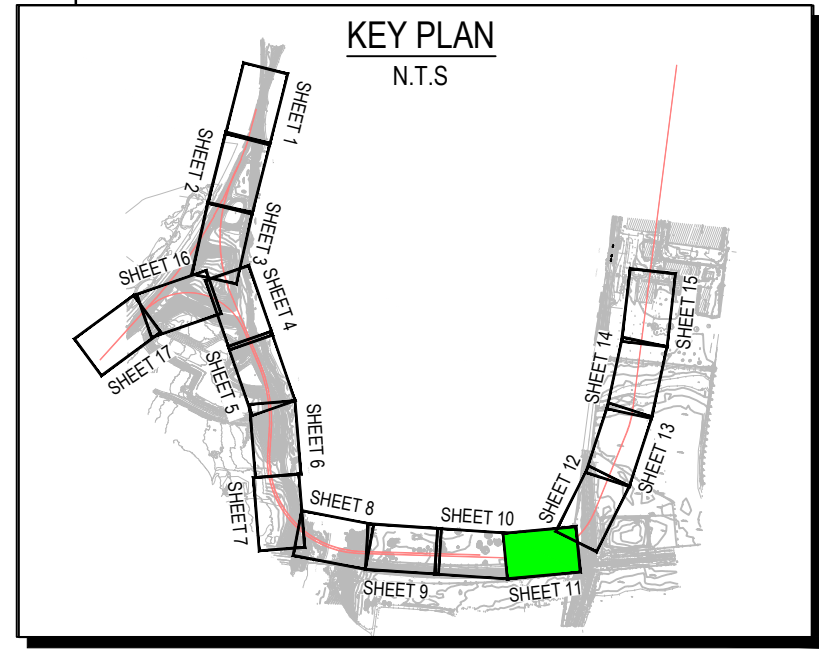
BALLAST ARRESTOR

MIT EAST TERMINAL LINE

To Moorebank Inter Terminal

4 km 500

41km 400



FOUNDATION TREATMENT LEGEND

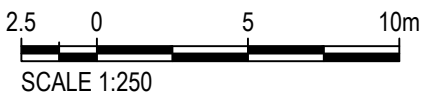
EMBANKMENTS

	E1		E5
	E2		E6
	E3		E7
	E4		E8

CUTS

	C1 OR C3
	C2

PLAN
1:250



ARTC DRAWING No			EDMS No			EDMS REV					
PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1										
TITLE	BULK EARTHWORKS GROUND TREATMENT PLAN SHEET 11 OF 17										
DRAWING No.	PROJECT No.	-	ZONE	-	TYPE	-	DISC	-	NUMBER	-	REV
	N01031		PWD		DRG		GEN		0120		01

REV	DATE	REVISION DETAILS	APPROVED
01	20.01.17	ACCEPTED FOR CONSTRUCTION	

SCALE	SIZE	FOR CONSTRUCTION
AS SHOWN	A1	
		



AD JOINS DRG N01031-PWD-DRG-GEN-000120

From Sydney

AVENUE

MOOREBANK AVENUE BRIDGE

To Moorebank Imex Terminal

MIT SOUTH TRANSFER ROAD

K
GEN-0053

W
GEN-0057

41km 700

41km 600

NOTES FOR GROUND TREATMENT PLANS

1. THIS DRAWING IS IN TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER N01031-PWD-SPE-EWK-0001[A3]).
2. REFER TO THE EARTHWORKS SPECIFICATION FOR A DESCRIPTION OF EMBANKMENT AND CUT FOUNDATION TREATMENTS.
3. REFER TO DRAWINGS N01031-PWD-SPE-EWK-0025 TO N01031-PWD-DRG-GEN-0039 FOR EARTHWORKS CROSS SECTIONS.
4. REFER TO DRAWINGS N01031-PWD-DRG-GEN-0050 TO N01031-PWD-DRG-GEN-0057 FOR TYPICAL CROSS SECTIONS.
5. REFER TO DRAWINGS N01031-PWD-DRG-GEN-0110 TO N01031-PWD-DRG-GEN-0126 FOR GROUND TREATMENT PLANS.
6. REFER TO DRAWING N01031-PWD-DRG-GEN-0160 FOR THE EARTHWORKS FOUNDATION TREATMENT SCHEDULE.
7. C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.
8. THE EXTENT OF EACH FOUNDATION TREATMENT ZONE AS SHOWN HAS BEEN DETERMINED WITH REFERENCE TO EACH RAIL CONTROL LINE AND WHETHER IT IS IN CUT OR FILL. EXACT FOUNDATION TREATMENT ZONE EXTENTS AND TRANSITION FROM CUT FILL (AND VICE VERSA) TO BE DETERMINED ON SITE.

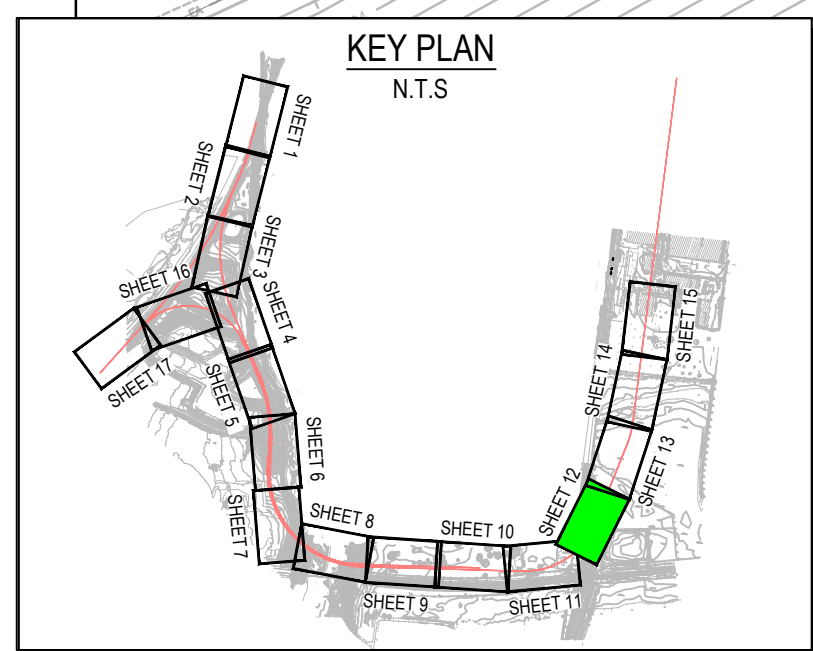
FOUNDATION TREATMENT LEGEND

EMBANKMENTS

	E1		E5
	E2		E6
	E3		E7
	E4		E8

CUTS

	C1 OR C3
	C2



PLAN
1:250

2.5 0 5 10m
SCALE 1:250

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CLIENT



REV	DATE	REVISION DETAILS	APPROVED
01	20.01.17	ACCEPTED FOR CONSTRUCTION	

SCALE
AS SHOWN

SIZE
A1

FOR CONSTRUCTION

DRAWN

ARTC DRAWING No		EDMS No		EDMS REV		
PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1					
TITLE	BULK EARTHWORKS GROUND TREATMENT PLAN SHEET 12 OF 17					
DRAWING No.	PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV
	N01031	- PWD	- DRG	- GEN	- 0121	- 01



AD JOINS DRG N01031-PWD-DRG-GEN-000121

From Sydney

To Moorebank Imex Terminal

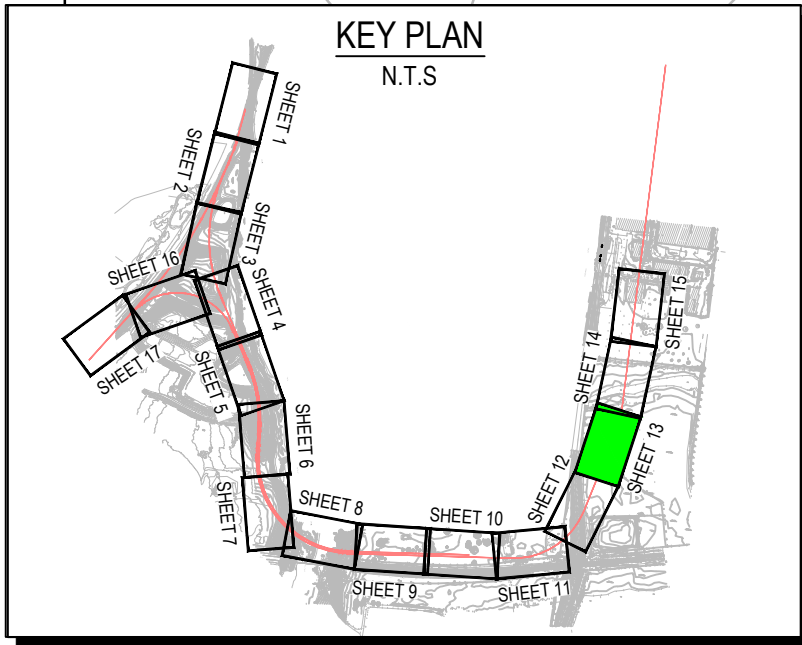
AD JOINS DRG N01031-PWD-DRG-GEN-00123

MIT EAST TERMINAL LINE

41km 800

NOTES FOR GROUND TREATMENT PLANS

1. THIS DRAWING IS IN TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER N01031-PWD-SPE-EWK-0001[A3]).
2. REFER TO THE EARTHWORKS SPECIFICATION FOR A DESCRIPTION OF EMBANKMENT AND CUT FOUNDATION TREATMENTS.
3. REFER TO DRAWINGS N01031-PWD-SPE-EWK-0025 TO N01031-PWD-DRG-GEN-0039 FOR EARTHWORKS CROSS SECTIONS.
4. REFER TO DRAWINGS N01031-PWD-DRG-GEN-0050 TO N01031-PWD-DRG-GEN-0057 FOR TYPICAL CROSS SECTIONS.
5. REFER TO DRAWINGS N01031-PWD-DRG-GEN-0110 TO N01031-PWD-DRG-GEN-0126 FOR GROUND TREATMENT PLANS.
6. REFER TO DRAWING N01031-PWD-DRG-GEN-0160 FOR THE EARTHWORKS FOUNDATION TREATMENT SCHEDULE.
7. C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.
8. THE EXTENT OF EACH FOUNDATION TREATMENT ZONE AS SHOWN HAS BEEN DETERMINED WITH REFERENCE TO EACH RAIL CONTROL LINE AND WHETHER IT IS IN CUT OR FILL. EXACT FOUNDATION TREATMENT ZONE EXTENTS AND TRANSITION FROM CUT FILL (AND VICE VERSA) TO BE DETERMINED ON SITE.



FOUNDATION TREATMENT LEGEND

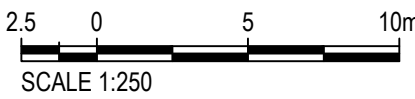
EMBANKMENTS

	E1		E5
	E2		E6
	E3		E7
	E4		E8

CUTS

	C1 OR C3
	C2

PLAN
1:250



CLIENT



REV	DATE	REVISION DETAILS	APPROVED
01	20.01.17	ACCEPTED FOR CONSTRUCTION	

SCALE
AS SHOWN

SIZE
A1

FOR CONSTRUCTION

DRAWN

ARTC DRAWING No			EDMS No			EDMS REV		
PROJECT			MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1					
TITLE			BULK EARTHWORKS GROUND TREATMENT PLAN SHEET 13 OF 17					
DRAWING No.		PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV	
		N01031	- PWD -	DRG	- GEN -	0122	- 01	

Proj Date: 20.01.17 11:22:15 AM Drawn: CPB WORKS/SEV LITTLE/ANZ Project: D020270/N01031-PWD-DRG-GEN-0122.DWG



AD JOINS DRG N01031-PWD-DRG-GEN-000122

From Sydney

ANZAC CULVERT

MIT EAST TERMINAL LINE

To Moorebank Imex Terminal

AD JOINS DRG N01031-PWD-DRG-GEN-00124

NOTES FOR GROUND TREATMENT PLANS

- THIS DRAWING IS IN TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER N01031-PWD-SPE-EWK-0001[A3]).
- REFER TO THE EARTHWORKS SPECIFICATION FOR A DESCRIPTION OF EMBANKMENT AND CUT FOUNDATION TREATMENTS.
- REFER TO DRAWINGS N01031-PWD-SPE-EWK-0025 TO N01031-PWD-DRG-GEN-0039 FOR EARTHWORKS CROSS SECTIONS.
- REFER TO DRAWINGS N01031-PWD-DRG-GEN-0050 TO N01031-PWD-DRG-GEN-0057 FOR TYPICAL CROSS SECTIONS.
- REFER TO DRAWINGS N01031-PWD-DRG-GEN-0110 TO N01031-PWD-DRG-GEN-0126 FOR GROUND TREATMENT PLANS.
- REFER TO DRAWING N01031-PWD-DRG-GEN-0160 FOR THE EARTHWORKS FOUNDATION TREATMENT SCHEDULE.
- C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.
- THE EXTENT OF EACH FOUNDATION TREATMENT ZONE AS SHOWN HAS BEEN DETERMINED WITH REFERENCE TO EACH RAIL CONTROL LINE AND WHETHER IT IS IN CUT OR FILL. EXACT FOUNDATION TREATMENT ZONE EXTENTS AND TRANSITION FROM CUT FILL (AND VICE VERSA) TO BE DETERMINED ON SITE.

PLAN
1:250

42km 000

41km 900

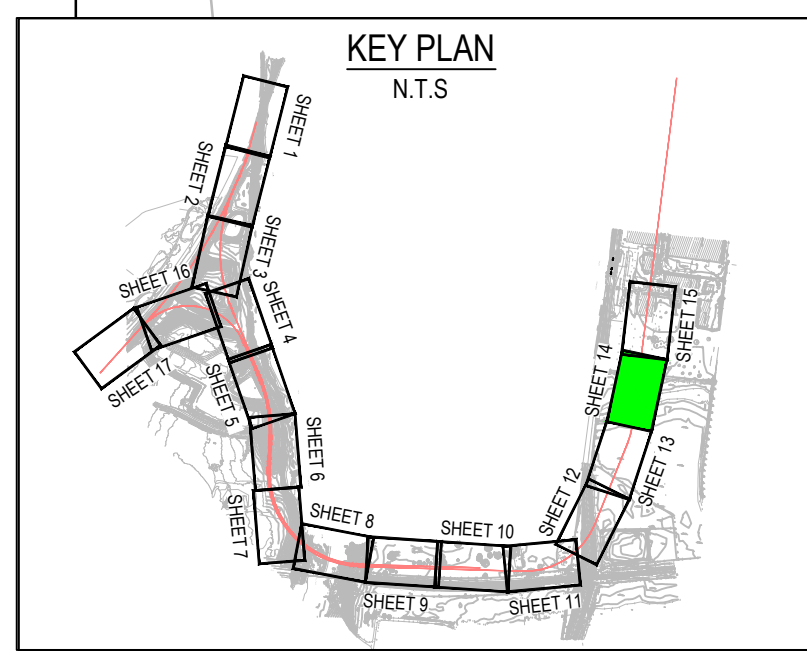
FOUNDATION TREATMENT LEGEND

EMBANKMENTS

	E1		E5
	E2		E6
	E3		E7
	E4		E8

CUTS

	C1 OR C3
	C2



2.5 0 5 10m
SCALE 1:250

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REV	DATE	REVISION DETAILS
01	20.01.17	ACCEPTED FOR CONSTRUCTION

SCALE	SIZE
AS SHOWN	A1

FOR CONSTRUCTION

ARTC DRAWING No	EDMS No	EDMS REV
PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1	
TITLE	BULK EARTHWORKS GROUND TREATMENT PLAN SHEET 14 OF 17	
DRAWING No.	PROJECT No.	ZONE
	N01031	PWD
		DRG
		GEN
		NUMBER
		0123
		REV
		01



From Sydney

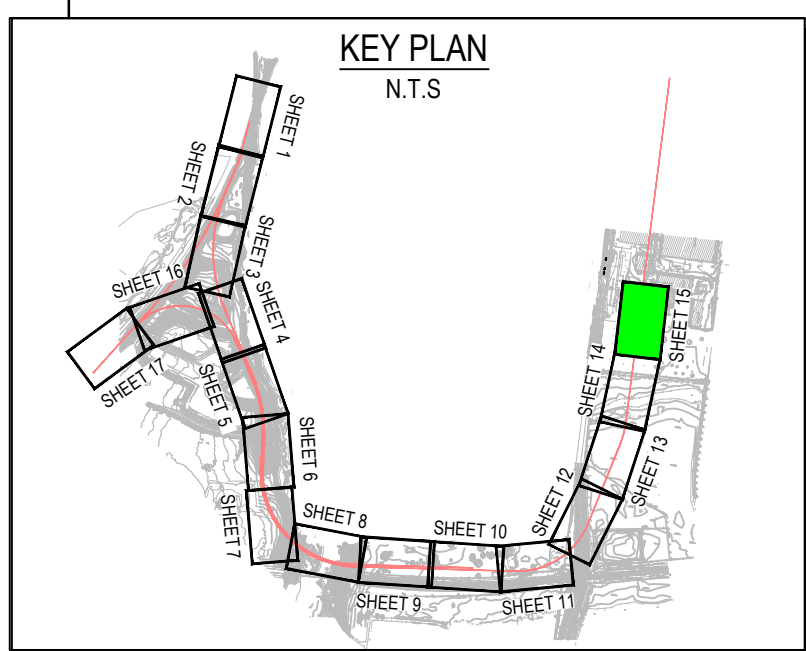
ADJOINS DRG N01031-PWD-DRG-GEN-000123

AD JOINC BDC N04034 D1/D BDC CFN 0013F

To Moorebank Imex Terminal

42km 100

1. THIS DRAWING IS IN TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER NO1031-PWD-SPE-EWK-0001[A3]).
2. REFER TO THE EARTHWORKS SPECIFICATION FOR A DESCRIPTION OF EMBANKMENT AND CUT FOUNDATION TREATMENTS.
3. REFER TO DRAWINGS NO1031-PWD-SPE-EWK-0025 TO NO1031-PWD-DRG-GEN-0039 FOR EARTHWORKS CROSS SECTIONS.
4. REFER TO DRAWINGS NO1031-PWD-DRG-GEN-0050 TO NO1031-PWD-DRG-GEN-0057 FOR TYPICAL CROSS SECTIONS.
5. REFER TO DRAWINGS NO1031-PWD-DRG-GEN-0110 TO NO1031-PWD-DRG-GEN-0126 FOR GROUND TREATMENT PLANS.
6. REFER TO DRAWING NO1031-PWD-DRG-GEN-0160 FOR THE EARTHWORKS FOUNDATION TREATMENT SCHEDULE.
7. C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.
8. THE EXTENT OF EACH FOUNDATION TREATMENT ZONE AS SHOWN HAS BEEN DETERMINED WITH REFERENCE TO EACH RAIL CONTROL LINE AND WHETHER IT IS IN CUT OR FILL. EXACT FOUNDATION TREATMENT ZONE EXTENTS AND TRANSITION FROM CUT FILL (AND VICE VERSA) TO BE DETERMINED ON SITE.











PLAN
1:250



42km 200




FOUNDATION TREATMENT LEGEND

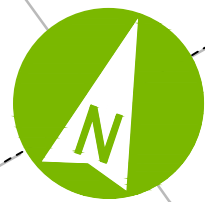
EMBANKMENTS

	E1		E5
	E2		E6
	E3		E7
	E4		E8

CUTS

 C1 OR C3
 C2

CLIENT		REV	DATE	REVISION DETAILS	APPROVED	SCALE	SIZE	FOR CONSTRUCTION	PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1				
<div><div>SIMTA SYDNEY INTERMODAL TERMINAL ALLIANCE</div></div>		01	20.01.17	ACCEPTED FOR CONSTRUCTION		AS SHOWN	A1		TITLE	BULK EARTHWORKS GROUND TREATMENT PLAN SHEET 15 OF 17				
DRAWING No.	PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV								
N01031	-	PWD	-	DRG	-	GEN	-	0124	-	01				



MAIN SOUTHERN RAILWAY LINE

MIT SOUTH CONNECTION

From Glenfield

To Moorebank Inex Terminal

39m 900

39m 800

40m 000

NOTES FOR GROUND TREATMENT PLANS

- THIS DRAWING IS IN TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER N01031-PWD-SPE-EWK-0001[A3]).
- REFER TO THE EARTHWORKS SPECIFICATION FOR A DESCRIPTION OF EMBANKMENT AND CUT FOUNDATION TREATMENTS.
- REFER TO DRAWINGS N01031-PWD-SPE-EWK-0025 TO N01031-PWD-DRG-GEN-0039 FOR EARTHWORKS CROSS SECTIONS.
- REFER TO DRAWINGS N01031-PWD-DRG-GEN-0050 TO N01031-PWD-DRG-GEN-0057 FOR TYPICAL CROSS SECTIONS.
- REFER TO DRAWINGS N01031-PWD-DRG-GEN-0110 TO N01031-PWD-DRG-GEN-0126 FOR GROUND TREATMENT PLANS.
- REFER TO DRAWING N01031-PWD-DRG-GEN-0160 FOR THE EARTHWORKS FOUNDATION TREATMENT SCHEDULE.
- C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.
- THE EXTENT OF EACH FOUNDATION TREATMENT ZONE AS SHOWN HAS BEEN DETERMINED WITH REFERENCE TO EACH RAIL CONTROL LINE AND WHETHER IT IS IN CUT OR FILL. EXACT FOUNDATION TREATMENT ZONE EXTENTS AND TRANSITION FROM CUT FILL (AND VICE VERSA) TO BE DETERMINED ON SITE.

FOUNDATION TREATMENT LEGEND

EMBANKMENTS

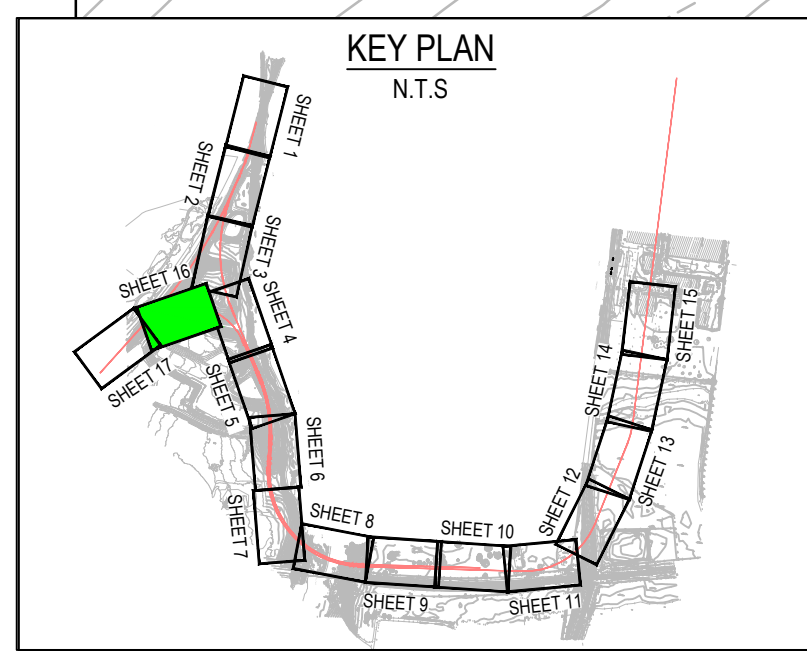
	E1		E5
	E2		E6
	E3		E7
	E4		E8

CUTS

	C1 OR C3
	C2

PLAN
1:250

2.5 0 5 10m
SCALE 1:250



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REV	DATE	REVISION DETAILS	APPROVED
01	20.01.17	ACCEPTED FOR CONSTRUCTION	

SCALE AS SHOWN	SIZE A1	FOR CONSTRUCTION

ARTC DRAWING No	EDMS No	EDMS REV
PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1	
TITLE	BULK EARTHWORKS GROUND TREATMENT PLAN SHEET 16 OF 17	
DRAWING No.	PROJECT No.	ZONE
	N01031	PWD
		DRG
		GEN
		NUMBER
		0125
		REV
		01



NOTES FOR GROUND TREATMENT PLANS

1.

THIS DRAWING IS IN TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER N01031-PWD-SPE-EWK-0001[A3]).
2.

REFER TO THE EARTHWORKS SPECIFICATION FOR A DESCRIPTION OF EMBANKMENT AND CUT FOUNDATION TREATMENTS.
3.

REFER TO DRAWINGS N01031-PWD-SPE-EWK-0025 TO N01031-PWD-DRG-GEN-0039 FOR EARTHWORKS CROSS SECTIONS.
4.

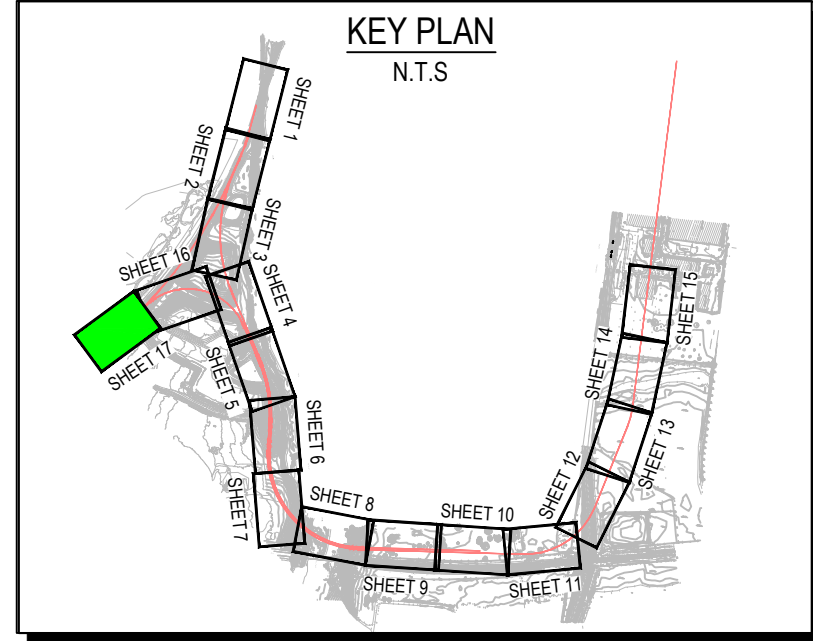
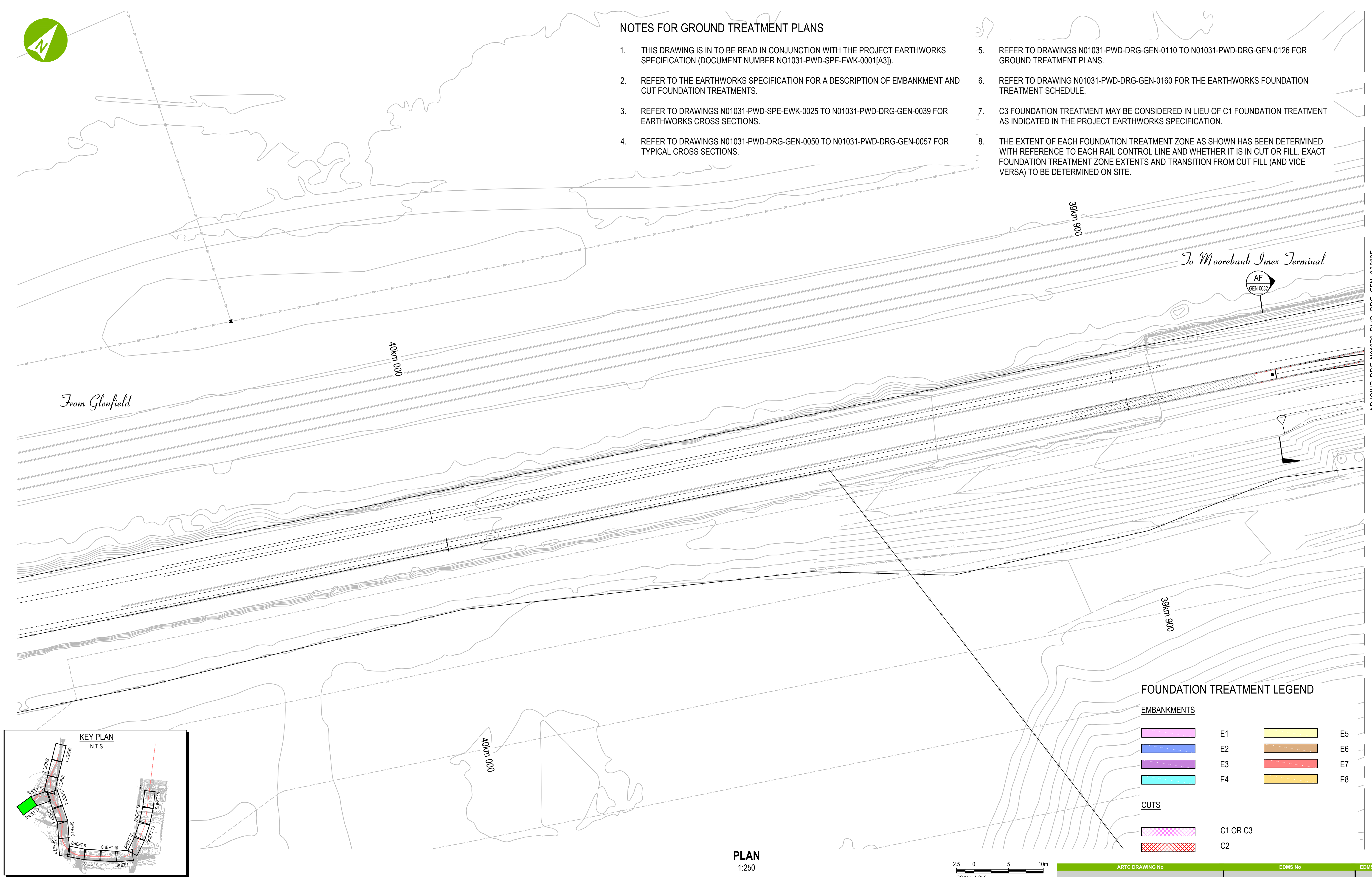
REFER TO DRAWINGS N01031-PWD-DRG-GEN-0050 TO N01031-PWD-DRG-GEN-0057 FOR TYPICAL CROSS SECTIONS.
5.

REFER TO DRAWINGS N01031-PWD-DRG-GEN-0110 TO N01031-PWD-DRG-GEN-0126 FOR GROUND TREATMENT PLANS.
6.

REFER TO DRAWING N01031-PWD-DRG-GEN-0160 FOR THE EARTHWORKS FOUNDATION TREATMENT SCHEDULE.
7.

C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.
8.

THE EXTENT OF EACH FOUNDATION TREATMENT ZONE AS SHOWN HAS BEEN DETERMINED WITH REFERENCE TO EACH RAIL CONTROL LINE AND WHETHER IT IS IN CUT OR FILL. EXACT FOUNDATION TREATMENT ZONE EXTENTS AND TRANSITION FROM CUT FILL (AND VICE VERSA) TO BE DETERMINED ON SITE.



FOUNDATION TREATMENT LEGEND

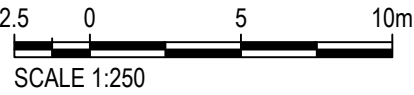
EMBANKMENTS

	E1		E5
	E2		E6
	E3		E7
	E4		E8

CUTS

	C1 OR C3
	C2

PLAN
1:250



ARTC DRAWING No			EDMS No			EDMS REV		
PROJECT			MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1					
TITLE			BULK EARTHWORKS GROUND TREATMENT PLAN SHEET 17 OF 17					
DRAWING No.		PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV	
		N01031	PWD	DRG	GEN	0126	01	

CLIENT

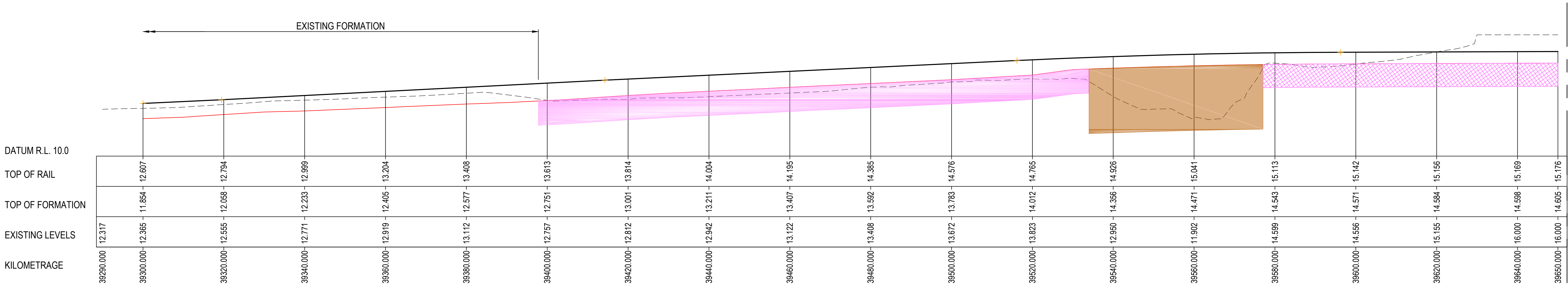
SIMTA

SYDNEY INTERMODAL TERMINAL ALLIANCE

REV	DATE	REVISION DETAILS	APPROVED
01	20.01.17	ACCEPTED FOR CONSTRUCTION	

SCALE	SIZE	FOR CONSTRUCTION
AS SHOWN	A1	

Plot Date: 28/01/2017 11:28:07 AM Client: AUS/30 Filename: C:\PM\WORKSPACE\LEVEL\N10131-PWD\DRG-GEN\150.DWG



LONGITUDINAL SECTION ALONG - MB2N
SCALE 1:500 H
SCALE 1:100 V

GENERAL NOTES

- THIS DRAWING IS IN TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER N01031-PWD-SPE-EWK-0001[A3]).
- REFER TO THE EARTHWORKS SPECIFICATION FOR A DESCRIPTION OF EMBANKMENT AND CUT FOUNDATION TREATMENTS.
- REFER TO DRAWINGS N01031-PWD-SPE-EWK-0025 TO N01031-PWD-DRG-GEN-0039 FOR EARTHWORKS CROSS SECTIONS.
- REFER TO DRAWINGS N01031-PWD-DRG-GEN-0050 TO N01031-PWD-DRG-GEN-0054 FOR TYPICAL CROSS SECTIONS.
- REFER TO DRAWINGS N01031-PWD-DRG-GEN-0110 TO N01031-PWD-DRG-GEN-0126 FOR GROUND TREATMENT PLANS.
- REFER TO DRAWING N01031-PWD-DRG-GEN-0160 FOR THE EARTHWORKS FOUNDATION TREATMENT SCHEDULE.
- C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.

LEGEND

- TOP OF RAIL
- TOP OF FORMATION
- EXISTING SURFACE

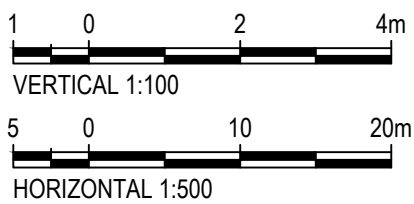
FOUNDATION TREATMENT LEGEND

EMBANKMENTS

- E1
- E2
- E3
- E4
- E5
- E6
- E7
- E8

CUTS

- C1 OR C3
- C2

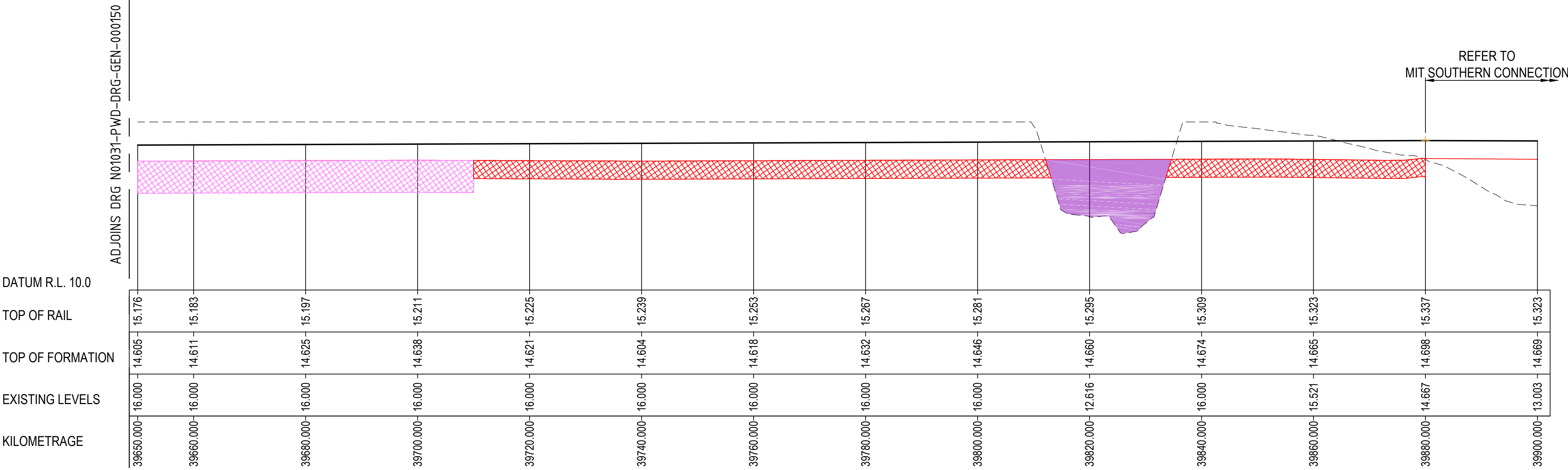


REV	DATE	REVISION DETAILS	APPROVED
01	20.01.17	ACCEPTED FOR CONSTRUCTION	

SCALE	SIZE	FOR CONSTRUCTION
AS SHOWN	A1	

ARTC DRAWING No	EDMS No	EDMS REV
PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1	
TITLE	BULK EARTHWORKS GROUND TREATMENT LONGSECTION SHEET 1 OF 9	
DRAWING No.	PROJECT No.	ZONE
	N01031	PWD
		DRG
		GEN
		NUMBER
		0150
		REV
		01

Plot Date: 28/01/2017 11:28:30 AM Client: AUSO Filename: C:\P\ WORKSPACE\LEVEL\N2\ PROJ\002\07\0N01031-PWD-DRG-GEN\0151.DWG



LONGITUDINAL SECTION ALONG - MB2N
SCALE 1:500 H
SCALE 1:100 V

GENERAL NOTES

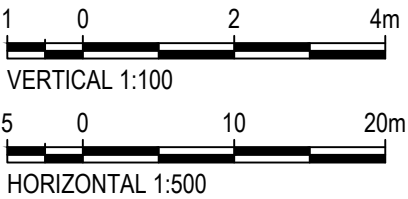
- THIS DRAWING IS IN TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER N01031-PWD-SPE-EWK-0001[A3]).
- REFER TO THE EARTHWORKS SPECIFICATION FOR A DESCRIPTION OF EMBANKMENT AND CUT FOUNDATION TREATMENTS.
- REFER TO DRAWINGS N01031-PWD-SPE-EWK-0025 TO N01031-PWD-DRG-GEN-0039 FOR EARTHWORKS CROSS SECTIONS.
- REFER TO DRAWINGS N01031-PWD-DRG-GEN-0050 TO N01031-PWD-DRG-GEN-0054 FOR TYPICAL CROSS SECTIONS.
- REFER TO DRAWINGS N01031-PWD-DRG-GEN-0110 TO N01031-PWD-DRG-GEN-0126 FOR GROUND TREATMENT PLANS.
- REFER TO DRAWING N01031-PWD-DRG-GEN-0160 FOR THE EARTHWORKS FOUNDATION TREATMENT SCHEDULE.
- C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.

LEGEND

- TOP OF RAIL
- TOP OF FORMATION
- EXISTING SURFACE

FOUNDATION TREATMENT LEGEND

- EMBANKMENTS
- E1
 - E2
 - E3
 - E4
 - E5
 - E6
 - E7
 - E8
- CUTS
- C1 OR C3
 - C2



REV	DATE	REVISION DETAILS	APPROVED
01	20.01.17	ACCEPTED FOR CONSTRUCTION	

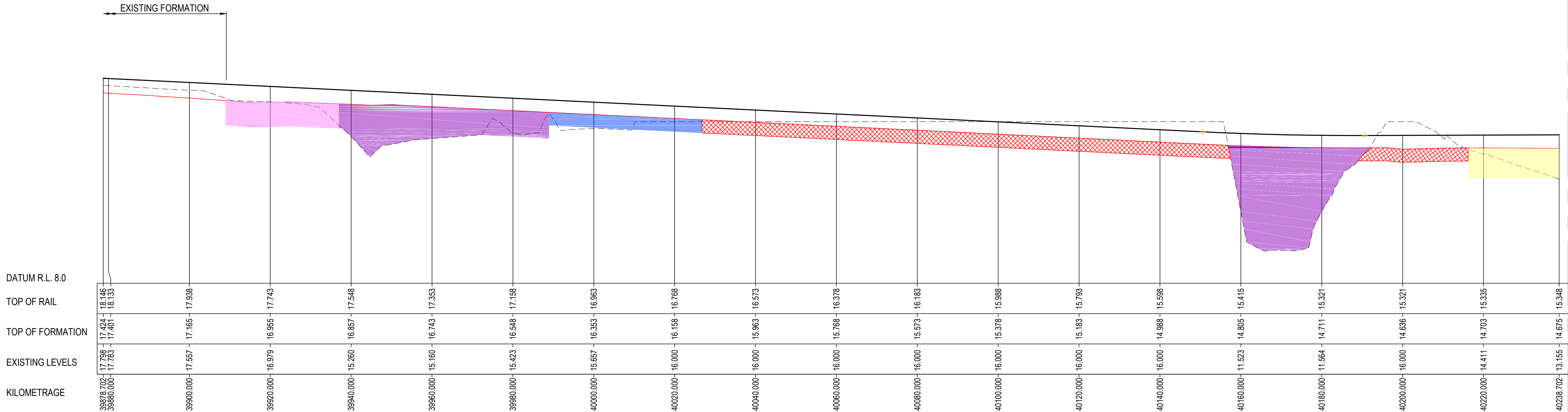
SCALE
AS SHOWN

SIZE
A1

FOR CONSTRUCTION

ARTC DRAWING No		EDMS No	EDMS REV
PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1		
TITLE	BULK EARTHWORKS GROUND TREATMENT LONGSECTION SHEET 2 OF 9		
DRAWING No.	PROJECT No.	ZONE	TYPE
	N01031	PWD	DRG
		DISC	GEN
		NUMBER	REV
		0151	01

Proj Date: 28/01/2017 11:28:32 AM Office: AUS/0 Filename: C:\P\WORKSPACE\LEVEL\LEARN\PROJECTS\2017\N01031-PWD-DRG-GEN\151.DWG



LONGITUDINAL SECTION ALONG - MB2S

SCALE 1:500 H
SCALE 1:100 V

GENERAL NOTES

1.

THIS DRAWING IS IN TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER N01031-PWD-SPE-EWK-0001[A3]).
2.

REFER TO THE EARTHWORKS SPECIFICATION FOR A DESCRIPTION OF EMBANKMENT AND CUT FOUNDATION TREATMENTS.
3.

REFER TO DRAWINGS N01031-PWD-SPE-EWK-0025 TO N01031-PWD-DRG-GEN-0039 FOR EARTHWORKS CROSS SECTIONS.
4.

REFER TO DRAWINGS N01031-PWD-DRG-GEN-0050 TO N01031-PWD-DRG-GEN-0054 FOR TYPICAL CROSS SECTIONS.
5.

REFER TO DRAWINGS N01031-PWD-DRG-GEN-0110 TO N01031-PWD-DRG-GEN-0126 FOR GROUND TREATMENT PLANS.
6.

REFER TO DRAWING N01031-PWD-DRG-GEN-0160 FOR THE EARTHWORKS FOUNDATION TREATMENT SCHEDULE.
7.

C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.

LEGEND

- TOP OF RAIL
- TOP OF FORMATION
- EXISTING SURFACE

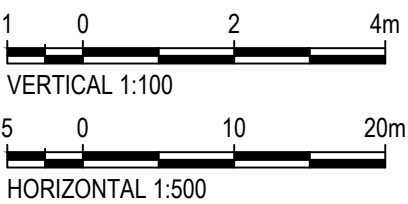
FOUNDATION TREATMENT LEGEND

EMBANKMENTS

- E1
- E2
- E3
- E4
- E5
- E6
- E7
- E8

CUTS

- C1 OR C3
- C2



REV	DATE	REVISION DETAILS	D
01	20.01.17	ACCEPTED FOR CONSTRUCTION	

SCALE

AS SHOWN

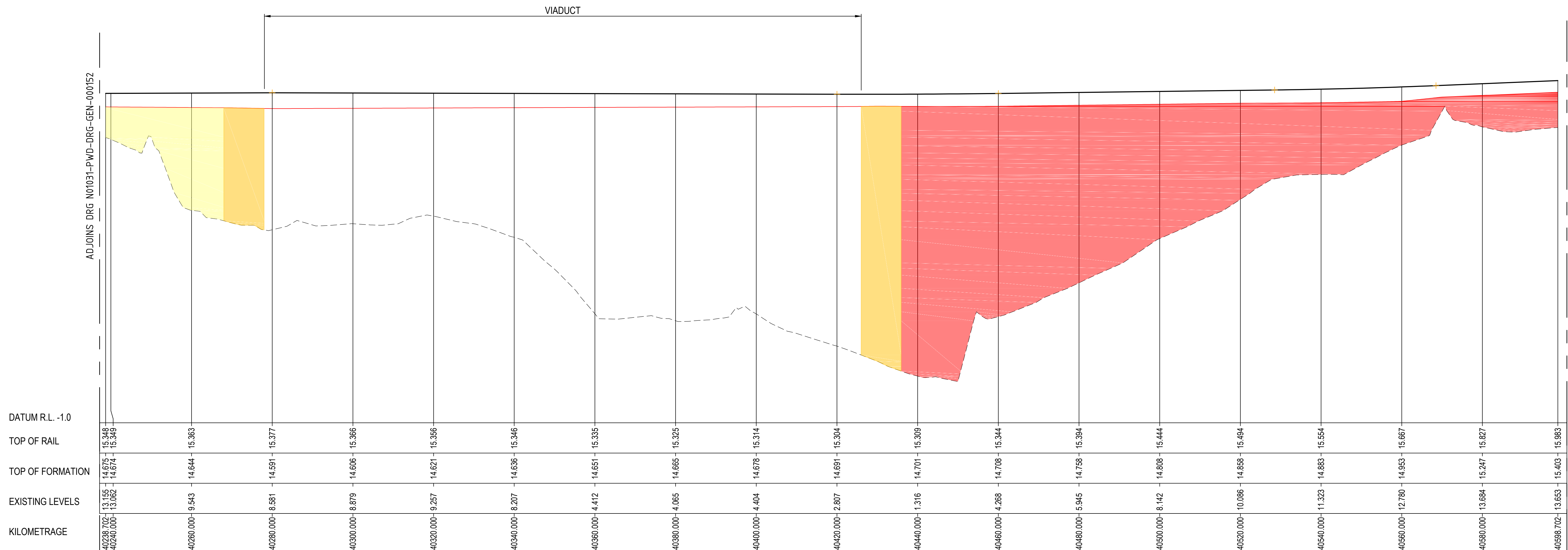
SIZE

A1

FOR CONSTRUCTION

ARTC DRAWING No		EDMS No		EDMS REV	
PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1				
TITLE	BULK EARTHWORKS GROUND TREATMENT LONGSECTION SHEET 3 OF 9				
DRAWING No.	PROJECT No.	ZONE	TYPE	DISC	NUMBER
	N01031	-	PWD	-	DRG
			GEN	-	0152
					- 01

Proj Date: 28/01/17 11:28:14 AM Office: AUS/30 Filename: C:\P\ WORKSPACE\LEVEL\LEARN\PROJECTS\2017\N01031-PWD-DRG-GEN\153.DWG



LONGITUDINAL SECTION ALONG - MB2S

SCALE 1:500 H
SCALE 1:100 V

GENERAL NOTES

1.

THIS DRAWING IS IN TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER N01031-PWD-SPE-EWK-0001[A3]).
2.

REFER TO THE EARTHWORKS SPECIFICATION FOR A DESCRIPTION OF EMBANKMENT AND CUT FOUNDATION TREATMENTS.
3.

REFER TO DRAWINGS N01031-PWD-SPE-EWK-0025 TO N01031-PWD-DRG-GEN-0039 FOR EARTHWORKS CROSS SECTIONS.
4.

REFER TO DRAWINGS N01031-PWD-DRG-GEN-0050 TO N01031-PWD-DRG-GEN-0054 FOR TYPICAL CROSS SECTIONS.
5.

REFER TO DRAWINGS N01031-PWD-DRG-GEN-0110 TO N01031-PWD-DRG-GEN-0126 FOR GROUND TREATMENT PLANS.
6.

REFER TO DRAWING N01031-PWD-DRG-GEN-0160 FOR THE EARTHWORKS FOUNDATION TREATMENT SCHEDULE.
7.

C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.

LEGEND

- TOP OF RAIL
- TOP OF FORMATION
- EXISTING SURFACE

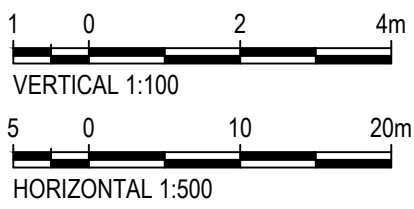
FOUNDATION TREATMENT LEGEND

EMBANKMENTS

- E1
- E2
- E3
- E4
- E5
- E6
- E7
- E8

CUTS

- C1 OR C3
- C2



REV	DATE	REVISION DETAILS	APPROVED
01	20.01.17	ACCEPTED FOR CONSTRUCTION	

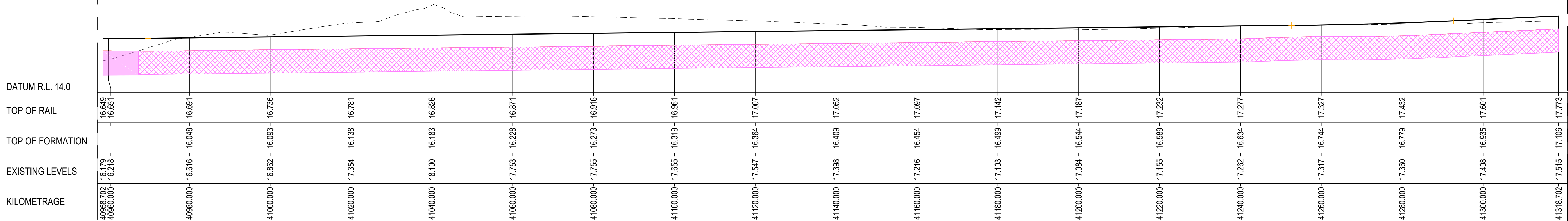
SCALE	SIZE	FOR CONSTRUCTION
AS SHOWN	A1	

ARTC DRAWING No	EDMS No	EDMS REV
PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1	
TITLE	BULK EARTHWORKS GROUND TREATMENT LONGSECTION SHEET 4 OF 9	
DRAWING No.	PROJECT No.	ZONE
	N01031	PWD
		DRG
		GEN
		NUMBER
		0153
		REV
		01

Plot Date: 28/01/2017 11:31:42 AM Office: AUS/30 Filename: C:\P\WORKSPACE\LEVEL\LEARN\PROJECTS\2017\N01031-PWD-DRG-GEN\156.DWG

ADJOINS DRG N01031-PWD-DRG-GEN-000154

ADJOINS DRG N01031-PWD-DRG-GEN-00156



LONGITUDINAL SECTION ALONG - MB2S
SCALE 1:500 H
SCALE 1:100 V

GENERAL NOTES

1.

THIS DRAWING IS IN TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER N01031-PWD-SPE-EWK-0001[A3]).
2.

REFER TO THE EARTHWORKS SPECIFICATION FOR A DESCRIPTION OF EMBANKMENT AND CUT FOUNDATION TREATMENTS.
3.

REFER TO DRAWINGS N01031-PWD-SPE-EWK-0025 TO N01031-PWD-DRG-GEN-0039 FOR EARTHWORKS CROSS SECTIONS.
4.

REFER TO DRAWINGS N01031-PWD-DRG-GEN-0050 TO N01031-PWD-DRG-GEN-0054 FOR TYPICAL CROSS SECTIONS.
5.

REFER TO DRAWINGS N01031-PWD-DRG-GEN-0110 TO N01031-PWD-DRG-GEN-0126 FOR GROUND TREATMENT PLANS.
6.

REFER TO DRAWING N01031-PWD-DRG-GEN-0160 FOR THE EARTHWORKS FOUNDATION TREATMENT SCHEDULE.
7.

C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.

LEGEND

- TOP OF RAIL
- TOP OF FORMATION
- EXISTING SURFACE

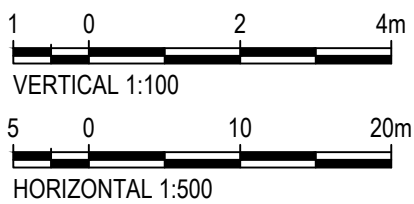
FOUNDATION TREATMENT LEGEND

EMBANKMENTS

- E1
- E2
- E3
- E4
- E5
- E6
- E7
- E8

CUTS

- C1 OR C3
- C2

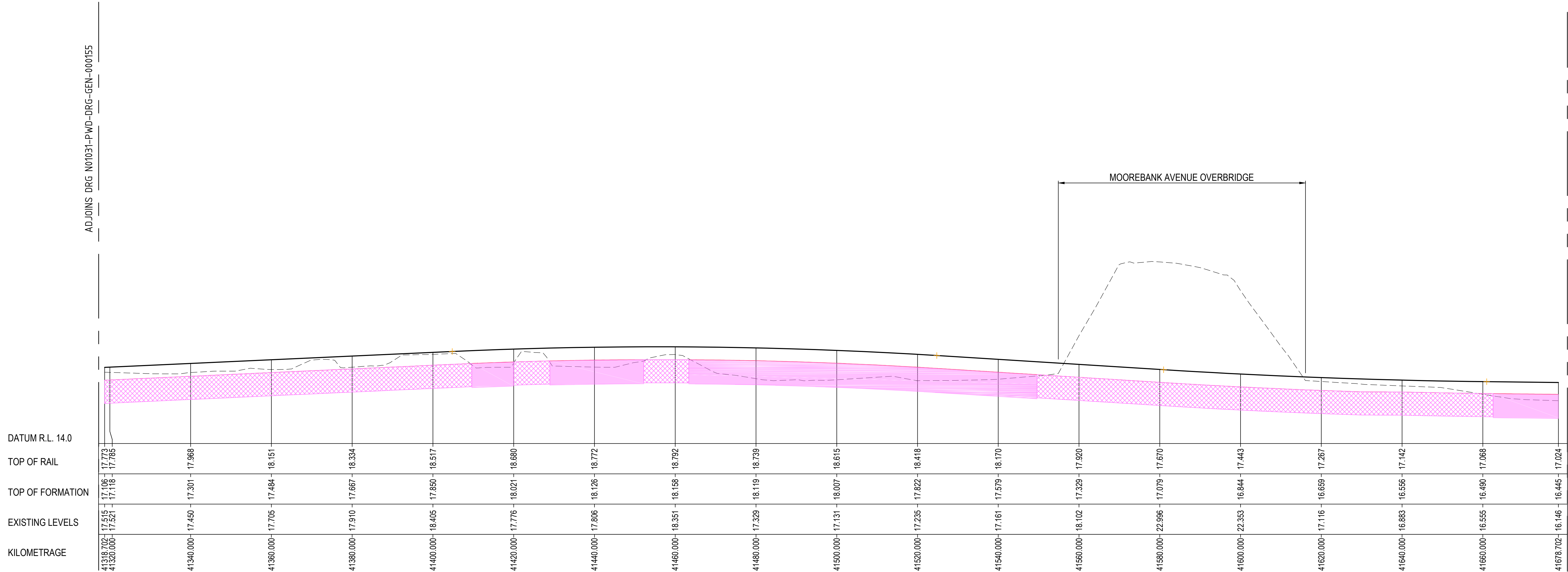


REV	DATE	REVISION DETAILS	APPROVED
01	20.01.17	ACCEPTED FOR CONSTRUCTION	

SCALE	SIZE	FOR CONSTRUCTION
AS SHOWN	A1	
DRAWN		

ARTC DRAWING No		EDMS No	EDMS REV
PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1		
TITLE	BULK EARTHWORKS GROUND TREATMENT LONGSECTION SHEET 6 OF 9		
DRAWING No.	PROJECT No. N01031	ZONE PWD	TYPE DRG
	DISC GEN	NUMBER 0155	REV 01

Plot Date: 28/01/2017 11:32:27 AM Office: AUS/30 Filename: C:\P\WORKSPACE\LEVEL\LEARN\PROJECTS\2017\N01031-PWD-DRG-GEN\156.DWG



LONGITUDINAL SECTION ALONG - MB2S
SCALE 1:500 H
SCALE 1:100 V

GENERAL NOTES

1.

THIS DRAWING IS IN TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER N01031-PWD-SPE-EWK-0001[A3]).
2.

REFER TO THE EARTHWORKS SPECIFICATION FOR A DESCRIPTION OF EMBANKMENT AND CUT FOUNDATION TREATMENTS.
3.

REFER TO DRAWINGS N01031-PWD-SPE-EWK-0025 TO N01031-PWD-DRG-GEN-0039 FOR EARTHWORKS CROSS SECTIONS.
4.

REFER TO DRAWINGS N01031-PWD-DRG-GEN-0050 TO N01031-PWD-DRG-GEN-0054 FOR TYPICAL CROSS SECTIONS.
5.

REFER TO DRAWINGS N01031-PWD-DRG-GEN-0110 TO N01031-PWD-DRG-GEN-0126 FOR GROUND TREATMENT PLANS.
6.

REFER TO DRAWING N01031-PWD-DRG-GEN-0160 FOR THE EARTHWORKS FOUNDATION TREATMENT SCHEDULE.
7.

C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.

LEGEND

- TOP OF RAIL
- TOP OF FORMATION
- EXISTING SURFACE

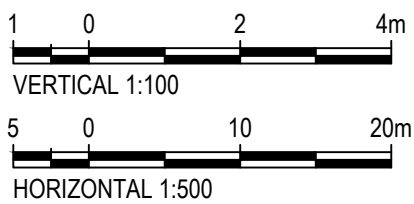
FOUNDATION TREATMENT LEGEND

EMBANKMENTS

- E1
- E2
- E3
- E4
- E5
- E6
- E7
- E8

CUTS

- C1 OR C3
- C2



REV	DATE	REVISION DETAILS
01	20.01.17	ACCEPTED FOR CONSTRUCTION

SCALE
AS SHOWN

SIZE
A1

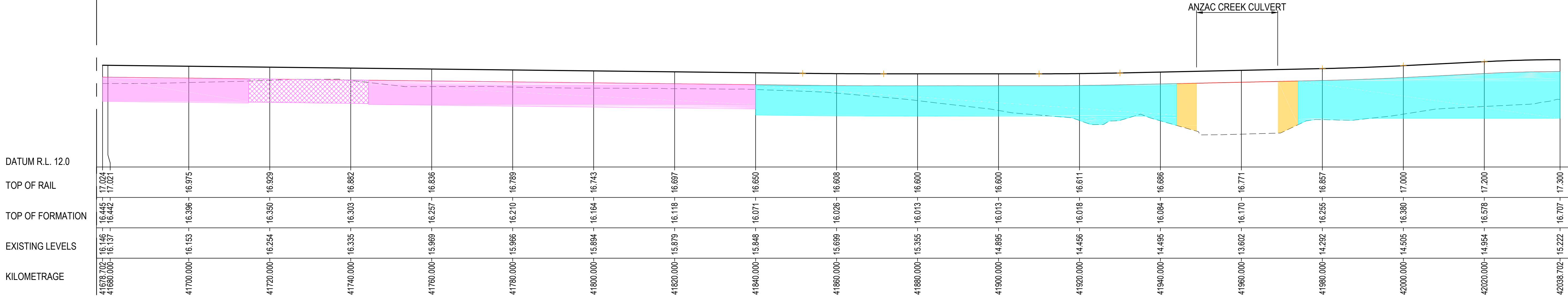
FOR CONSTRUCTION

ARTC DRAWING No			EDMS No			EDMS REV	
PROJECT			MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1				
TITLE			BULK EARTHWORKS GROUND TREATMENT LONGSECTION SHEET 7 OF 9				
DRAWING No.		PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV
		N01031	- PWD	- DRG	- GEN	0156	- 01

Proj Date: 28/01/2017 11:03:10 AM Office: AUS/0 Filename: C:\P\WORKSPACE\LEVEL\LEARN\PROJECTS\2017\MOORE\01-PWD-DRG-GEN\151.DWG

ADJOINS DRG N01031-PWD-DRG-GEN-000156

ADJOINS DRG N01031-PWD-DRG-GEN-00158



LONGITUDINAL SECTION ALONG - MB2S

SCALE 1:500 H
SCALE 1:100 V

GENERAL NOTES

1.

THIS DRAWING IS IN TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER N01031-PWD-SPE-EWK-0001[A3]).
2.

REFER TO THE EARTHWORKS SPECIFICATION FOR A DESCRIPTION OF EMBANKMENT AND CUT FOUNDATION TREATMENTS.
3.

REFER TO DRAWINGS N01031-PWD-SPE-EWK-0025 TO N01031-PWD-DRG-GEN-0039 FOR EARTHWORKS CROSS SECTIONS.
4.

REFER TO DRAWINGS N01031-PWD-DRG-GEN-0050 TO N01031-PWD-DRG-GEN-0054 FOR TYPICAL CROSS SECTIONS.
5.

REFER TO DRAWINGS N01031-PWD-DRG-GEN-0110 TO N01031-PWD-DRG-GEN-0126 FOR GROUND TREATMENT PLANS.
6.

REFER TO DRAWING N01031-PWD-DRG-GEN-0160 FOR THE EARTHWORKS FOUNDATION TREATMENT SCHEDULE.
7.

C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.

LEGEND

- TOP OF RAIL
- TOP OF FORMATION
- EXISTING SURFACE

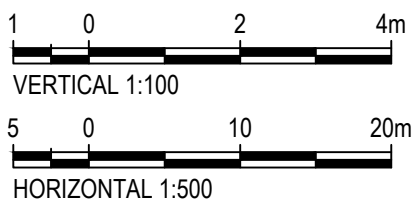
FOUNDATION TREATMENT LEGEND

EMBANKMENTS

- E1
- E2
- E3
- E4
- E5
- E6
- E7
- E8

CUTS

- C1 OR C3
- C2



REV	DATE	REVISION DETAILS
01	20.01.17	ACCEPTED FOR CONSTRUCTION

APPROVED

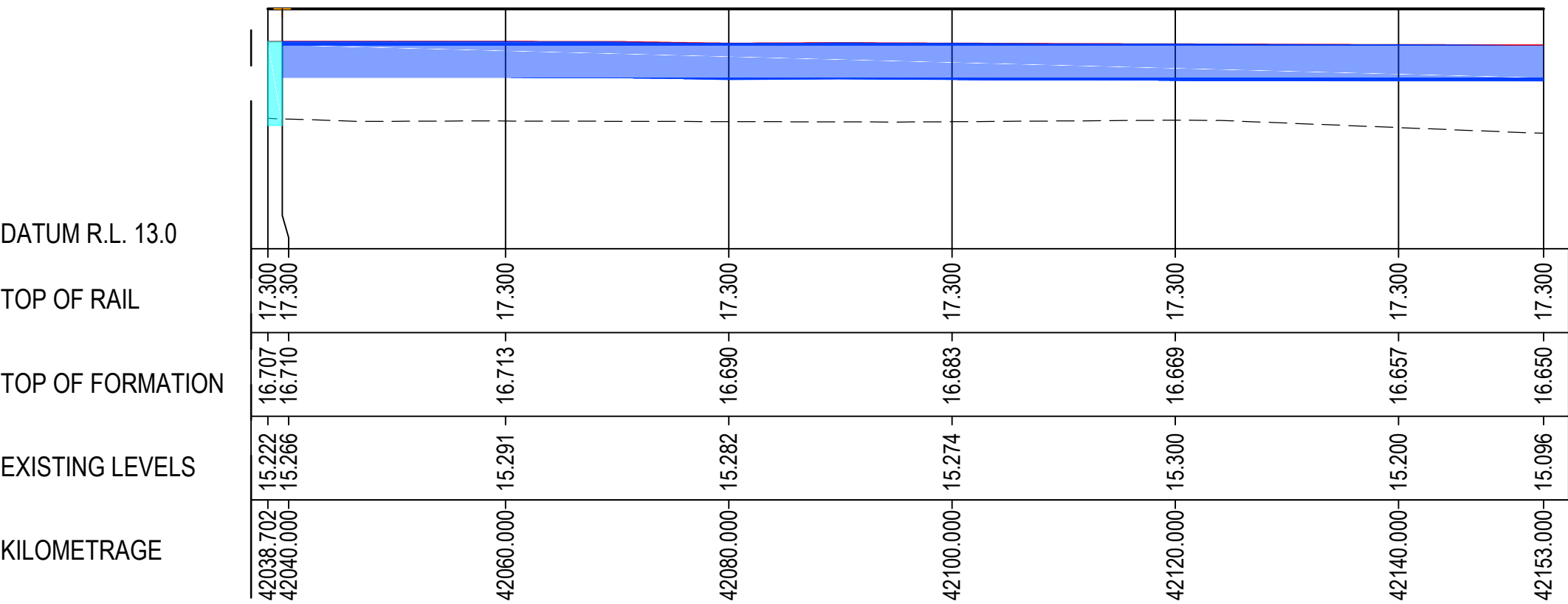
SCALE
AS SHOWN

SIZE
A1

FOR CONSTRUCTION

ARTC DRAWING No			EDMS No			EDMS REV			
PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1								
TITLE	BULK EARTHWORKS GROUND TREATMENT LONGSECTION SHEET 8 OF 9								
DRAWING No.	PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV			
	N01031	- PWD	- DRG	- GEN	- 0157	- 01			

ADJOINS DRG N01031-PWD-DRG-GEN-000157



LONGITUDINAL SECTION ALONG - MB2S

SCALE 1:500 H
SCALE 1:100 V

GENERAL NOTES

1.

THIS DRAWING IS IN TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER N01031-PWD-SPE-EWK-0001[A3]).
2.

REFER TO THE EARTHWORKS SPECIFICATION FOR A DESCRIPTION OF EMBANKMENT AND CUT FOUNDATION TREATMENTS.
3.

REFER TO DRAWINGS N01031-PWD-SPE-EWK-0025 TO N01031-PWD-DRG-GEN-0039 FOR EARTHWORKS CROSS SECTIONS.
4.

REFER TO DRAWINGS N01031-PWD-DRG-GEN-0050 TO N01031-PWD-DRG-GEN-0054 FOR TYPICAL CROSS SECTIONS.
5.

REFER TO DRAWINGS N01031-PWD-DRG-GEN-0110 TO N01031-PWD-DRG-GEN-0126 FOR GROUND TREATMENT PLANS.
6.

REFER TO DRAWING N01031-PWD-DRG-GEN-0160 FOR THE EARTHWORKS FOUNDATION TREATMENT SCHEDULE.
7.

C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.

LEGEND

- TOP OF RAIL
- TOP OF FORMATION
- EXISTING SURFACE

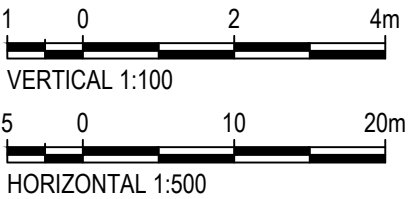
FOUNDATION TREATMENT LEGEND

EMBANKMENTS

- E1
- E2
- E3
- E4
- E5
- E6
- E7
- E8

CUTS

- C1 OR C3
- C2



REV	DATE	REVISION DETAILS	APPROVED
01	20.01.17	ACCEPTED FOR CONSTRUCTION	

SCALE	SIZE	
AS SHOWN	A1	FOR CONSTRUCTION

ARTC DRAWING No		EDMS No		EDMS REV				
PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1							
TITLE	BULK EARTHWORKS GROUND TREATMENT LONGSECTION SHEET 9 OF 9							
DRAWING No.	PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV		
N01031	-	PWD	-	DRG	-	0158	-	01

EARTHWORKS SCHEDULE FOR PROPOSED NEW RAIL LINE												
Rail Line	Kilometrage Start (km)	Kilometrage End (km)	Length (m)	Cut / Fill / Grade / Structure	Maximum Cut / Fill Height (m)	Formation Level (RL m AHD)	Indicative In-situ CBR (%)	Required Capping Material Thickness (mm)	Required Structural Zone Fill (with CBR = 8%) Thickness (mm)	Required Structural Zone Fill (with CBR = 20%) Thickness (mm)	Required Minimum Drainage Blanket Thickness (mm)	Foundation Treatment Type
North	39.300	39.420	120	Existing Formation	-	-	-	-	-	-	-	-
North	39.420	39.534	114	Fill	0.5	12.8 - 14.0	>1 and <3%	150	1000	600	-	E1
North	39.534	39.576	42	Fill	4.5	14.0 - 14.4	>3% (after foundation treatment)	150	500	300	-	E6
North	39.576	39.710	134	Cut	2.0	14.4 - 14.5	>1 and <3%	150	1000	600	-	C1 or C3
North	39.710	39.812	102	Cut	2.0	14.5 - 14.6	>3%	150	500	300	-	C2
North	39.812	39.835	23	Fill	2.5	14.6 - 14.6	>3%	150	500	300	-	E3
North	39.835	39.880	45	Cut	2.0	14.6 - 14.7	>3%	150	500	300	-	C2
North	39.880	40.910	1030	REFER TO SOUTHERN MIT CONNECTION								

NOTES FOR EARTHWORKS SCHEDULE

1.

THIS DRAWING IS IN TO BE READ IN CONJUNCTION WITH THE PROJECT EARTHWORKS SPECIFICATION (DOCUMENT NUMBER NO1031-PWD-SPE-EWK-0001[A3]).

2.

REFER TO THE EARTHWORKS SPECIFICATION FOR A DESCRIPTION OF EMBANKMENT AND CUT FOUNDATION TREATMENTS.

3.

REFER TO DRAWINGS N01031-PWD-DRG-GEN-0025 TO N01031-PWD-DRG-GEN-0039 FOR EARTHWORKS CROSS SECTIONS.

4.

REFER TO DRAWINGS N01031-PWD-DRG-GEN-0050 TO N01031-PWD-DRG-GEN-0057 FOR TYPICAL CROSS SECTIONS.

5.

REFER TO DRAWINGS N01031-PWD-DRG-GEN-0110 TO N01031-PWD-DRG-GEN-0126 FOR GROUND TREATMENT PLANS.

6.

REFER TO DRAWING N01031-PWD-DRG-GEN-0150 TO N01031-PWD-DRG-GEN-0158 FOR FOUNDATION TREATMENT LONG SECTIONS.

7.

FOUNDATION TREATMENT TYPES TO BE CONFIRMED BY GEOTECHNICAL ENGINEER ON SITE BASED ON OBSERVED GROUND CONDITIONS.

8.

C3 FOUNDATION TREATMENT MAY BE CONSIDERED IN LIEU OF C1 FOUNDATION TREATMENT AS INDICATED IN THE PROJECT EARTHWORKS SPECIFICATION.

EARTHWORKS SCHEDULE FOR PROPOSED NEW RAIL LINE												
Rail Line	Kilometrage Start (km)	Kilometrage End (km)	Length (m)	Cut / Fill / Grade / Structure	Maximum Cut / Fill Height (m)	Formation Level (RL m AHD)	Indicative In-situ CBR (%)	Required Capping Material Thickness (mm)	Required Structural Zone Fill (with CBR = 8%) Thickness (mm)	Required Structural Zone Fill (with CBR = 20%) Thickness (mm)	Required Minimum Drainage Blanket Thickness (mm)	Foundation Treatment Type
South	39.892	39.937	45	Fill	1.2	17.2 - 16.9	>1 and <3%	150	1000	600	-	E1
South	39.937	39.989	52	Fill	2.5	16.9 - 16.3	>3%	150	500	300		E3
South	39.989	40.027	38	Fill	1.0	16.3 - 16.1	>3%	150	500	300	-	E2
South	40.027	40.157	130	Cut	2.0	16.1 - 14.7	>3%	150	500	300	-	C2
South	40.157	40.191	34	Fill	5.0	14.7 - 14.6	>3%	150	500	300	-	E3
South	40.191	40.217	26	Cut	1.8	14.6 - 14.6	>3%	150	500	300	-	C2
South	40.217	40.268	51	RSW	6.5	14.6 - 14.7	>3%	150	500	300	300	E5
South	40.268	40.278	10	Fill	6.8	14.7 - 14.7	>3%	150	500	300(?)	300	E8
South	40.278	40.426	148	Viaduct	-	-	-	-	-	-	-	-
South	40.426	40.436	10	Fill	4.4000	14.8 - 14.8	>3%	150	500	300*	-	E8
South	40.436	40.736	300	Fill	5.0	14.8 - 16.0	>3% (after ground treatment)	150	500		-	E7
South	40.736	40.746	10	Fill	1.0	16.0 - 16.0	>3%	150	500	300*	-	E8
South	40.746	40.924	178	Georges River Bridge	-	-	-	-	-	-	-	-
South	40.924	40.934	10	Fill	1.2000	16.0 - 16.0	>3%	150	500	300*	-	E8
South	40.934	40.967	33	Fill	1.2	16.0 - 16.0	>1 and <3%	150	1000	600	-	E1
South	40.967	41.410	443	Cut	2.2	16.0 - 17.8	>1 and <3%	150	1000	600	-	C1 or C3
South	41.410	41.420	10	Fill	0.5	17.8 - 17.9	>1 and <3%	150	1000	600	-	E1
South	41.420	41.429	9	Cut	0.6	17.9 - 18.0	>1 and <3%	150	1000	600	-	C1 or C3
South	41.429	41.452	23	Fill	0.5	18.0 - 18.1	>1 and <3%	150	1000	600	-	E1
South	41.452	41.465	13	Cut	0.5000	18.1 - 18.1	>1 and <3%	150	1000	600	-	C1 or C3
South	41.465	41.550	85	Fill	1.0	18.1 - 17.3	>1 and <3%	150	1000	600	-	E1
South	41.550	41.565	15	Cut	Up to 4m for bridge	17.3 - 17.2	>1 and <3%	150	1000	600	-	C1 or C3
South	41.565	41.606	41	Moorebank Avenue Bridge	Up to 6m for bridge	17.2 - 16.8	>1 and <3%	150	1000	600	-	C1 or C3
South	41.606	41.663	57	Cut	Up to 4m for bridge	16.8 - 16.4	>1 and <3%	150	1000	600	-	C1 or C3
South	41.663	41.713	50	Fill	0.3000	16.4 - 16.3	>1 and <3%	150	1000	600	-	E1
South	41.713	41.745	32	Cut	0.3000	16.3 - 16.2	>1 and <3%	150	1000	600	-	C1 or C3
South	41.745	41.840	95	Fill	0.3000	16.2 - 16.0	>1 and <3%	150	1000	600	-	E1
South	41.840	41.944	104	Fill	2.0	16.0 - 15.9	>3%	150	500	300	300	E4
South	41.944	41.949	5	Fill	2.0	15.9 - 15.9	>3%	150	500	300*	300	E8
South	41.949	41.969	20	Anzac Creek Culvert	-	-	-	-	-	-	-	-
South	41.969	41.974	5	Fill	2.0	15.9 - 15.9	>3%	150	500	300*	300	E8
South	41.974	42.040	66	Fill	2.0	15.9 - 15.9	>3%	150	500	300	300	E4
South	42.040	42.138	98	Fill	0.7000	15.9 - 15.9	>3%	150	500	300	-	E2
South	42.153	42.153	15	Existing Formation	-	-	-	-	-	-	-	-

NOTES

1.

PROPOSED TREATMENT TYPES ARE AS PER THE PROJECT SPECIFICATION DESCRIPTIONS.

2.

STRUCTURAL ZONE FILL THICKNESS WILL VERY DEPENDING ON THE QUALITY OF MATERIAL ADOPTED. THICKNESS HAVE BEEN PROVIDED FOR CBR > 8% AND CBR > 20%..

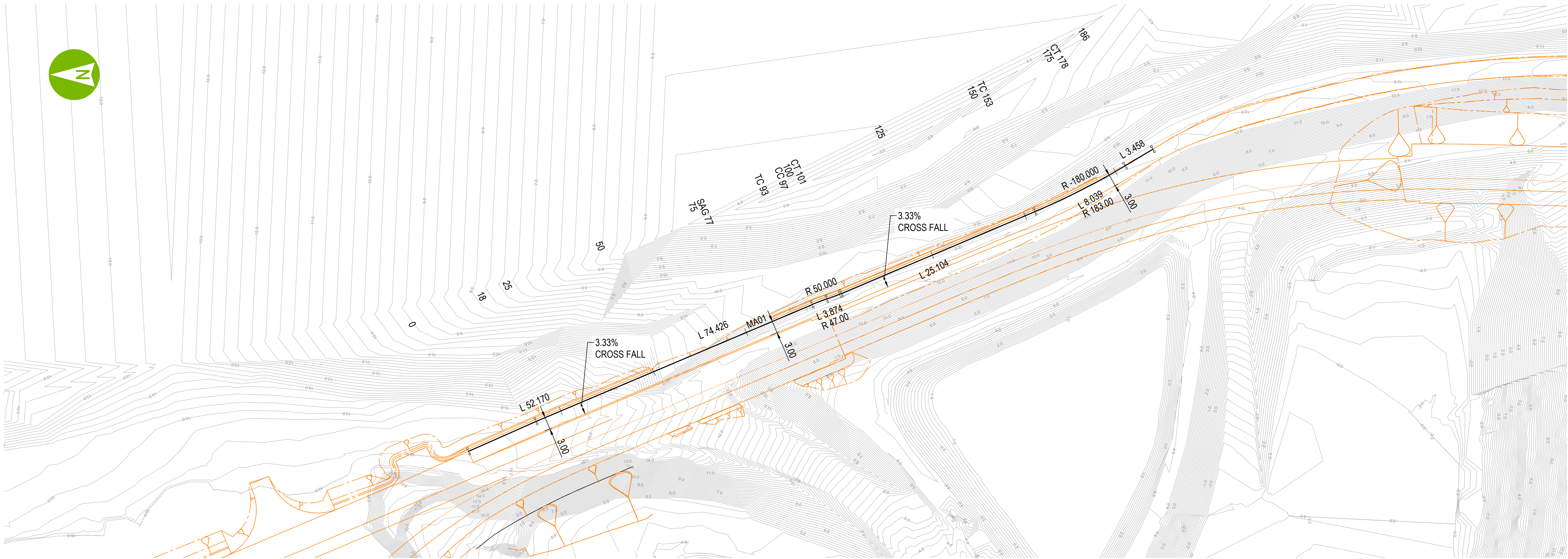
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WHERE CONSTRAINTS APPLY A STRUCTURAL ZONE FILL COMPRISING DGB20 & DGS20 WITH A GEOFABRIC SEPARATOR MAY BE ADOPTED. THICKNESS AND LOCATIONS TO BE CONFIRMED BY THE GEOTECHNICAL ENGINEER. AS IT WILL NEED TO BE CONFIRMED USING MECHANISTIC DESIGN OF THE RAIL PAVEMENT.

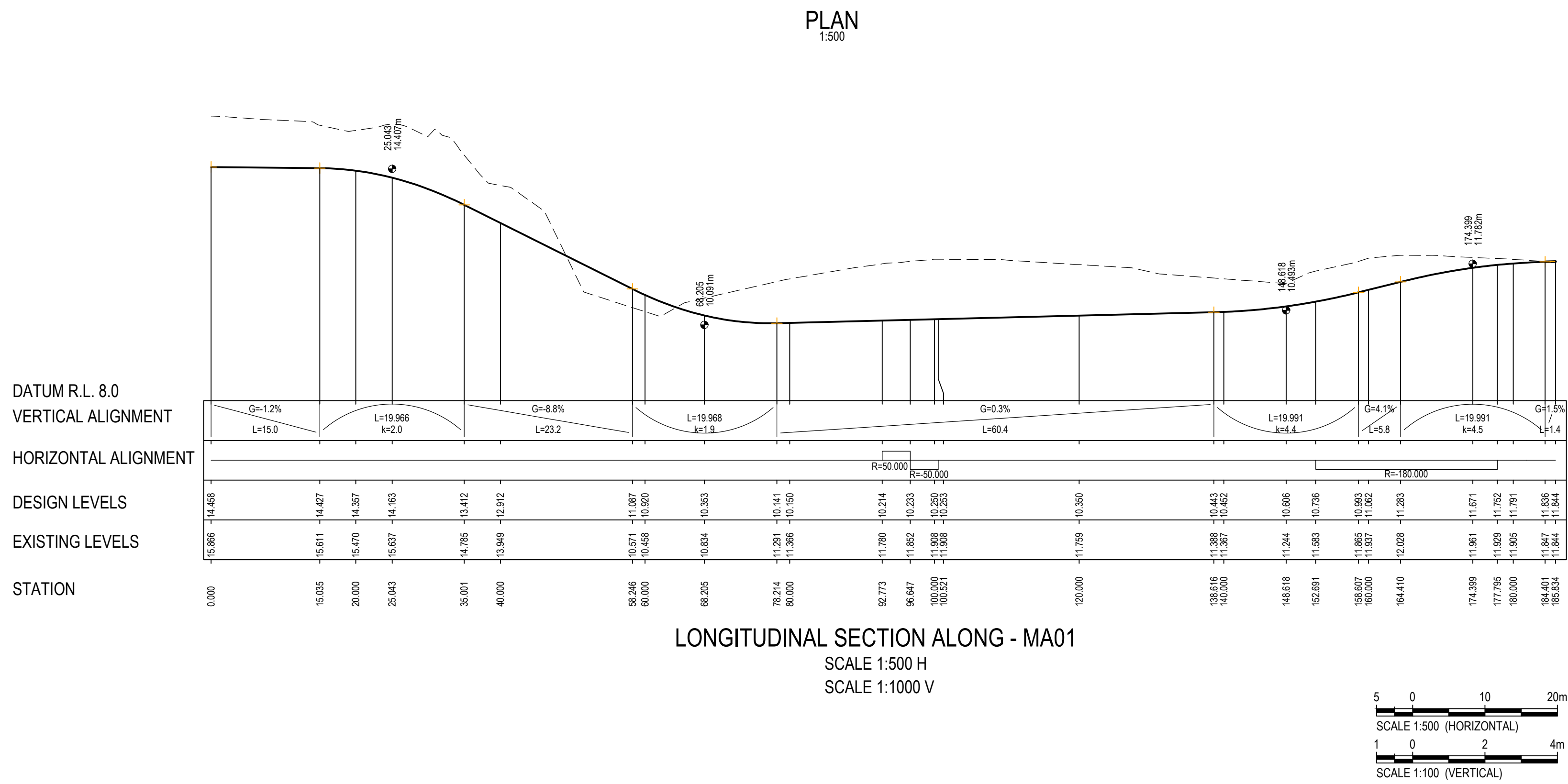
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EDMS No

EDMS REV



- LEGEND**
- CONTROL LINE
 - PROPOSED DESIGN
 - EXISTING CONTOURS



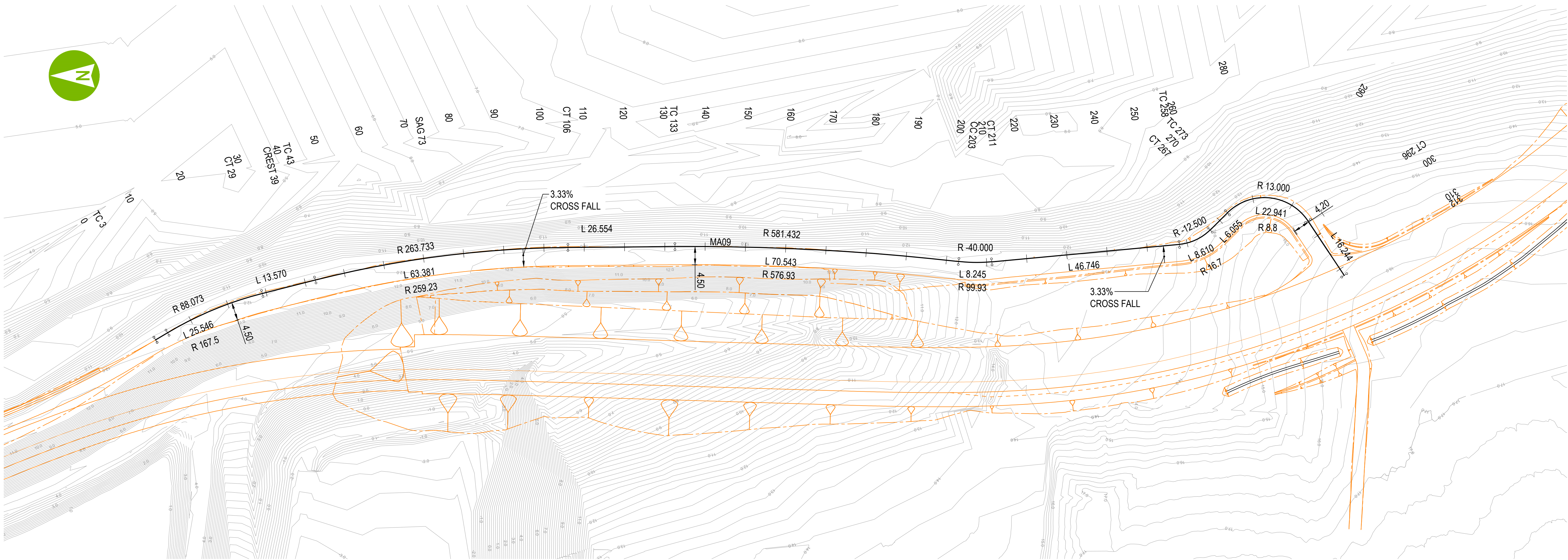
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DRAWN		

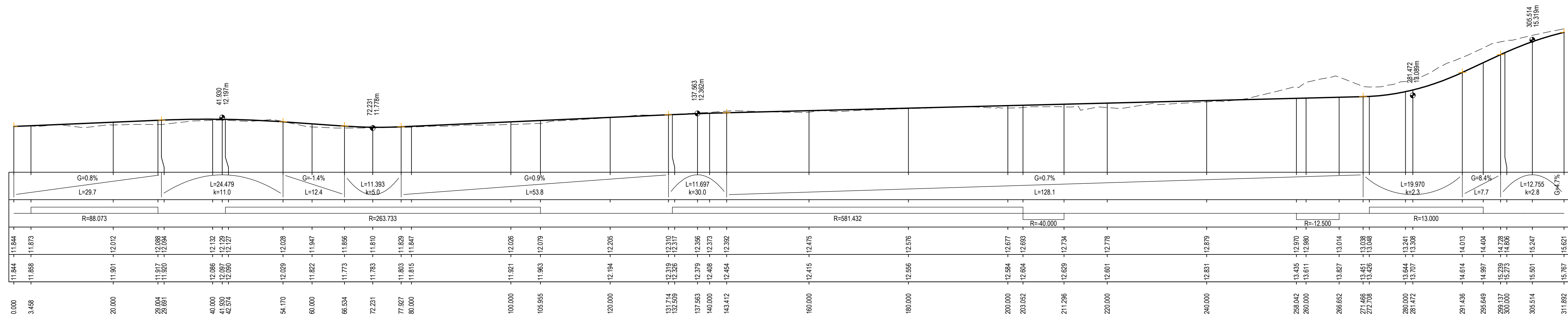
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TITLE	BULK EARTHWORKS ACCESS ROAD PLAN & LONG SECTION SHEET 01 OF 08					
DRAWING No.	PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV
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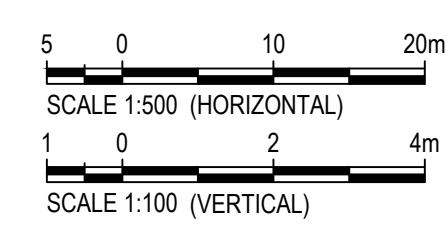
- LEGEND
- CONTROL LINE
 - PROPOSED DESIGN
 - EXISTING CONTOURS


PLAN
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HORIZONTAL ALIGNMENT
DESIGN LEVELS
EXISTING LEVELS
STATION



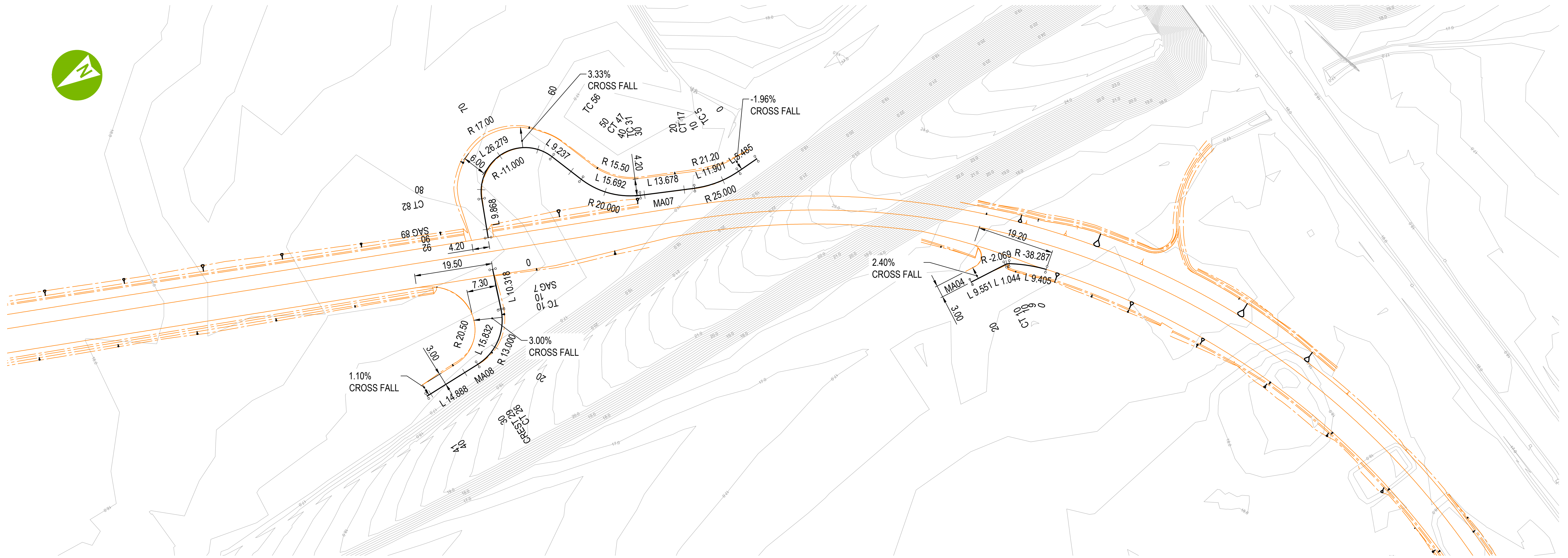
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SCALE 1:1000 V



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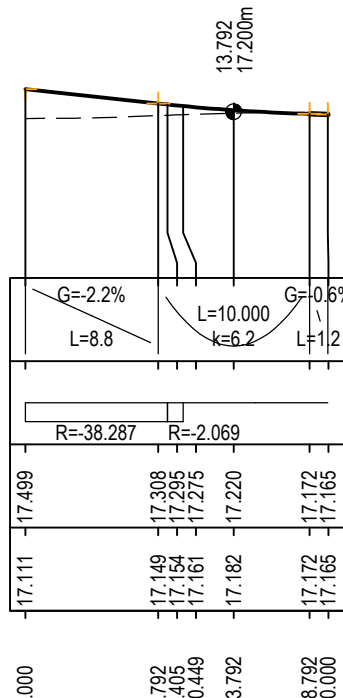




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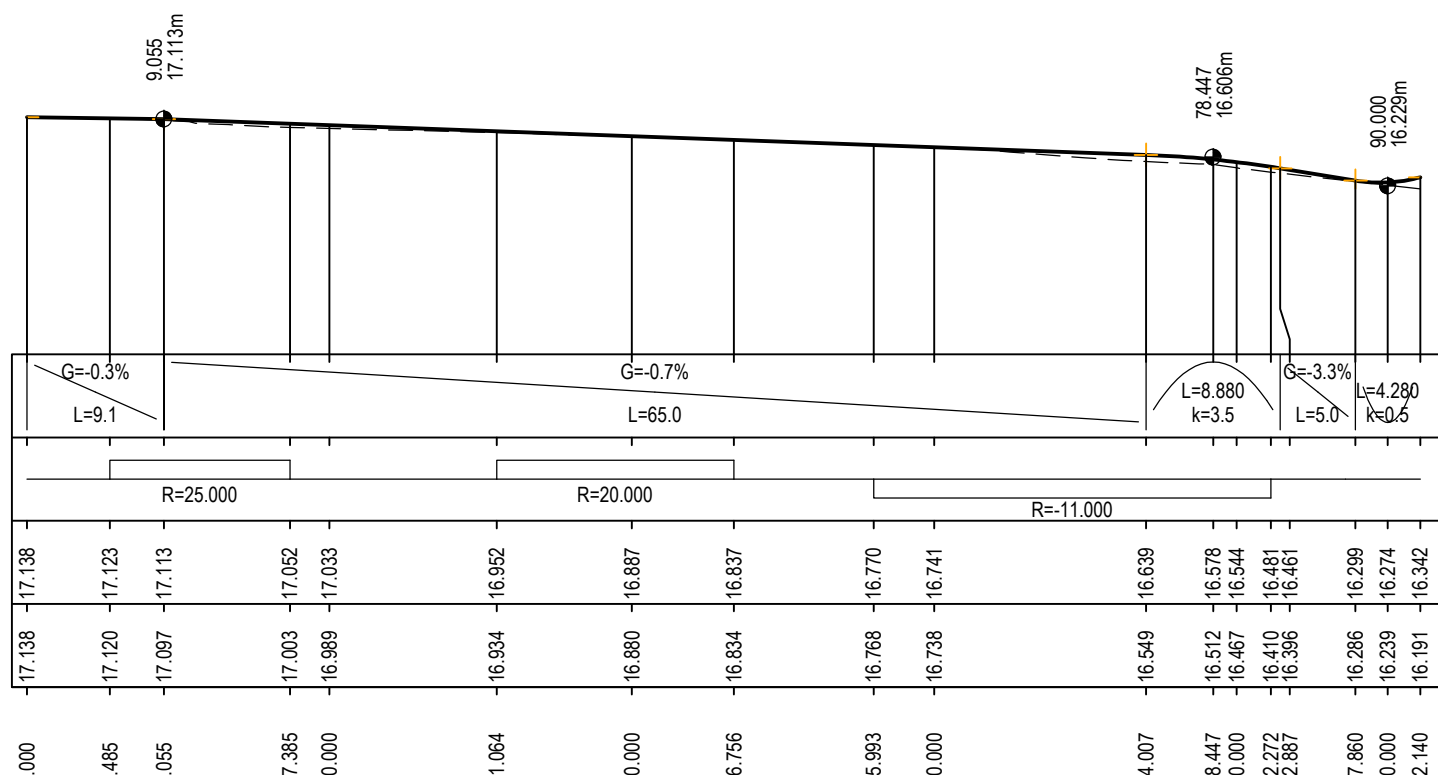
- LEGEND
- CONTROL LINE
 - PROPOSED DESIGN
 - EXISTING CONTOURS

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HORIZONTAL ALIGNMENT
DESIGN LEVELS
EXISTING LEVELS
STATION



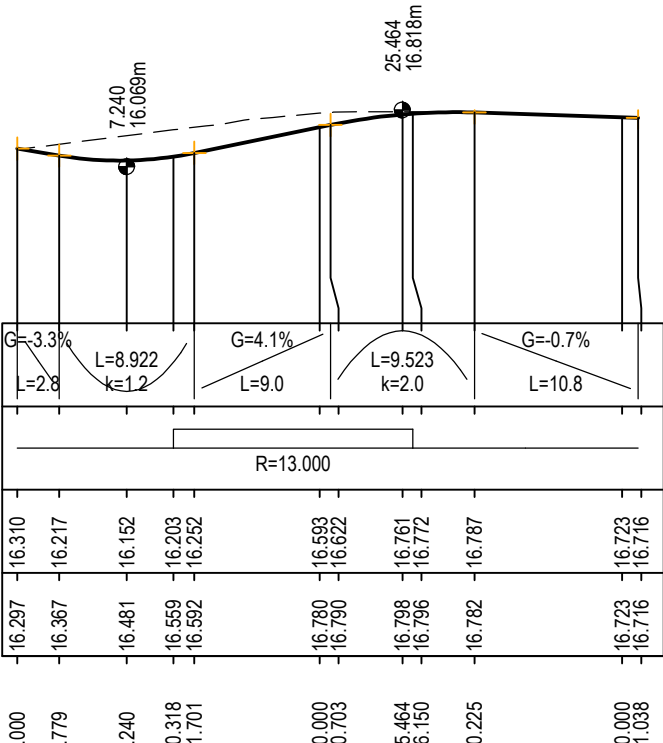
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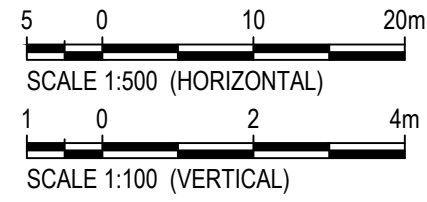


LONGITUDINAL SECTION ALONG - MA07
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SCALE 1:1000 V

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HORIZONTAL ALIGNMENT
DESIGN LEVELS
EXISTING LEVELS
STATION



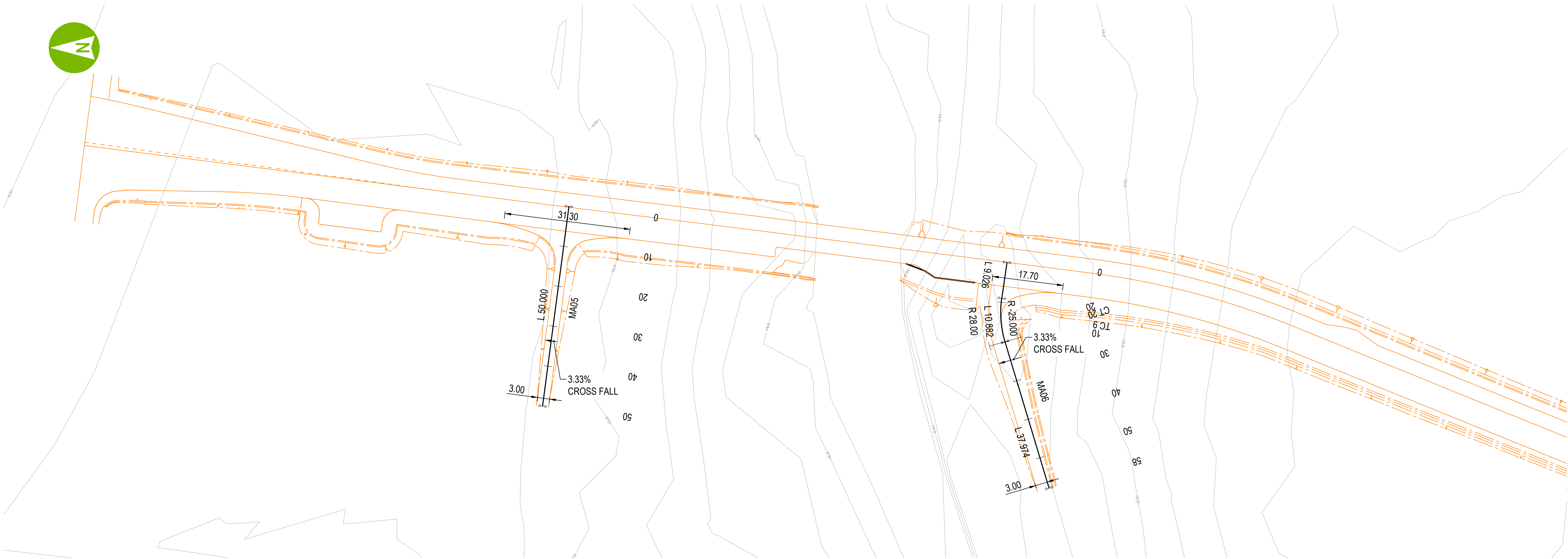
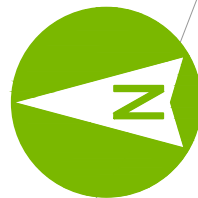
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SCALE 1:1000 V



REV	DATE	REVISION DETAILS
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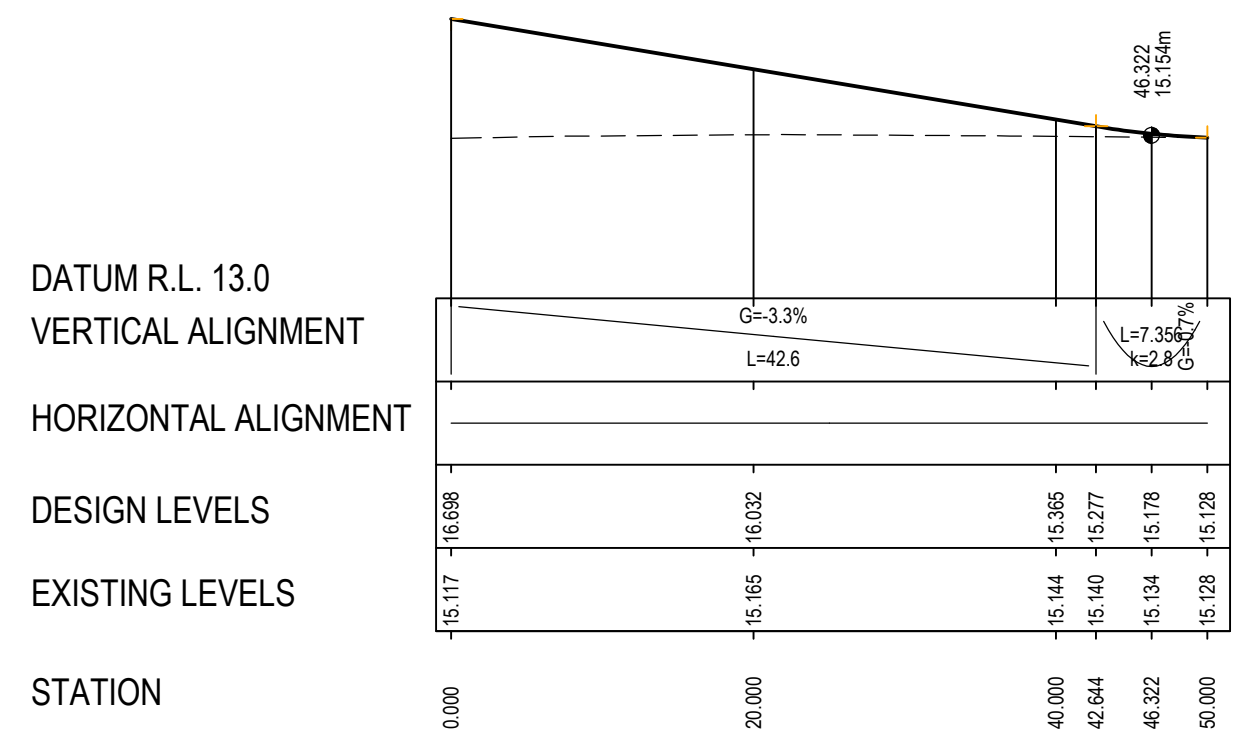
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TITLE			BULK EARTHWORKS ACCESS ROAD PLAN & LONG SECTION SHEET 04 OF 08					
DRAWING No.			PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV
			N01031	- PWD	- DRG	- GEN	- 0203	- 01

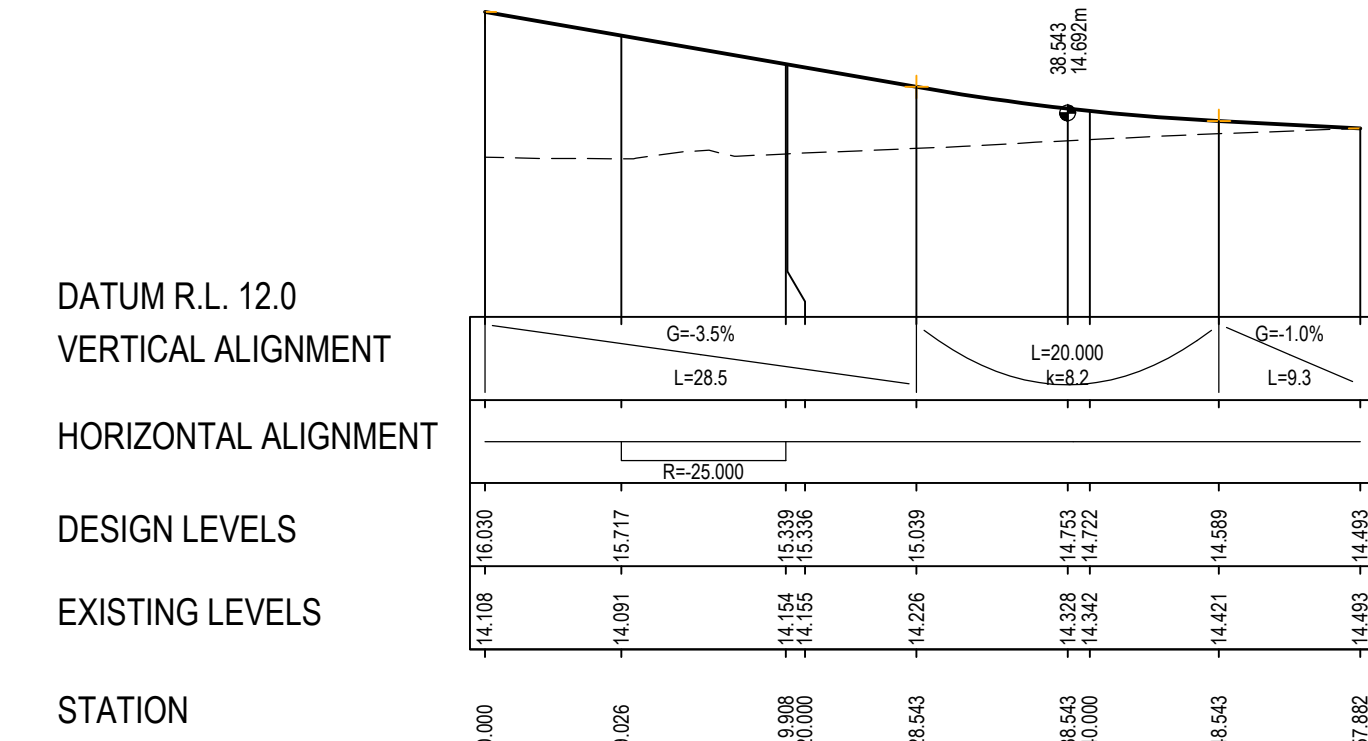


- LEGEND**
- CONTROL LINE
 - PROPOSED DESIGN
 - EXISTING CONTOURS

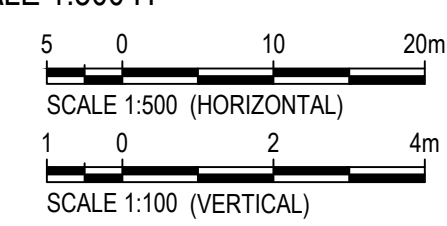
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LONGITUDINAL SECTION ALONG - MA05
SCALE 1:500 H



LONGITUDINAL SECTION ALONG - MA06
SCALE 1:500 H



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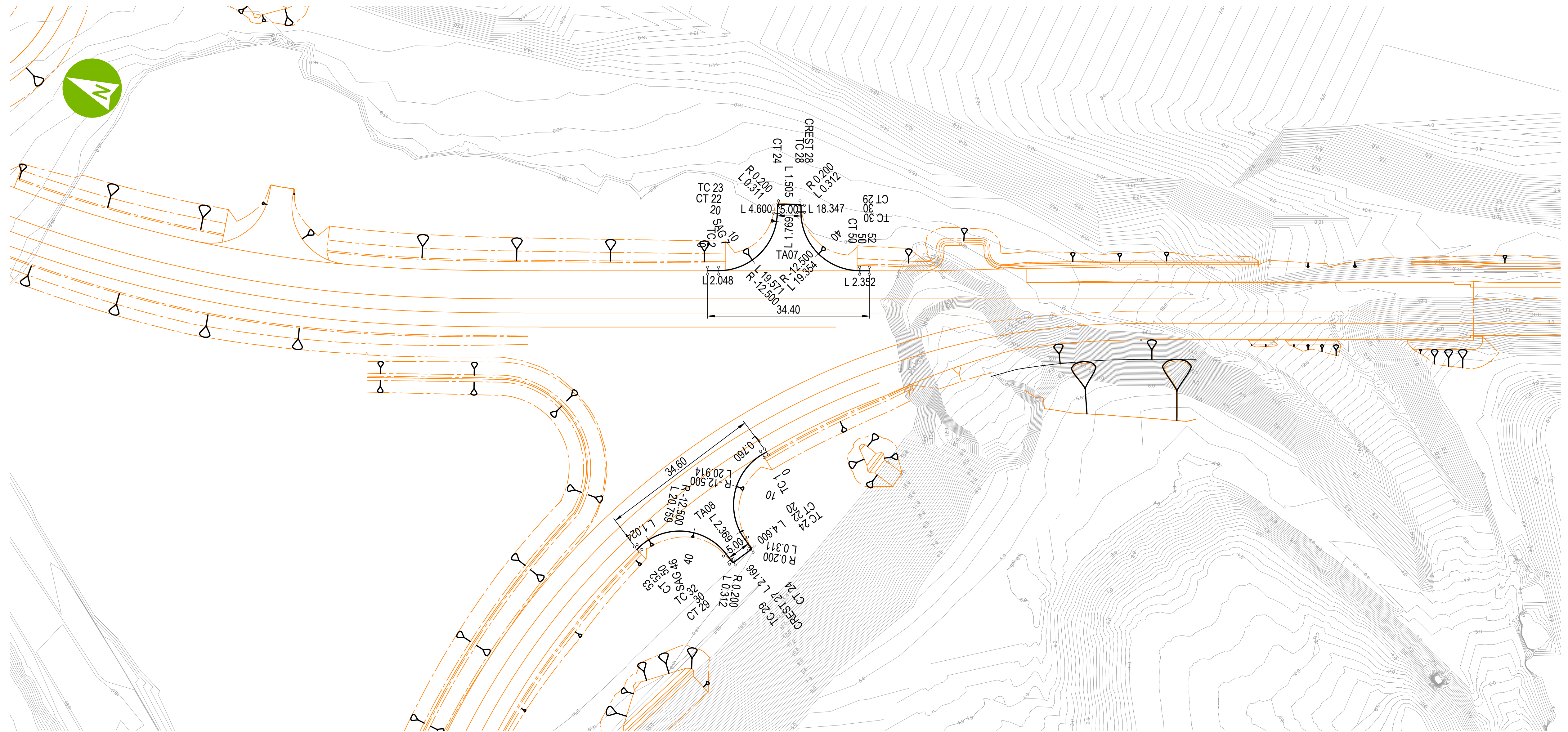
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01	20.01.17	ACCEPTED FOR CONSTRUCTION

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SIZE
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FOR CONSTRUCTION

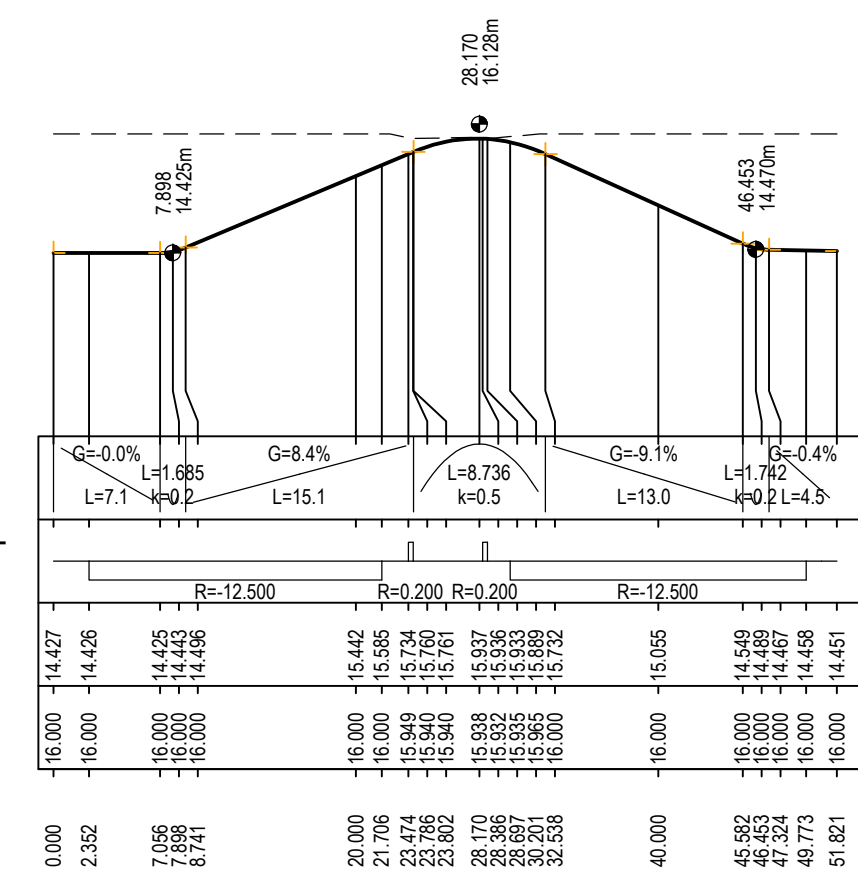
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PLAN
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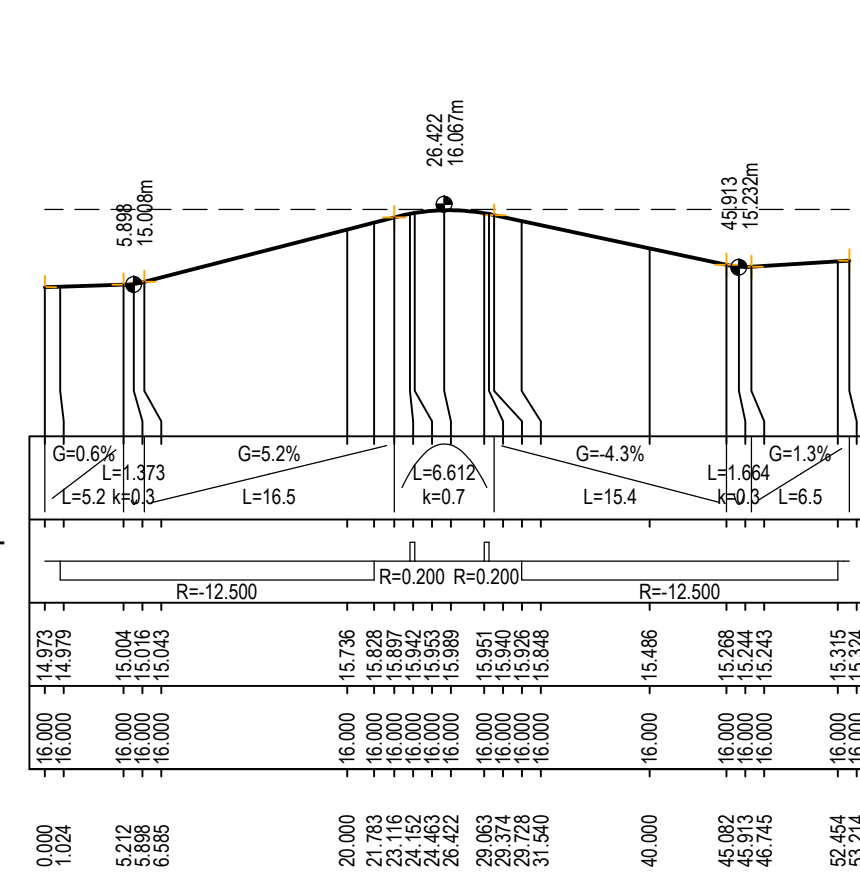
- LEGEND
- CONTROL LINE
 - PROPOSED DESIGN
 - EXISTING CONTOURS

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DESIGN LEVELS
EXISTING LEVELS
STATION

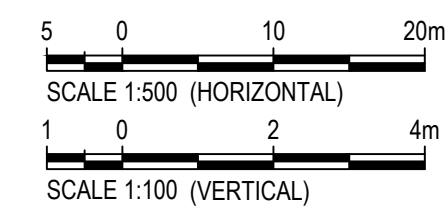


LONGITUDINAL SECTION ALONG - TA07
SCALE 1:500 H

DATUM R.L. 13.0
VERTICAL ALIGNMENT
HORIZONTAL ALIGNMENT
DESIGN LEVELS
EXISTING LEVELS
STATION



LONGITUDINAL SECTION ALONG - TA08
SCALE 1:500 H



CLIENT

CPB CONTRACTORS

SIMTA SYDNEY INTERMODAL TERMINAL ALLIANCE

REV	DATE	REVISION DETAILS	APPROVED
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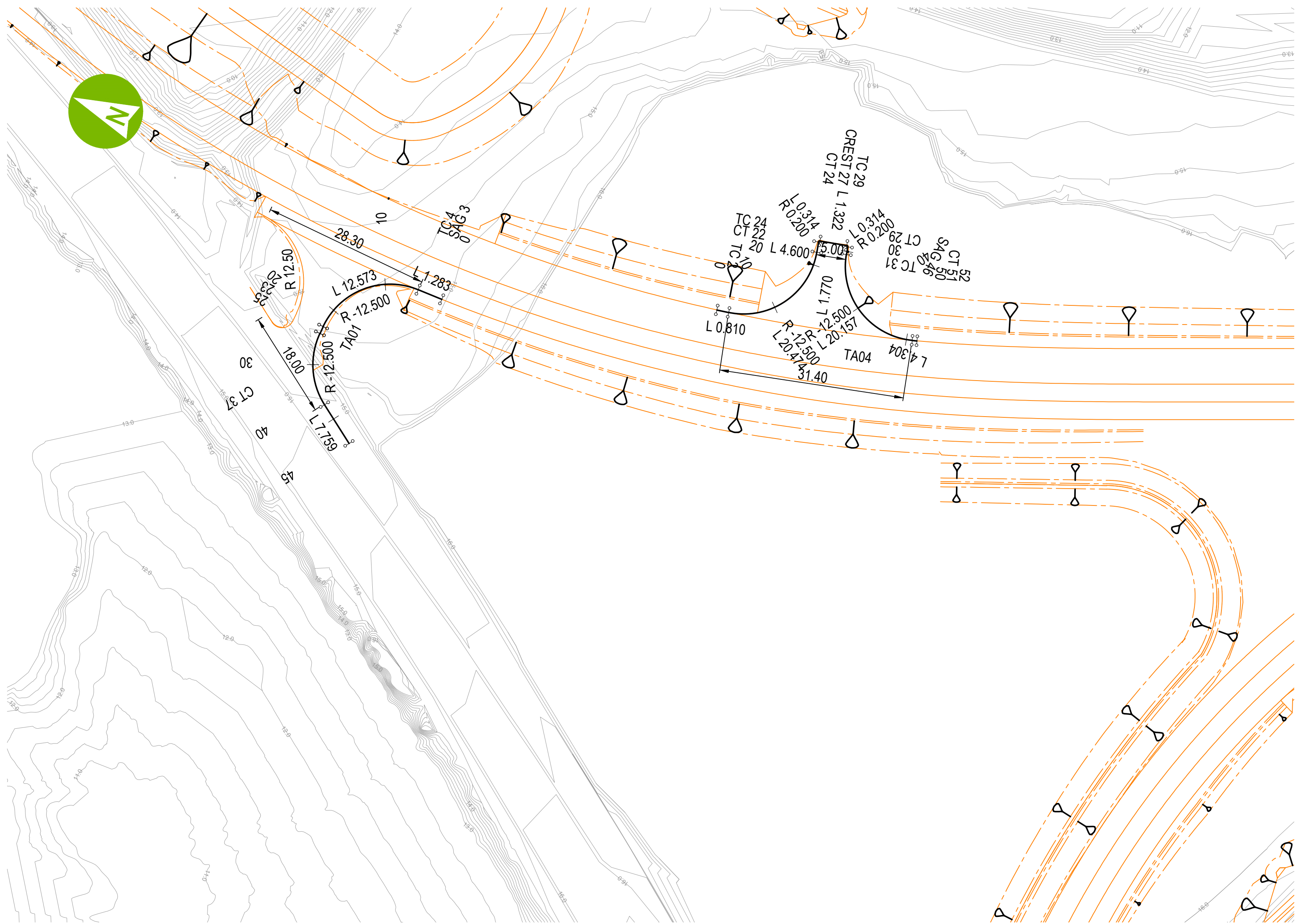
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FOR CONSTRUCTION

ARTC DRAWING No			EDMS No			EDMS REV		
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TITLE			BULK EARTHWORKS ACCESS ROAD PLAN & LONG SECTION SHEET 06 OF 08					
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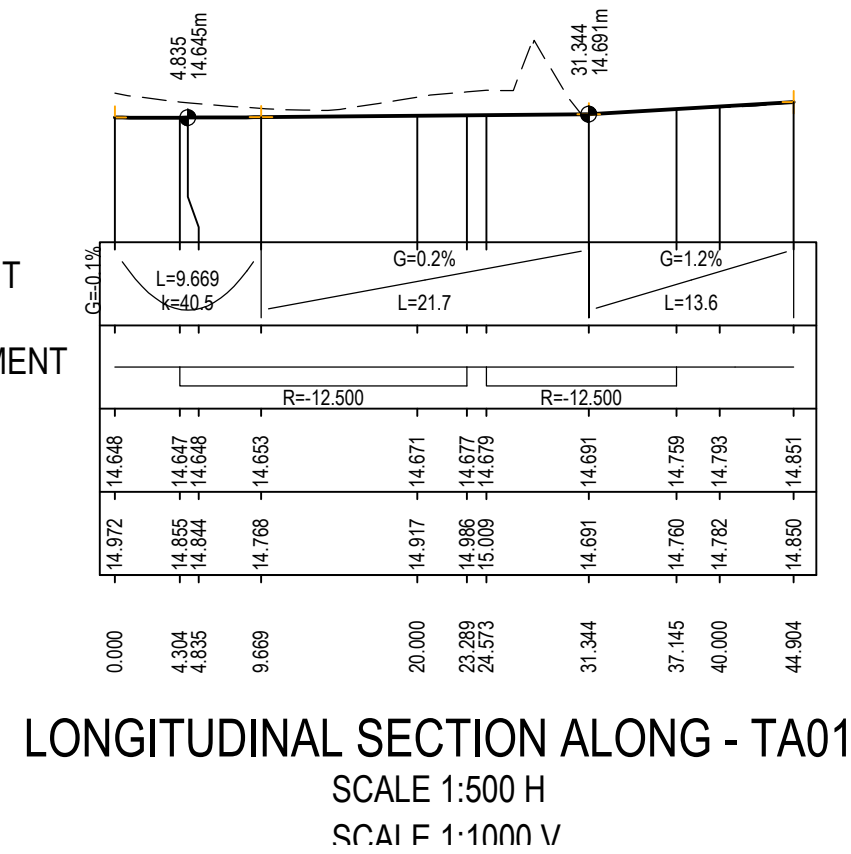
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- LEGEND**
- CONTROL LINE
 - PROPOSED DESIGN
 - EXISTING CONTOURS

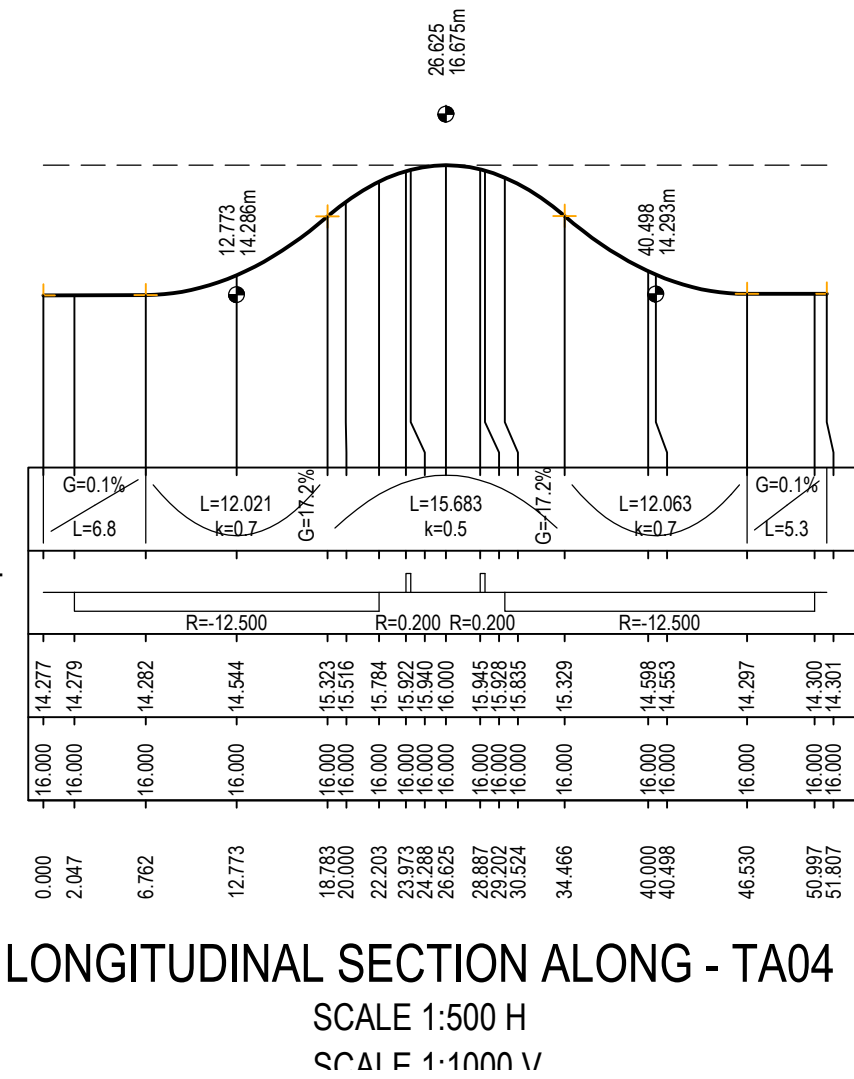
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HORIZONTAL ALIGNMENT
DESIGN LEVELS
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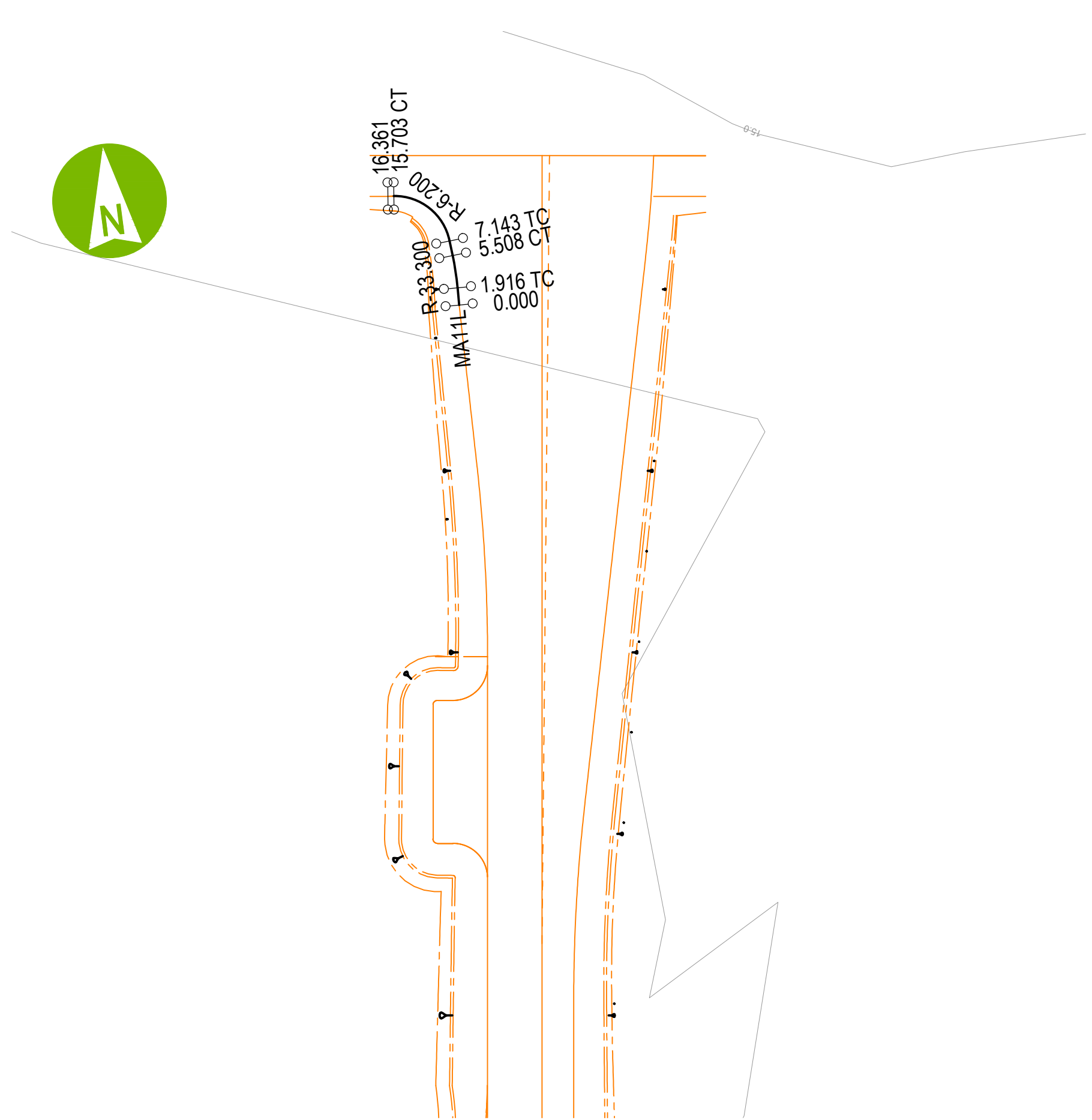


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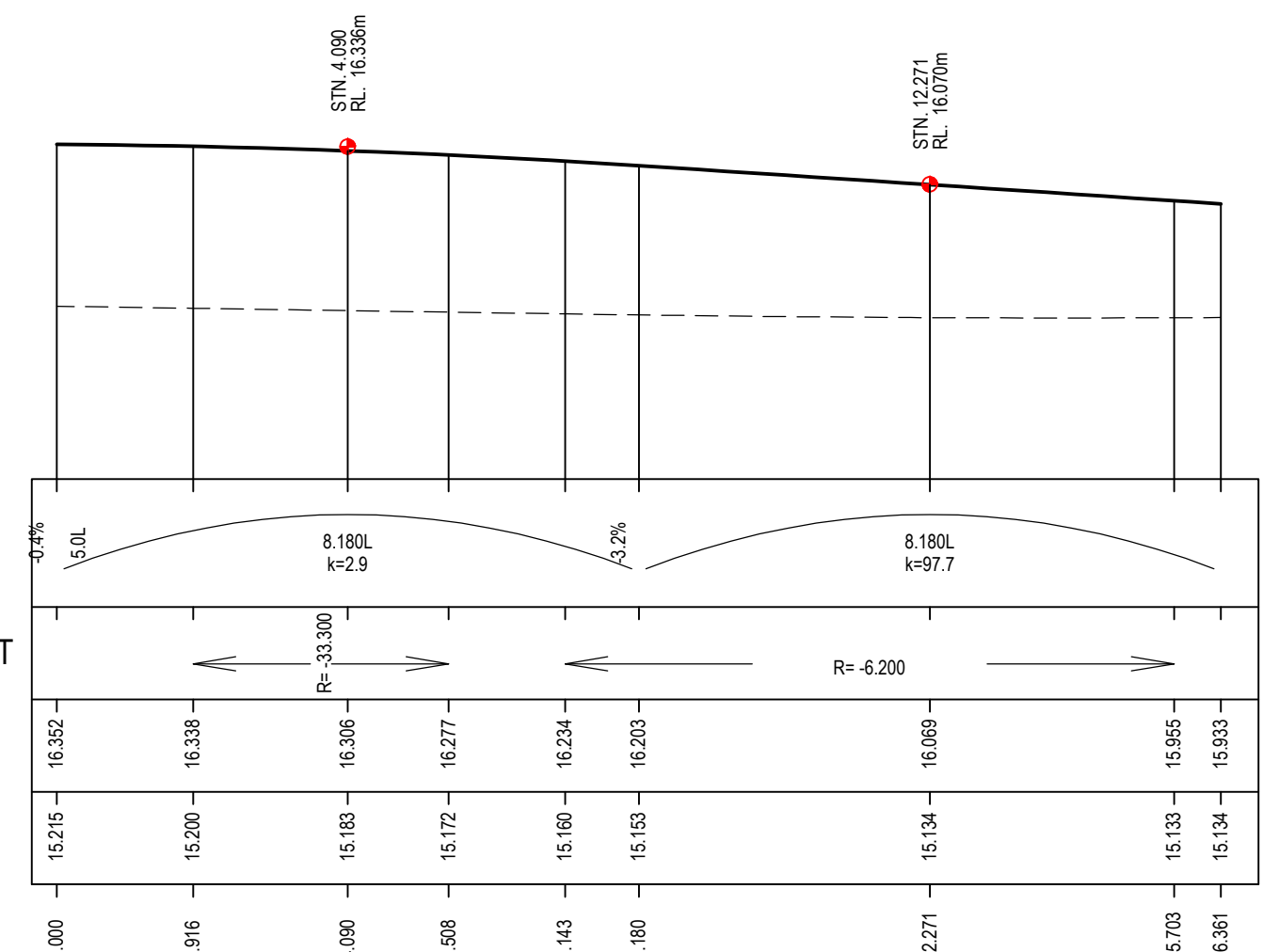


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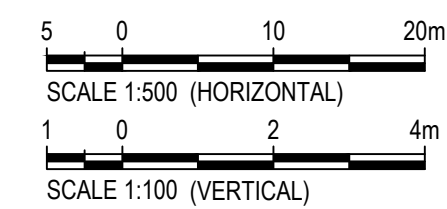


PLAN
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DATUM R.L. 14.0
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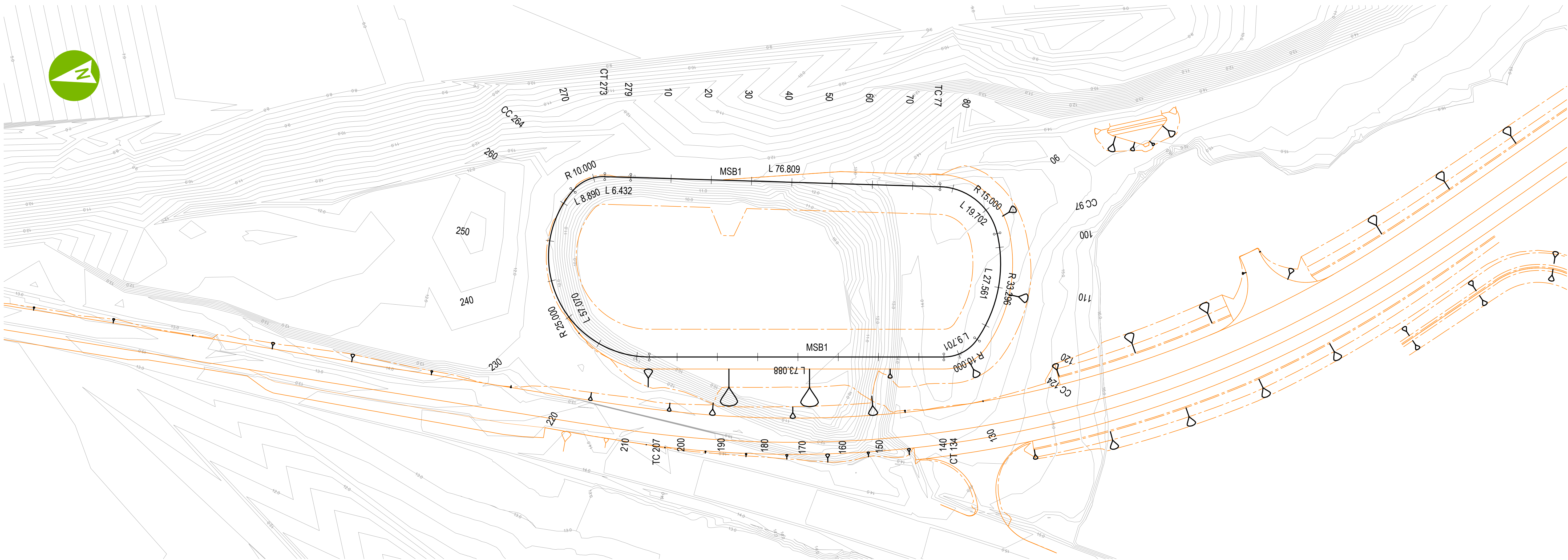
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REV	DATE	REVISION DETAILS	APPROVED
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02	09.06.17	ACCEPTED FOR CONSTRUCTION RE-SUBMISSION	

SCALE	SIZE	FOR CONSTRUCTION
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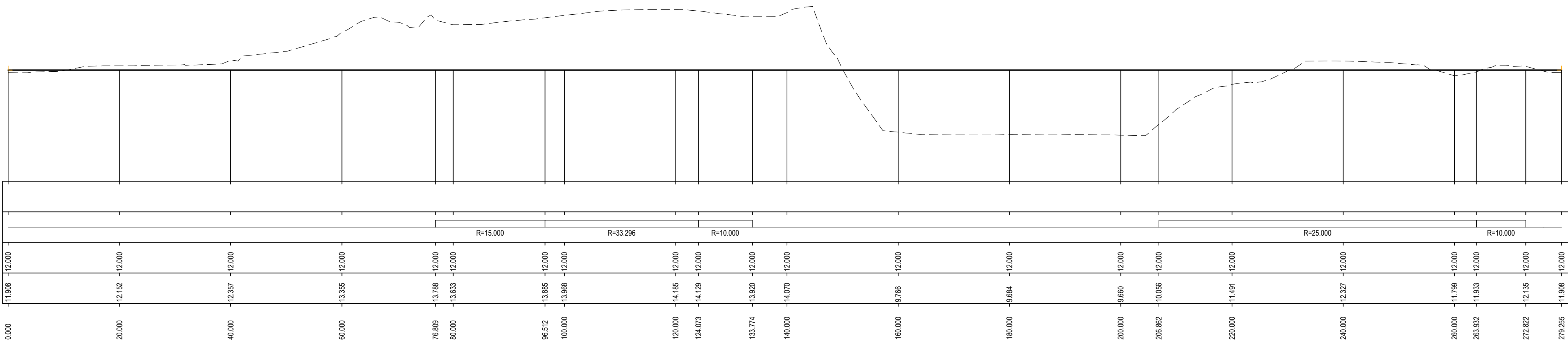
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TITLE	BULK EARTHWORKS ACCESS ROAD PLAN & LONG SECTION SHEET 07 OF 08	
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	N01031	PWD
		DRG
		GEN
		NUMBER
		0206
		REV
		02



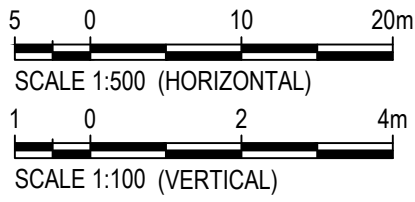
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- LEGEND
- CONTROL LINE
 - PROPOSED DESIGN
 - EXISTING CONTOURS

DATUM R.L. 8.0
VERTICAL ALIGNMENT
HORIZONTAL ALIGNMENT
DESIGN LEVELS
EXISTING LEVELS
STATION



LONGITUDINAL SECTION ALONG - MSB1
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02	09.06.17	ACCEPTED FOR CONSTRUCTION RE-SUBMISSION	

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DRAWING No.	PROJECT No. N01031	ZONE PWD
	TYPE DRG	DISC GEN
	NUMBER 0207	REV 02

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ALIGN ACCESS ROAD->MA01 HORIZONTAL POINTS

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IP 1	0.000	306998.639	6240392.706	14.458	156°06'43.86"			
IP 2	18.347	307006.069	6240375.930	14.394				
	25.000	307008.663	6240369.804	14.165	157°02'55.58"			
	50.000	307018.412	6240346.783	11.912	157°02'55.58"			
	75.000	307028.160	6240323.762	10.152	157°02'55.58"			
TC	92.773	307035.091	6240307.396	10.214	157°02'55.58"			
IP 3	94.710	307035.846	6240305.612	10.224		R = 50.000	3.874	4°26'21.89"
CC	96.647	307036.462	6240303.774	10.233	161°29'17.47"			
IP 4	98.584	307037.077	6240301.936	10.243		R = -50.000	3.874	4°26'21.79"
	100.000	307037.632	6240300.632	10.250	157°38'44.56"			
CT	100.521	307037.833	6240300.152	10.253	157°02'55.69"			
	125.000	307047.378	6240277.610	10.375	157°02'55.69"			
	150.000	307057.127	6240254.589	10.646	157°02'55.69"			
TC	152.691	307058.176	6240252.112	10.736	157°02'55.69"			
IP 5	165.243	307063.079	6240240.535	11.324		R = -180.000	25.104	7°59'27.09"
	175.000	307068.125	6240232.159	11.687	149°56'51.08"			
CT	177.795	307069.543	6240229.751	11.752	149°03'28.60"			
IP 6	185.834	307073.677	6240222.856	11.844	149°03'28.60"			

ALIGN ACCESS ROAD->MA02 HORIZONTAL POINTS

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
IP 1	0.000	307332.248	6239779.778	16.043	1°50'00.00"			
TC	20.904	307332.917	6239800.671	15.812	1°49'60.00"			
	25.000	307332.880	6239804.766	15.829	357°08'21.17"			
IP 2	29.902	307333.208	6239809.763	15.850		R = -50.000	17.996	20°37'19.06"
CT	38.900	307330.278	6239818.375	15.888	341°12'40.94"			
	50.000	307326.703	6239828.884	15.937	341°12'40.94"			
IP 3	59.803	307323.546	6239838.164	16.008	341°12'40.94"			

ALIGN ACCESS ROAD->MA03 HORIZONTAL POINTS

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
IP 1	0.000	307026.541	6239923.688	17.160	93°09'19.53"			
	25.000	307051.503	6239922.312	16.711	93°09'19.53"			
TC	39.023	307065.506	6239921.540	16.343	93°09'19.53"			
IP 2	41.349	307067.871	6239921.410	16.090		R = -10.000	4.652	26°39'15.23"
CT	43.675	307070.043	6239922.354	15.818	66°30'04.30"			
	50.000	307075.843	6239924.876	15.820	66°30'04.30"			
IP 3	51.610	307077.320	6239925.518	15.884	66°30'04.30"			

ALIGN ACCESS ROAD->MA04 HORIZONTAL POINTS

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
IP 1	0.000	307868.050	6239817.053	17.499	46°58'48.69"			
IP 2	4.702	307871.506	6239820.277	17.397		R = -38.287	9.405	14°04'25.70"
IP 3	9.405	307874.073	6239824.245	17.295				
IP 4	9.927	307874.363	6239824.693	17.285		R = -2.069	1.044	28°55'15.31"
CT	10.449	307874.400	6239825.225	17.275	3°59'06.74"			
IP 5	20.000	307875.064	6239834.753	17.165	3°59'06.74"			

ALIGN ACCESS ROAD->MA05 HORIZONTAL POINTS

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING
IP 1	0.000	308041.392	6240280.388	16.698	277°31'42.30"
	25.000	308016.607	6240283.664	15.865	277°31'42.30"
IP 2	50.000	307991.823	6240286.939	15.128	277°31'42.30"

ALIGN ACCESS ROAD->MA06 HORIZONTAL POINTS

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
IP 1	0.000	308027.508	6240171.673	16.030	278°13'08.84"			
TC	9.026	308018.574	6240172.963	15.717	278°13'08.84"			
IP 2	14.467	308013.103	6240173.753	15.528		R = -25.000	10.882	24°56'20.37"
CT	19.908	308007.808	6240172.163	15.339	253°16'48.47"			
	25.000	308002.931	6240170.698	15.162	253°16'48.47"			
	50.000	307978.988	6240163.506	14.574	253°16'48.47"			
IP 3	57.882	307971.439	6240161.238	14.493	253°16'48.47"			

ALIGN ACCESS ROAD->MA07 HORIZONTAL POINTS

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
IP 1	0.000	307929.176	6239864.733	17.138	356°31'10.24"			
TC	5.485	307928.843	6239870.207	17.123	356°31'10.24"			
IP 2	11.435	307928.475	6239876.261	17.095		R = 25.000	11.901	27°16'26.50"
CT	17.385	307930.922	6239881.811	17.052	23°47'36.74"			
	25.000	307933.994	6239888.779	16.996	23°47'36.74"			
TC	31.064	307936.440	6239894.327	16.952	23°47'36.74"			
IP 3	38.910	307939.779	6239901.899	16.895		R = 20.000	15.692	44°57'20.16"
CT	46.756	307947.491	6239904.898	16.837	68°44'56.90"			
	50.000	307950.515	6239906.074	16.814	68°44'56.90"			
TC	55.993	307956.100	6239908.246	16.770	68°44'56.90"			
IP 4	62.563	307963.073	6239910.958	16.722		R = -11.000	13.140	68°26'25.95"
CT	69.133	307963.113	6239918.439	16.674	0°18'30.95"			
	75.000	307961.615	6239924.040	16.630	329°44'49.00"			
IP 5	75.702	307963.153	6239925.920	16.622		R = -11.000	13.140	68°26'25.95"
CT	82.272	307956.210	6239928.706	16.481	291°52'05.01"			
IP 6	92.140	307947.052	6239932.382	16.342	291°52'05.01"			



REV	DATE	REVISION DETAILS	APPROVED
01	20.01.17	ACCEPTED FOR CONSTRUCTION	

SCALE
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A1

FOR CONSTRUCTION

ARTC DRAWING No			EDMS No			EDMS REV	
PROJECT			MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1				
TITLE			BULK EARTHWORKS SETOUT TABLE SHEET 01 OF 04				
DRAWING No.		PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV
		N01031	- PWD	- DRG	- GEN	0220	- 01

Plot Date: 28/02/2017 11:41:21 AM Project: CPB WORKS/SEV LITTLE/ANZ PWD/02/2017/001/031/PWD.DWG/GEN/021.DWG Office: AUS/0

ALIGN ACCESS ROAD->MA08 HORIZONTAL POINTS

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
IP 1	0.000	307939.712	6239935.498	16.310	289°22'55.59"			
TC	10.318	307929.979	6239938.922	16.203	289°22'55.59"			
IP 2	18.234	307921.427	6239941.930	16.521		R = 13.000	15.832	69°46'43.72"
	25.000	307921.362	6239949.847	16.752	354°05'33.12"			
CT	26.150	307921.294	6239950.995	16.772	359°09'39.31"			
IP 3	41.038	307921.076	6239965.882	16.716	359°09'39.31"			

ALIGN ACCESS ROAD->MA09 HORIZONTAL POINTS

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
IP 1	0.000	307073.677	6240222.856	11.844	149°09'00.64"			
TC	3.458	307075.450	6240219.887	11.873	149°09'00.64"			
IP 2	16.231	307082.046	6240208.844	11.981		R = 88.073	25.546	16°37'07.55"
	25.000	307084.136	6240200.233	12.054	163°09'50.41"			
CT	29.004	307085.208	6240196.375	12.088	165°46'08.19"			
TC	42.574	307088.544	6240183.222	12.127	165°46'08.19"			
	50.000	307090.268	6240175.999	12.077	167°22'56.09"			
IP 3	74.264	307096.372	6240152.356	11.809		R = 263.733	63.381	13°46'09.97"
	75.000	307094.566	6240151.381	11.811	172°48'48.54"			
	100.000	307096.514	6240126.466	12.026	178°14'40.99"			
CT	105.955	307096.629	6240120.513	12.079	179°32'18.15"			
	125.000	307096.782	6240101.468	12.250	179°32'18.15"			
TC	132.509	307096.843	6240093.960	12.317	179°32'18.15"			
	150.000	307096.721	6240076.470	12.425	181°15'43.20"			
IP 4	167.780	307097.128	6240058.646	12.515		R = 581.432	70.543	6°57'05.35"
	175.000	307095.633	6240051.495	12.551	183°43'32.03"			
	200.000	307093.473	6240026.591	12.677	186°11'20.85"			
CC	203.052	307093.136	6240023.557	12.693	186°29'23.50"			
IP 5	207.174	307092.668	6240019.447	12.714		R = -40.000	8.245	11°48'34.23"
CT	211.296	307093.052	6240015.328	12.734	174°40'49.27"			
	225.000	307094.322	6240001.683	12.804	174°40'49.27"			
	250.000	307096.640	6239976.791	12.930	174°40'49.27"			
TC	258.042	307097.386	6239968.784	12.970	174°40'49.27"			
IP 6	262.347	307097.802	6239964.319	12.992		R = -12.500	8.610	39°28'03.32"
CT	266.652	307100.960	6239961.137	13.014	135°12'45.96"			
TC	272.708	307105.226	6239956.839	13.048	135°12'45.96"			
	275.000	307106.690	6239955.078	13.083	145°18'55.16"			
IP 7	284.178	307116.357	6239945.625	13.456		R = 13.000	22.941	101°06'31.17"
CT	295.649	307103.209	6239936.863	14.404	236°19'17.13"			
	300.000	307099.588	6239934.450	14.806	236°19'17.13"			
IP 8	311.892	307089.691	6239927.855	15.621	236°19'17.13"			

ALIGN TURN AROUND->TA01 HORIZONTAL POINTS

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
IP 1	0.000	306918.171	6240602.834	14.648	359°20'46.59"			
TC	4.304	306918.122	6240607.138	14.647	359°20'46.59"			
	10.000	306916.784	6240612.624	14.654	333°14'18.74"			
IP 2	13.797	306917.986	6240619.004	14.660		R = -12.500	18.985	87°01'20.21"
	20.000	306909.361	6240618.923	14.671	287°24'06.90"			
IP 3	23.289	306906.130	6240619.485	14.677				
IP 4	23.290	306906.129	6240619.485	14.677				
IP 5	24.573	306904.848	6240619.537	14.679				
IP 6	24.573	306904.848	6240619.537	14.679				
	30.000	306899.546	6240618.592	14.688	247°26'44.24"			
IP 7	30.859	306897.977	6240619.816	14.690		R = -12.500	12.573	57°37'44.66"
CT	37.145	306894.063	6240614.162	14.759	214°41'37.83"			
	40.000	306892.438	6240611.815	14.793	214°41'37.83"			
IP 8	44.904	306889.647	6240607.783	14.851	214°41'37.83"			

ALIGN TURN AROUND->TA04 HORIZONTAL POINTS

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
IP 1	0.000	306934.651	6240559.342	14.277	168°57'11.72"			
TC	2.047	306935.043	6240557.333	14.279	168°57'11.72"			
	10.000	306938.867	6240550.512	14.359	132°29'53.96"			
IP 2	12.125	306937.540	6240544.542	14.491		R = -12.500	20.157	92°23'27.76"
	20.000	306948.039	6240547.249	15.516	86°39'42.11"			
CT	22.203	306950.216	6240547.570	15.784	76°33'43.97"			
TC	23.973	306951.938	6240547.982	15.922	76°33'43.97"			
IP 3	24.130	306952.132	6240548.028	15.931		R = 0.200	0.314	90°00'01.75"
CT	24.288	306952.179	6240547.834	15.940	166°33'45.72"			
TC	28.887	306953.248	6240543.360	15.945	166°33'45.72"			
IP 4	29.045	306953.294	6240543.165	15.937		R = 0.200	0.314	89°59'57.40"
CT	29.202	306953.100	6240543.119	15.928	256°33'43.12"			
	30.000	306952.323	6240542.933	15.877	256°33'43.12"			
TC	30.524	306951.814	6240542.811	15.835	256°33'43.12"			
	40.000	306944.250	6240537.485	14.598	213°07'33.35"			
IP 5	40.761	306938.811	6240539.705	14.531		R = -12.500	20.474	93°50'40.28"
	50.000	306942.525	6240527.903	14.300	167°17'21.51"			
CT	50.997	306942.783	6240526.940	14.300	162°43'02.84"			
IP 6	51.807	306943.024	6240526.167	14.301	162°43'02.84"			



REV	DATE	REVISION DETAILS	APPROVED
01	20.01.17	ACCEPTED FOR CONSTRUCTION	

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FOR CONSTRUCTION

ARTC DRAWING No			EDMS No			EDMS REV		
PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1							
TITLE	BULK EARTHWORKS SETOUT TABLE SHEET 02 OF 04							
DRAWING No.	PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV		
	N01031	- PWD	- DRG	- GEN	0221	01		

Plot Date: 28/02/2017 11:41:31 AM Office: AUS/0 Filename: C:\PIU\WORKSPACE\LEV\LITTLEANZ\PROJECTS\2017\TA07\031\PROJ.DWG-GEN-0222.DWG

ALIGN TURN AROUND->TA07 HORIZONTAL POINTS

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
IP 1	0.000	306971.657	6240455.140	14.427	157°02'59.69"			
TC	2.352	306972.574	6240452.975	14.426	157°02'59.69"			
	10.000	306977.462	6240447.247	14.601	121°59'30.71"			
IP 2	12.029	306977.340	6240441.720	14.772		R = -12.500	19.354	88°42'44.37"
	20.000	306987.076	6240445.712	15.442	76°09'18.86"			
CT	21.706	306988.699	6240446.232	15.585	68°20'15.32"			
TC	23.474	306990.342	6240446.884	15.734	68°20'15.32"			
IP 3	23.630	306990.526	6240446.957	15.747		R = 0.200	0.312	89°14'51.32"
CT	23.786	306990.601	6240446.775	15.760	157°35'06.64"			
TC	28.386	306992.355	6240442.522	15.936	157°35'06.64"			
IP 4	28.541	306992.430	6240442.340	15.935		R = 0.200	0.311	89°10'12.86"
CT	28.697	306992.249	6240442.262	15.933	246°45'19.50"			
	30.000	306991.052	6240441.748	15.898	246°45'19.50"			
TC	30.201	306990.867	6240441.669	15.889	246°45'19.50"			
IP 5	39.987	306979.440	6240436.760	15.056		R = -12.500	19.571	89°42'31.04"
	40.000	306984.197	6240434.834	15.055	201°50'32.02"			
CT	49.773	306984.290	6240425.308	14.458	157°02'48.45"			
	50.000	306984.378	6240425.099	14.457	157°02'48.45"			
IP 6	51.821	306985.088	6240423.423	14.451	157°02'48.45"			

ALIGN TURN AROUND->TA08 HORIZONTAL POINTS

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
IP 1	0.000	306940.968	6240428.534	14.973	306°21'32.86"			
TC	1.024	306940.143	6240429.141	14.979	306°21'32.86"			
	10.000	306931.690	6240431.531	15.220	265°12'59.88"			
IP 2	11.403	306929.128	6240437.250	15.292		R = -12.500	20.759	95°09'00.12"
	20.000	306923.070	6240427.006	15.736	219°22'48.03"			
CT	21.783	306922.041	6240425.552	15.828	211°12'32.74"			
TC	24.152	306920.814	6240423.526	15.942	211°12'32.74"			
IP 3	24.307	306920.711	6240423.357	15.948		R = 0.200	0.312	89°14'53.44"
CT	24.463	306920.541	6240423.457	15.953	300°27'26.18"			
TC	29.063	306916.576	6240425.789	15.951	300°27'26.18"			
IP 4	29.219	306916.406	6240425.889	15.946		R = 0.200	0.311	89°09'59.95"
CT	29.374	306916.504	6240426.060	15.940	29°37'26.13"			
	30.000	306916.813	6240426.604	15.914	29°37'26.13"			
TC	31.540	306917.574	6240427.943	15.848	29°37'26.13"			
	40.000	306919.049	6240436.110	15.486	350°50'51.58"			
IP 5	41.997	306924.420	6240439.982	15.400		R = -12.500	20.914	95°51'39.32"
	50.000	306913.880	6240444.360	15.284	305°00'39.74"			
CT	52.454	306911.745	6240445.562	15.315	293°45'46.81"			
IP 6	53.214	306911.049	6240445.868	15.324	293°45'46.81"			

ALIGN SED BASIN->MSB1 HORIZONTAL POINTS

PT	CHAINAGE	EASTING	NORTHING	HEIGHT	BEARING	RAD/SPIRAL	A.LENGTH	DEFL.ANGLE
IP 1	0.000	307002.931	6240691.711	12.000				
	25.000	306996.990	6240667.427	12.000	193°44'46.37"			
	50.000	306991.050	6240643.143	12.000	193°44'46.37"			
	75.000	306985.109	6240618.859	12.000	193°44'46.37"			
TC	76.809	306984.679	6240617.101	12.000	193°44'46.37"			
IP 2	86.661	306981.931	6240605.869	12.000		R = 15.000	19.702	75°15'26.94"
CC	96.512	306970.370	6240605.668	12.000	269°00'13.31"			
	100.000	306966.885	6240605.790	12.000	275°00'22.25"			
IP 3	110.292	306955.746	6240605.414	12.000		R = 33.296	27.561	47°25'37.76"
CC	124.073	306945.666	6240616.010	12.000	316°25'51.06"			
	125.000	306945.059	6240616.711	12.000	321°44'28.56"			
IP 4	128.924	306942.033	6240619.829	12.000		R = 10.000	9.701	55°34'59.49"
CT	133.774	306943.131	6240624.984	12.000	12°00'50.55"			
	150.000	306946.508	6240640.855	12.000	12°00'50.55"			
	175.000	306951.712	6240665.307	12.000	12°00'50.55"			
	200.000	306956.916	6240689.759	12.000	12°00'50.55"			
TC	206.862	306958.344	6240696.471	12.000	12°00'50.55"			
IP 5	221.130	306961.685	6240712.169	12.000		R = 25.000	28.535	65°23'49.71"
	225.000	306967.955	6240711.386	12.000	53°34'57.09"			
CC	235.397	306977.348	6240715.667	12.000	77°24'40.27"			
IP 6	249.665	306993.011	6240719.165	12.000		R = 25.000	28.535	65°23'49.71"
	250.000	306991.706	6240714.626	12.000	110°52'41.89"			
CC	263.932	307002.712	6240706.380	12.000	142°48'29.98"			
IP 7	268.377	307005.591	6240702.585	12.000		R = 10.000	8.890	50°56'15.40"
CT	272.822	307004.459	6240697.959	12.000	193°44'45.38"			
	275.000	307003.942	6240695.844	12.000	193°44'45.38"			



REV	DATE	REVISION DETAILS
01	20.01.17	ACCEPTED FOR CONSTRUCTION

SCALE
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SIZE
A1

FOR CONSTRUCTION

ARTC DRAWING No			EDMS No			EDMS REV	
PROJECT			MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1				
TITLE			BULK EARTHWORKS SETOUT TABLE SHEET 03 OF 04				
DRAWING No.		PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV
		N01031	-	PWD	-	DRG	-
				GEN	-	0222	-
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S	39878.702	306725.696	6240407.767	18.146	51°58'12.00"	ARC	190.000	32.632
CS	39911.335	306749.552	6240429.974	17.828	51°58'12.00"	TRANSITION		20.416
SC	39931.751	306766.321	6240441.598	17.628	58°45'46.80"	ARC	160.000	264.405
CS	40196.155	306992.416	6240376.320	15.318	153°26'45.60"	TRANSITION		20.037
ST	40216.192	307000.613	6240358.040	15.332	157°02'56.40"	LINE		88.599
TS	40304.791	307035.162	6240276.455	15.364	157°02'56.40"	TRANSITION		50.000
SC	40354.791	307053.040	6240229.786	15.338	163°00'00.00"	ARC	243.500	54.327
CS	40409.118	307063.021	6240176.498	15.310	175°46'58.80"	TRANSITION		50.000
ST	40459.118	307063.245	6240126.523	15.342	181°43'58.80"	LINE		69.400
TS	40528.519	307061.146	6240057.154	15.516	181°43'58.80"	TRANSITION		60.000
SC	40588.519	307062.002	6239997.208	15.898	174°07'04.80"	ARC	-230.000	23.459
CS	40611.978	307065.591	6239974.035	16.093	168°16'26.40"	TRANSITION		20.016
SC	40631.993	307070.487	6239954.634	16.259	163°28'01.20"	ARC	-250.000	287.383
CS	40919.376	307277.072	6239777.975	16.645	97°36'10.80"	TRANSITION		50.784
ST	40970.160	307327.727	6239774.712	16.668	91°43'04.80"	LINE		406.070
TC	41376.230	307733.615	6239762.537	18.300	91°43'04.80"	ARC	-200.000	242.968
CT	41619.199	307924.900	6239887.161	17.273	22°06'46.80"	LINE		230.718
TC	41849.917	308011.750	6240100.908	16.627	22°06'46.80"	ARC	-200.000	51.784
CT	41901.701	308024.849	6240150.858	16.600	7°16'40.80"	LINE		81.076
TC	41982.777	308035.120	6240231.281	16.870	7°16'40.80"	ARC	-3800.000	20.000
CT	42002.777	308037.602	6240251.127	17.028	6°58'33.60"	LINE		22.344
TC	42025.121	308040.315	6240273.305	17.245	6°58'33.60"	ARC	3800.000	20.000
CT	42045.121	308042.797	6240293.151	17.300	7°16'40.80"	LINE		780.241
E	42825.362	308141.638	6241067.106		7°16'40.80"			

ALIGN ACCESS ROAD->MA11L HORIZONTAL POINTS

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IP 1	0.000	308045.376	6240385.426	16.352	1°45'31.77"			
TC	1.916	308045.435	6240387.341	16.338	1°45'31.77"			
IP 2	3.712	308045.490	6240389.138	16.313		R = -33.300	3.592	6°10'49.33"
CT	5.508	308045.352	6240390.930	16.277	355°34'42.44"			
TC	7.143	308045.225	6240392.560	16.234	355°34'42.44"			
IP 3	11.423	308044.831	6240397.666	16.097		R = -6.200	8.560	79°06'26.59"
CT	15.703	308039.743	6240398.243	15.955	276°28'15.85"			
IP 4	16.361	308039.089	6240398.317	15.933	276°28'15.85"			

02

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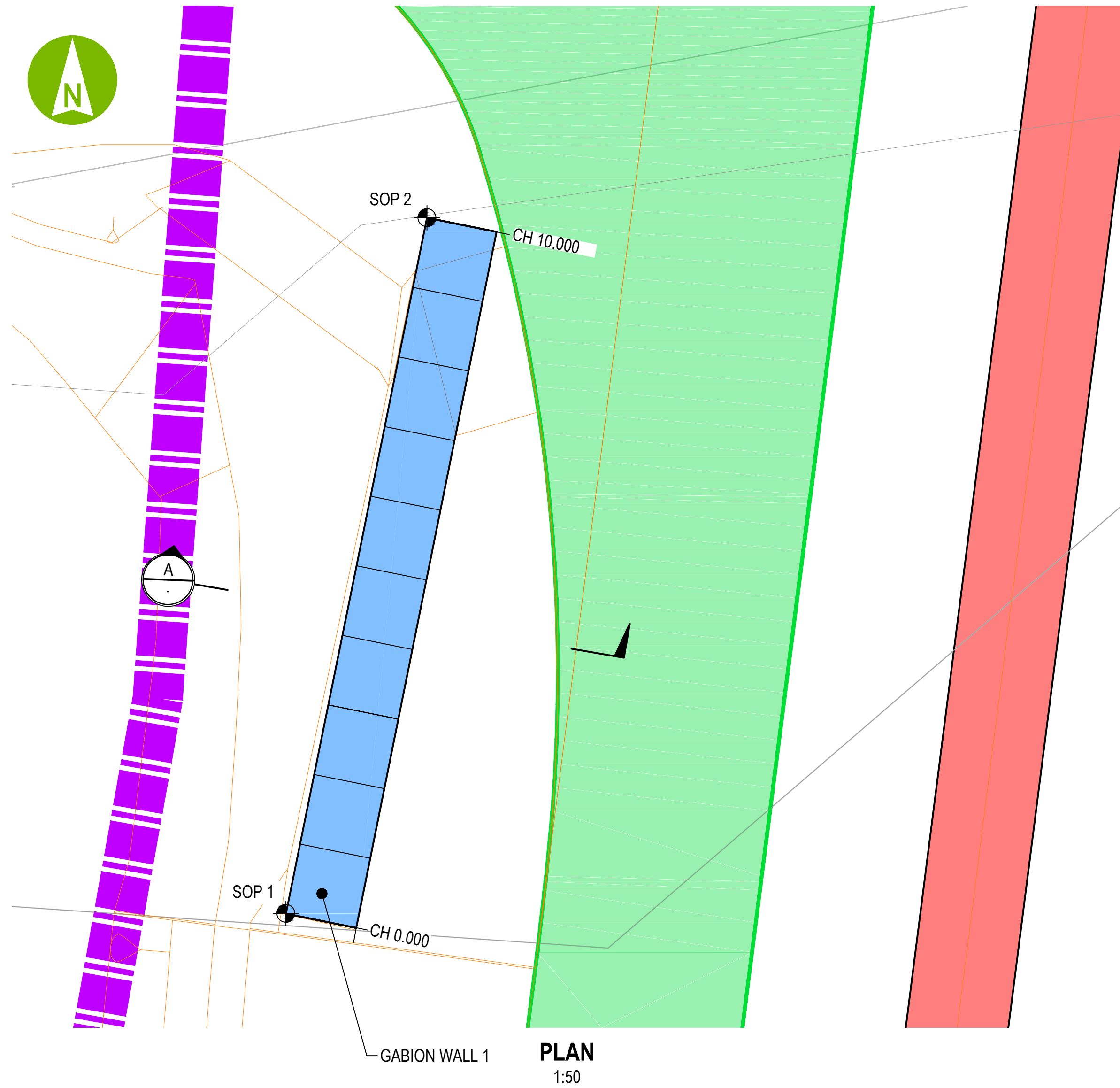
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CS	39306.760	307014.306	6240895.682	12.670	198°13'46.66"	TRANSITION		20.000
SC	39326.760	307007.765	6240876.782	12.864	199°52'42.17"	ARC	800.000	19.063
CT	39345.823	307001.070	6240858.934	13.059	201°14'37.16"	LINE		141.391
TS	39487.214	306949.840	6240727.151	14.454	201°14'37.16"	TRANSITION		40.100
SC	39527.314	306936.230	6240689.441	14.829	197°03'08.22"	ARC	-275.652	172.293
CS	39699.607	306938.756	6240519.958	15.211	161°14'24.71"	TRANSITION		40.100
ST	39739.707	306953.483	6240482.670	15.239	157°02'55.78"	LINE		214.807
TS	39954.514	307037.246	6240284.868	15.334	157°02'55.78"	TRANSITION		60.000
SC	40014.514	307058.447	6240228.778	15.376	163°45'26.73"	ARC	260.000	56.319
CS	40070.833	307068.244	6240173.429	15.415	176°10'06.18"	TRANSITION		50.000
ST	40120.833	307068.354	6240123.450	15.450	181°44'00.13"	LINE		66.561
TS	40187.394	307066.341	6240056.920	15.497	181°44'00.13"	TRANSITION		60.000
SC	40247.394	307067.262	6239996.977	15.695	173°56'03.04"	ARC	-224.800	22.509
DIS	40269.903	307070.757	6239974.750	15.886	89°59'60.00"	ARC		22.509
DIS	40292.412	307076.429	6239952.970	16.077	163°17'10.72"	ARC	-244.800	280.360
CS	40572.772	307277.488	6239783.166	16.540	97°40'03.69"	TRANSITION		50.258
ST	40623.030	307327.616	6239779.917	16.613	91°43'05.28"	LINE		293.844
E	40916.874	307621.328	6239771.107		91°43'05.28"			

REV	DATE	REVISION DETAILS	APPROVED
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02	09.06.17	ACCEPTED FOR CONSTRUCTION RE-SUBMISSION	

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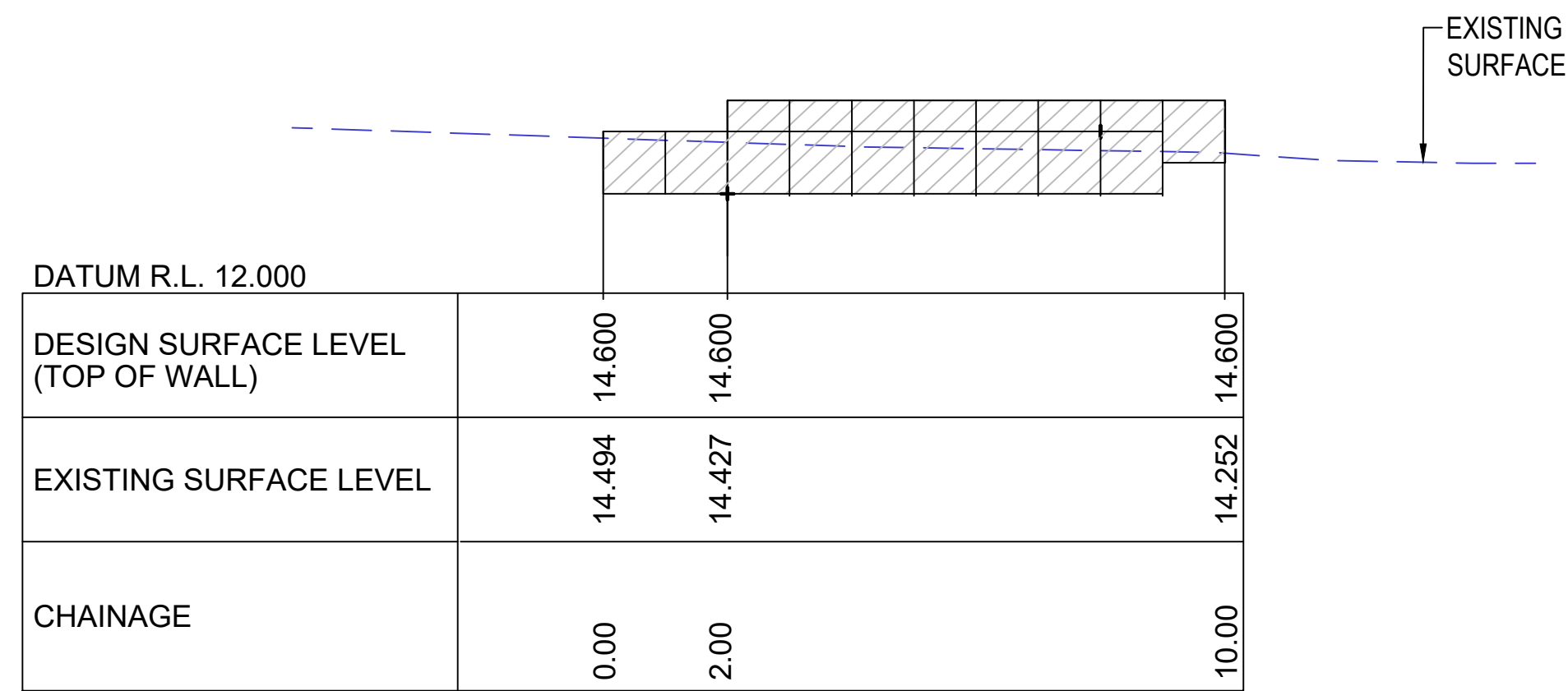
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DRAWING No.	PROJECT No.	ZONE	TYPE	DISC	NUMBER
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					REV
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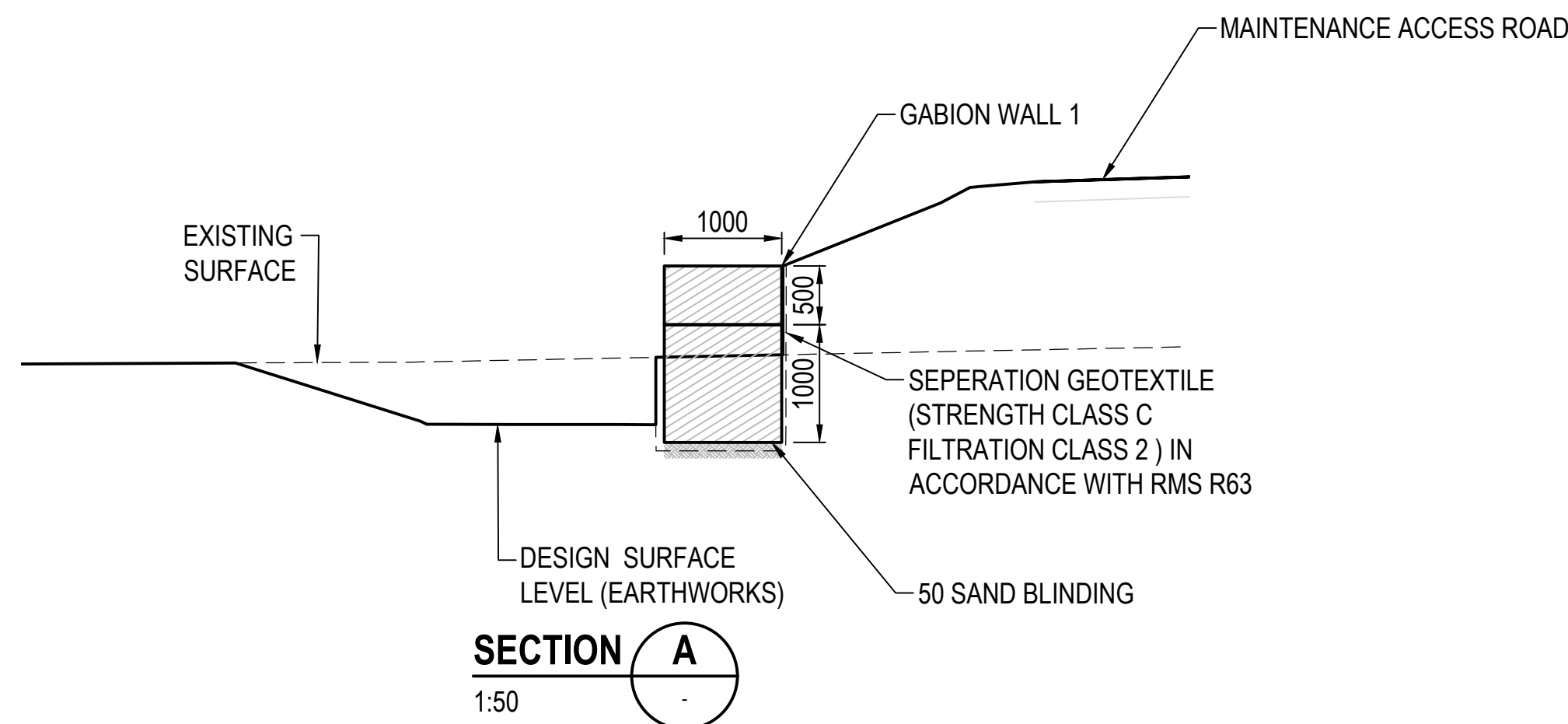


PLAN
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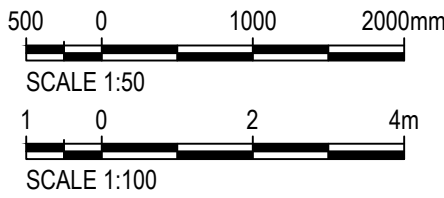
LONGITUDINAL SECTION ALONG GABION WALL 1
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SECTION A
1:50

NOTES:

- FILL MATERIALS SHALL BE IN ACCORDANCE WITH EARTHWORKS SPECIFICATION.
- BASE PREPARATION FOR THE RETAINING WALL SHALL BE CONFIRMED BY THE GEOTECHNICAL ENGINEER ON SITE TO ACHIEVE A FOUNDATION ALLOWABLE BEARING CAPACITY OF 200KPa.
- SUPPLY AND INSTALLATION OF GABIONS SHALL BE AS PER RMS SPECIFICATION R55 AND IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.

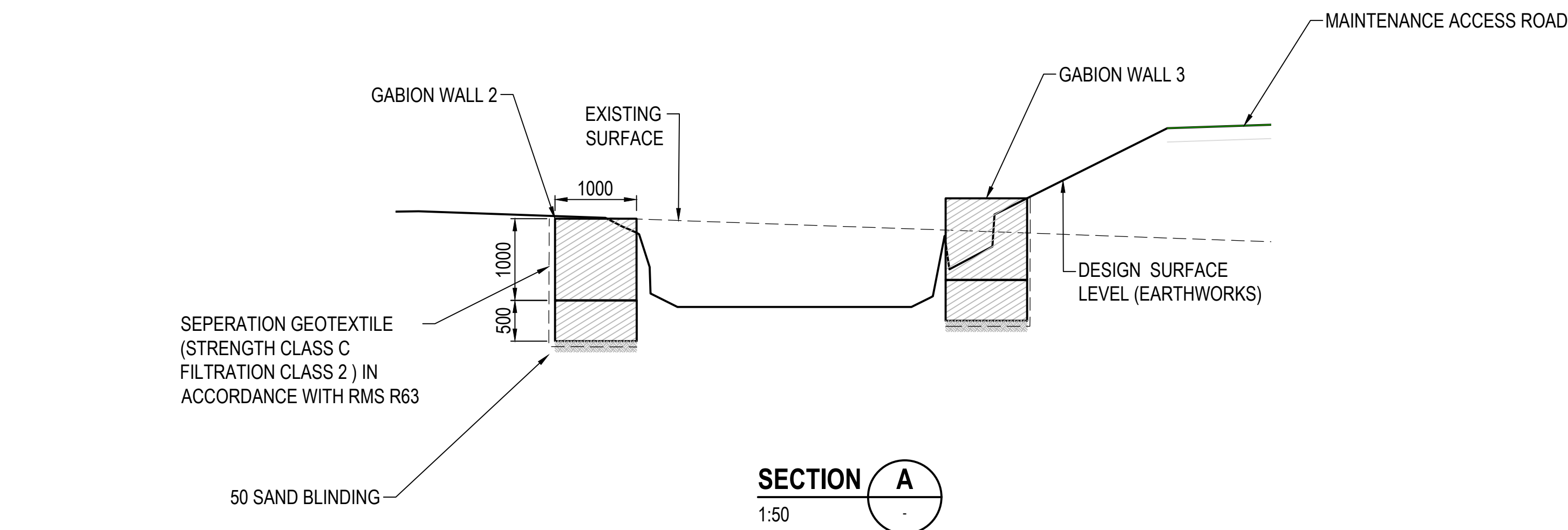
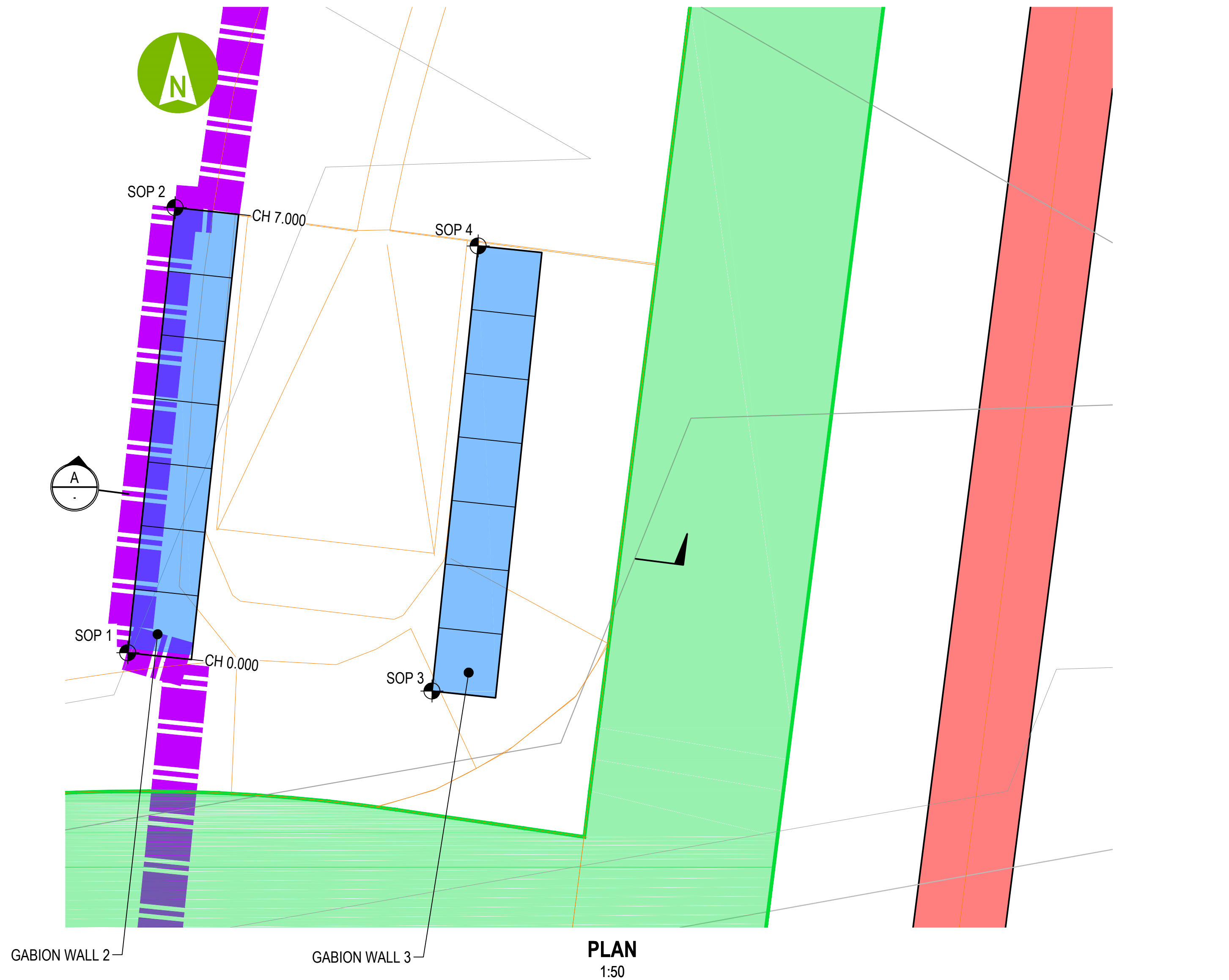


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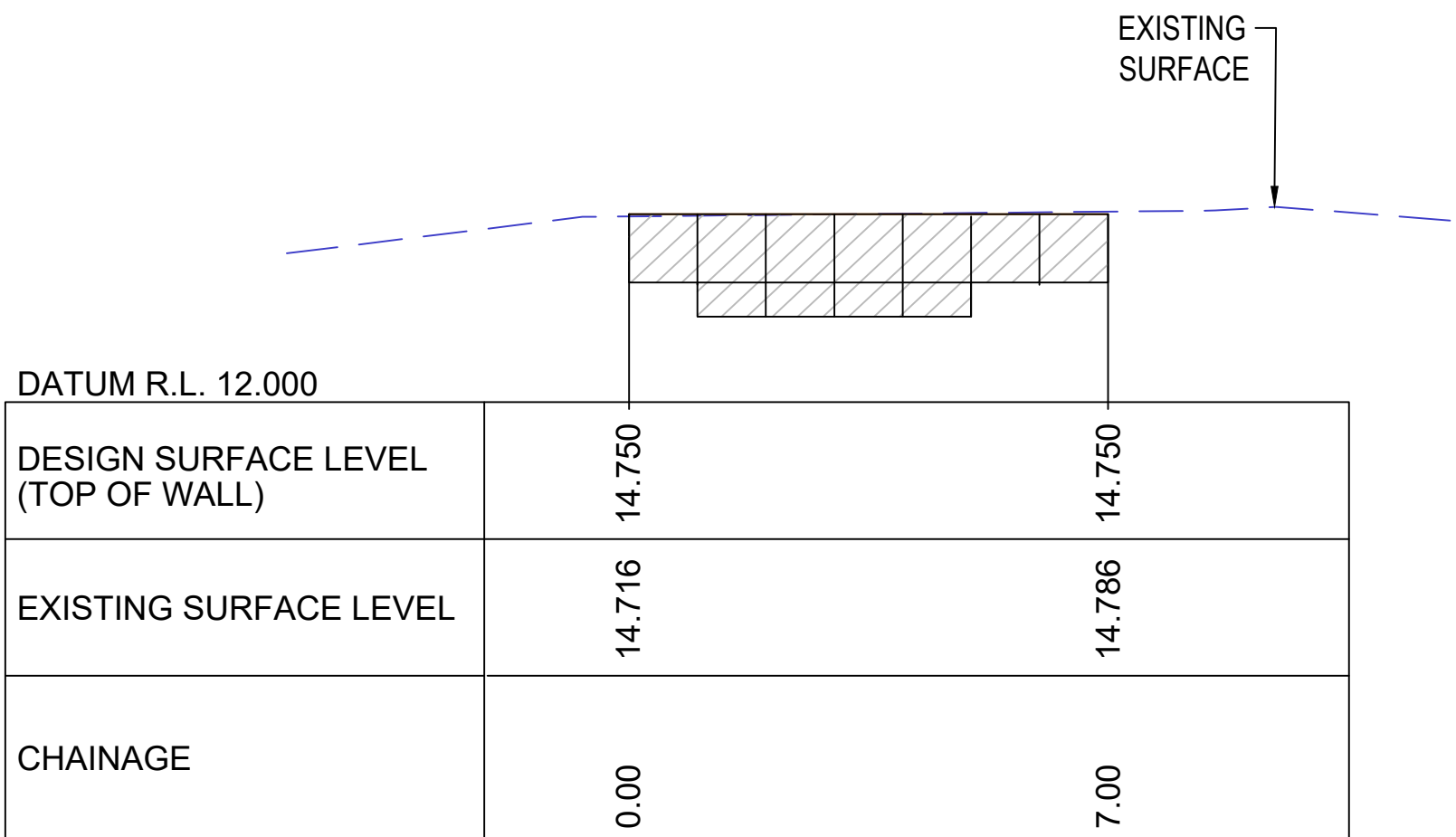
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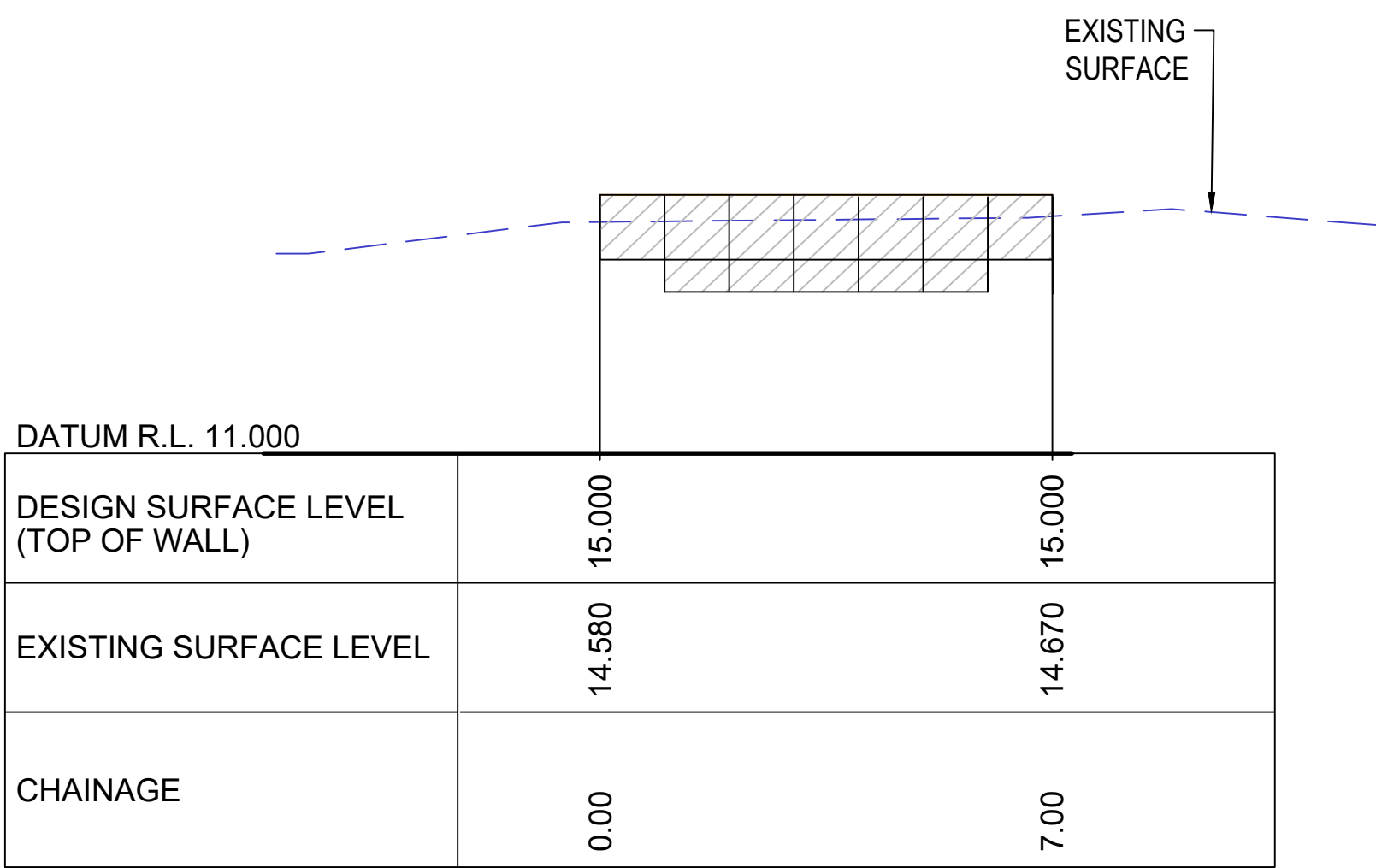
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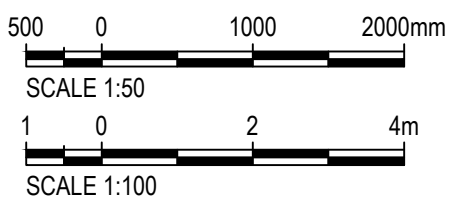
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LONGITUDINAL SECTION ALONG GABION WALL 2
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LONGITUDINAL SECTION ALONG GABION WALL 3
1:100



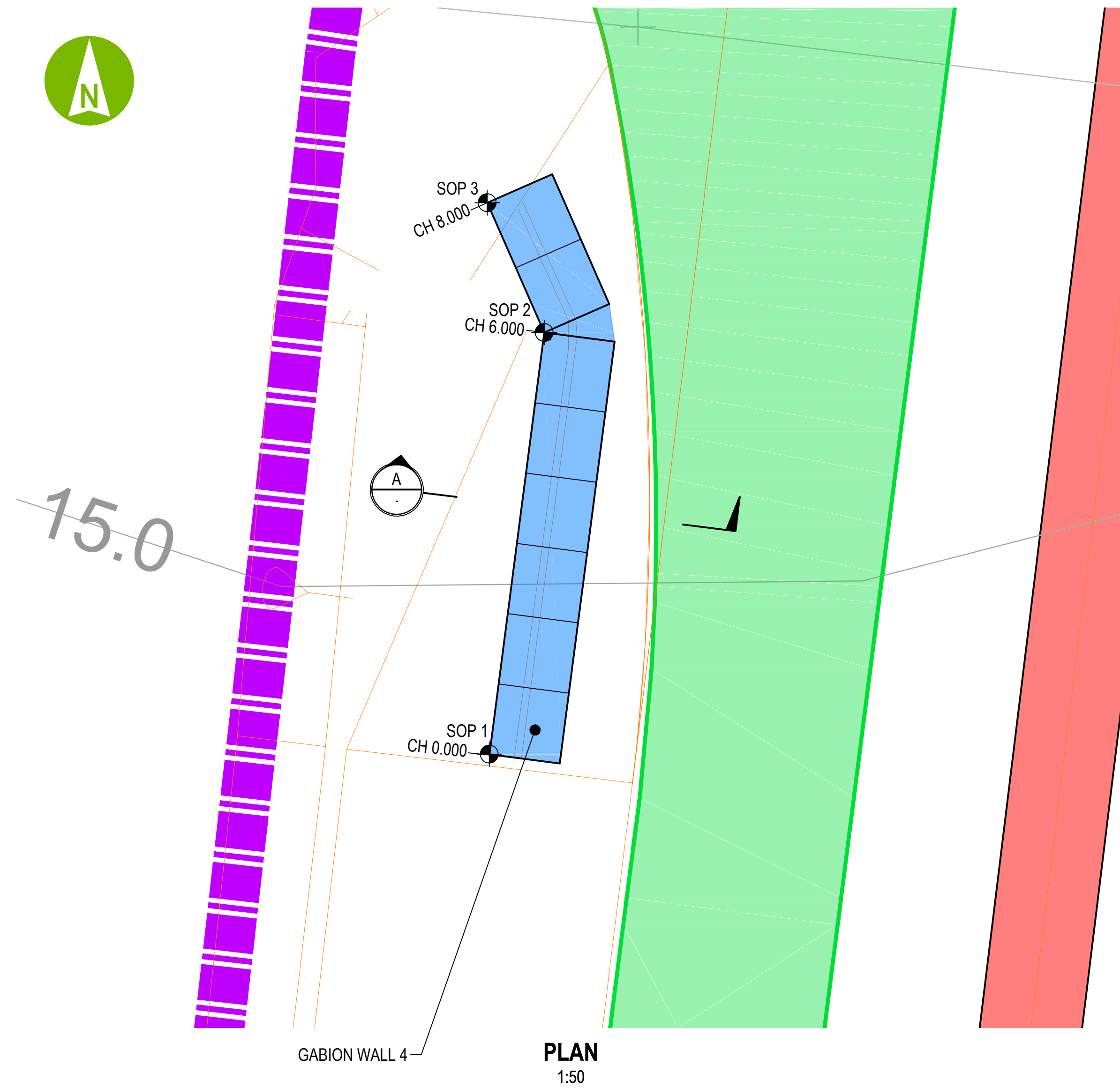
NOTES:

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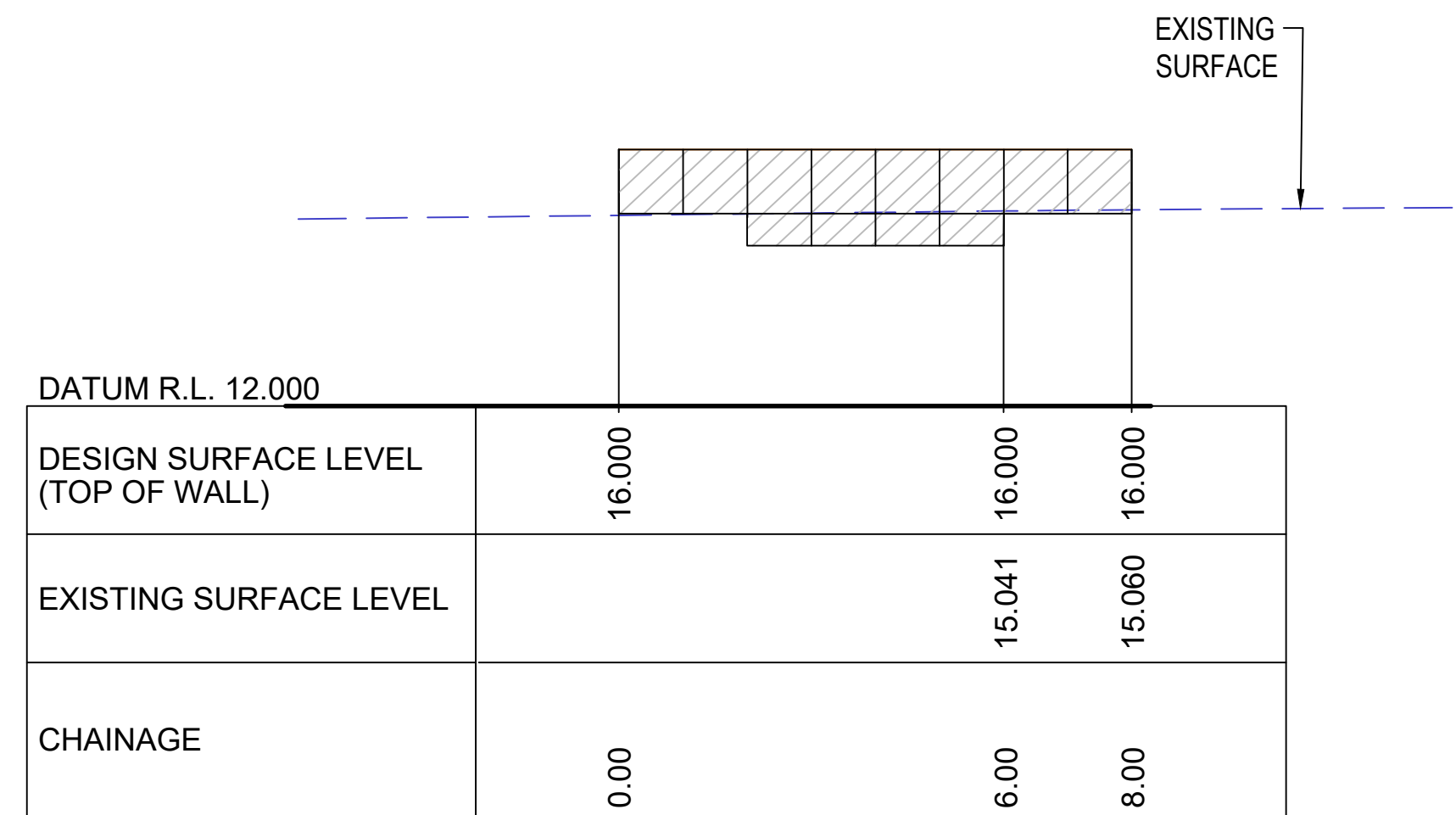
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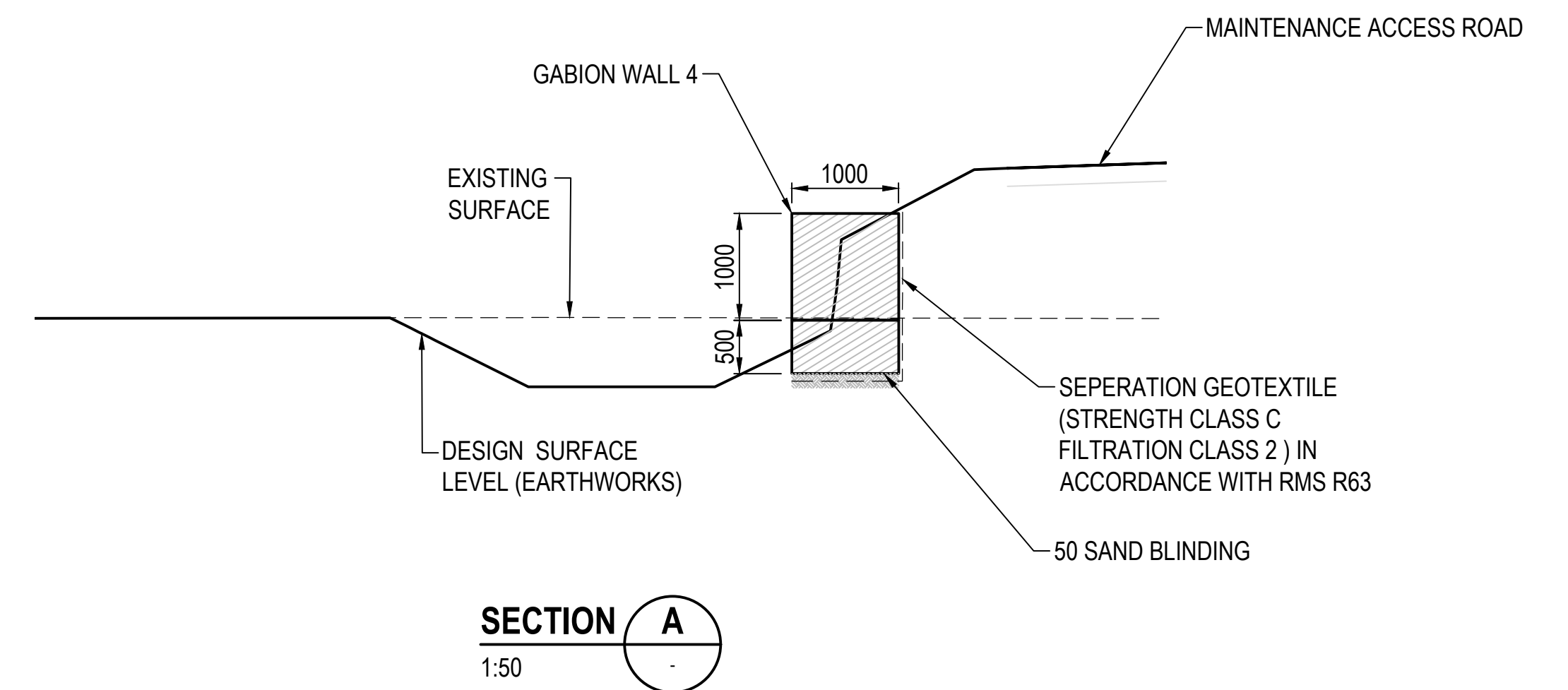
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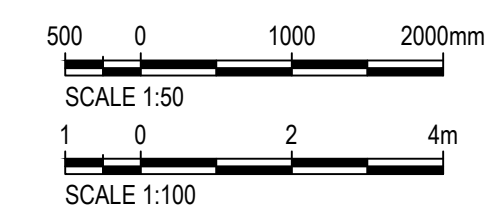
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SECTION A
1:50

NOTES:

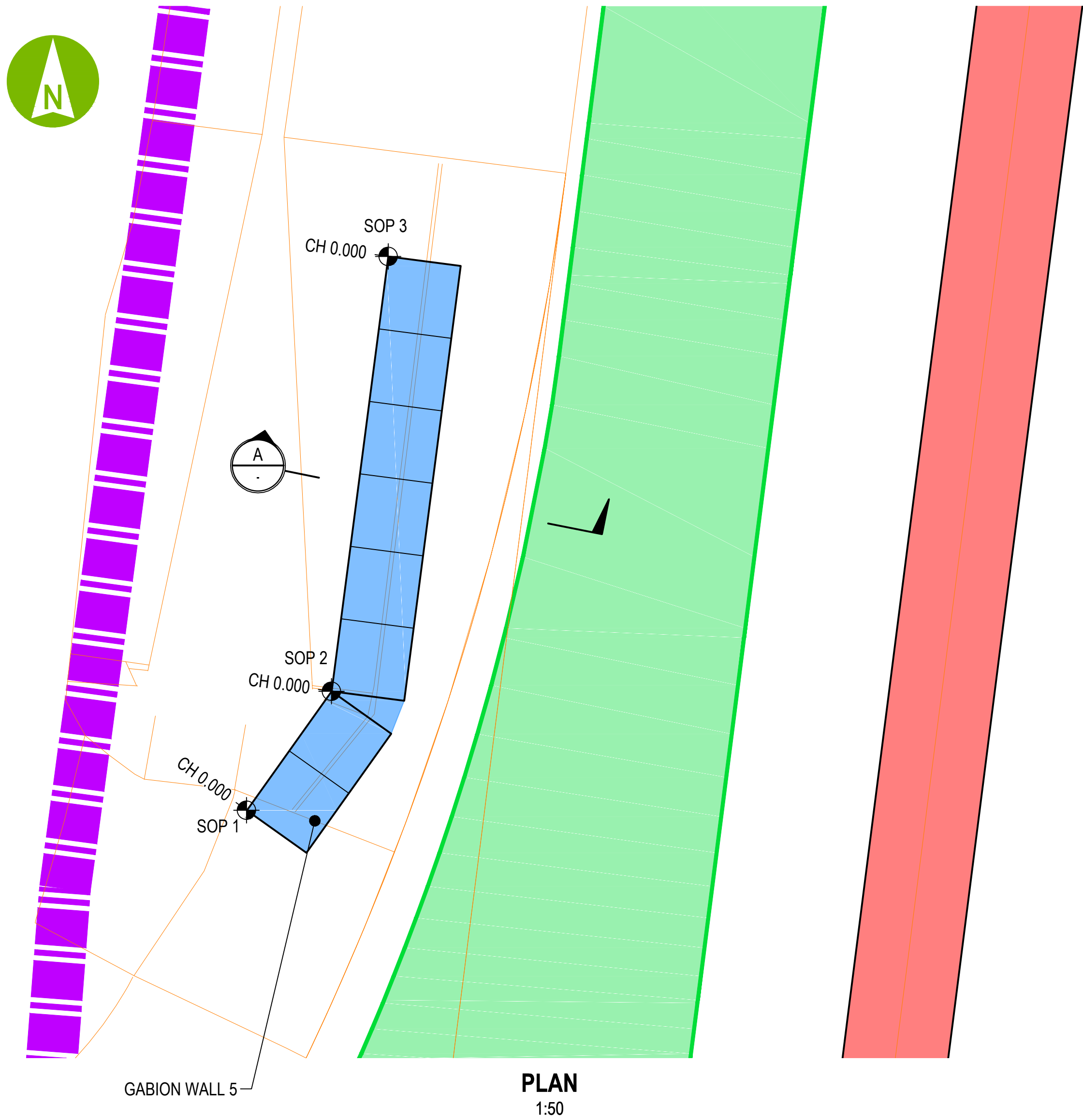
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- BASE PREPARATION FOR THE RETAINING WALL SHALL BE CONFIRMED BY THE GEOTECHNICAL ENGINEER ON SITE TO ACHIEVE A FOUNDATION ALLOWABLE BEARING CAPACITY OF 200KPa.
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REV	DATE	REVISION DETAILS
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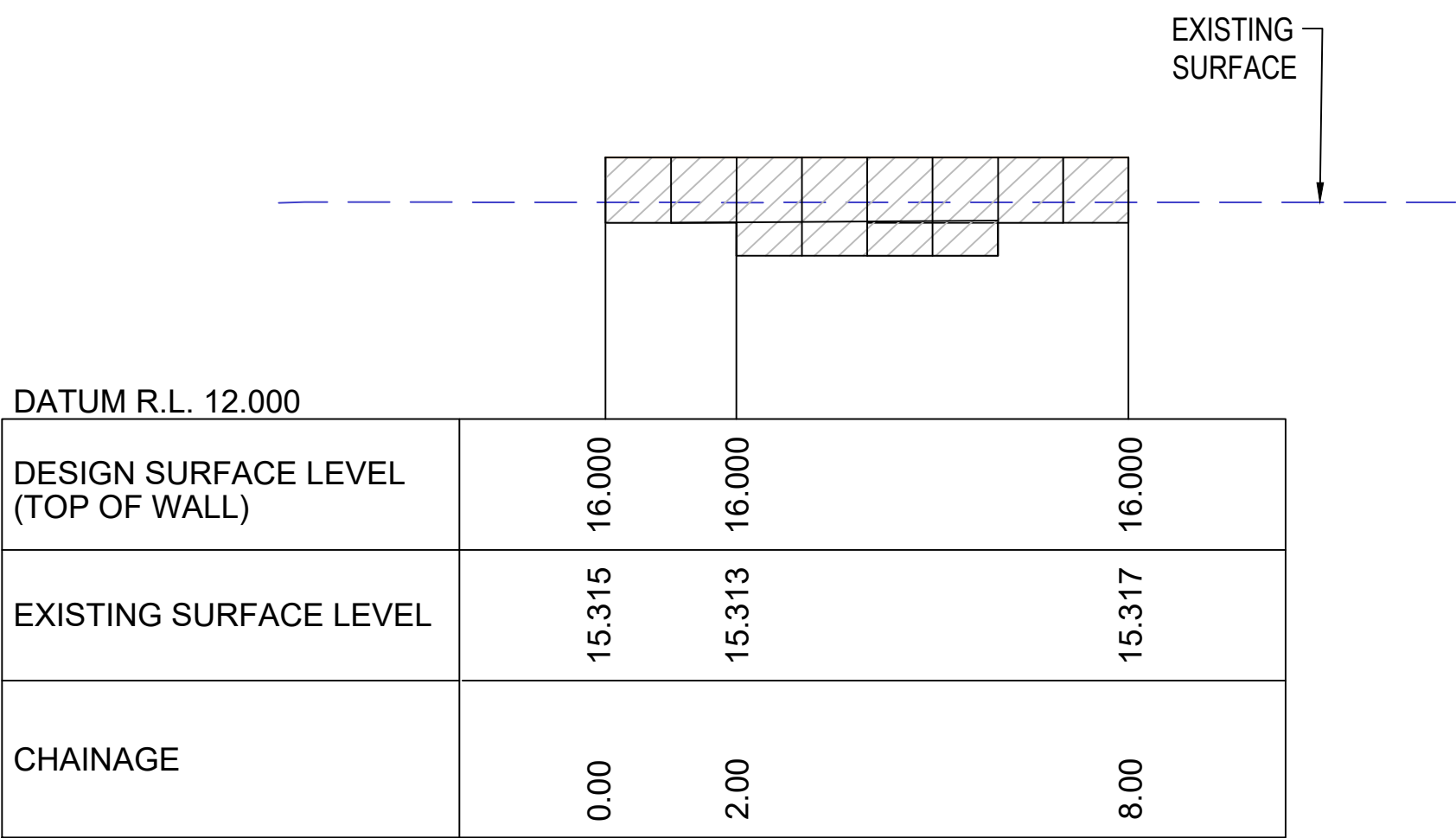
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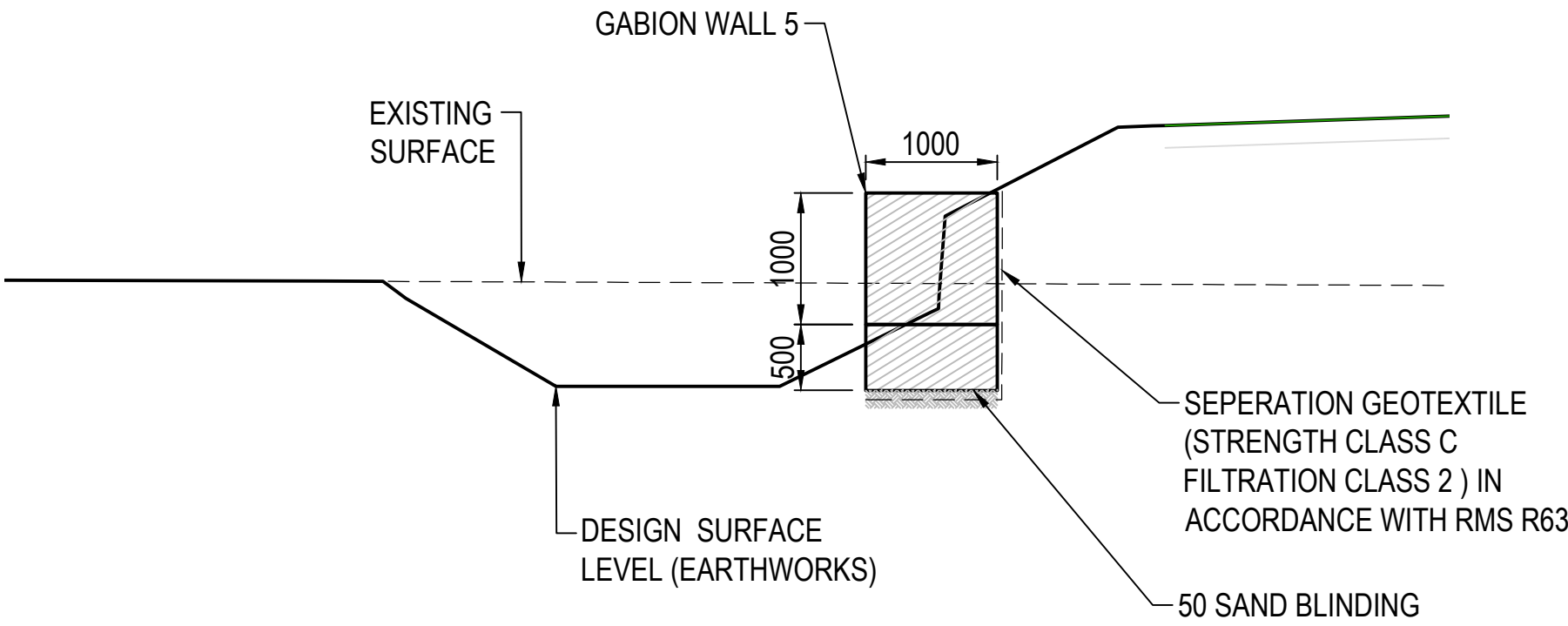


PLAN
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SOP 3	E 308035.160
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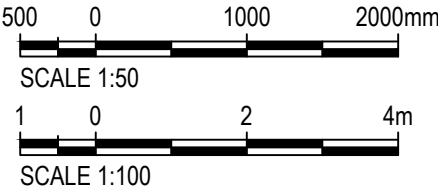
ELEVATION
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SECTION A
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NOTES:

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REV	DATE	REVISION DETAILS	APPROVED
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							01	

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Appendix B – Data Quality Objectives

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DATA QUALITY OBJECTIVES

The following data quality objectives (DQO) are based on the requirements detailed in Appendix IV of the *Guidelines for the NSW Site Auditor Scheme (2nd edition)* (NSW DEC, 2006).

Step 1: State the problem	<p>The primary objective of the remediation and validation program is to:</p> <ul style="list-style-type: none"> • The broad remediation goal is to remediate/manage the contamination at the site to a level where there is a low risk of adverse impact to human health or the environment and the site is made suitable for the proposed rail use in accordance with relevant legislation and guidelines. <p>The main problems are:</p> <ul style="list-style-type: none"> • What is the extent of contamination • How many soil samples should be collected? • What sample layout should be used to achieve the above objectives? • What analytes should be tested?
Step 2: Identify the decision	<ul style="list-style-type: none"> • Following remediation, is the Site suitable for the proposed land use? • Based on the outcome of the remedial works, will other media (groundwater, surface water, vapour) require assessment? • If fill is brought to the site, is it suitable for use? • What is the waste classification of material designated for offsite disposal?
Step 3: Identify inputs to the decision	<ul style="list-style-type: none"> • A review of a previous environmental assessment undertaken at the site; • Field observations, soil laboratory results; • Applicable NSW EPA / DEC / DECC / DECCW / OEH / WA DOH / NEPC and CRC Care guidelines.
Step 4: Define the boundaries of the study	<p>The study boundaries are defined by the extent of the Remediation Areas and pre-validation areas. The Site and remediation areas are shown on Figures 2 to 5. Vertically, the remediation extent is expected to be up to the base of the construction depth.</p> <p>Based on previous investigation, groundwater is unlikely to have been impacted by contamination identified within soils at the site.</p>
Step 5: Develop a decision rule	<p>The decision rule for soil for each identified contaminant/layer to assess the suitability of the site will be as follows:</p> <ul style="list-style-type: none"> • QA/QC assessment indicates that the data is usable • Where contaminant concentrations for each sample are below the validation acceptance criteria then no further assessment / remediation is required with respect to that contaminant / soil unit / area • Where contaminant concentrations are reported to exceed the validation acceptance criteria, additional excavation and validation works will be carried out to ensure complete removal of the identified impact.
Step 6: Acceptable limits on decision error	<p>There are two types of decision errors:</p> <ul style="list-style-type: none"> • Sampling errors, which occur when the samples collected are not representative of the conditions within the remediation area • Measurement errors, which occur during sample collection, handling, preparation, analysis and data reduction. <p>The null hypothesis for this study is:</p>

	<ul style="list-style-type: none"> Contaminant concentrations within the subsurface of the site are less than the proposed validation criteria. <p>These errors may lead the decision maker to make the following errors:</p> <ol style="list-style-type: none"> Deciding that the Site has been validated when it has actually not Deciding that the Site has not been validated when it actually is. <p>The validation will aim with 95% probability to conclude that the site is suitable for the proposed use (i.e. the acceptable error limit for the type 1 error is 5%). For this reason, the 95% UCL will be used to assess the true mean.</p> <p>The consequences of a type 2 error are less than a type 1 error and therefore we propose a greater limit on the type 2 error (say 80% probability).</p>
Step 7: Optimise the design for obtaining data.	<p>The methodology for validation and numbers of validation samples / locations selected will be based on the RAP as described in Section 7.</p>

Appendix C – Basis for Gas Protection Measures

BASIS FOR GAS PROTECTION MEASURES

Summary

Gas monitoring was been conducted in six monitoring wells, which were positioned within the rail corridor and inactive section of the GWS landfill facility. Data from the gas monitoring events are presented in the Land Contamination Status Report (Coffey, 2016a). Gas monitoring was conducted on three separate occasions.

A summary of the monitoring results are presented below:

Monitoring Well	Highest CH ₄ (%)	Highest CO ₂ (%)	Highest Flow Rate (L/hr)	Gas Screening Value (GSV)		Highest Characteristic Situation (CS)
				CH ₄	CO ₂	
BH5S	12.1	14.5	0	0	0	1
BH5D	5	3.7	1.5	0.08	0.003	2
BH8	65.8	33.9	0.1	0.07	0.02	1
BH9	63	33.9	7.8	4.91	1.67	4
BH18S	2.4	3.2	0	0	0	1
BH18D	1.5	1.4	0	0	0	1

Based on the gas monitoring data currently available from the site, and the methodology presented within Guidelines for the Assessment and Management of Sites Impacted by Hazardous Ground Gases (the 'Guidelines') (NSW EPA, 2012), a Characteristic Situation of 4 (CS4) is assigned to the Glenfield Waste Service section of the proposed rail corridor, which corresponds to a moderate to high risk rating. Significant sources of ground gases have not been identified in other parts of the rail corridor.

As the proposed development comprises an above ground rail link passing through an open area, Coffey considers there to be negligible opportunities for ground gases to accumulate resulting in exposure. The only exception to this would be gas accumulation within buried infrastructure such as utility pits or trenches. Based on the results obtained from the gas monitoring rounds conducted to date, further consideration of the mitigation measures required to mitigate health risks to workers installing, or conducting future maintenance of buried services.

Scope of Gas Protection Measures

The Guidelines provide guidance on the applicability of different gas protection measures for a range of structures within different land uses settings. They do not provide specific guidance on gas mitigation for subsurface structures such as utility pits. Whilst the proposed development does not propose to introduce structures that are consistent with those described within Table 7 of the Guidelines, Coffey consider a utility pit within the rail corridor to be most consistent with an Industrial Building, based on the following rationale:

- Utility pits would be accessed by workers conducting construction or maintenance activities.
- Workers within the rail corridor will access utility pits on an intermittent basis. The frequency and potential exposure duration is assessed to be less than that considered within a standard commercial/industrial setting.
- Large industrial buildings inherently comprise a large internal volume offering greater potential to dilute gases that enter the structure. Also, these buildings are typically characterised by large voids (e.g. access doors to allow vehicles/plant to enter) allowing an increased air exchange rate relative to that of a typical residential dwelling or other public buildings (e.g. school, shopping centre etc.). These factors are considered to be most aligned with the utility pit setting within the rail corridor.

Based on the ratings set out within Table 7 of the Guidelines, a Gas Protection Guidance Value of 3 is required for CS4 in order to mitigate the risks posed by the gases. Based on the information provided, it is assessed the proposed design of the utility pits will account for the following Gas Protection Guidance Value score, as outlined within Table 8 within the guidelines:

Utility Pit Aspect	GPV Score	Comment
Membranes		
- Proprietary gas resistant membrane to reasonable levels of workmanship under independent CQA with integrity testing and independent validation	2	CPB will install a GCL and HDPE membrane within the embankment along Remediation Area 4 (shown in Figures 2 and 3).
Pathway Intervention Measures		
- Compaction of rail embankment	0.5	Each utility pit and associated trench will be constructed within an embankment over the landfill. Compaction of the landfill is required to construct the rail embankment. This process will reduce the effective porosity of the underlying fill, thereby reducing the potential for gas to migrate through the compacted embankment soil and enter utility pits.
- Concrete pits	0.5	Utility pits will be constructed with either prefabricated concrete, or cast in-situ reinforced concrete. Utility trenches will be constructed with prefabricated concrete or steel boxes/cable ducts.
Monitoring & Detection		
- Intermittent monitoring using hand held equipment	0.5	Access to each utility pit will be required for maintenance purposes. Gas monitoring would be required as part of the LTEMP to check build-up of gases had not occurred

Memorandum

Recipient name	[REDACTED]	Recipient company	CPB Contractors Pty Ltd
Copied recipients	[REDACTED]	Memo date	22 May 2019
Author	[REDACTED]		
Project reference	754-GEOTLCOV24072AH.M01-Rev2		
Memo subject	RE: Response to Request for Information dated 14 May 2019 – Gas Protection Measures for Service Pits within the GWS Premise as Detailed within the Project Remediation Action Plan		

As requested by CPB Contractors Pty Ltd (CPB), this memo presents Coffey's response to the Request for Information (RFI) dated 14 May 2019 (N01031-RFI-CPB-00252, Gas Protection Measures for Service Pits within the GWS Premise as Detailed within the Project Remediation Action Plan) – presented within Attachment A. CPB's questions are provided below in bold, and Coffey's responses are provided beneath each respective question.

It is important to note that the required protection guidance values and corresponding protection scores were based on the guidance given in *NSW EPA (1992) Guidelines for Assessment and Management of Sites Impacted by Hazardous Ground Gases*. The protection guidance values and corresponding protection scores presented in this EPA guidance document have been developed for buildings and not for service pits and similar structures in linear transport infrastructure. In assigning required guidance values and protection scores for service pits around transport infrastructure, we consider that the technical and management principles that are used in *NSW EPA (1992) Guidelines for Assessment and Management of Sites Impacted by Hazardous Ground Gases* can be utilised and the approach would be adequately conservative and robust.

It is also important to note that to our knowledge currently there is no gas extraction taking place at the landfill and also to our knowledge, there is no provision to implement landfill gas extraction in the currently capped areas and the proposed Cell X.

1. Has the GCL + HDPE liner been considered as part of the project's GPV score?

No information regarding the GCL + HDPE liner was available at the time of preparing the Remedial Action Plan (RAP) for the project. The liner has hence not been considered for the GPV score within the RAP.

- 2. If GCL + HDPE liner has not been considered, could you please advise whether it can be considered as an adequate mitigation measure to be included in the project's GPV score?**

The NSW EPA (2012), Guidelines for the Assessment and Management of Hazardous Ground Gases (the guideline) attributes a GPV score of 2 to a "propriety gas resistant membrane to reasonable levels of workmanship under independent CQA with integrity testing and independent validation" (Table 8). Coffey considers that landfill GCL and HDPE membranes fall under this category of protection, provided it is constructed reasonably under independent CQA (with records) with integrity testing and independent validation.

- 3. If the GCL+HDPE liner can be considered, could this measure be a substitute for a passive ventilation wind ventilator, as well as the need for longer term monitoring?**

Yes, the GCL + HDPE liner (if built appropriately with CQA records) will attribute a GPV score of 2 points.

A total of 3 GPV points are required for the Characteristic Gas Situation 4 (CS4) at the site, hence additional protection measures from Table 8 of the guideline are required, in addition to the GCL + HDPE to obtain a score of 3. Coffey notes that the RAP allows for use of concrete pits (0.5 points) and compaction of the rail embankment (0.5 points). Utilising this combination would provide the points required for CS4 (3). Coffey notes that a LTEMP will still be required for the site to ensure that the protection measures chosen (in this case the GCL + HDPE, compaction of rail embankment and concrete pits) remain in place (and in a proper functioning state) whilst the rail link is operational. Coffey also notes that entry to the pit should additionally be controlled via "confined space conditions", and this should be outlined within the Long Term Environmental Management Plan (LTEMP) for the site.

Coffey notes that other pits are located on the northern connector, however the closest pit to the (future) landfill mass within Cell X (pit 14) is situated over approximately 100m away from the future landfill mass in Cell X, thus protection measures are unlikely to be required for these pits¹ unless significant future changes to the landfill occurs, in which case this statement should be re-assessed.

- 4. If the liner cannot be considered as part of the project's GPV score or considered as a substitute, for either of the wind ventilator or for longer term monitoring, could you please advise on alternative options available to the project to substitute these items?**

Not applicable.

CLOSURE

We trust the above report meets your current requirements. If you have any further queries regarding the information presented herein, please do not hesitate to contact us.

For and on behalf of Coffey

¹ Coffey notes that the Auditor approved Remedial Action Plan (RAP) for the project does not include gas protection measures for this area of the MIRL.



Attachment A: CPB Request for Information

Request for Information

Moorebank Intermodal Terminal Development - RALP No. 1

CPB Contractors Pty Ltd

472 Pacific Highway, St Leonards NSW 2065



Subject: N01031-RFI-CPB-00252, Gas protection measures for service pits within the GWS premise as detailed within the project Remediation Action Plan

Sent: Tuesday, 14 May 2019 10:39 AM

From: [REDACTED]

To: [721 Coffey RFI Review]

Cc: [REDACTED]

Info:

☒ Request for Information

Project No.

N01031 - Moorebank Intermodal

RFI No.

N01031-RFI-CPB-00252

Status

Issued - Coffey

Due Date

15/05/2019

Classification

Minor

Category

Confirm/Change Process

Impact

Issue With

Query from Site

Date Closed

Discipline

SER - Services

Construction Lot No.

Other Reference

Construction Area Plan

CAP005 - Civil Works West of Georges River

Work Pack

CAP005-WP004 - Combined Services Route (CSR)

Subject

Gas protection measures for service pits within the GWS premise as detailed within the project Remediation Action Plan

Details'

modified by [REDACTED] CPB at 14/05/2019 10:39:42 AM

Could Coffey please provide a response to the below RFI by close of business Wednesday 15 May 2019.

Queries, please give me a call to discuss.

Many Thanks

[REDACTED]

M: 0433 562 397

modified by [REDACTED], CPB at 10/05/2019 5:35:59 PM

In relation to the project's Remediation Action Plan (RAP) dated 24th September 2018 and the need for gas protection measures for service pits, as part of the Rail Link within the GWS premise, could you please advise on the below queries regarding the GPV score and necessary mitigation measures to be adopted.

For context, Appendix C of the RAP details the basis for gas protection measures, which stipulates a requirement to achieve a score of 3 to mitigate risks posed by gases to achieve a CS4 rating. Measures proposed by the project to achieve this rating has obtained a higher GPV score of 3.5 compared to 3 and includes measures that the project is looking to substitute / change. These measures include:

- The need for ventilation of service pits through instalment of a 'passive wind ventilator', and
- The need for intermittent monitoring as part of the long-term operation of the project.

Thus in consideration of the measures outlined in Appendix C of the RAP, could you please advise:

- Has the GCL + HDPE liner been considered as part of the project's GCL score?
- If GCL + HDPE liner has not been considered, could you please advise whether it can be considered as an adequate mitigation measure to be included in the project's GCL score?
- If the GCL + HDPE liner can be considered, could this measure be a substitute for a passive ventilation wind ventilator, as well as the need for longer term monitoring?
- If the liner cannot be considered as part of the project's GCL score or considered as a substitute, for either of the wind ventilator or for longer term monitoring, could you please advise on alternative options available to the project to substitute these items?

To assist with your review, I have attached the latest utility design drawings for the project with mark up of location of liner in proximity to the service pits.

In addition to the above, Appendix C of the RAP states that Coffey have reviewed utility design drawings for the project and determined the need to install wind ventilators on 5 pits. However, the most recent design drawings have 12 service pits within GWS., although not all area above or in close proximity to the existing or future landfill cells.

As such, I have attached drawings with mark up showing those pits that are either in close proximity to landfill or above landfill that may require ventilation in the event the wind ventilator cannot be removed or substituted to achieve a GPV score of 3.

If you have any queries of your own in relation to the above, please contact [REDACTED] in the first instance.

Regards, [REDACTED]

Attachment(s)

 [10052019173303-0001.pdf](#)

Originator

[REDACTED]

Original Create Date

10/05/2019

Completion Record

Document Link

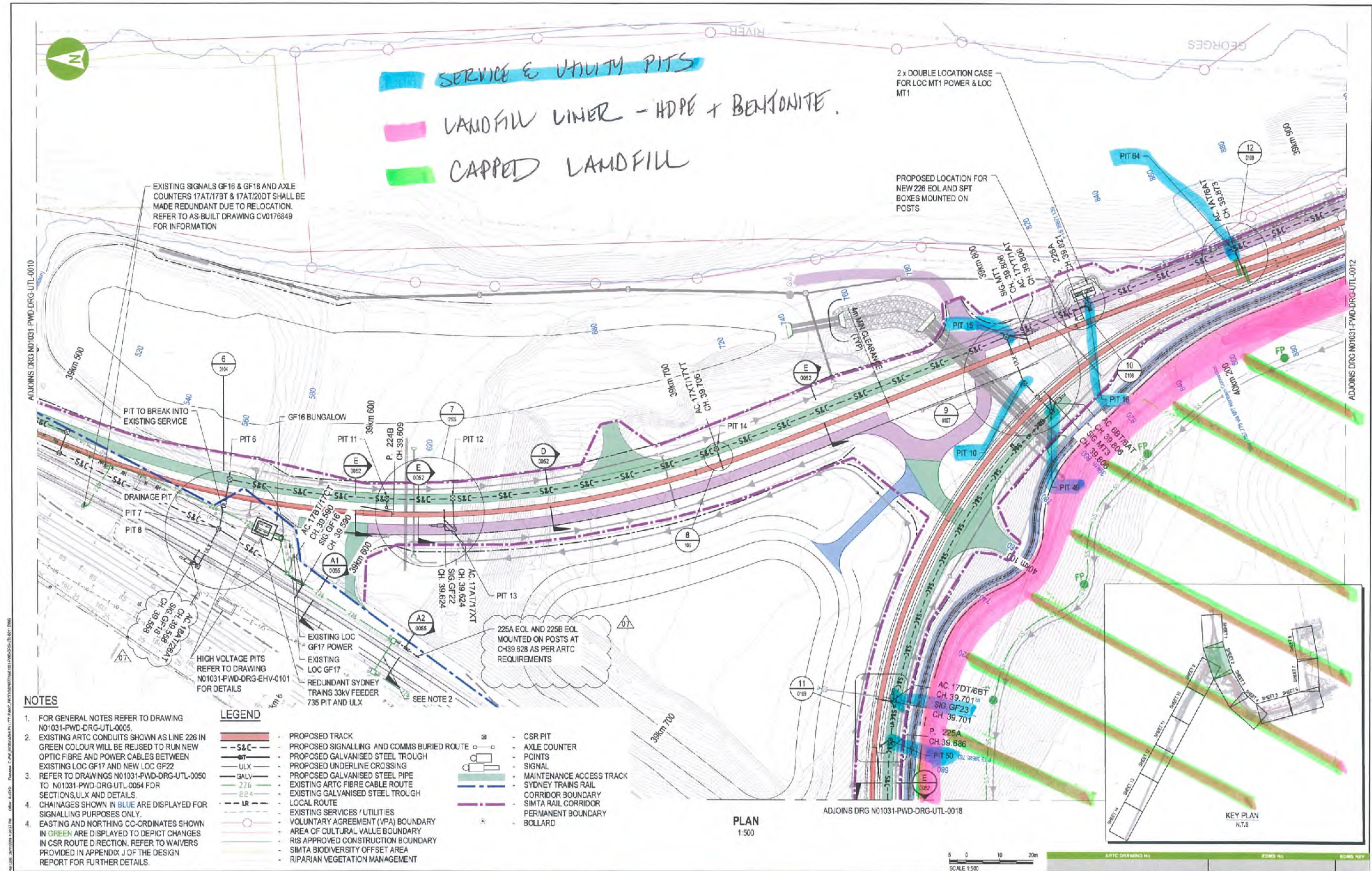
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modified by [REDACTED] CPB at 14/05/2019 10:39:42 AM

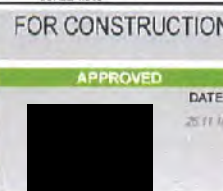
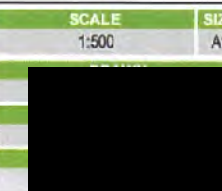
Issued - Coffey

modified by [REDACTED], CPB at 10/05/2019 5:35:59 PM

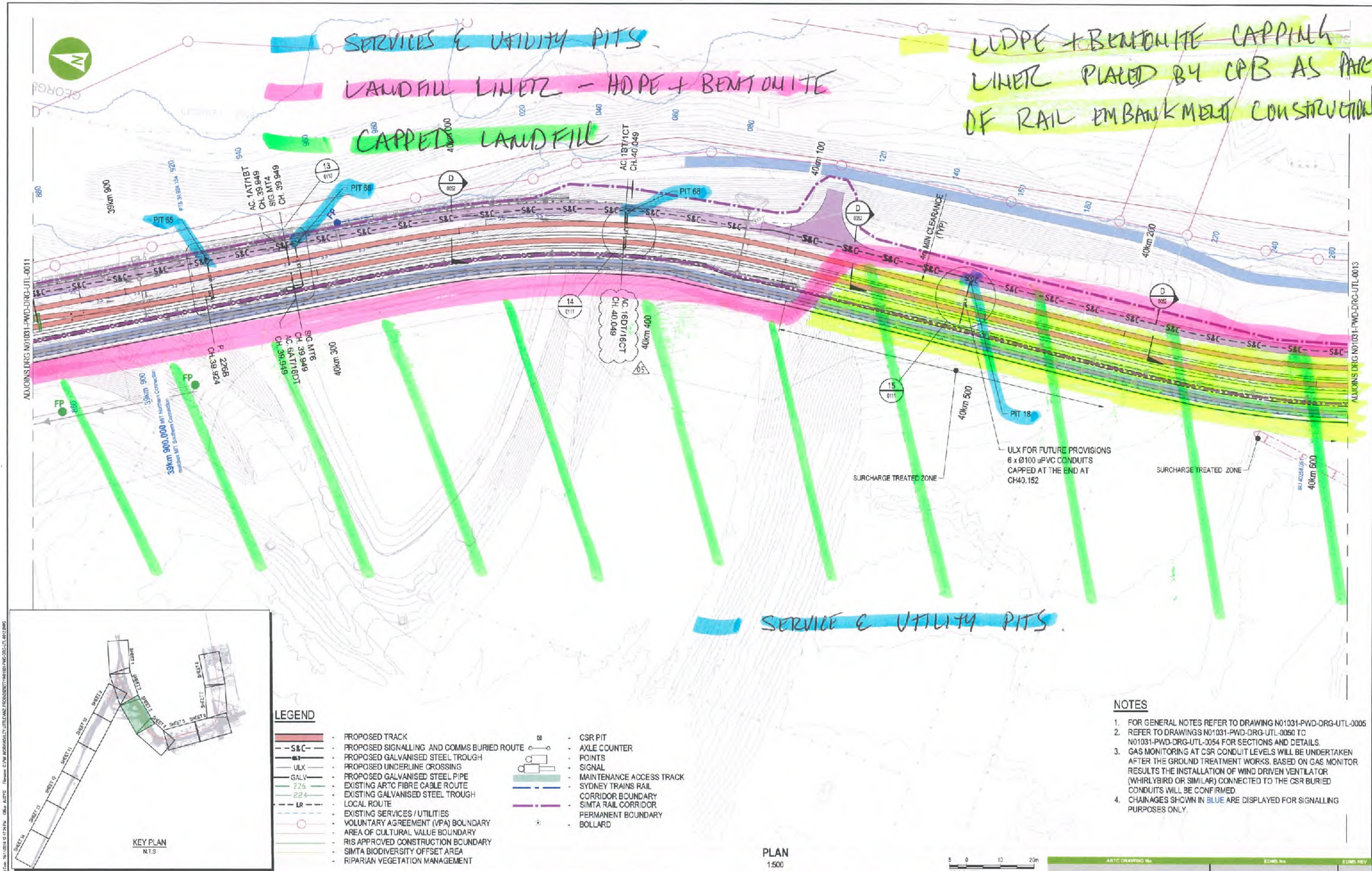
Engineering Review



REV	DATE	REVISION DETAILS
01	08.03.17	ACCEPTED FOR CONSTRUCTION
02	03.07.17	ACCEPTED FOR CONSTRUCTION RESUBMISSION
03	14.07.17	90% ARTC DESIGN ISSUE
04	30.08.17	ACCEPTED FOR CONSTRUCTION RESUBMISSION
05	02.02.18	90% ARTC DESIGN ISSUE (RESUBMISSION)
D1	09.07.18	GWS RE-DESIGN - 35% DEVELOPED DESIGN
06	10.10.18	ACCEPTED FOR CONSTRUCTION RESUBMISSION
07	28.11.18	ACCEPTED FOR CONSTRUCTION RESUBMISSION



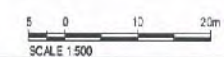
FOR CONSTRUCTION	PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1
APPROVED	TITLE	SERVICES AND UTILITIES GENERAL ARRANGEMENTS PLAN SHEET 2 OF 14
DATE	DRAWING No.	N01031
25.11.18	TYPE	PWD - DRG - UTL
	NUMBER	0011
	REV	07



LEGEND

- PROPOSED TRACK
- PROPOSED SIGNALLING AND COMMS BURIED ROUTE
- PROPOSED GALVANISED STEEL TROUGH
- ULX
- PROPOSED UNDERLINE CROSSING
- GALV
- PROPOSED GALVANISED STEEL PIPE
- EXISTING ARTC FIBRE CABLE ROUTE
- EXISTING GALVANISED STEEL TROUGH
- LOCAL ROUTE
- EXISTING SERVICES / UTILITIES
- VOLUNTARY AGREEMENT (VPA) BOUNDARY
- AREA OF CULTURAL VALUE BOUNDARY
- RIS APPROVED CONSTRUCTION BOUNDARY
- SIMTA BIODIVERSITY OFFSET AREA
- RIPARIAN VEGETATION MANAGEMENT
- CSR PIT
- AXLE COUNTER
- POINTS
- SIGNAL
- MAINTENANCE ACCESS TRACK
- SYDNEY TRAINS RAIL
- CORRIDOR BOUNDARY
- SIMTA RAIL CORRIDOR
- PERMANENT BOUNDARY
- BOLLARD

PLAN
1:500



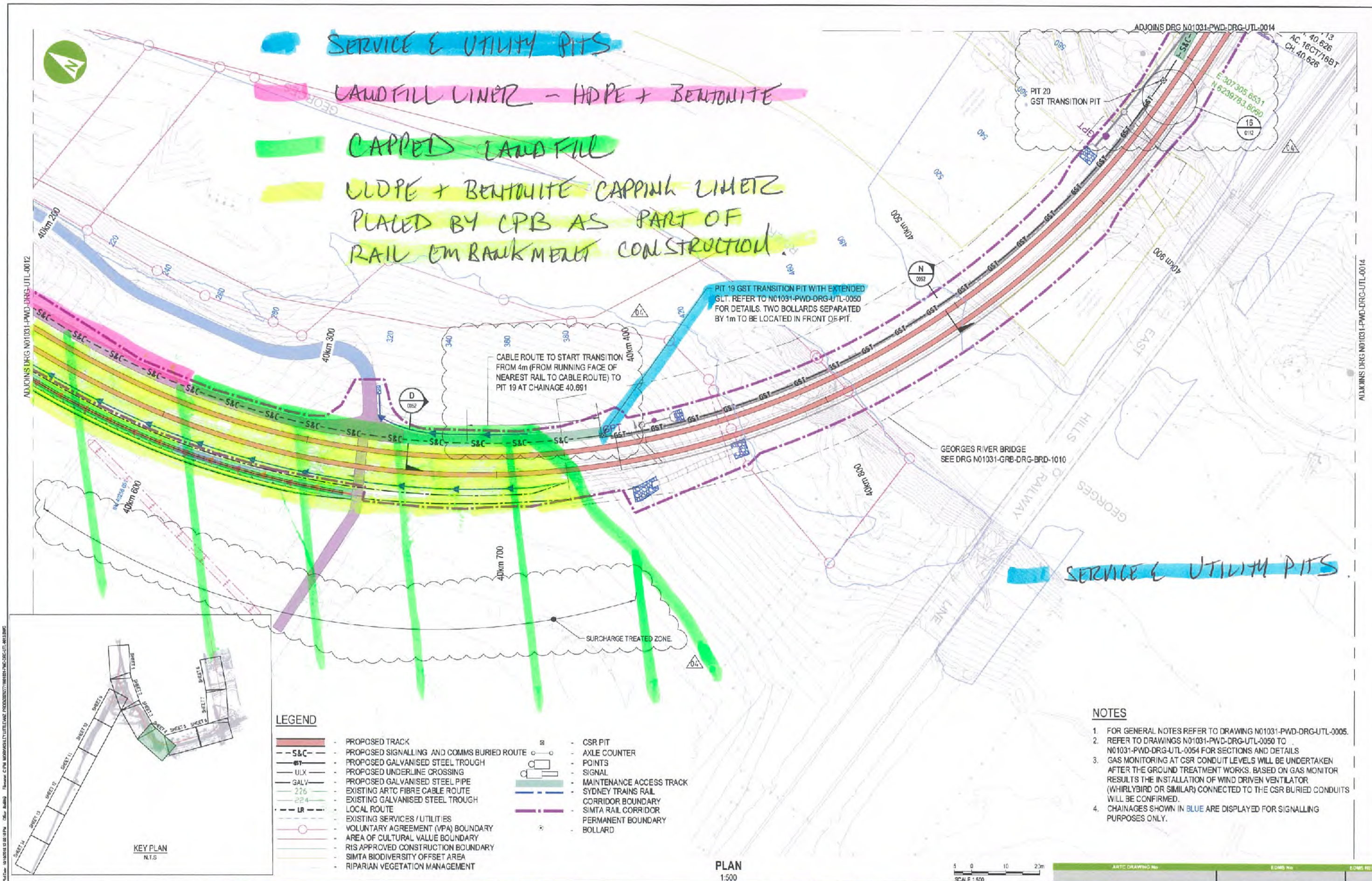
NOTES

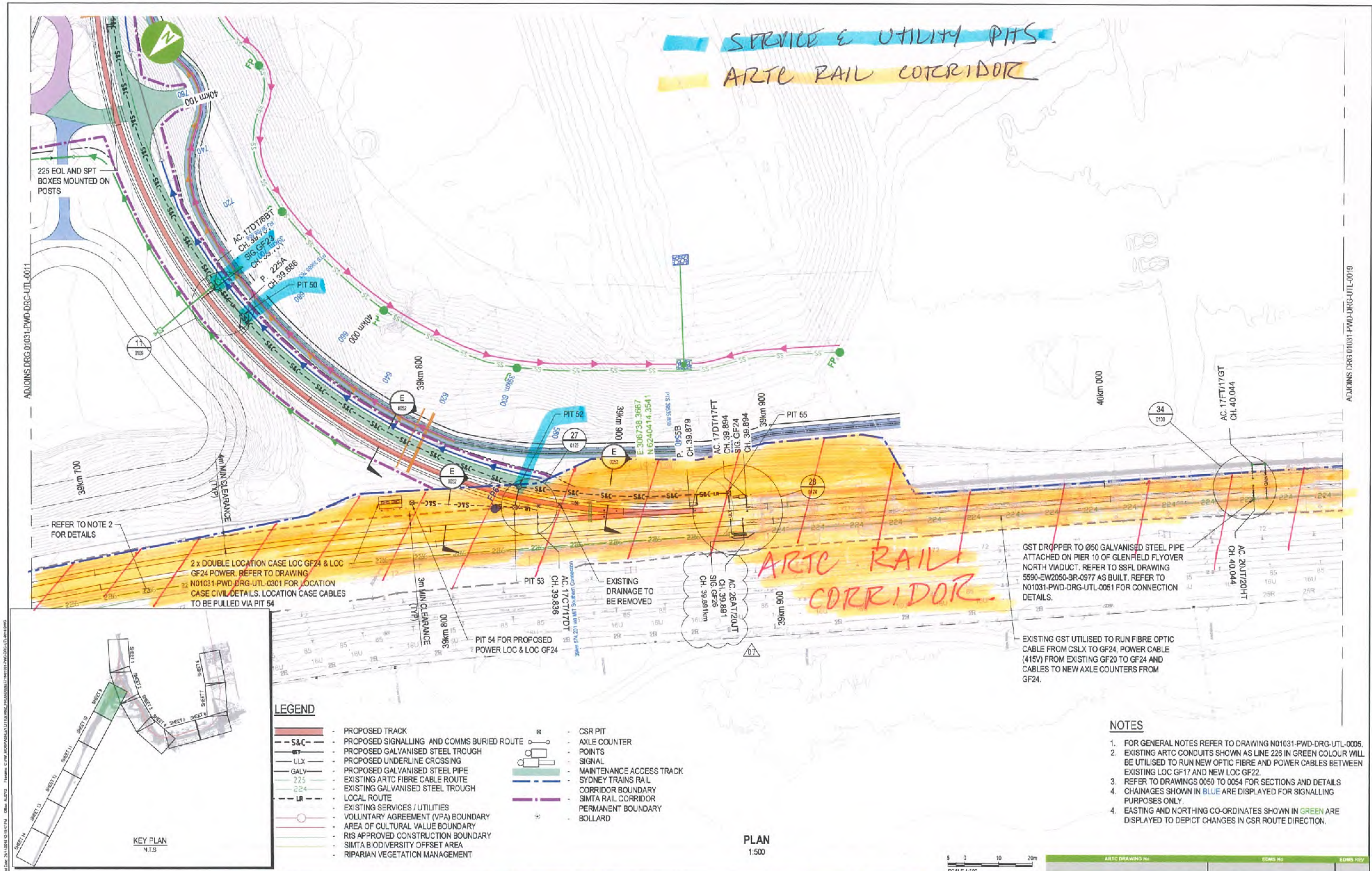
- FOR GENERAL NOTES REFER TO DRAWING N01031-PWD-DRG-UTL-0005
- REFER TO DRAWINGS N01031-PWD-DRG-UTL-0050 TO N01031-PWD-DRG-UTL-0054 FOR SECTIONS AND DETAILS.
- GAS MONITORING AT CSR CONDUIT LEVELS WILL BE UNDERTAKEN AFTER THE GROUND TREATMENT WORKS. BASED ON GAS MONITOR RESULTS THE INSTALLATION OF WIND DRIVEN VENTILATOR (WHIRLYBIRD OR SIMILAR) CONNECTED TO THE CSR BURIED CONDUITS WILL BE CONFIRMED.
- CHAINAGES SHOWN IN BLUE ARE DISPLAYED FOR SIGNALLING PURPOSES ONLY.

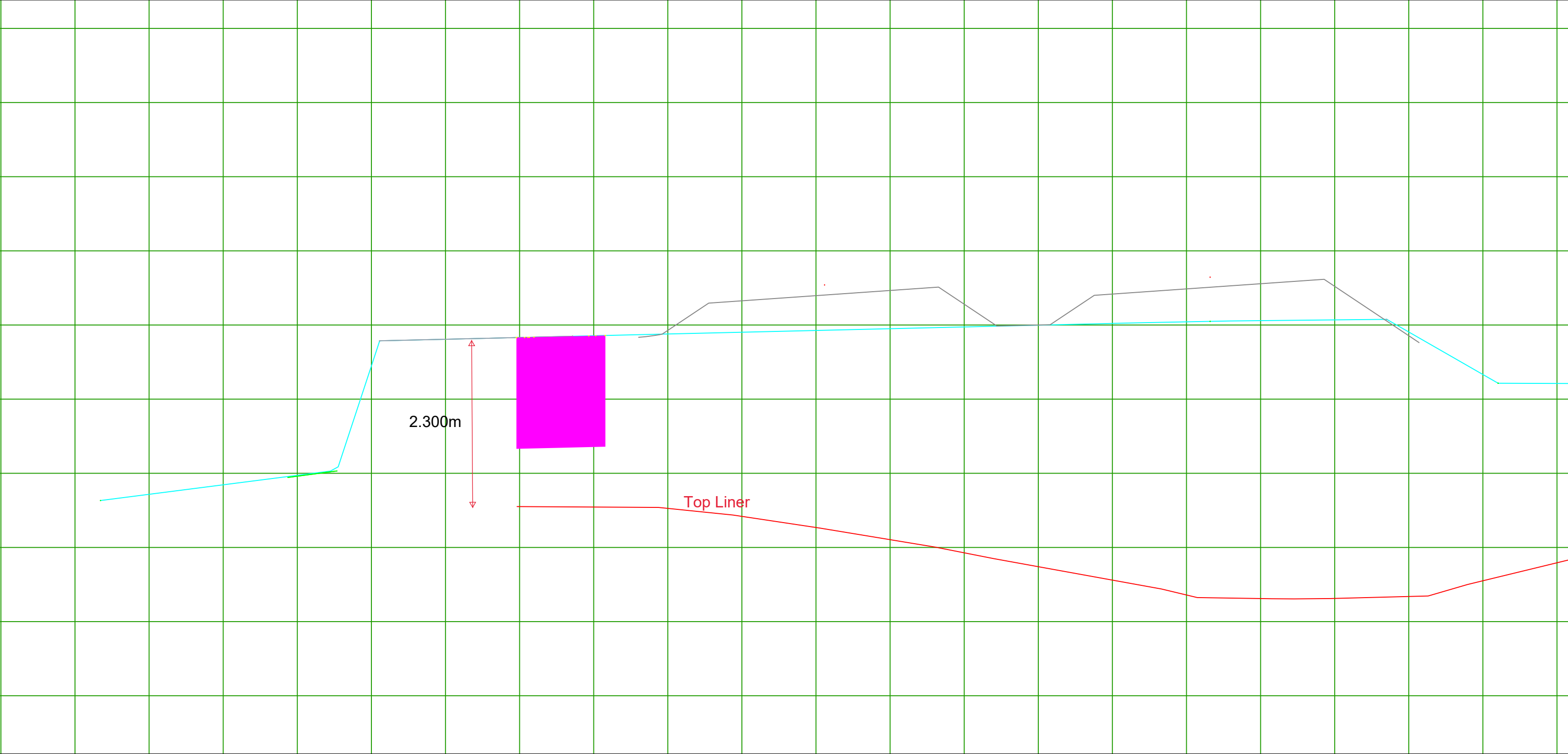
REV	DATE	REVISION DETAILS
01	08.03.17	ACCEPTED FOR CONSTRUCTION
02	03.07.17	ACCEPTED FOR CONSTRUCTION RESUBMISSION
03	30.08.17	ACCEPTED FOR CONSTRUCTION RESUBMISSION
04	09.07.18	GWS RE-DESIGN - 35% DEVELOPED DESIGN
05	10.10.18	ACCEPTED FOR CONSTRUCTION RESUBMISSION
06	26.11.18	ACCEPTED FOR CONSTRUCTION RESUBMISSION

APPROVED	SCALE	SIZE	FOR CONSTRUCTION
	1:500	A1	

PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1
TITLE	SERVICES AND UTILITIES GENERAL ARRANGEMENT PLAN SHEET 3 OF 14
DRAWING No.	N01031 - PWD - DRG - UTL - 0012 - 05

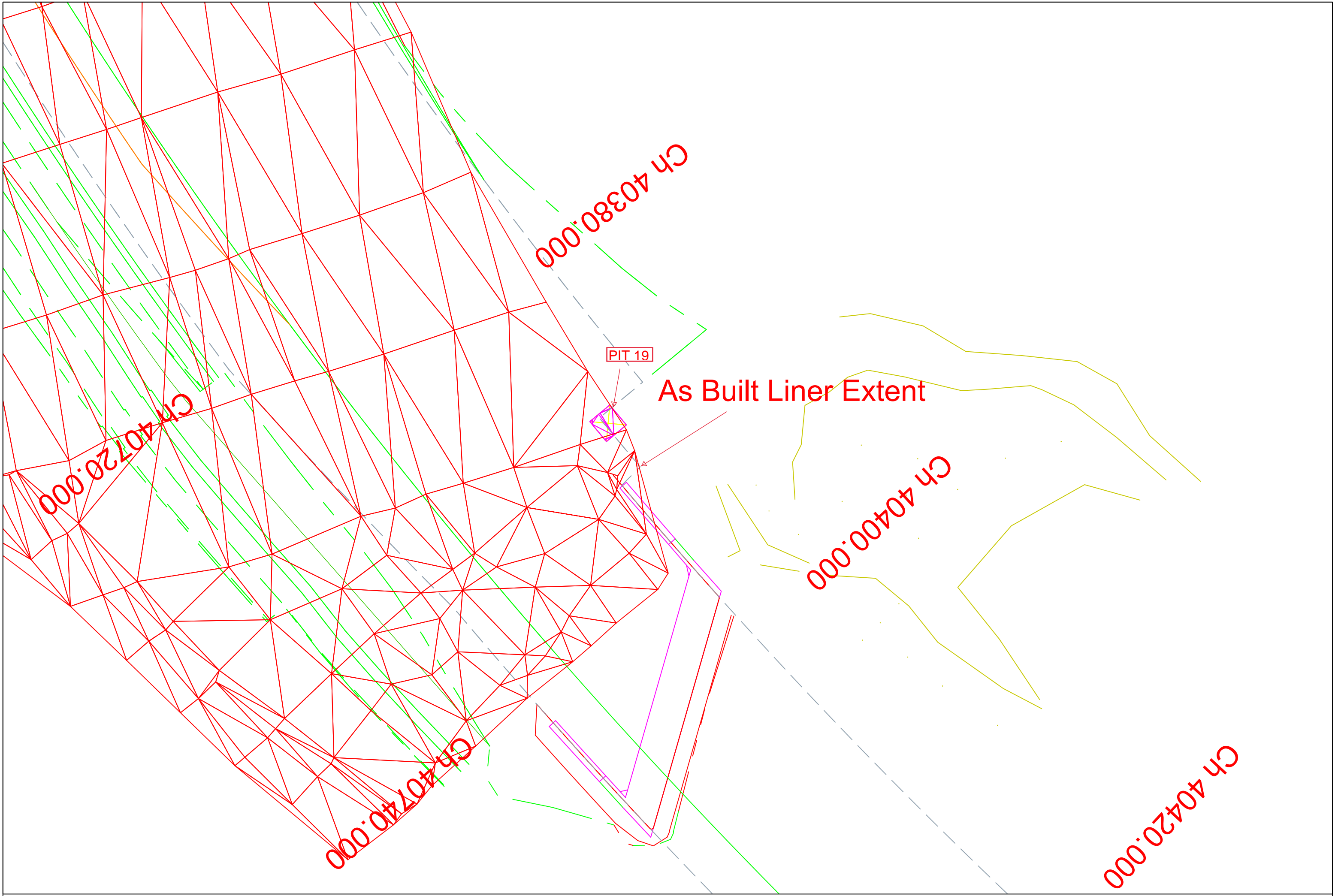






MITD ,GWS
Liner Asbuilt Ch40732 MB2S

12d Model
Horizontal Scale 1:50
Vertical Scale 1:50
Mon May 20 12:59:52 2019



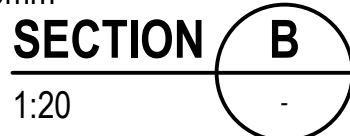


1:10

CUSTOM MADE HOT DIP GALVANISED 5mm THICK SHEET
STEEL CABLE COVER TRANSITION INTO DUCTS
SECURED USING STAINLESS STEEL LADDER COVER
STRAPS CAPABLE OF BEING REMOVED
COVERS BITUMEN COATED

TYPICAL U/G TRENCH TO GST TRANSITION

1:20



1:5

TABLE 1

GST WIDTH	'a'	't'
100	125	10
150	175	10
200	225	12



1:5



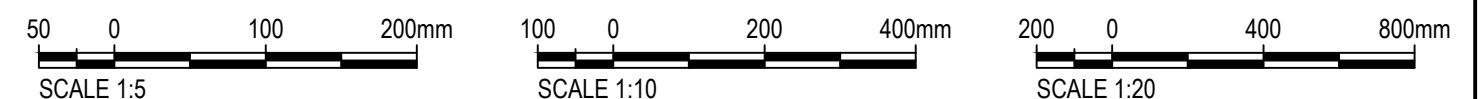
1:10



CONFINED SPACE SIGNAGE LOCATED CENTRALLY

NOTES

-



SCALE 1:5	SCALE 1:10	SCALE 1:20
ARTC DRAWING No	EDMS No	EDMS REV

PROJECT	MOOREBANK INTERMODAL TERMINAL DEVELOPMENT PACKAGE 1- RALP No.1					
TITLE	SERVICES AND UTILITIES SECTIONS AND DETAILS SHEET 1 OF 5					
DRAWING No.	PROJECT No.	ZONE	TYPE	DISC	NUMBER	REV
	N01031	- PWD	- DRG	- UTL	0050	- 04

Appendix D - Conceptual Site Model

Table D1: Summary of plausible exposure pathways for human receptors

Sources	Location	CoPC	Receptors	Plausible complete exposure pathways			Comment
				Inhalation	Ingestion	Direct contact	
Impacted fill material	Southern Connection and proposed Cell X wall cut section of the Rail Link	Lead	Construction workers on the Rail Link	✓	✓	✓	Workers during the construction may be exposed to impacted fill material via direct contact and ingestion (for lead) and via inhalation (for lead and asbestos).
	Former RAE Golf Course	Bonded ACM	Future maintenance workers	✓	✓	✓	
Potential asbestos-containing buried/fly-tipped wastes	Commonwealth Land, Sydney Trains Land, eastern embankment of Moorebank Ave, Lands on either sides of Georges River	Bonded ACM and possible friable asbestos (Sydney Trains Land only)	Construction workers on the Rail Link Future maintenance workers Users of adjoining land	✓	×	×	Workers during the redevelopment of the site may be exposed to fill material impacted by asbestos via the inhalation pathway.
Landfill waste	The GWS facility	Landfill waste Leachate Landfill gas (CH ₄ and CO ₂)	Construction workers working on the Rail Link Future maintenance workers Users of adjoining land	✓	✓	✓	Construction workers may be exposed to the landfill waste material and leachate via direct contact, inhalation of ground gas and accidental ingestion. It is assessed that the proposed rail embankment will limit the potential for workers conducting future maintenance activities to be

Sources	Location	CoPC	Receptors	Plausible complete exposure pathways			Comment
				Inhalation	Ingestion	Direct contact	
PFAS Impacted Soil and groundwater	RAE Golf Course and Georges River Crossing (East bank)	PFAS	Construction workers on the Rail Link	x	x	x	exposed to buried wastes in the future, although exposure to landfill gases via the inhalation pathway will remain complete when entering into underground service pits and trenches etc.). Users of adjoining land are unlikely to be exposed to landfilled wastes, leachates or gases during the construction or operation of the Rail Link, although construction/maintenance activities may give rise to odour emissions (aesthetic impact).
	South eastern corner of GWS Facility		Future maintenance workers				Based on available results, the level of PFAS reported within unsaturated soils is unlikely to pose an unacceptable risks to workers involved with the construction of the Rail Link, or workers conducting future maintenance works.

Table D2: Summary of plausible exposure pathways for environmental receptors

Sources	Location	CoPC	Receptors	Plausible complete exposure pathways			Comment
				Infiltration / leaching from unsaturated Soil	Lateral groundwater migration	Surface runoff / Overland flow	
Landfill waste	The GWS facility	Leachate (Ammonia)	Aquatic receptors in Georges River	✓	✓	x	<p>Ammonia concentrations detected in BH18S potentially indicates leachate from the landfill has entered the groundwater adjacent to the waste disposal areas of the GWS Facility. Lateral migration of ammonia in groundwater through permeable strata would discharge into. Georges River.</p> <p>Based on local topography, it is assessed that accidental release of leachate would be retained within the landfill and collected by the leachate barrier system.</p>
PFAS Impacted Soil	RAE Golf Course and Georges River Crossing (East bank)	PFAS	Shallow groundwater	✓	-	-	<p>PFAS has been detected in a number of soil samples collected along the RAE Golf Course Section. Infiltration has the potential to mobilise PFAS with shorter perfluoroalkyl chain lengths (e.g. PFOA) and leach into groundwater. Longer chain PFAS (e.g. PFOS) can adsorb to organic matter in</p>

Sources	Location	CoPC	Receptors	Plausible complete exposure pathways			Comment
				Infiltration / leaching from unsaturated Soil	Lateral groundwater migration	Surface runoff / Overland flow	
PFAS Impacted Groundwater							soil, although will also remain mobile.
			Aquatic receptors in Georges River	-	✓	✓	Surface water runoff has the potential to carry PFAS-impacted sediment and discharge these into the Georges River.
	RAE Golf Course and Georges River Crossing (East bank) South eastern corner of GWS Facility	PFAS	Aquatic receptors in Georges River	-	✓	-	PFAS are soluble and have a lower tendency to adsorb to soil particles or sediment once in the saturated zone. Given their solubility, PFAS have a tendency to remain in water and be transported. PFAS are not volatile and are not known to biodegrade. Standing water levels recorded along the Rail Link show groundwater will flow in a westerly direction, posing a risk to aquatic receptors in the Georges River.

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Appendix E– Legal Advice

25 March 2019

[REDACTED]
[REDACTED]
Environmental Manager
CPB Contractors
Chatham Avenue
Moorebank NSW 2170
[REDACTED]

Legal Review of Lead Remediation Revised Approach

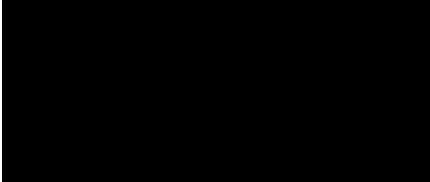
I refer to your memo entitled "Moorebank Intermodal Rail Link; SSD #6766 MPE Stage 1, Package 1) – Lead Remediation Revised Approach" dated 25 March 2019 (**Memo**).

I confirm that I have conducted a legal review of the Memo and consider that it correctly concludes that the proposed deposition of the excavated lead contaminated soil within the Glenfield Waste Services waste facility (**Revised Approach**):

- is authorised by development consent SSD 6766 granted under the Environmental Planning and Assessment Act 1979 subject to:
 - the Remediation Action Plan being updated to reflect the Revised Approach; and
 - the updated Remediation Action Plan being approved by the Site Auditor, in consultation with the EPA, as required by condition C8;
- does not constitute a separate scheduled activity under the *Protection of the Environment Operations Act 1997 (NSW)* (**POEO Act**);
- is able to be carried out under the conditions of environment protection licence no. 4614 held by L A Kennett Enterprises Pty Ltd in relation to the Glenfield Waste Services waste facility (**GWF EPL**);
- is able to be carried out under the conditions of environment protection licence no. 20966 held by CPB Contractors Pty Limited in relation to the Moorebank Intermodal Rail Link; and
- does not attract the payment of a waste levy under the POEO Act by the holder of the GWF EPL. This is because the lead contaminated soil originates from within, and will at all times remain within, the premises the subject of the GWF EPL so will not ever be "received at the facility" within the meaning of section 88(2) of the POEO Act.

Please contact me if you would like to discuss.

Yours sincerely,



K&L Gates
Level 31, 1 O'Connell Street
Sydney NSW 2000, Australia



MEMO



Reference: N01031-CORR-02357

25 March 2019

To:

From:

CC:

Moorebank Intermodal Rail Link; SSD #6766 (MPE Stage 1, Package 1) – Lead Remediation Revised Approach

Detailed within is the Moorebank Intermodal Rail Link's (herein referred to as '**the Project**') revised approach for the remediation of the lead contaminated soil located within the Glenfield Waste Services waste facility (**GWF**).

OVERVIEW

Lead contaminated soil was identified within a portion of the GWF, in the area of the Southern Connection of the Project to the Southern Sydney Freight Line and the Cell X/X1 embankment works for GWF operations in the *JBS&G (2015a) Phase 2 Contamination Assessment* and the *Coffey (2018l) Land Contamination Status Report*.

A Remediation Action Plan (**RAP**) dated 24 September 2018 was subsequently approved under condition C8 of development consent SSD 6766 granted for the Project (**SSD Consent**).

The GWF is subject to environment protection licence no. 4614 (**GWF EPL**) held by L A Kennett Enterprises Pty Ltd (**Kennett Enterprises**).

CPB Contractors Pty Limited holds environment protection licence no. 20966 (**Project EPL**) in relation to the Project.

In October 2018, the lead contaminated soil was soil excavated from within the premises of the GWF EPL and temporarily stockpiled within the GWF premises, pending determination of the remediation approach. Refer to **Attachment A** of this memo for current location of the temporarily stockpiled soil and a schematic showing the controls installed to manage potential leachate runoff.

Section 6.5.1 of the RAP identifies that the preferred approach for the remediation of the lead contaminated soil is to contain the lead impacted soil by 'encapsulation' within the Project. This approach is no longer viable due to Project programme constraints. Further, it is considered that encapsulating the lead impacted soil within the Project does not deliver the best environmental outcome when compared to utilising the existing lined cells and leachate management systems in the GWF which are designed to minimise possible impacts beyond the site and into the broader Georges River catchment.

ID Code

CPB Contractors Pty Ltd ABN 98 000 893 667

Sydney

Level 10, Tower 1, 495 Victoria Avenue Chatswood NSW 2067 Australia. PO Box 5276 West Chatswood NSW 1515 Australia
T +61 2 9035 5805 cpbcon.com.au



Given this, it is proposed to update the RAP to provide for the deposition of the excavated lead contaminated soil within the GWF.

In determining this approach for the site, we have carried out a review of the revised approach against the requirements of the SSD Consent, the GWF EPL, the Project EPL and relevant legislative requirements.

REVISED APPROACH FOR LEAD REMEDIATION - GWF DISPOSAL

Proposal

The revised approach consists of depositing the lead contaminated soil within the GWF premises as follows:

1. A Landfill Expert will determine and advise the Project of the relevant placement requirements to ensure integrity of the GWF liner / leachate collection system is maintained.
2. Kennett Enterprises to provide the Project with the proposed location for deposition of the lead contaminated soil within the GWF where it will be managed by the existing leachate system.
3. Update the RAP to include the deposition of the lead contaminated soil within the GWF. The updated RAP will include appropriate controls as determined by the Landfill Expert.
4. The updated RAP will be submitted for review by the Site Auditor in draft form and amended to address any comments arising.
5. The Environment Protection Authority (EPA) will be consulted with in relation to the updated RAP.
6. The updated RAP will then be finalised and submitted to the Site Auditor for approval under Condition C8 of the SSD Consent.
7. The Project will place the soil at the location nominated by Kennett Enterprises within the GWF in accordance with the updated RAP.
8. The placement of the soil in accordance with the RAP will be validated in accordance with condition C8 of the SSD Consent.
9. A Site Audit Statement will then be obtained for the Project site.

Context

The Project consists of a 2.8 km rail link connecting the proposed intermodal terminal facility to the Southern Sydney Freight Line (SSFL).

The SSD Consent authorises the carrying out of the Project subject to conditions. Condition C8 of the SSD Consent states:

The subject site is to be remediated in accordance with:

- *The approved Remedial Action Plan;*
- *State Environmental Planning Policy No. 55 – Remediation of Land; and*
- *The guidelines in force under the Contaminated Land Management Act.*

Amendments to the approved Remedial Action Plan required as a result of further site investigations must be approved by the Site Auditor in consultation with the EPA.

Within 3 months after the completion of the remediation works, a notice of completion, including a validation and/or monitoring report is to be provided to the Secretary. This notice must be consistent with State Environmental Planning Policy No. 55 – Remediation of Land.

The validation and/or monitoring report is to be independently audited and a Site Audit Statement Issued. The audit is to be carried out by an independent auditor accredited by the EPA. Any conditions recorded on the Site Audit Statement are to be complied with.

As detailed earlier, lead contaminated soil was identified within the GWF premises and in proximity to the Project's southern connection to the SSFL (refer to figure contained in **Attachment A**). The lead contaminated soil was identified as *Remediation Area #1* in Table 3 of the RAP. Investigations into the extent of the contamination found it to be located at a range of 0.5 metres to 3 metres below the surface and to have lead

concentrations of 2,000 mg/kg to 12,000 mg/kg. Refer to figure contained in **Attachment B** showing the extent and concentration of lead-impacted soil that is currently stockpiled on the GWF premises. Approximately 4,000m³ of lead contaminated soil was excavated from within the GWF premises.

It is noted that the premises of the GWF EPL and the Project EPL have been varied since the lead contaminated soil was excavated from within the GWF. In particular:

- At the time the lead contaminated soil was excavated from within the GWF, the source area was wholly within the GWF EPL. See Attachment A for details of the EPL premises at this time.
- Since the lead contaminated soil was excavated, the EPL premises have been varied so that the source area is now partially within the Project EPL.
- The temporarily stockpiled lead contaminated soil remains wholly within the GWF EPL premises and it is proposed to update the RAP to enable it to be permanently deposited within the GWF EPL premises.
- The lead contaminated soil has remained within the GWF EPL premises at all times and at no time has it been located or transported within the Project EPL premises.

Study Area / Disposal Site

The Project area the subject of the SSD Consent is shown by the figure (source: EIS, Hyder 2015) contained in **Attachment C** of this memo and includes the GWF. The SSD Consent relates to specified land (as defined in the SSD Consent) which includes the GWF.

The GWF premises are owned by LA Kennett Enterprises Pty Ltd and operated by Glenfield Waste Services (**GWS**) at Cambridge Avenue, Glenfield, New South Wales, in accordance with the GWF EPL. The GWF EPL authorises a number of scheduled activities including "waste storage" and "waste disposal (application to land)" subject to conditions. The current extent of the GWF EPL premises is defined by the figure referenced in condition A2.2 of the GWF EPL. Refer to **Attachment E** of this memo for a copy of the GWF EPL.

The lead contaminated soil excavated from within the GWF EPL premises is currently stockpiled within the GWF EPL premises at the location shown in **Attachment A** and is proposed to be disposed of within an active landfill cell of the GWF premises, in accordance with the steps outlined under the subheading "Proposal" above.

Current Remediation Action Plan

The RAP dated 24 September 2018 was approved by the Site Auditor under condition C8 of the SSD Consent following consultation with the EPA on 4 October 2018. Section 6.5.1 of the RAP detailed the following options for the remediation and management of the lead contaminated soil:

- Remediation of lead impacted area via encapsulation (**RAP's preferred approach**);
- In-situ containment; and
- Offsite disposal.

The RAP's preferred approach for remediation of lead soil, as detailed previously, is no longer a viable option due to programme constraints and is also considered to be least preferred as having the less favourable environmental outcomes.

In-situ containment, as a contingency in the RAP, is also no longer possible, as the lead contaminated soil was identified within the embankment for Cell X/X1 as part of the GWF operations under the GWF EPL and within the engineered strata layer for the Rail Link. Accordingly, the lead impacted soil has been excavated and temporarily stockpiled within the GWF site.

The remaining contingency in the RAP, namely the disposal of lead soil offsite, is still an option. However, offsite disposal at an alternative waste facility is considered a last resort for the Project given that condition E16 of the SSD Consent requires that offsite disposal be minimised as follows:

Condition E16:

The reuse and/or recycling of waste materials generated on site shall be maximised as far as practicable, to minimise the need for treatment or disposal of those materials off site.

The Project's revised approach, namely the disposal of lead contaminated soil within the GWF, is not detailed in the most recent version of the approved RAP. As a result, this option will be included in an update to the RAP, where required, following consultation and agreement of this revised approach with the Site Auditor in consultation with the EPA.

It is noted that the Project EPL (contained in **Attachment F**) currently still refers to the previously approved RAP dated 6 October 2017 (**Earlier RAP**) (see Conditions O5.5 and O5.8 of the Project EPL). The Earlier RAP identified '**GWF disposal**' as the preferred remediation approach for the lead contaminated soil. However, this option was removed in the updated version of the RAP as, at that time, it was considered that encapsulating the soil within the rail embankment would be viable. However, as outlined above, this approach is no longer viable and it is now proposed that the material be deposited within the GWF in a manner consistent with the Earlier RAP.

Environment Protection Licences

GWF EPL

A review of the GWF EPL was carried out to determine the consistency of the proposed disposal of the lead contaminated soil currently stockpiled on the GWF site within the GWF and identify any conditions that impose obligations on the handling and disposal of lead contaminated soil, including longer-term management of this soil. Findings from this review are presented in the following table:

EPL 4614 Condition #	Condition/Requirement	Action/Response												
L3.1	Waste The licensee must not cause, permit or allow any waste to be received at the premises, except the wastes expressly referred to in the column titled “Waste” and meeting the definition, if any, in the column titled “Description” in the table below...	The excavated lead contaminated soil is waste. However, the Project considers that the lead contaminated soil has not been “received at the premises” as it was excavated from within the GWF EPL premises and, at all times, has remained within the GWF EPL premises. In this regard it is noted that Schedule 1 of the <i>Protection of the Environment Operations Act 1997 (NSW) (POEO Act)</i> makes it clear that the scheduled activities of "waste storage" and "waste disposal (application to land)" only apply to "waste received from off site". As a result, this condition does not restrain the revised approach, as the lead contaminated soil both originated from within the GWF EPL Premises and will remain within the GWF EPL premises at all times. Refer to Attachment A showing source location and current location of the contaminated soil. At the time of transfer from its source to the current location in October 2018, both locations were within premises of the GWF EPL (being the version dated 28 September 2018). While the GWF EPL premises have since been varied to exclude part of the source location, the excavated contaminated soil remains within the GWF EPL premises.												
	<table><tr><th>Waste</th><th>Description</th></tr><tr><td>Asbestos waste</td><td>As defined in Schedule 1 of the POEO Act, as in force from time to time.</td></tr><tr><td>General soil waste (non-putrescible)</td><td>As defined in Schedule 1 of the POEO Act, as in force from time to time.</td></tr><tr><td>Waste tyres</td><td>As defined in Schedule 1 of the POEO Act, as in force from time to time.</td></tr><tr><td>Wood waste</td><td>As defined in Schedule 1 of the POEO Act, as in force from time to time.</td></tr><tr><td>Garden waste</td><td>As defined in Schedule 1 of the POEO Act, as in force from time to time.</td></tr></table>		Waste	Description	Asbestos waste	As defined in Schedule 1 of the POEO Act, as in force from time to time.	General soil waste (non-putrescible)	As defined in Schedule 1 of the POEO Act, as in force from time to time.	Waste tyres	As defined in Schedule 1 of the POEO Act, as in force from time to time.	Wood waste	As defined in Schedule 1 of the POEO Act, as in force from time to time.	Garden waste	As defined in Schedule 1 of the POEO Act, as in force from time to time.
	Waste		Description											
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	General soil waste (non-putrescible)		As defined in Schedule 1 of the POEO Act, as in force from time to time.											
	Waste tyres		As defined in Schedule 1 of the POEO Act, as in force from time to time.											
	Wood waste		As defined in Schedule 1 of the POEO Act, as in force from time to time.											
Garden waste	As defined in Schedule 1 of the POEO Act, as in force from time to time.													


O1.1	<p>Activities Must Be Carried Out in a Competent Manner</p> <p>Licensed activities must be carried out in a competent manner.</p> <p>This includes:</p> <ul style="list-style-type: none"> a) The processing, handling, movement and storage of soils and substances used to carry out the activity; and b) The treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity. 	The works will be carried out in accordance with a RAP approved by the Site Auditor.
O4.1	<p>Waste Management</p> <p>Daily and Intermediate Cover</p> <p>Cover soil must be virgin excavated natural soil.</p> <ul style="list-style-type: none"> a) Daily cover Cover soil must be applied to a minimum depth of 15 centimetres over all exposed landfilled waste prior to ceasing operations at the end of each day. b) Intermediate cover Cover soil must be applied to a depth of 30 centimetres over surfaces of the landfilled waste at the premises which are to be exposed for more than 90 days. c) Cover soil stockpile At least two weeks' cover soil must be available at the premises under all weather conditions. This soil may be won on site or, alternatively, a cover stockpile must be maintained adjacent to the tip face. 	The lead contaminated soil is not exposed landfill waste. However, this condition will be complied with in the disposal of the lead contaminated soil within the GWF.
O4.7 to O4.14	<p>Leachate Management</p> <p>Conditions relating to 'Leachate Management' on the premises.</p>	This condition will continue to be able to be complied with in the disposal of the lead contaminated soil within the GWF.
M2	<p>Monitoring and Recording Conditions</p> <p>Conditions relating to the 'Requirement to monitor concentrations of pollutants discharged'.</p>	This condition will continue to be able to be complied with following the disposal of the lead contaminated soil within the GWF.
E2.3	<p>Environmental Obligations of Licensee</p> <p>After the licensee's premises cease to be used for the purposes to which the licence relates or in the event that the licensee ceases to carry out the activity that is the subject of this licence, that licensee must:</p> <ul style="list-style-type: none"> a) Remove and lawfully dispose of all liquid and non-liquid waste stored on the licensee's premises; and b) Rehabilitate the premises, including conducting an assessment of the site and, if required, remediation of any site contamination. 	<p>This condition will continue to be able to be complied with following the disposal of the lead contaminated soil within the GWF.</p> <p>To ensure that the lead contaminated soil is able to be factored into the ultimate closure plans for the GWF, it is proposed that the location and extent of lead contaminated soil deposited within the GWF will be surveyed. Leachability characteristics, as well as the survey data, will be provided to GWS.</p>

Project EPL

The Project EPL is contained in **Attachment F**. The Project EPL authorises the following scheduled activities, subject to scale limits, at the Project EPL premises as shown by the map in Condition A2.2 of the licence:

- Crushing, grinding or separating
- Extractive activities

A review of the Project EPL has been carried out to determine the consistency of the proposed alternative option for the disposal of the lead contaminated soil within the GWF. As outlined above, the lead contaminated soils have at all times remained within the GWF EPL premises and are proposed to be deposited within the GWF EPL premises. However, given that the Project EPL premises now cover part of the area from which the lead contaminated soil was originally excavated and the Project EPL conditions contemplate the remediation of the lead contaminated soil, it is considered appropriate to have regard to conditions of the Project EPL. Findings from this review are presented in the following table:

EPL 20966 Condition #	Condition / Requirement	Action / Response
A2.2	<p>Premises or plant to which this licence applies</p> <p>The premises location is shown on the map below.</p> 	<p>The location of the lead contaminated soil currently stockpiled on the GWF site, as shown in Attachment A, is outside of the Project EPL premises as shown here and more clearly on the licence contained in Attachment F.</p>
O4.2	<p>Waste Management</p> <p>The licensee must not cause, permit or allow any waste generated:</p> <p>...</p> <p>(b) At the premises to be disposed of at the premises, except as permitted in Condition O4.3.</p>	<p>This condition would only be applicable to the preferred approach detailed in the RAP and not the revised approach. Under the revised approach now proposed, the lead contaminated soil will not be disposed within the Project EPL premises. As a result, this condition is not applicable.</p>
O5.12	<p>Lead Contamination</p> <p>Prior to remediation of lead contaminated soils, the licensee must notify EPA Waste Compliance in writing. This notification must outline the sampling, management and/or disposal actions to be taken, as approved by the site auditor and required by condition C8 of Development Consent SSD 6766. The notification must also include the timeframe for the work.</p>	<p>Although the lead contaminated soil has not ever been located within the Project EPL premises, notification to the EPA will occur prior to remediation of the lead contaminated soil (following approval of the revised approach from the Site Auditor).</p>
O5.13	<p>Lead Contamination</p> <p>If on-site containment cells are proposed:</p> <ul style="list-style-type: none"> • The notification in Condition O5.12 must include detailed designs prepared by an appropriately qualified and experienced person with 	<p>An on-site containment cell is not proposed as part of the revised approach and, as such, this condition not triggered by the revised approach.</p>

	<p>experience in landfill design and construction; and</p> <ul style="list-style-type: none"> At the completion of remediation works, the licensee must submit to the EPA Waste Compliance a validation report prepared by an accredited site auditor, as required by condition C8 of Development Consent SSD 6766. 	<p>A validation report will still be prepared by an accredited Site Auditor to comply with condition C8 of the SSD Consent.</p>
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State Environmental Planning Policy No. 55 – Remediation of Land

The objective of the *State Environmental Planning Policy No. 55 --Remediation of Land (SEPP 55)* is to promote the remediation of contaminated land for the purpose of reducing the risk of harm to human health or any other aspect of the environment. SEPP 55:

- specifies when consent is required, and when it is not required, for remediation work;
- specifies certain considerations that are relevant in rezoning land and in determining development applications in general and development applications for consent to carry out remediation work; and
- requires that remediation work meet certain standards and notification requirements.

SEPP 55 was taken into account in assessing and approving the Project under the SSD Consent. The RAP approved under the SSD Consent was prepared in accordance with contaminated planning guidelines, SEPP 55 and relevant guidelines in force under the *Contaminated Land Management Act 1997 (CLM Act)*.

Contaminated Land Management Act 1997

The CLM Act establishes a framework for the investigating and remediation of land, where appropriate, that is significantly contaminated to require regulation under the CLM Act. The subject land is not being regulated by the EPA under the CLM Act. However, a number of guidelines have been approved by the EPA under section 105 of the CLM Act. The revised approach proposed in this memo is considered to be consistent with the guidelines approved by the EPA under the CLM Act.

Protection of the Environment (Operations) Act 1997 (NSW) and Protection of the Environment Operations (Waste) Regulation 2014 (NSW)

The disposal of the lead contaminated soil originating from within the GWF EPL premises within the GWF EPL premises is not a scheduled activity under the POEO Act. However, the conditions of the GWF EPL remain applicable to all activities carried out within the GWF EPL premises (see analysis above in this regard).

In considering whether a waste levy is applicable to the undertaking of the revised approach, namely the retention and disposal of the lead contaminated soil within the GWF EPL premises, a review of the *Protection of the Environment Operations (Waste) Regulation 2014* and the POEO Act was carried out.

Section 88(2) of the POEO Act relevantly provides that:

88 Contributions by licensee of waste facility

...

(2) The occupier of a waste facility to which this section applies is required to pay to the EPA in respect of all waste received at the facility such contribution as is prescribed by the regulations. (emphasis added)

This obligation only applies to waste "received at" the facility. As outlined above, the Project considers that the lead contaminated soil has not been "received at the premises" as it was excavated from within the GWF EPL premises and, at all times, has remained within the GWF premises. As a result, the retention and disposal of the lead contaminated soil within the GWF EPL premises does not trigger any obligation to pay the waste levy.

Summary

The memo outlines the findings of a review of the revised approach for the remediation of lead contaminated soil and its appropriateness in accordance with the requirements of the SSD Consent, the GWF EPL and the Project EPL and applicable legislative requirements. The key findings of this review are summarised below:

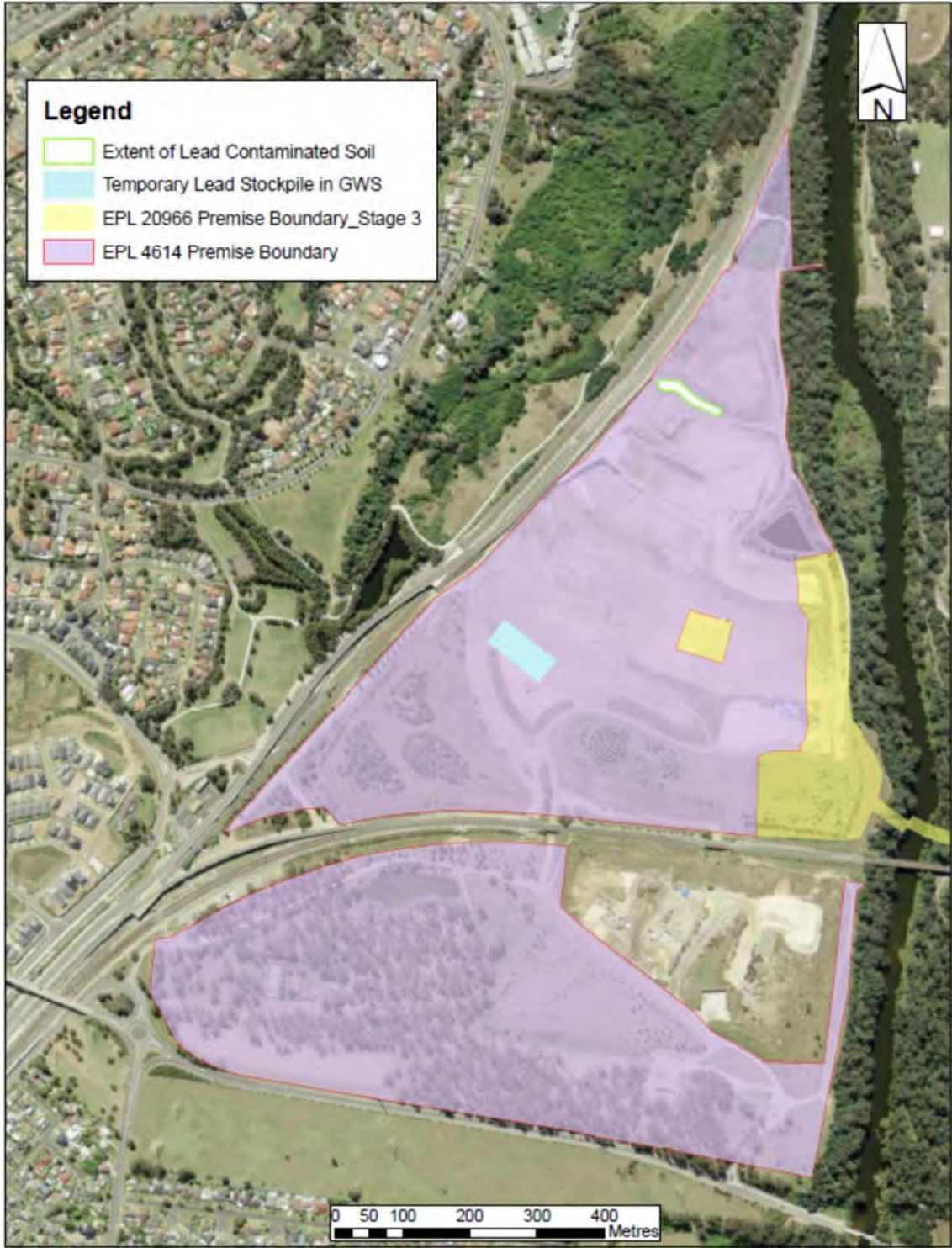
- The lead contaminated soil originated within, and is currently temporarily stockpiled on, the GWF EPL premises.
- The disposal of the lead contaminated soil on site within the GWF EPL premises is considered to be authorised under the conditions of the GWF EPL.
- A waste levy is not payable by the holder of the GWF EPL for the disposal of the lead contaminated soil as it has not been "received at the facility" within the meaning of section 88(2) of the POEO Act.
- The disposal of the lead contaminated soil on site within the GWF EPL premises is considered to be consistent with the Project EPL. The EPA will be notified of remediation of the lead contaminated soil as required by Condition O5.12 of the Project EPL.
- The disposal location for lead contaminated soil within the GWF site is within the study area for the Project and subject to the SSD Consent. It is proposed that the current RAP will be updated as contemplated by condition C8 of the SSD Consent so as to reflect the revised approach for the disposal of lead contaminated soil within the GWF. It is also noted that the superseded RAP dated 6 October 2017 approved under the conditions of the SSD Consent included disposal of the lead contaminated soil within the GWF as a contingency and the revised approach would be consistent with this previously approved RAP.
- A landfill expert will be engaged to confirm the appropriateness of the existing liner / leachate collection system to accommodate the lead contaminated soil, as well as advise of any further requirements for treatment or containment prior to placement within the GWF.

It is clear from the findings summarised above that the revised approach for the disposal of lead contaminated soil within the GWF site is considered to be consistent with all relevant legal requirements provided the RAP is updated as contemplated by condition C8 of the SSD Consent.

Please do not hesitate to contact the undersigned if you would like to discuss this further

Kind regards,

Attachment A –Lead Contaminated Soil Stockpile site in relation to respective EPL Boundaries as at the date the soil was excavated, as well as a schematic showing stockpile design for management of the Lead Contaminated Soil



Electronic Transmission

To	[REDACTED]	From	[REDACTED]
Email address	[REDACTED]	Date	12 December 2018
Company	CPB Contractors	Reference	GEOTLCOV24072AH-L10
		Pages	1 of 2
Subject	Moorebank Intermodal Rail Link – Temporary Lead Stockpile Schematic		



1. Introduction

Coffey understands that CPB require advice (namely a stockpile schematic) in relation to the appropriate design of a temporary stockpile to contain lead contaminated soils (to minimise potential human health and environmental risks). Coffey also understands that the soils will be temporarily stockpiled within the GWS Facility, prior to imminent remediation and/or offsite disposal of the soils.

This letter outlines Coffey's recommendations for the design of the stockpile.

2. Stockpile Design

Coffey has attached a stockpile schematic sketch to this letter. The sketch should be viewed in conjunction with the notes below:

- Establish a dedicated stockpile area to minimise cross-contamination of uncontaminated soils, and release of leachate and/or sediment laden runoff;
- Stockpiles area to be positioned away from the site boundaries, footpaths, regular site access routes, gutters or stormwater pits (if present). Where possible, stockpiles will be positioned and formed to minimise potential for erosion via water and/or wind. The perimeter of the stockpile shall be accessible by earthmoving vehicles.
- Locate stockpile area away from stormwater channels, drains, culverts and the groundwater table. Where this is not possible, provide effective controls (e.g. silt fences) to prevent sediment entering the stormwater system.
- The stockpile area ground shall be elevated from the surrounding area such that stormwater run-off from the surrounding areas do not run-on to the stockpile and the runoff from the stockpile surface is readily and easily shed away from the stockpile. The ground surface around the stockpile shall be maintained to be extent practicable in a condition that will not permit water ponding.

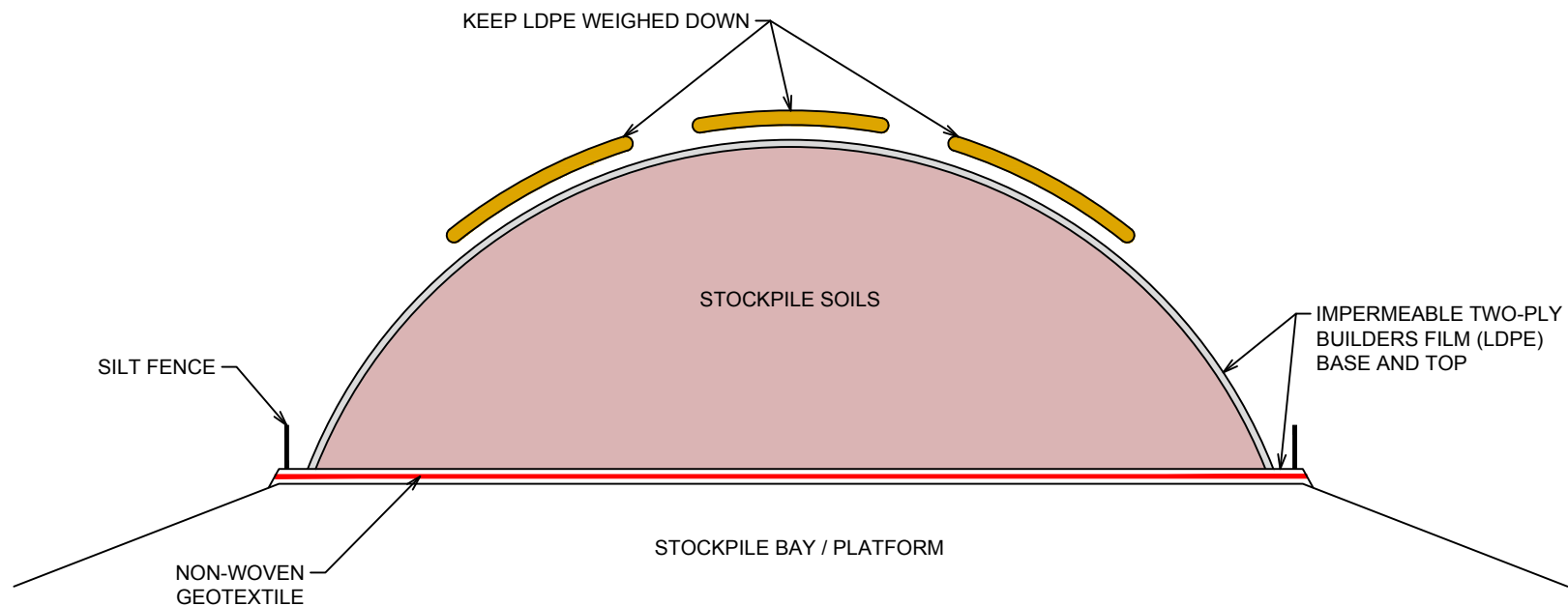
- The ground surface of the stockpile footprint shall be prepared to be flat and smooth to the extent practicable. The ground surface shall be free of protruding objects such as rocks and other material that could damage or puncture the bottom liner.
- The bottom liner shall comprise of two ply Builders Film (LDPE) or similar plastic which is underlain by a non-woven geotextile placed as a cushioning layer. The joints in the liner shall be overlapped by minimum 200mm.
- When placing the first layer of soil, care should be taken not to drive earthmoving machinery directly on the plastic surface.
- At the end of each work day, during heavy rain or windy conditions, the stockpile shall be covered with a Builders Film or similar material (covering sheet) that will prevent the water from seeping into the stockpile soil. The covering sheet shall also be placed with overlapping joints that will minimise opportunities for water infiltration into the stockpile. The covering sheet should be weighed down (against being blown in the wind) with tyres or similar object that will not damage or puncture the film.
- The final stockpile shall be shaped such that the slopes are stable and the surface is not undulating (i.e. no opportunity for the water to pond on the covering sheet). The final covering sheet shall be placed and maintained as discussed in the point above.
- The condition of the cover shall be checked regularly and any damaged sheets or dislodged sheets shall be immediately fixed.

For and on behalf of Coffey




Attachment 1 – Stockpile Schematic.

PLOT DATE: 12/12/2018 9:53:47 AM DWG FILE: \NTS\779\5\1\LOCAL\DATA\2 TECHNICAL\GEOTECHNICS\1 PROJECTS\GEOTLCOV24072AH MRL REDESIGN\CAD\754-GEOTLCOV24072AH.L10.DWG



DRAFT

	drawn		 A TETRA TECH COMPANY	client: CPB CONTRACTORS PTY LTD		
	approved	-		project: MOOREBANK INTERMODAL RAIL LINK GES FACILITY MOOREBANK, NSW		
	date	12 / 12 / 18				
	scale	AS SHOWN		title: TEMPORARY STOCKPILE CROSS SECTION SKETCH		
	original size	A4		project no: 754-GEOTLCOV24072AH-L10	figure no: FIGURE 1	rev: A

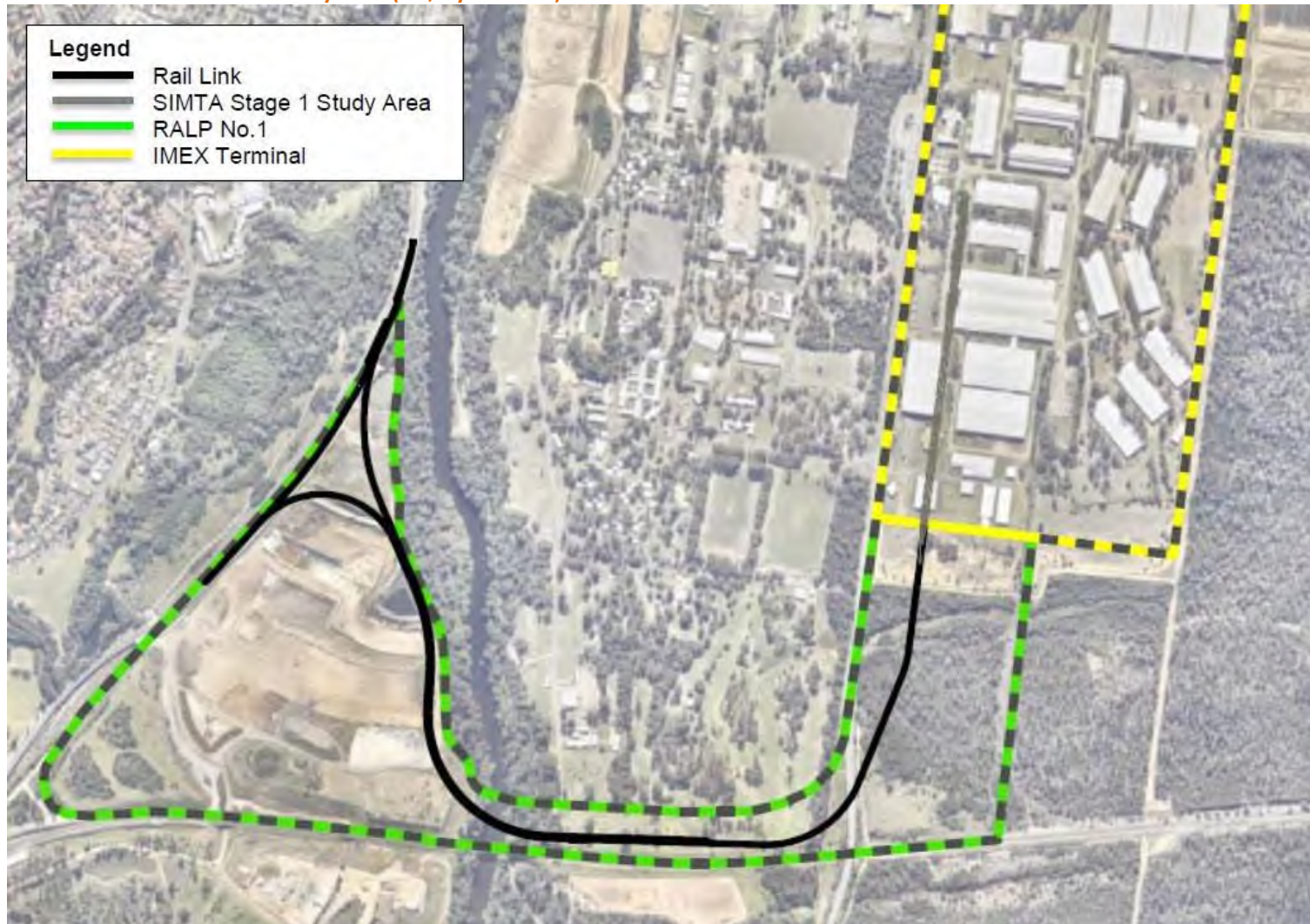
Attachment B – Extent and concentration of lead contamination (Coffey 2018)



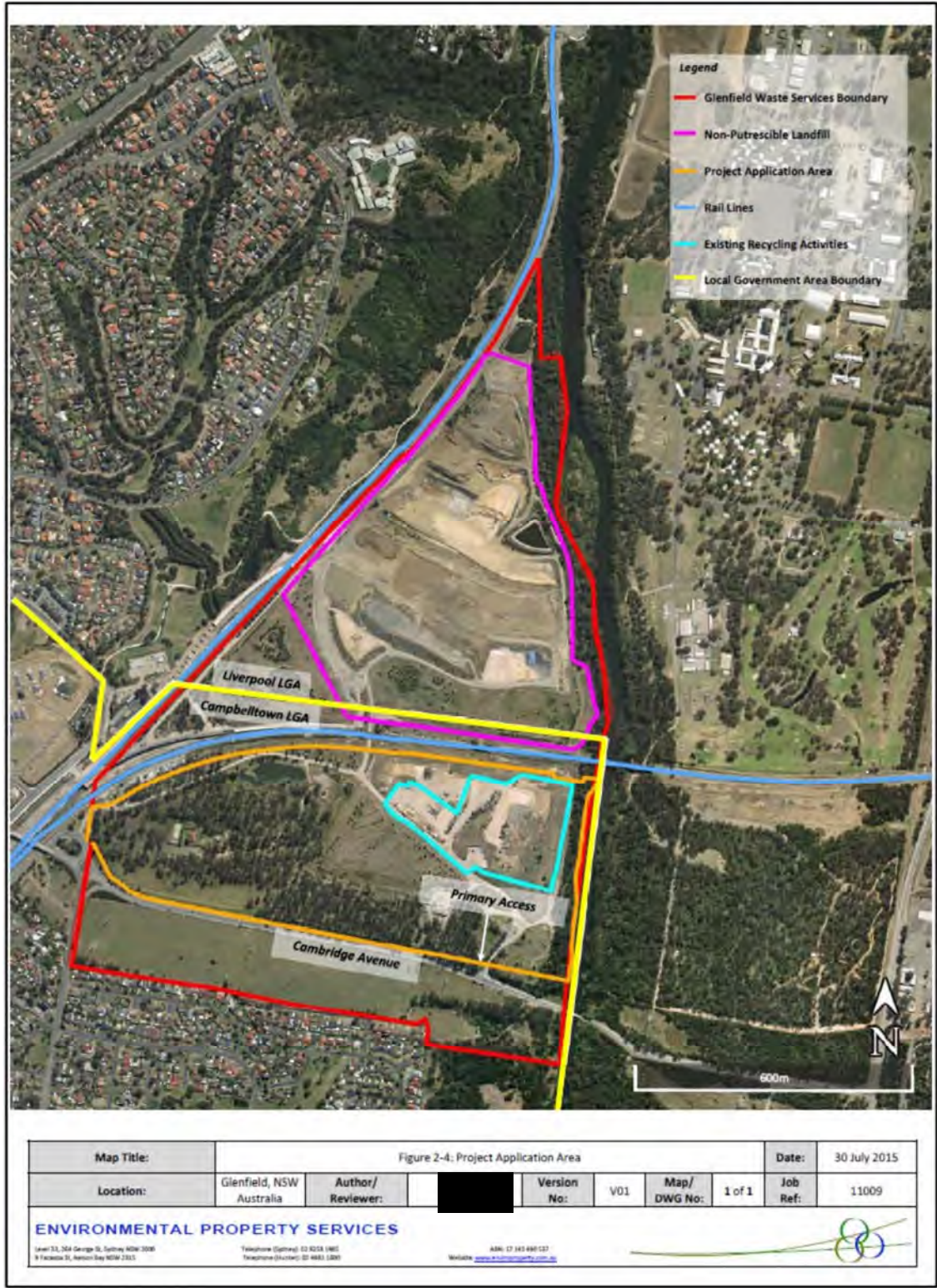
ID Code

CPB Contractors Pty Ltd ABN 98 000 893 667

Attachment C – SSD #6766 Study Area (EIS, Hyder 2015)



Attachment D – GWF Property Boundary (source: Material Recycling Facility EIS, EPS 2016)



Attachment E – GWS Landfill Facility EPL #4614



Environment Protection Licence

Licence - 4614

<u>Licence Details</u>	
Number:	4614
Anniversary Date:	01-March

<u>Licensee</u>
L A KENNETT ENTERPRISES PTY LTD
PO BOX 19
GLENFIELD NSW 2167

<u>Premises</u>
GLENFIELD WASTE SERVICES
CAMBRIDGE AVE
GLENFIELD NSW 2167

<u>Scheduled Activity</u>
Crushing, grinding or separating
Extractive activities
Waste disposal (application to land)
Waste processing (non-thermal treatment)
Waste storage

<u>Fee Based Activity</u>	<u>Scale</u>
Crushing, grinding or separating	> 30000-100000 T annual processing capacity
Land-based extractive activity	> 100000-500000 T annual capacity to extract, process or store
Non-thermal treatment of general waste	Any annual processing capacity
Waste disposal by application to land	Any capacity
Waste storage - other types of waste	Any other types of waste stored

<u>Region</u>
Waste & Resource Recovery
59-61 Goulburn Street
SYDNEY NSW 2000
Phone: (02) 9995 5000
Fax: (02) 9995 5999
PO Box A290
SYDNEY SOUTH NSW 1232

Environment Protection Licence

Licence - 4614



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Environment Protection Licence

Licence - 4614



Information about this licence

Dictionary

A definition of terms used in the licence can be found in the dictionary at the end of this licence.

Responsibilities of licensee

Separate to the requirements of this licence, general obligations of licensees are set out in the Protection of the Environment Operations Act 1997 ("the Act") and the Regulations made under the Act. These include obligations to:

- ensure persons associated with you comply with this licence, as set out in section 64 of the Act;
- control the pollution of waters and the pollution of air (see for example sections 120 - 132 of the Act);
- report incidents causing or threatening material environmental harm to the environment, as set out in Part 5.7 of the Act.

Variation of licence conditions

The licence holder can apply to vary the conditions of this licence. An application form for this purpose is available from the EPA.

The EPA may also vary the conditions of the licence at any time by written notice without an application being made.

Where a licence has been granted in relation to development which was assessed under the Environmental Planning and Assessment Act 1979 in accordance with the procedures applying to integrated development, the EPA may not impose conditions which are inconsistent with the development consent conditions until the licence is first reviewed under Part 3.6 of the Act.

Duration of licence

This licence will remain in force until the licence is surrendered by the licence holder or until it is suspended or revoked by the EPA or the Minister. A licence may only be surrendered with the written approval of the EPA.

Licence review

The Act requires that the EPA review your licence at least every 5 years after the issue of the licence, as set out in Part 3.6 and Schedule 5 of the Act. You will receive advance notice of the licence review.

Fees and annual return to be sent to the EPA

For each licence fee period you must pay:

- an administrative fee; and
- a load-based fee (if applicable).

Environment Protection Licence

Licence - 4614



The EPA publication “A Guide to Licensing” contains information about how to calculate your licence fees. The licence requires that an Annual Return, comprising a Statement of Compliance and a summary of any monitoring required by the licence (including the recording of complaints), be submitted to the EPA. The Annual Return must be submitted within 60 days after the end of each reporting period. See condition R1 regarding the Annual Return reporting requirements.

Usually the licence fee period is the same as the reporting period.

Transfer of licence

The licence holder can apply to transfer the licence to another person. An application form for this purpose is available from the EPA.

Public register and access to monitoring data

Part 9.5 of the Act requires the EPA to keep a public register of details and decisions of the EPA in relation to, for example:

- licence applications;
- licence conditions and variations;
- statements of compliance;
- load based licensing information; and
- load reduction agreements.

Under s320 of the Act application can be made to the EPA for access to monitoring data which has been submitted to the EPA by licensees.

This licence is issued to:

L A KENNETT ENTERPRISES PTY LTD
PO BOX 19
GLENFIELD NSW 2167

subject to the conditions which follow.

Environment Protection Licence

Licence - 4614

1 Administrative Conditions

A1 What the licence authorises and regulates

- A1.1 This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation.

Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition.

Scheduled Activity	Fee Based Activity	Scale
Crushing, grinding or separating	Crushing, grinding or separating	> 30000 - 100000 T annual processing capacity
Extractive activities	Land-based extractive activity	> 100000 - 500000 T annual capacity to extract, process or store
Waste processing (non-thermal treatment)	Non-thermal treatment of general waste	Any annual processing capacity
Waste disposal (application to land)	Waste disposal by application to land	Any capacity
Waste storage	Waste storage - other types of waste	Any other types of waste stored

A2 Premises or plant to which this licence applies

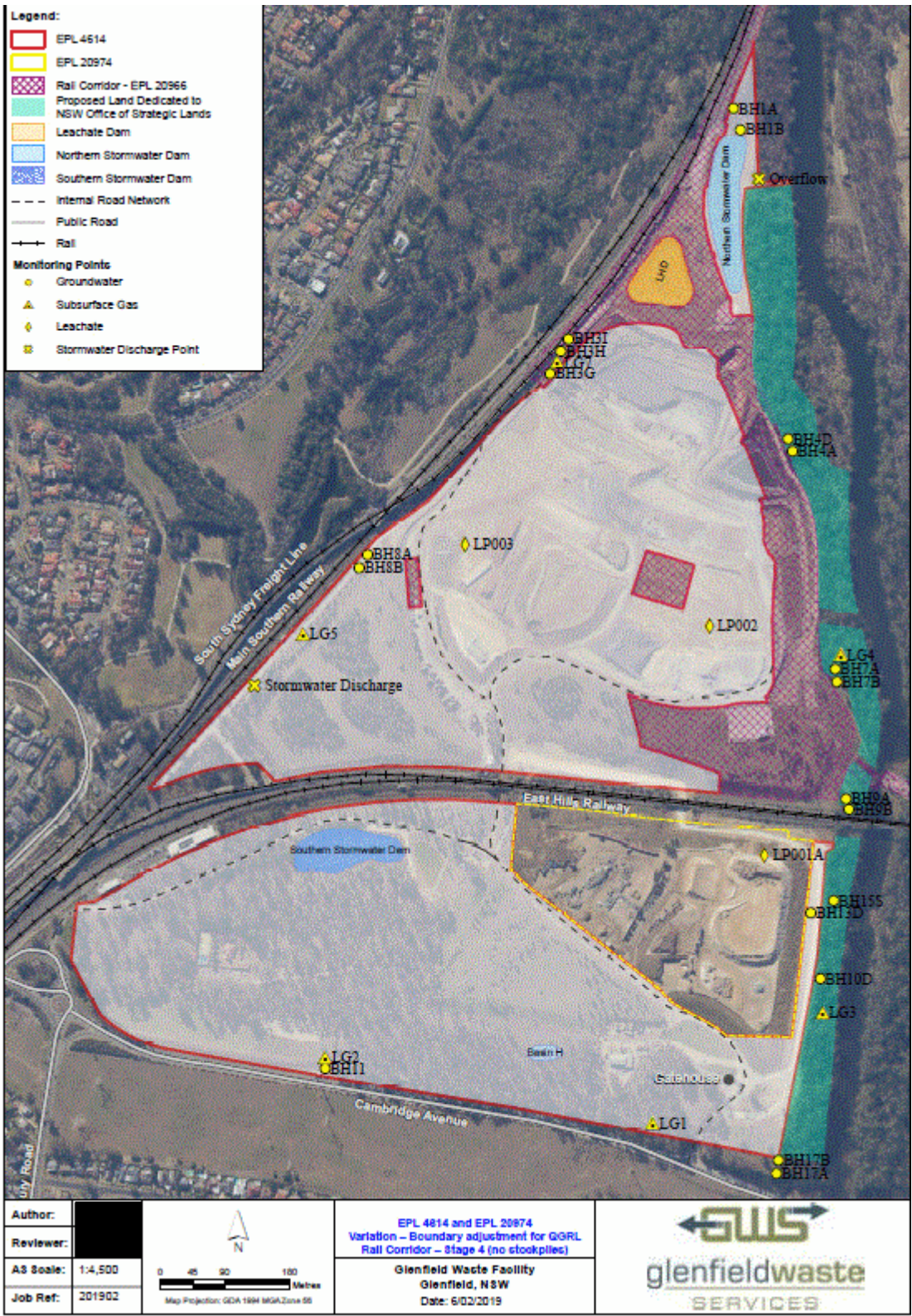
- A2.1 The licence applies to the following premises:

Premises Details
GLENFIELD WASTE SERVICES
CAMBRIDGE AVE
GLENFIELD
NSW 2167
LOT 1 DP 113201, LOT 2 DP 333578, LOT 51 DP 515696, LOT 52 DP 517310, LOT 3 DP 735524, PART LOT 3 DP 736881, LOT 5 DP 833516, LOT 6 DP 833516, LOT 104 DP 1143827, PART LOT 91 DP 1155962, LOT 92 DP 1155962
AS IDENTIFIED IN THE MAP BELOW AND DETAILED IN FIGURE TITLED "EPL 4614 AND EPL 20974 VARIATION - BOUNDARY ADJUSTMENT FOR QGRL RAIL CORRIDOR - STAGE 4 (NO STOCKPILES)" DATED 6 FEBRUARY 2019 (EPA REF DOC19/138202).

- A2.2 The premises location is shown on the map below.

Environment Protection Licence

Licence - 4614



A3 Information supplied to the EPA

Environment Protection Licence

Licence - 4614

- A3.1 Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence.

In this condition the reference to "the licence application" includes a reference to:

- a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and
- b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.

2 Discharges to Air and Water and Applications to Land

P1 Location of monitoring/discharge points and areas

- P1.1 The following points referred to in the table are identified in this licence for the purposes of the monitoring and/or the setting of limits for discharges of pollutants to water from the point.

Water and land

EPA Identification no.	Type of Monitoring Point	Type of Discharge Point	Location Description
1	Surface Water Discharge Discharge Quality Monitoring	Surface Water Discharge Discharge Quality Monitoring	Stormwater discharge from B1 sedimentation dam to Glenfield Creek labelled as 'Stormwater discharge' in map "EPL 4614 and EPL 20974 Variation-Boundary adjustment for QGRL Rail Corridor-Stage 4(no stockpiles)" dated 6/02/19(EPA ref DOC19/138202).
2	Surface Water Discharge Discharge Quality Monitoring	Surface Water Discharge Discharge Quality Monitoring	Stormwater overflow from B7 Stormwater basin dam to Georges River labelled as 'Overflow' in Figure titled "EPL 4614 and EPL 20974 Variation-Boundary adjustment for QGRL Rail Corridor-Stage 4(no stockpiles)" dated 6/02/19(EPA ref DOC19/138202).

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3	Leachate quality monitoring	Concrete leachate riser located in southern portion of the old cell labelled as 'LP001A' as identified in Figure titled "EPL 4614 and EPL 20974 Variation-Boundary adjustment for QGRL Rail Corridor-Stage 4(no stockpiles)" dated 6/02/19(EPA ref DOC19/138202
4	Leachate quality monitoring	Concrete leachate riser located in north western portion of old cell labelled as 'LP003' as identified in Figure titled "EPL 4614 and EPL 20974 Variation-Boundary adjustment for QGRL Rail Corridor-Stage 4(no stockpiles)" dated 6/02/19(EPA ref DOC19/138202
5	Leachate quality monitoring	Concrete leachate riser located in NE portion of old cells labelled as 'LP002' as identified in Figure titled "EPL 4614 and EPL 20974 Variation-Boundary adjustment for QGRL Rail Corridor-Stage 4(no stockpiles)" dated 6/02/19(EPA ref DOC19/138202)
6	Groundwater monitoring point	Groundwater monitoring bore labelled as "BH8A" midway along western boundary as in identified in Figure titled "EPL 4614 and EPL 20974 Variation-Boundary adjustment for QGRL Rail Corridor-Stage 4(no stockpiles)" dated 6/02/19(EPA ref DOC19/138202).
7	Groundwater monitoring point	Groundwater monitoring bore labelled as "BH1B" at northern end of landfill as identified in Figure titled "EPL 4614 and EPL 20974 Variation-Boundary adjustment for QGRL Rail Corridor-Stage 4(no stockpiles)" dated 6/02/19(EPA ref DOC19/138202).
8	Groundwater monitoring point	Groundwater monitoring bore labelled as "BH7B" midway along western boundary as identified in Figure titled "EPL 4614 and EPL 20974 Variation-Boundary adjustment for QGRL Rail Corridor-Stage 4(no stockpiles)" dated 6/02/19(EPA ref DOC19/138202).

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10	Groundwater monitoring point	Groundwater monitoring bore labelled as "BH9A" midway along western boundary as identified in Figure titled "EPL 4614 and EPL 20974 Variation-Boundary adjustment for QGRL Rail Corridor-Stage 4(no stockpiles)" dated 6/02/19(EPA ref DOC19/138202).
11	Groundwater monitoring point	Groundwater monitoring bore labelled "BH10D" as identified in Figure titled "EPL 4614 and EPL 20974 Variation-Boundary adjustment for QGRL Rail Corridor-Stage 4(no stockpiles)" dated 6/02/19(EPA ref DOC19/138202).
12	Groundwater monitoring point	Groundwater monitoring bore labelled as "BH13D" as identified in Figure titled "EPL 4614 and EPL 20974 Variation-Boundary adjustment for QGRL Rail Corridor-Stage 4(no stockpiles)" dated 6/02/19(EPA ref DOC19/138202).
13	Groundwater monitoring point	Groundwater monitoring point labelled as "BH15S" as identified in Figure titled "EPL 4614 and EPL 20974 Variation-Boundary adjustment for QGRL Rail Corridor-Stage 4(no stockpiles)" dated 6/02/19(EPA ref DOC19/138202).
14	Groundwater monitoring point	Groundwater monitoring bore labelled as "BH11" as identified in Figure titled "EPL 4614 and EPL 20974 Variation-Boundary adjustment for QGRL Rail Corridor-Stage 4(no stockpiles)" dated 6/02/19(EPA ref DOC19/138202).
15	Groundwater monitoring point	Groundwater monitoring bore labelled as "BH9B" as identified in Figure titled "EPL 4614 and EPL 20974 Variation-Boundary adjustment for QGRL Rail Corridor-Stage 4(no stockpiles)" dated 6/02/19(EPA ref DOC19/138202).

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16	Groundwater monitoring point	Groundwater monitoring bore labelled as "BH3G" as identified in Figure titled "EPL 4614 and EPL 20974 Variation-Boundary adjustment for QGRL Rail Corridor-Stage 4(no stockpiles)" dated 6/02/19(EPA ref DOC19/138202).
17	Groundwater monitoring point	Groundwater monitoring bore labelled as "BH3H" as identified in Figure titled "EPL 4614 and EPL 20974 Variation-Boundary adjustment for QGRL Rail Corridor-Stage 4(no stockpiles)" dated 6/02/19(EPA ref DOC19/138202).
18	Groundwater monitoring point	Groundwater monitoring bore labelled as "BH3I" as identified in Figure titled "EPL 4614 and EPL 20974 Variation-Boundary adjustment for QGRL Rail Corridor-Stage 4(no stockpiles)" dated 6/02/19(EPA ref DOC19/138202).
19	Groundwater monitoring point	Groundwater monitoring bore labelled as "BH4A" as identified in Figure titled "EPL 4614 and EPL 20974 Variation-Boundary adjustment for QGRL Rail Corridor-Stage 4(no stockpiles)" dated 6/02/19(EPA ref DOC19/138202).
20	Groundwater monitoring point	Groundwater monitoring bore labelled as "BH4D" as identified in Figure titled "EPL 4614 and EPL 20974 Variation-Boundary adjustment for QGRL Rail Corridor-Stage 4(no stockpiles)" dated 6/02/19(EPA ref DOC19/138202).
21	Groundwater Monitoring	Groundwater monitoring well labelled as "BH7A" as identified in Figure titled "EPL 4614 and EPL 20974 Variation-Boundary adjustment for QGRL Rail Corridor-Stage 4(no stockpiles)" dated 6/02/19(EPA ref DOC19/138202).

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22	Groundwater Monitoring	Groundwater monitoring well labelled as "BH8B" as identified in Figure titled "EPL 4614 and EPL 20974 Variation-Boundary adjustment for QGRL Rail Corridor-Stage 4(no stockpiles)" dated 6/02/19(EPA ref DOC19/138202).
23	Groundwater monitoring	Groundwater monitoring well labelled as "BH1A" as identified in Figure titled "EPL 4614 and EPL 20974 Variation-Boundary adjustment for QGRL Rail Corridor-Stage 4(no stockpiles)" dated 6/02/19(EPA ref DOC19/138202).
24	Groundwater monitoring	Groundwater monitoring well labelled as "BH17A" as identified in Figure titled "EPL 4614 and EPL 20974 Variation-Boundary adjustment for QGRL Rail Corridor-Stage 4(no stockpiles)" dated 6/02/19(EPA ref DOC19/138202).
26	Subsurface Gas Monitoring	Subsurface gas monitoring well labelled as "LG1" as identified in Figure titled "EPL 4614 and EPL 20974 Variation-Boundary adjustment for QGRL Rail Corridor-Stage 4(no stockpiles)" dated 6/02/19(EPA ref DOC19/138202).
27	Subsurface Gas Monitoring	Subsurface gas monitoring well labelled as "LG2" as identified in Figure titled "EPL 4614 and EPL 20974 Variation-Boundary adjustment for QGRL Rail Corridor-Stage 4(no stockpiles)" dated 6/02/19(EPA ref DOC19/138202).
28	Subsurface Gas Monitoring	Subsurface gas monitoring well labelled as "LG3" as identified in Figure titled "EPL 4614 and EPL 20974 Variation-Boundary adjustment for QGRL Rail Corridor-Stage 4(no stockpiles)" dated 6/02/19(EPA ref DOC19/138202).

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29	Subsurface Gas Monitoring	Subsurface gas monitoring well labelled as "LG4" as identified in Figure titled "EPL 4614 and EPL 20974 Variation-Boundary adjustment for QGRL Rail Corridor-Stage 4(no stockpiles)" dated 6/02/19(EPA ref DOC19/138202).
30	Subsurface Gas Monitoring	Subsurface gas monitoring well labelled as "LG5" as identified in Figure titled "EPL 4614 and EPL 20974 Variation-Boundary adjustment for QGRL Rail Corridor-Stage 4(no stockpiles)" dated 6/02/19(EPA ref DOC19/138202).
31	Subsurface Gas Monitoring	Subsurface gas monitoring well labelled as "LG7" as identified in Figure titled "EPL 4614 and EPL 20974 Variation-Boundary adjustment for QGRL Rail Corridor-Stage 4(no stockpiles)" dated 6/02/19(EPA ref DOC19/138202).
33	Leachate Quality Monitoring	Leachate holding dam labelled "LHD" as identified in Figure titled "EPL 4614 and EPL 20974 Variation-Boundary adjustment for QGRL Rail Corridor-Stage 4(no stockpiles)" dated 6/02/19(EPA ref DOC19/138202).
34	Stormwater Quality Monitoring	Stormwater within Dam B7 labelled as "Stormwater basin" in Figure titled "EPL 4614 and EPL 20974 Variation-Boundary adjustment for QGRL Rail Corridor-Stage 4(no stockpiles)" dated 6/02/19(EPA ref DOC19/138202).
35	Stormwater Quality Monitoring	Stormwater within Dam B1 labelled as "Dam B1" in Figure titled "EPL 4614 and EPL 20974 Variation-Boundary adjustment for QGRL Rail Corridor-Stage 4(no stockpiles)" dated 6/02/19(EPA ref DOC19/138202).
36	Stormwater Quality Monitoring	Stormwater within Dam H labelled as "Basin H" in Figure titled "EPL 4614 and EPL 20974 Variation-Boundary adjustment for QGRL Rail Corridor-Stage 4(no stockpiles)" dated 6/02/19(EPA ref DOC19/138202).

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3 Limit Conditions

L1 Pollution of waters

- L1.1 Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.

L2 Concentration limits

- L2.1 For each monitoring/discharge point or utilisation area specified in the table\ below (by a point number), the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentration limits specified for that pollutant in the table.
- L2.2 Where a pH quality limit is specified in the table, the specified percentage of samples must be within the specified ranges.
- L2.3 To avoid any doubt, this condition does not authorise the pollution of waters by any pollutant other than those specified in the table\.
- L2.4 Water and/or Land Concentration Limits

POINT 1,2

Pollutant	Units of Measure	50 percentile concentration limit	90 percentile concentration limit	3DGM concentration limit	100 percentile concentration limit
Ammonia	milligrams per litre				1
Conductivity	microsiemens per centimetre				1500
pH	pH				6.5-8.5
Total suspended solids	milligrams per litre				50

L3 Waste

- L3.1 The licensee must not cause, permit or allow any waste to be received at the premises, except the wastes expressly referred to in the column titled "Waste" and meeting the definition, if any, in the column titled "Description" in the table below.

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Any waste received at the premises must only be used for the activities referred to in relation to that waste in the column titled "Activity" in the table below.

Any waste received at the premises is subject to those limits or conditions, if any, referred to in relation to that waste contained in the column titled "Other Limits" in the table below.

This condition does not limit any other conditions in this licence.

Code	Waste	Description	Activity	Other Limits
NA	Asbestos waste	As defined in Schedule 1 of the POEO Act, as in force from time to time.	Waste disposal (application to land)	NA
NA	General solid waste (non-putrescible)	As defined in Schedule 1 of the POEO Act, as in force from time to time.	Waste disposal (application to land) Waste processing (non-thermal treatment) Waste storage	Volume of waste stored in the transfer station must not exceed 4,000 cubic metres at any one time.
NA	Waste tyres	As defined in Schedule 1 of the POEO Act, as in force from time to time.	Waste disposal (application to land) Waste storage	Stockpiling of waste tyres must not exceed 50 tonnes or 5000 tyres.
NA	Wood waste	As defined in Schedule 1 of the POEO Act, as in force from time to time.	Waste processing (non-thermal treatment) Waste storage	Stockpiling of unshredded and shredded garden waste and wood waste (as defined in the EPA Waste Guidelines) at the premises must not exceed 10,000 cubic metres (m3) at any one time.
NA	Garden waste	As defined in Schedule 1 of the POEO Act, as in force from time to time.	Waste processing (non-thermal treatment) Waste storage	Stockpiling of unshredded and shredded garden waste and wood waste (as defined in the EPA Waste Guidelines) at the premises must not exceed 10,000 cubic metres (m3) at any one time.

L3.2 The licensee must not dispose of any tyre at the premises unless:

a) The tyre has a diameter of 1.2 metres or more; and/or

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- b) The tyre has been shredded or had its walls removed; and/or
- c) The tyre was delivered to the premises as part of a domestic load.

L3.3 For the purposes of this condition:

- a) Tyres are taken to be shredded only if the tyres are in pieces measuring no more than 250mm in any direction; and
- b) Domestic load means a load containing no more than 5 tyres having a diameter of less than 1.2 metres.

L3.4 The total quantity of used, rejected or unwanted tyres (including shredded tyres and tyre pieces) stockpiled at the premises must not exceed 50 tonnes.

L3.5 The Licensee must only dispose of waste at the Premises in Landfill Cell B2.

L3.6 Stockpiling of unshredded and shredded garden waste and wood waste (as defined in the EPA Waste Classification Guidelines) at the premises must not exceed 10,000 cubic metres (m3) at any one time.

L4 Noise limits

L4.1 Noise from the premises must not exceed an noise emission criterion of 50 dB(A), $L_{A10(15 \text{ minute})}$ except as previously provided by this licence.

L4.2 Noise from the premises is to be measured at any point within one metre of the nearest affected residence or other noise sensitive areas to determine compliance with Condition L4.1. 5 dB(A) must be added if the noise is tonal or impulsive in character.

L5 Potentially offensive odour

L5.1 No condition of this licence identifies a potentially offensive odour for the purposes of section 129 of the Protection of the Environment Operations Act 1997.

Note: Section 129 of the Protection of the Environment Operations Act 1997, provides that the licensee must not cause or permit the emission of any offensive odour from the premises but provides a defence if the emission is identified in the relevant environment protection licence as a potentially offensive odour and the odour was emitted in accordance with the conditions of a licence directed at minimising odour.

4 Operating Conditions

O1 Activities must be carried out in a competent manner

O1.1 Licensed activities must be carried out in a competent manner. This includes:

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- a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
- b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

O2 Maintenance of plant and equipment

- O2.1 All plant and equipment installed at the premises or used in connection with the licensed activity:
- a) must be maintained in a proper and efficient condition; and
 - b) must be operated in a proper and efficient manner.

O3 Processes and management

- O3.1 The licensee must take all practicable steps to control entry to the premises.
- O3.2 All operations and activities occurring at the Premises must be carried out in a manner that will prevent and minimise fire at the Premises
- O3.3 There must be no incineration or burning of any waste at the Premises.

O4 Waste management

Daily and Intermediate Cover

- O4.1 Cover material must be virgin excavated natural material.
- a) Daily cover
Cover material must be applied to a minimum depth of 15 centimetres over all exposed landfilled waste prior to ceasing operations at the end of each day.
 - b) Intermediate cover
Cover material must be applied to a depth of 30 centimetres over surfaces of the landfilled waste at the premises which are to be exposed for more than 90 days.
 - c) Cover material stockpile
At least two weeks cover material must be available at the premises under all weather conditions. This material may be won on site, or alternatively a cover stockpile must be maintained adjacent to the tip face.
- O4.2 Where wastes are received at the Premises for purposes of reuse, processing, recovery, recycling or transfer to another premises, then such wastes are not required to be covered on a daily basis provided that:
- a) Such wastes are stored and managed so as not to cause or be likely to cause any off-site environmental effects; and
 - b) Such wastes are stored in a clearly defined area of the Premises away from the tipping face.

Capping and Landfilling Height Restrictions

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O4.3 The depth of the waste landfilled within 20 metres of the eastern extremity or Haul Road end of Cell A2 may not be landfilled above 11.7m AHD.

O4.4 The depth of the waste landfilled in Cell A1 and A2, including capping and any other material placed above the cap must not exceed 30 metres.

Waste Exhumation

O4.5 Except as provided in Condition O5.2, the licensee must not exhume any landfilled waste unless approved in writing by the EPA.

New Cell Construction

O4.6 The Licensee must obtain approval from the EPA prior to constructing any landfill cells at the Premises.

Leachate Management

O4.7 The Licensee must maintain an earthen bund wall nominally parallel with and at a suitable distance from the northern and eastern extremities of Cell B1. The bunded area must form an enclosure to contain and isolate fugitive leachate emissions from the batter of Cell B1.

O4.8 The licensee must ensure that an operational freeboard of 0.5 metres is maintained within the leachate holding dam (LHD).

O4.9 If the height of leachate in the risers for cells A1 and B1 exceeds -5m AHD and/or the height of the leachate in the riser for the leachate collection drain (LCD) exceeds -6 metres AHD and/or if the leachate dam's freeboard is exceeded, the licensee must within 7 days of either of these events occurring submit a report to the EPA.

O4.10 The report required by condition O4.9 must propose how the licensee will lower the leachate level in the riser serving the subject Cell below -5 metres AHD and/or the leachate level in the riser serving the LCD below -6 metres AHD whilst still maintaining the leachate storage dam's operational freeboard of 0.5 metres.

O4.11 The licensee must operate and maintain a system comprising:

- a) An automated pump out from the riser in Cell A1 and B1 configured such that the leachate level in the riser is maintained below -6 metres AHD;
- b) A high level alarm configured to activate when the leachate level in the riser serving Cell A1 and B1 exceeds -5 metres AHD;
- c) An automated pump out from the LCD configured such that the leachate level in the riser serving the LCD is maintained below -7 metres AHD;
- d) A high level alarm configured to activate when the leachate level in the riser serving the LCD exceeds -6 metres AHD; and
- e) A leak detection and interlock system configured such that leachate transfer from Cell A1 and B1 and/or the LCD is shut down when:
 - i) There is any leakage from the transfer pipe system; and or
 - ii) The freeboard in the leachate holding dam is less than 0.5 metres.

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O4.12 Water which contacts waste, other than virgin excavated natural material, must be managed as leachate. Leachate must be disposed of by:

- a) evaporation from the leachate storage dam;
- b) irrigation onto the active tipping face;
- c) reinjection back into the waste; and
- d) tanker transfer off-site for disposal at a suitably licenced facility.

O4.13 All water from within the void space of the active cell shall be managed as leachate if the water has a total ammonia concentration of 0.9mg/L or more than.

O4.14 The Licensee must sample and analyse for the total ammonia concentration of any surface waters(that do not come into contact with waste) removed out of the void space of the active cell. The frequency of monitoring must be at least once per every 100,000 litres removed.

Leachate Barrier System - Cell X

O4.15 A leachate barrier system incorporating a geosynthetic clay liner (GCL) overlain by a flexible membrane liner (FML) must be installed on the floor and walls of proposed cells X1 and X2 (together referred to as Cell X) as depicted in Figure 5 of the "*Leachate Management Plan (LMP): Cell X. Glenfield Waste Disposals, General Solid Waste Landfill, Cambridge Avenue, Glenfield, New South Wales*", prepared by Edison Environmental & Engineering Pty Ltd and dated 6 August 2018 (**the LMP**) (EPA ref DOC18/559576-02).

O4.16 The GCL and FML must be installed in Cell X in accordance with the procedures detailed in Section 4.6.1, 4.6.2, 4.6.4 and 4.6.5 of the LMP.

O4.17 The specifications of the GCL to be installed in Cell X, must be in accordance with Table 1 of the LMP.

O4.18 The specifications of the FML to be installed in Cell X must be in accordance with Table 2 of the LMP.

O4.19 A 300 mm thick granular (<20 mm) padding layer must be installed on the floors of Cell X, overlying the FML.

Leachate Collection and Conveyance System - Cell X

O4.20 A leachate collection and conveyance system (**LCCS**) must be installed on the floors and walls of Cell X, overlying the padding layer.

O4.21 The LCCS on the floor of Cell X must comprise a lower separation geotextile, gravel, pipe network, upper separation geotextile and a 150 mm thick sand layer in accordance with Section 4.7, 4.7.1, 4.7.2 and Figure 6 of the LMP.

O4.22 The LCCS on the walls of the Cell X must comprise a drainage geocomposite in accordance with Section 1.8 of the "*Environmental Guidelines: Solid waste landfills*", NSW EPA (2016).

O4.23 The specifications of lower and upper separation geotextiles in the LCCS must be in accordance with Section 4.7.1.1 of the LMP.

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- O4.24 The specifications of the gravel in the LCCS must be in accordance with Section 4.7.1.2 of the LMP.
- O4.25 The LCCS pipe network must comprise thick walled HDPE pipes in accordance with 4.7.2 and Figure 6 of the LMP.
- O4.26 The LCCS HDPE pipework must be installed in accordance with 4.7.2 of and Figure 6 of the LMP.
- O4.27 A leachate sump and riser must be installed in Cell X in accordance with Section 4.7.3 and Figure 7 of the LMP.

Construction Quality Assurance - Cell X

- O4.28 During the installation of the leachate barrier system, LCCS and liner system, the Licensee must implement:
1. the relevant Construction Quality Assurance (CQA) procedures detailed in Annexure 5 of the LMP; and
 2. the independent conformance testing procedures for the GCL, FML and separation geotextiles detailed in Section 11.3 and Tables 8, 10 and 11 of the Landfill Guidelines.
- O4.29 Within 30 days of completion of construction Cell X1 and/or Cell X2 ,the Licensee must provide the EPA with a CQA report detailing the CQA procedures that were implemented during that construction. The CQA report must include:
- photographic evidence of the works;
 - as built surveys;
 - manufactures certification;
 - the results of all testing that was undertaken;
 - a statement that the works were constructed generally in accordance with their design and specifications; and
 - be signed off by a suitably qualified person.

Approval to dispose of waste in Cell X

- O4.30 The Licensee must not dispose of any waste into Cell X1 or Cell X2, until it has written approval from the EPA.

Waste Tyres

- O4.31 The licensee must ensure that stockpiles of used, rejected or unwanted tyres (including shredded tyres and tyre pieces) are located in a clearly defined area.
- O4.32 The licensee must ensure that stockpiles of used, rejected or unwanted tyres (including shredded tyres and tyre pieces) are managed so as not to cause or to be likely to cause the spread of disease by vermin.

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O4.33 The licensee must ensure that measures are taken to prevent stockpiles of used, rejected or unwanted tyres (including shredded tyres and tyre pieces) from catching on fire.

Filling Plan

O4.34 The Licensee must maintain a filling plan that identifies areas to be used in the future for the disposal of waste. The filling plan must be updated at intervals of no greater than twelve months.

Recycling Area

O4.35 Recycling facilities at the premises must be clearly marked and be available for access by the public.

Landfill Capping and Closure Plan

O4.36 The Licensee must ensure that the landfill cells are capped progressively during operations and specifically at times when the level of waste reaches final heights.

O4.37 Final capping of cells A1, A2, B1/B2, X1, X2, must be done in accordance with the "*Landfill Closure Plan: Glenfield Waste Disposals, General Solid Waste Landfill Cambridge Avenue, Glenfield, New South Wales*", prepared by Edison Environmental & Engineering Pty Ltd, and dated 16 May 2018 (EPA ref DOC18/559576-02). The capping must include:

- a 300 mm thick seal-bearing layer;
- a 300 mm thick gas drainage layer;
- a 600 mm thick sealing layer with an in-situ hydraulic conductivity of less than 1×10^{-9} m/s; and
- either a 1000 mm thick of suitable material or a vegetation layer consisting of 1000 mm layer of suitable growing medium in accordance with Section 9. 1 of the "*Environmental Guidelines: Solid waste landfills*", NSW EPA (2016).

O4.38 Capped surfaces must be free of depressions that may result in ponding. The Licensee must develop a maintenance regime that includes filling or other works of depressions identified in the capped surface of any landfill cell.

O5 Other operating conditions

Stormwater Basin Works

O5.1 Stormwater basin works, including but not limited to:

- de-silting and deepening of the southern basin;
- re-configuring and expanding the northern basin; and
- construction of a basin for catchment H,

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must be done in accordance with section 5.4 of the document “*Soil and Water Management Plan: Glenfield Waste Disposals, General Solid Waste Landfill, Cambridge Avenue, Glenfield, New South Wales*” prepared by Edison Environmental & Engineering Pty Ltd and dated 6 August 2018” (EPA ref DOC18/559576-02).

Eastern Underpass Works

O5.2 Construction of the eastern underpass must be done in accordance with the “*Environmental Management Plan (EMP), Eastern Rail Underpass Roadway Development, Glenfield Waste Disposals, General Solid Waste Landfill, Cambridge Avenue, Glenfield, New South Wales*” prepared by Edison Environmental & Engineering Pty Ltd, and dated 10 May 2018 (EPA ref. DOC18/559576-02). This includes, but is not limited to:

- removal and stockpiling of suitable capping material for re-use;
- pumping and transfer of leachate and ponded water;
- daily covering of exposed waste material;
- daily burial of excavated material in active landfill; and
- prompt loading of haul trucks for transfer of excavated material and placement of daily cover over material in active landfill cell.

5 Monitoring and Recording Conditions

M1 Monitoring records

- M1.1 The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.
- M1.2 All records required to be kept by this licence must be:
- a) in a legible form, or in a form that can readily be reduced to a legible form;
 - b) kept for at least 4 years after the monitoring or event to which they relate took place; and
 - c) produced in a legible form to any authorised officer of the EPA who asks to see them.
- M1.3 The following records must be kept in respect of any samples required to be collected for the purposes of this licence:
- a) the date(s) on which the sample was taken;
 - b) the time(s) at which the sample was collected;
 - c) the point at which the sample was taken; and
 - d) the name of the person who collected the sample.
- M1.4 The licensee must record the date, duration and volume of any relevant leachate discharge to surface water.

M2 Requirement to monitor concentration of pollutants discharged

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M2.1 For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:

M2.2 Water and/ or Land Monitoring Requirements

POINT 1,2

Pollutant	Units of measure	Frequency	Sampling Method
Ammonia	milligrams per litre	Special Frequency 1	Grab sample
Conductivity	microsiemens per centimetre	Special Frequency 1	Grab sample
pH	pH	Special Frequency 1	Grab sample
Total organic carbon	milligrams per litre	Special Frequency 1	Grab sample
Total suspended solids	milligrams per litre	Special Frequency 1	Grab sample

POINT 3,4,5,33

Pollutant	Units of measure	Frequency	Sampling Method
Alkalinity (as calcium carbonate)	milligrams per litre	Yearly	Grab sample
Aluminium	milligrams per litre	Yearly	Grab sample
Arsenic	milligrams per litre	Yearly	Grab sample
Barium	milligrams per litre	Yearly	Grab sample
Benzene	milligrams per litre	Yearly	Grab sample
Cadmium	milligrams per litre	Yearly	Grab sample
Calcium	milligrams per litre	Yearly	Grab sample
Chloride	milligrams per litre	Yearly	Grab sample
Chromium (hexavalent)	milligrams per litre	Yearly	Grab sample
Cobalt	milligrams per litre	Yearly	Grab sample
Conductivity	microsiemens per centimetre	Quarterly	Probe
Copper	milligrams per litre	Yearly	Grab sample
Ethyl benzene	milligrams per litre	Yearly	Grab sample
Fluoride	milligrams per litre	Yearly	Grab sample
Lead	milligrams per litre	Yearly	Grab sample
Magnesium	milligrams per litre	Yearly	Grab sample
Manganese	milligrams per litre	Yearly	Grab sample
Mercury	milligrams per litre	Yearly	Grab sample
Nitrate	milligrams per litre	Yearly	Grab sample
Nitrite	milligrams per litre	Yearly	Grab sample
Nitrogen (ammonia)	milligrams per litre	Yearly	Grab sample

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Organochlorine pesticides	milligrams per litre	Yearly	Grab sample
Organophosphate pesticides	milligrams per litre	Yearly	Grab sample
pH	pH	Yearly	Grab sample
Phosphate	milligrams per litre	Yearly	Grab sample
Phosphorus (total)	milligrams per litre	Yearly	Grab sample
Polycyclic aromatic hydrocarbons	milligrams per litre	Yearly	Grab sample
Potassium	milligrams per litre	Yearly	Grab sample
Sodium	milligrams per litre	Yearly	Grab sample
Standing Water Level	metres	Yearly	Special Method 1
Sulfate	milligrams per litre	Yearly	Grab sample
Toluene	milligrams per litre	Yearly	Grab sample
Total chromium	milligrams per litre	Yearly	Grab sample
Total dissolved solids	milligrams per litre	Yearly	Grab sample
Total organic carbon	milligrams per litre	Yearly	Grab sample
Total petroleum hydrocarbons	milligrams per litre	Yearly	Grab sample
Total Phenolics	milligrams per litre	Yearly	Grab sample
Xylene	milligrams per litre	Yearly	Grab sample
Zinc	milligrams per litre	Yearly	Grab sample

POINT 6,7,8,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24

Pollutant	Units of measure	Frequency	Sampling Method
Alkalinity (as calcium carbonate)	milligrams per litre	Quarterly	Grab sample
Aluminium	milligrams per litre	Yearly	Grab sample
Arsenic	milligrams per litre	Yearly	Grab sample
Barium	milligrams per litre	Yearly	Grab sample
Benzene	milligrams per litre	Yearly	Grab sample
Cadmium	milligrams per litre	Yearly	Grab sample
Calcium	milligrams per litre	Quarterly	Grab sample
Chloride	milligrams per litre	Quarterly	Grab sample
Chromium (hexavalent)	milligrams per litre	Yearly	Grab sample
Chromium (total)	milligrams per litre	Yearly	Grab sample
Cobalt	milligrams per litre	Yearly	Grab sample
Copper	milligrams per litre	Yearly	Grab sample
Ethyl benzene	milligrams per litre	Yearly	Grab sample
Fluoride	milligrams per litre	Yearly	Grab sample
Lead	milligrams per litre	Yearly	Grab sample
Magnesium	milligrams per litre	Quarterly	Grab sample
Manganese	milligrams per litre	Yearly	Grab sample
Mercury	milligrams per litre	Yearly	Grab sample

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Nitrate	milligrams per litre	Yearly	Grab sample
Nitrite	milligrams per litre	Yearly	Grab sample
Nitrogen (ammonia)	milligrams per litre	Quarterly	Grab sample
Organochlorine pesticides	milligrams per litre	Yearly	Grab sample
Organophosphate pesticides	milligrams per litre	Yearly	Grab sample
pH	pH	Quarterly	Grab sample
Polycyclic aromatic hydrocarbons	milligrams per litre	Yearly	Grab sample
Potassium	milligrams per litre	Quarterly	Grab sample
Sodium	milligrams per litre	Quarterly	Grab sample
Standing Water Level	metres	Quarterly	Special Method 1
Sulfate	milligrams per litre	Quarterly	Grab sample
Toluene	milligrams per litre	Yearly	Grab sample
Total dissolved solids	milligrams per litre	Quarterly	Grab sample
Total organic carbon	milligrams per litre	Quarterly	Grab sample
Total petroleum hydrocarbons	milligrams per litre	Yearly	Grab sample
Total Phenolics	milligrams per litre	Yearly	Grab sample
Xylene	milligrams per litre	Yearly	Grab sample
Zinc	milligrams per litre	Yearly	Grab sample

POINT 26,27,28,29,30,31

Pollutant	Units of measure	Frequency	Sampling Method
Methane	parts per million by volume	Quarterly	Special Method 2

POINT 34,35,36

Pollutant	Units of measure	Frequency	Sampling Method
Ammonia	milligrams per litre	Special Frequency 2	Grab sample
Conductivity	microsiemens per centimetre	Special Frequency 2	Grab sample
pH	pH	Special Frequency 2	Grab sample
Total organic carbon	milligrams per litre	Special Frequency 2	Grab sample
Total suspended solids	milligrams per litre	Special Frequency 2	Grab sample

M2.3 For the purposes of the table(s) above Special Frequency 1 means the collection of samples daily during discharge.

M2.4 For the purposes of the table(s) above Special Frequency 2 means the collection of samples quarterly and prior discharge.

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M2.5 For the purposes of the table(s) above, Special Method 1 means measurements taken relevant to AHD.

M2.6 For the purposes of the table(s) above, Special Method 2 means monitoring undertaken in accordance with Section 5.3 of the "*Environmental Guidelines: Solid waste landfills*", NSW EPA (2016).

Surface Gas and Gas Accumulation Monitoring

M2.7 Surface gas emission monitoring must be undertaken on a quarterly basis in accordance with the method outlined in Section 5.2 of the "*Environmental Guidelines: Solid waste landfills*" NSW EPA(2016).

M2.8 Gas accumulation monitoring must be undertaken on a quarterly basis in accordance with the method outlined in Section 5.4 of the "*Environmental Guidelines: Solid waste landfills*", NSW EPA (2016).

M3 Testing methods - concentration limits

M3.1 Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before any tests are conducted.

M4 Weather monitoring

M4.1 The licensee must monitor daily rainfall at the Premises

M5 Recording of pollution complaints

M5.1 The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.

M5.2 The record must include details of the following:

- a) the date and time of the complaint;
- b) the method by which the complaint was made;
- c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
- d) the nature of the complaint;
- e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
- f) if no action was taken by the licensee, the reasons why no action was taken.

M5.3 The record of a complaint must be kept for at least 4 years after the complaint was made.

M5.4 The record must be produced to any authorised officer of the EPA who asks to see them.

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M6 Telephone complaints line

- M6.1 The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.
- M6.2 The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.
- M6.3 The preceding two conditions do not apply until 3 months after: the date of the issue of this licence.

6 Reporting Conditions

R1 Annual return documents

- R1.1 The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:
1. a Statement of Compliance,
 2. a Monitoring and Complaints Summary,
 3. a Statement of Compliance - Licence Conditions,
 4. a Statement of Compliance - Load based Fee,
 5. a Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan,
 6. a Statement of Compliance - Requirement to Publish Pollution Monitoring Data; and
 7. a Statement of Compliance - Environmental Management Systems and Practices.

At the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.

- R1.2 An Annual Return must be prepared in respect of each reporting period, except as provided below.
- R1.3 Where this licence is transferred from the licensee to a new licensee:
- a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and
 - b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.
- R1.4 Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on:
- a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or
 - b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.
- R1.5 The Annual Return for the reporting period must be supplied to the EPA via eConnect *EPA* or by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').

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R1.6 The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.

R1.7 Within the Annual Return, the Statements of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:

- a) the licence holder; or
- b) by a person approved in writing by the EPA to sign on behalf of the licence holder.

Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.

Note: An application to transfer a licence must be made in the approved form for this purpose.

R2 Notification of environmental harm

R2.1 Notifications must be made by telephoning the Environment Line service on 131 555.

R2.2 The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.

R2.3 The Licensee must notify the EPA within 24 hours of detecting methane concentrations above 1% v/v in any of the subsurface gas monitoring bores at the premises.

Note: The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.

R2.4 If the results of surface water quality monitoring in the stormwater basin(s) required by conditions M2.2 indicate ammonia concentrations greater than 1mg/L the Licensee must contact the EPA within 24 hours and advise of the results of that monitoring.

R3 Written report

R3.1 Where an authorised officer of the EPA suspects on reasonable grounds that:

- a) where this licence applies to premises, an event has occurred at the premises; or
 - b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence,
- and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.

R3.2 The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.

R3.3 The request may require a report which includes any or all of the following information:

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- a) the cause, time and duration of the event;
- b) the type, volume and concentration of every pollutant discharged as a result of the event;
- c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event;
- d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;
- e) action taken by the licensee in relation to the event, including any follow-up contact with any complainants;
- f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and
- g) any other relevant matters.

R3.4 The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.

R4 Other reporting conditions

- R4.1 The Licensee must notify the EPA of the occurrence of all fires on the Premises in accordance conditions R2.1 and R2.2 as soon as practical after becoming aware of the fire.
- R4.2 The Licensee must notify the EPA within 24 hours of detecting methane concentrations above 1% v/v in any of the subsurface gas monitoring bores at the Premises.

7 General Conditions

G1 Copy of licence kept at the premises or plant

- G1.1 A copy of this licence must be kept at the premises to which the licence applies.
- G1.2 The licence must be produced to any authorised officer of the EPA who asks to see it.
- G1.3 The licence must be available for inspection by any employee or agent of the licensee working at the premises.

8 Pollution Studies and Reduction Programs

U1 Groundwater Assessment

- U1.1 The Licensee must engage a suitably qualified person to undertake an investigation to determine whether it is likely that landfill leachate is impacting the adjoining Georges River. The investigation must comprise in stream water quality monitoring within the Georges River. The monitoring must be undertaken at a minimum of two suitable locations; one upstream, and one downstream of the landfill. The monitoring

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must be undertaken for minimum of six months in accordance with the following table.

Parameter	Units of Measure	Frequency	Method
Water level	metres (m) AHD	monthly	measurement
Biochemical oxygen demand	milligrams per litre	monthly	grab sample
Nitrogen (ammonia)	milligrams per litre	monthly	grab sample
Total iron	milligrams per litre	monthly	grab sample
pH	pH	monthly	probe

U1.2 By no later than **3 May 2019**, the Licensee must submit a monitoring summary report to the EPA. The report must include, but not be limited to, the following:

- water sampling results;
- sampling methodology;
- quality control procedures used in sampling and analysis;
- assessment criteria;
- assessment of sampling data; and
- recommendations for any necessary remedial actions.

U1.3 By no later than **23 November 2018**, the licensee must provide the EPA with an Sampling Analysis and Quality Plan (SQAP) for all water and leachate monitoring conducted at the Premises. As a minimum, the SQAP must incorporate the QA/QC measures, tolerable drawdown amendments and a quarterly leachate monitoring programme as proposed in Section 6.1 of the report “*Groundwater Assessment Report: Glenfield Waste Disposals, General Solid Waste Landfill, Cambridge Avenue, Glenfield, NSW*” dated 27 June 2018 and prepared by Edison Environmental & Engineering Pty Ltd (EPA ref DOC18/432458-02).

9 Special Conditions

E1 Financial assurance

E1.1 A financial assurance, in favour of the EPA, in the amount of nine hundred and sixty thousand dollars (\$960,000) must be maintained during the operation of activities in relation to EPL 4614 and EPL 20974 and until such time as the EPA is satisfied the premises outlined in EPL 4614 and/or EPL 20974 are environmentally secure. This assurance must be replenished to the full amount should the EPA have any reason to call up the financial assurance or any part thereof to correct environmental problems which have not been remedied by the licensee of EPL 4614 or EPL 20974 upon being given notice to do so. Failure to maintain the assurance at the full amount will result in suspension of the relevant EPL. This financial assurance shall be indexed to the Consumer Price Index (CPI). The EPA reserves the right to vary the magnitude of the bank guarantee at any time depending upon any reassessment of possible cost(s) of rehabilitation of the premises at EPL 4614 or EPL 20974.

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E2 Environmental obligations of licensee

- E2.1 While the licensee's premises are being used for the purpose to which the licence relates, the licensee must:
- a) Clean up any spill, leak or other discharge of any waste(s) or other material(s) as soon as practicable after it becomes known to the licensee or to one of the licensee's employees or agents.
 - b) In the event(s) that any liquid and non-liquid waste(s) is unlawfully deposited on the premises, such waste(s) must be removed and lawfully disposed of as soon as practicable or in accordance with any direction given by the EPA.
 - c) Provide all monitoring data as required by the conditions of this licence or as directed by the EPA.
- E2.2 In the event of an earthquake, storm, fire, flood or any other event where it is reasonable to suspect that a pollution incident has occurred, is occurring or is likely to occur, the licensee must:
- a) Make all efforts to contain all fire water on the premises;
 - b) Make all efforts to control air pollution from the premises;
 - c) Make all efforts to contain any discharge, spill or run-off from the premises;
 - d) Make all efforts to prevent flood water entering the premises;
 - e) Remediate and rehabilitate any exposed areas of soil and/or waste;
 - f) Lawfully dispose of all liquid and solid waste(s) stored on the premises that is not already securely disposed of;
 - g) At the request of the EPA, monitor groundwater beneath the premises and its potential to migrate from the premises;
 - h) At the request of the EPA, monitor surface water leaving the premises; and
 - i) Ensure the premises is secure.
- E2.3 After the licensee's premises cease to be used for the purposes to which the licence relates or in the event that the licensee ceases to carry out the activity that is the subject of this licence, that licensee must:
- a) Remove and lawfully dispose of all liquid and non-liquid waste stored on the licensee's premises; and
 - b) Rehabilitate the premises, including conducting an assessment of the site and if required remediation of any site contamination.

E3 Construction of Cell B2

- E3.1 Cell B2 must be constructed generally in accordance with the document "Cell B1 Design and Supplementary Leachate Management Plan, Glenfield Waste Services Landfill Facility, Environmental Protection Licence 4614, Geo-Environmental Engineering, 7 May 2012" (the Cell B1 Design Report).
Note: The Cell B1 Design Report contains design information for Cell B2 as it is part of one large void.
- E3.2 Waste must not be disposed of within Cell B2 unless the licensee has written approval from the EPA. To obtain EPA approval for the disposal of waste within Cell B2, the licensee must provide the EPA with a written request for that approval and a copy of the CQA report referred to in the Cell B1 Design Report.

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Dictionary

General Dictionary

3DGM [in relation to a concentration limit]	Means the three day geometric mean, which is calculated by multiplying the results of the analysis of three samples collected on consecutive days and then taking the cubed root of that amount. Where one or more of the samples is zero or below the detection limit for the analysis, then 1 or the detection limit respectively should be used in place of those samples
Act	Means the Protection of the Environment Operations Act 1997
activity	Means a scheduled or non-scheduled activity within the meaning of the Protection of the Environment Operations Act 1997
actual load	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
AM	Together with a number, means an ambient air monitoring method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .
AMG	Australian Map Grid
anniversary date	The anniversary date is the anniversary each year of the date of issue of the licence. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
annual return	Is defined in R1.1
Approved Methods Publication	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
assessable pollutants	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
BOD	Means biochemical oxygen demand
CEM	Together with a number, means a continuous emission monitoring method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .
COD	Means chemical oxygen demand
composite sample	Unless otherwise specifically approved in writing by the EPA, a sample consisting of 24 individual samples collected at hourly intervals and each having an equivalent volume.
cond.	Means conductivity
environment	Has the same meaning as in the Protection of the Environment Operations Act 1997
environment protection legislation	Has the same meaning as in the Protection of the Environment Administration Act 1991
EPA	Means Environment Protection Authority of New South Wales.
fee-based activity classification	Means the numbered short descriptions in Schedule 1 of the Protection of the Environment Operations (General) Regulation 2009.
general solid waste (non-putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997

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flow weighted composite sample	Means a sample whose composites are sized in proportion to the flow at each composites time of collection.
general solid waste (putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
grab sample	Means a single sample taken at a point at a single time
hazardous waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
licensee	Means the licence holder described at the front of this licence
load calculation protocol	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
local authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
material harm	Has the same meaning as in section 147 Protection of the Environment Operations Act 1997
MBAS	Means methylene blue active substances
Minister	Means the Minister administering the Protection of the Environment Operations Act 1997
mobile plant	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
motor vehicle	Has the same meaning as in the Protection of the Environment Operations Act 1997
O&G	Means oil and grease
percentile [in relation to a concentration limit of a sample]	Means that percentage [eg.50%] of the number of samples taken that must meet the concentration limit specified in the licence for that pollutant over a specified period of time. In this licence, the specified period of time is the Reporting Period unless otherwise stated in this licence.
plant	Includes all plant within the meaning of the Protection of the Environment Operations Act 1997 as well as motor vehicles.
pollution of waters [or water pollution]	Has the same meaning as in the Protection of the Environment Operations Act 1997
premises	Means the premises described in condition A2.1
public authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
regional office	Means the relevant EPA office referred to in the Contacting the EPA document accompanying this licence
reporting period	For the purposes of this licence, the reporting period means the period of 12 months after the issue of the licence, and each subsequent period of 12 months. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
restricted solid waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
scheduled activity	Means an activity listed in Schedule 1 of the Protection of the Environment Operations Act 1997
special waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
TM	Together with a number, means a test method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .

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TSP	Means total suspended particles
TSS	Means total suspended solids
Type 1 substance	Means the elements antimony, arsenic, cadmium, lead or mercury or any compound containing one or more of those elements
Type 2 substance	Means the elements beryllium, chromium, cobalt, manganese, nickel, selenium, tin or vanadium or any compound containing one or more of those elements
utilisation area	Means any area shown as a utilisation area on a map submitted with the application for this licence
waste	Has the same meaning as in the Protection of the Environment Operations Act 1997
waste type	Means liquid, restricted solid waste, general solid waste (putrescible), general solid waste (non - putrescible), special waste or hazardous waste



(By Delegation)

Date of this edition: 12-April-2001

Environment Protection Licence

Licence - 4614

End Notes

- 1 Licence varied by notice 1029056, issued on 20-Aug-2003, which came into effect on 14-Sep-2003.
- 2 Licence varied by notice 1053139, issued on 23-Jan-2006, which came into effect on 17-Feb-2006.
- 3 Licence varied by notice 1063048, issued on 22-Sep-2006, which came into effect on 22-Sep-2006.
- 4 Licence varied by notice 1066628, issued on 31-Oct-2006, which came into effect on 31-Oct-2006.
- 5 Licence varied by notice 1070981, issued on 14-Mar-2007, which came into effect on 14-Mar-2007.
- 6 Licence varied by notice 1076171, issued on 26-Oct-2007, which came into effect on 26-Oct-2007.
- 7 Licence varied by notice 1081090, issued on 14-Dec-2007, which came into effect on 14-Dec-2007.
- 8 Licence varied by notice 1081817, issued on 09-Jan-2008, which came into effect on 09-Jan-2008.
- 9 Licence varied by notice 1087536, issued on 09-Sep-2008, which came into effect on 09-Sep-2008.
- 10 Condition A1.3 Not applicable varied by notice issued on <issue date> which came into effect on <effective date>
- 11 Licence varied by notice 1092081, issued on 30-Jan-2009, which came into effect on 30-Jan-2009.
- 12 Licence varied by notice 1098546, issued on 08-Jul-2009, which came into effect on 08-Jul-2009.
- 13 Licence varied by notice 1107147, issued on 27-Oct-2009, which came into effect on 27-Oct-2009.
- 14 Licence varied by notice 1108130, issued on 19-Nov-2009, which came into effect on 19-Nov-2009.
- 15 Licence varied by Correction to EPA Region data record., issued on 28-Jun-2010, which came into effect on 28-Jun-2010.
- 16 Licence varied by correction to DECCW Region data record, issued on 07-Jul-2010, which came into effect on 07-Jul-2010.
- 17 Licence varied by notice 1501143 issued on 29-Sep-2011
- 18 Licence varied by notice 1507405 issued on 31-Jul-2012

Environment Protection Licence

Licence - 4614



19	Licence varied by notice	1508758 issued on 20-Sep-2012
20	Licence varied by notice	1511422 issued on 30-Jan-2013
21	Licence varied by notice	1511645 issued on 29-May-2013
22	Licence varied by notice	1520719 issued on 04-Apr-2014
23	Licence varied by notice	1528101 issued on 27-Feb-2015
24	Licence varied by notice	1553872 issued on 01-Sep-2017
25	Licence varied by notice	1561539 issued on 23-Mar-2018
26	Licence varied by notice	1563160 issued on 27-Mar-2018
27	Licence varied by notice	1565336 issued on 20-Jul-2018
28	Licence varied by notice	1568902 issued on 26-Sep-2018
29	Licence varied by notice	1570514 issued on 28-Sep-2018
30	Licence varied by notice	1572810 issued on 12-Dec-2018
31	Licence varied by notice	1574039 issued on 25-Feb-2019

Attachment F – CPB Contractors Rail Link EPL #20966



Environment Protection Licence

Licence - 20966

Licence Details	
Number:	20966
Anniversary Date:	18-August
Licensee	
CPB CONTRACTORS PTY LIMITED	
LEVEL 18 177 PACIFIC HIGHWAY	
NORTH SYDNEY NSW 2060	
Premises	
MOOREBANK PRECINCT EAST - RAIL ACCESS LAND PACKAGE NO.1	
3 KM RAIL LINK BETWEEN SSFL AND THE PROPOSED IMPORT-EXPORT TERMINAL	
LIVERPOOL NSW 2170	
Scheduled Activity	
Crushing, grinding or separating	
Extractive activities	
Fee Based Activity	
Scale	
Crushing, grinding or separating	> 30000-100000 T annual processing capacity
Land-based extractive activity	> 100000-500000 T annual capacity to extract, process or store
Region	
Waste & Resource Recovery	
59-61 Goulburn Street	
SYDNEY NSW 2000	
Phone: (02) 9995 5000	
Fax: (02) 9995 5999	
PO Box A290	
SYDNEY SOUTH NSW 1232	

Environment Protection Licence

Licence - 20966

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Environment Protection Licence

Licence - 20966



Information about this licence

Dictionary

A definition of terms used in the licence can be found in the dictionary at the end of this licence.

Responsibilities of licensee

Separate to the requirements of this licence, general obligations of licensees are set out in the Protection of the Environment Operations Act 1997 ("the Act") and the Regulations made under the Act. These include obligations to:

- ensure persons associated with you comply with this licence, as set out in section 64 of the Act;
- control the pollution of waters and the pollution of air (see for example sections 120 - 132 of the Act);
- report incidents causing or threatening material environmental harm to the environment, as set out in Part 5.7 of the Act.

Variation of licence conditions

The licence holder can apply to vary the conditions of this licence. An application form for this purpose is available from the EPA.

The EPA may also vary the conditions of the licence at any time by written notice without an application being made.

Where a licence has been granted in relation to development which was assessed under the Environmental Planning and Assessment Act 1979 in accordance with the procedures applying to integrated development, the EPA may not impose conditions which are inconsistent with the development consent conditions until the licence is first reviewed under Part 3.6 of the Act.

Duration of licence

This licence will remain in force until the licence is surrendered by the licence holder or until it is suspended or revoked by the EPA or the Minister. A licence may only be surrendered with the written approval of the EPA.

Licence review

The Act requires that the EPA review your licence at least every 5 years after the issue of the licence, as set out in Part 3.6 and Schedule 5 of the Act. You will receive advance notice of the licence review.

Fees and annual return to be sent to the EPA

For each licence fee period you must pay:

- an administrative fee; and
- a load-based fee (if applicable).

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The EPA publication “A Guide to Licensing” contains information about how to calculate your licence fees. The licence requires that an Annual Return, comprising a Statement of Compliance and a summary of any monitoring required by the licence (including the recording of complaints), be submitted to the EPA. The Annual Return must be submitted within 60 days after the end of each reporting period. See condition R1 regarding the Annual Return reporting requirements.

Usually the licence fee period is the same as the reporting period.

Transfer of licence

The licence holder can apply to transfer the licence to another person. An application form for this purpose is available from the EPA.

Public register and access to monitoring data

Part 9.5 of the Act requires the EPA to keep a public register of details and decisions of the EPA in relation to, for example:

- licence applications;
- licence conditions and variations;
- statements of compliance;
- load based licensing information; and
- load reduction agreements.

Under s320 of the Act application can be made to the EPA for access to monitoring data which has been submitted to the EPA by licensees.

This licence is issued to:

CPB CONTRACTORS PTY LIMITED
LEVEL 18 177 PACIFIC HIGHWAY
NORTH SYDNEY NSW 2060

subject to the conditions which follow.

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1 Administrative Conditions

A1 What the licence authorises and regulates

- A1.1 This licence authorises the carrying out of the scheduled activities listed below at the premises specified in A2. The activities are listed according to their scheduled activity classification, fee-based activity classification and the scale of the operation.

Unless otherwise further restricted by a condition of this licence, the scale at which the activity is carried out must not exceed the maximum scale specified in this condition.

Scheduled Activity	Fee Based Activity	Scale
Crushing, grinding or separating	Crushing, grinding or separating	> 30000 - 100000 T annual processing capacity
Extractive activities	Land-based extractive activity	> 100000 - 500000 T annual capacity to extract, process or store

- A1.2 Notwithstanding A1.1, the scale of the land-based extractive activity authorised under this licence must not exceed 100,000 tonnes tonnes per annum, being the amount equivalent to the extraction limit approved by the development consent granted under the *Environmental Planning and Assessment Act 1979* for the premises specified in A2.

A2 Premises or plant to which this licence applies

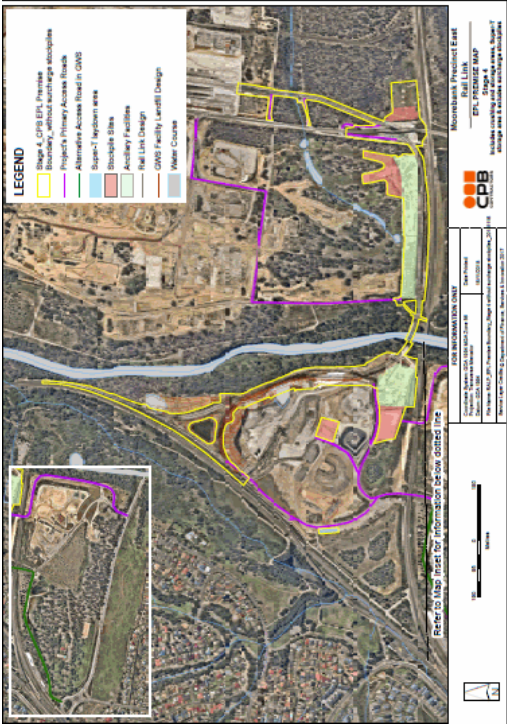
- A2.1 The licence applies to the following premises:

Premises Details
MOOREBANK PRECINCT EAST - RAIL ACCESS LAND PACKAGE NO.1
3 KM RAIL LINK BETWEEN SSFL AND THE PROPOSED IMPORT-EXPORT TERMINAL
LIVERPOOL
NSW 2170
THE PREMISE BOUNDARY IS DEFINED AS THE YELLOW LINE LABELLED "STAGE 4_CPB EPL PREMISE BOUNDARY_WITHOUT SURCHARGE STOCKPILES" ON THE MAP DATED 16/11/2018 IN EPA FILE DOC19/139641

- A2.2 The premises location is shown on the map below.

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A3 Information supplied to the EPA

A3.1 Works and activities must be carried out in accordance with the proposal contained in the licence application, except as expressly provided by a condition of this licence.

In this condition the reference to "the licence application" includes a reference to:

- a) the applications for any licences (including former pollution control approvals) which this licence replaces under the Protection of the Environment Operations (Savings and Transitional) Regulation 1998; and
- b) the licence information form provided by the licensee to the EPA to assist the EPA in connection with the issuing of this licence.

2 Limit Conditions

L1 Pollution of waters

L1.1 Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.

L2 Noise limits

L2.1 All works and activities must be undertaken in a manner that will minimise noise and vibration impacts on sensitive receivers.

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- L2.2 The licensee must ensure that all feasible and reasonable noise and vibration mitigation and management measures are implemented during construction work authorised by this licence, in accordance with the *Interim Construction Noise Guideline* (DECC, 2009).

L3 Hours of operation

L3.1 Construction hours

(a) Unless permitted by another condition of this licence, construction works and activities within the areas of the premises must only be undertaken during the following hours:

- (i) 7:00am to 6:00pm Monday to Friday inclusive;
- (ii) 8:00am to 1:00pm on Saturdays; and
- (iii) at no time on Sundays or public holidays.

L3.2 Restrictions on high noise impact works and activities

a) Notwithstanding Condition L2.1 and unless expressly permitted by another condition of this licence, high noise impact works and activities must only be undertaken during the following hours:

- (i) 8:00am to 5:00pm Monday to Friday inclusive;
- (ii) 8:00am to 1:00pm Saturdays; and
- (iii) at no time on Sundays and public holidays.

(b) Where the high noise impact works and activities exceed the noise management levels at any residential receiver or any other sensitive receiver, the works and activities must be undertaken in continuous blocks not exceeding three (3) hours each with a minimum respite from those activities and works of not less than one (1) hour between each block.

For the purposes of this condition:

(i) "high noise impact works and activities" means jack hammering, rock breaking or hammering, impact pile driving, vibratory rolling, cutting of pavement, concrete or steel, or other surface works that generate impulsive, tonal or low frequency noise, where the terms "impulsive noise", "tonal noise" and "low frequency noise" have the same meaning as in Section 4.2 of the *NSW Industrial Noise Policy* (EPA, 2000); and

(ii) "continuous" includes any period during which there is less than a one (1) hour respite between ceasing and recommencing any of the work that is the subject of this condition.

(iii) the "noise management levels" referred to in Condition L3.2(b) mean:

(1) in the case of residential receivers, the "noise affected" management level specified in Table 2 of the *Interim Construction Noise Guideline* (DECC, 2009)

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(2) in the case of other sensitive receivers, the noise management level specified in Table 3 of the *Interim Construction Noise Guideline* (DECC, 2009).

L3.3 Approved out of hours works

The following construction works and activities may be undertaken outside of the hours specified by Condition L3.1 and Condition L3.2:

(a) Construction works or activities that cause noise levels that are:

(i) no more than 5 dBA above the relevant rating background level during the day, evening or night-time periods at any residence, when measured using the LAeq(15 minute) noise descriptor; and

(ii) no more than the noise management levels specified in Table 3 of the *Interim Construction Noise Guideline* (DECC, 2009) using the LAeq(15 minute) noise descriptor at other sensitive land uses.

For the purpose of Condition L3.3(a), noise impacts on sensitive receivers must be determined in accordance with the *Interim Construction Noise Guideline* (DECC, 2009) and the "night-time" period is as defined in the *NSW Industrial Noise Policy* (EPA, 2000).

(b) Emergency works or activities required to avoid loss of life, damage to property or environmental harm.

(c) Deliveries of plant, equipment, materials or structures that have been determined by the police or other authorised authorities to require special arrangements for transport along public roads for safety reasons.

(d) Works that if carried out in compliance with Conditions L2.1 or L2.2 would cause unacceptable risks to construction personnel safety, public safety, road or rail network operational performance and/or essential utility services.

(e) Rail maintenance and repair work including tamping and regulating to remediate vertical or horizontal movement >4mm in track geometry that has occurred as a direct result of works being undertaken for the project.

(f) During local possessions and described in condition L3.4.

(g) Out-of-hours works approved by the Minister for Planning in accordance with the *Environmental Planning and Assessment Act 1979*.

L3.4 Works Approved Outside of Standard Construction Hours - Local Possessions

(a) Works and activities may be undertaken during any local possession, but only if:

(i) carrying on those works and activities during standard construction hours would cause unacceptable risks to;

(1) construction personnel safety;

(2) rail passenger and railways personnel safety; or

(3) railway network operational reliability as may be notified to the licensee from time to time by Sydney Trains and ARTC; and

(b) High noise impact works and activities (excluding rail adjustment, tamping and regulating, and use of

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hand held rattle guns) may be undertaken during any local possession permissible by Condition L3.4(a) as follows:

(i) between the hours of 6:00am to 10:00pm on any day subject to the works and activities being undertaken in continuous blocks not exceeding 3 hours each with a minimum respite from those works and activities of not less than one hour between each block.

For the purposes of this condition 'continuous' includes any period during which there is less than a 1 hour respite between ceasing and recommencing any of the works or activities the subject of this condition.

(c) Rail adjustment, tamping and regulating, and the use of hand held rattle guns, may occur at any time during a local possession for works and activities permissible by Condition L3.4(a).

L3.5 Community notification of approved out of hours works

(a) The licensee must notify potentially affected noise sensitive receivers of any out of hours works permitted by Condition L3.3(c), Condition L3.3(d), Condition L3.3(e), Condition L3.3(f) or Condition L3.3(g).

(b) The licensee must notify affected stakeholders and potentially affected receivers of any out of hours works about the timing and duration of potential works at least 48 hours prior to the commencement of the works.

(c) The notification required by this condition must be made via letterbox drop or electronic communication and via the project website.

(d) The notification required by this condition must provide details of:

- (i) the reason why out of hours works are required
- (ii) time restrictions that apply to the proposed works
- (iii) the location, nature, scope and duration of the proposed works
- (iv) predicted noise impacts on sensitive receivers
- (v) how complaints may be made and additional information obtained; and
- (vi) the telephone complaints hotline required by Condition M3.1

L3.6 Emergency works

For emergency works permitted by Condition L3.3, the licensee must:

(a) on becoming aware of the need to undertake emergency works or activities, notify the relevant EPA officer and Unit Head by email of the need for those works or activities; and

(b) on the next working day following the emergency works, submit a report by email to the relevant EPA officer and Unit Head detailing:

- (i) the cause, time and duration of the emergency;
- (ii) the action taken by the licensee in relation to the emergency; and

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(iii) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of the emergency.

3 Operating Conditions

O1 Activities must be carried out in a competent manner

O1.1 Licensed activities must be carried out in a competent manner.

This includes:

- a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
- b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

O2 Maintenance of plant and equipment

O2.1 All plant and equipment installed at the premises or used in connection with the licensed activity:

- a) must be maintained in a proper and efficient condition; and
- b) must be operated in a proper and efficient manner.

O3 Dust

O3.1 The licensee must ensure that construction work is carried on by such practicable means as may be necessary to minimise dust emissions on the premises, and implement all reasonable and feasible measures to prevent the release of dust from the premises.

O4 Waste management

O4.1 The licensee must assess, classify and manage any waste generated at the premises in accordance with the *Waste Classification Guidelines Part 1 : Classifying Waste* (Waste Guidelines, as in force from time to time) prior to dispatching the waste offsite.

O4.2 The licensee must not cause, permit or allow any waste generated:

- (a) outside the premises to be received at the premises, except for virgin excavated natural material (VENM) or materials that meet the EPA's Resource Recovery Exemptions for engineered fill purposes.
- (b) at the premises to be disposed of at the premises, except as permitted in Condition O4.3.

O4.3 Excavated material suitable for re-use within the premises may be transported from one part of the premises to another part by road in accordance with Condition O4.4.

O4.4 The licensee must ensure that:

- (a) the body of any vehicle or trailer, used to transport waste or excavation spoil from the premises, is covered before leaving the premises to minimise any spill or escape of any dust, waste, or spoil from the

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vehicle or trailer; and

(b) mud, splatter, dust and other material likely to fall from or be cast off the wheels, underside or body of any vehicle, trailer or motorised plant leaving the premises, is removed to the greatest extent practicable before the vehicle, trailer or motorised plant leaves the premises; and

(c) road surfaces subject to the tracking of material by vehicles leaving the premises are effectively cleaned at the end of each work day.

O5 Other operating conditions

Erosion and Sediment Control

O5.1 The licensee must, before undertaking any construction work (including any earthmoving or vegetation removal works), implement all soil and water management works required to minimise pollution of waters.

O5.2 All erosion and sediment control measures installed on the Premises must be inspected and works undertaken to repair and/or maintain these controls:

a) Weekly during normal construction hours outlined in condition L3.1

b) Daily during periods of rainfall greater than 10mm

c) Within 24 hours of the cessation of a rainfall event causing runoff to occur on or from the Premises.

Rail Construction

O5.3 Where the railway is constructed over waste filled areas then all ground stability works must be in accordance with Sections 2.2.1 and item e) in the table in Section 3 of the "*Moorebank Precinct East Stage 1 RALP No. 1 – Glenfield Waste Services Construction Impact Assessment Report*" dated 7 September 2018 and prepared by Coffey Geotechnics Pty Ltd.

O5.4 Within 3 months of completion of the ground stability works required in Condition O5.3 the Licensee must provide the EPA with a report which demonstrates that those works were completed in accordance with Sections 2.2.1 and item e) in the table in Section 3 of the "*Moorebank Precinct East Stage 1 RALP No. 1 – Glenfield Waste Services Construction Impact Assessment Report*" dated 7 September 2018 and prepared by Coffey Geotechnics Pty Ltd. This report must be prepared and signed-off by a suitably qualified and experienced design and Construction Quality Assurance practitioner.

Service pits and gas mitigation

O5.5 Service pits must be installed in accordance with Section 6.5.4 of the "*Moorebank Precinct East Stage 1 RALP No. 1, Remediation Action Plan*" Dated 6 October 2017 and prepared by Coffey Geotechnics Pty Ltd. [EPA ref DOC17/579104-02]

O5.6 During construction, the Licensee must conduct gas accumulation monitoring within each constructed service pit. Gas monitoring must continue monthly during construction, plus whenever service

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personnel intend to access a pit.

O5.7 If methane is detected at a concentration of greater than 1% (volume/volume) during construction works, the Licensee must immediately notify the EPA and submit a remedial plan. Except to the extent necessary to carry out monitoring and remedial works by a suitably qualified person, access to the pits must cease until monitoring demonstrates that the remediation measures are effective.

O5.8 Within 3 months of completion of the works required in Condition O5.5 the Licensee must provide the EPA with a report which demonstrates that those works were completed in accordance with Section 6.5.4 of the *"Moorebank Precinct East Stage 1 RALP No. 1, Remediation Action Plan"* Dated 6 October 2017 and prepared by Coffey Geotechnics Pty Ltd. [EPA ref DOC17/579104-02]

Landfill infrastructure re-instatement

O5.9 Except for the works required in Condition O5.3, any other landfill infrastructure that is disturbed or modified by the construction of the railway must be reinstated to a standard that meets the *Environmental Guidelines: Solid Waste Landfills* (EPA, 2016). This includes any landfill lining and capping that are breached by the works, other environmental controls, and monitoring installations.

O5.10 Following completion of any works required by Condition O5.9, a report must be submitted to the EPA demonstrating that the works were carried out as required by Condition O5.9. This report must be prepared and signed-off by a suitably qualified and experienced design and Construction Quality Assurance practitioner.

Exhumation of Waste

O5.11 If landfill waste is exhumed as part of the construction works, the Licensee must:

- not expose more waste than necessary to safely construct the works;
- cease or reduce excavation of waste in wet, windy and/or hot and humid conditions;
- not stockpile excavated waste;
- immediately dispose of excavated waste in a licensed landfill cell, or off-site at a place that can lawfully accept that waste;
- immediately stabilise and cover exposed waste with at least 300 mm of soil;
- divert surface water away from exposed waste surfaces;
- prevent water from pooling at any waste excavation location;
- prevent leachate from running off-site, must not store leachate at the site;
- dispose of leachate to sewer (where approved by Sydney Water) or transport leachate by tanker to a place that can lawfully accept that waste; and
- if necessary apply deodorisers in accordance with the manufacturer's instructions.

Lead Contamination

O5.12 Prior to remediation of lead contaminated soils, the Licensee must notify EPA Waste Compliance in writing. This notification must outline the sampling, management and/or disposal actions to be taken, as

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approved by the site auditor and required by condition C8 of Development Consent SSD 6766. The notification must also include the timeframe for the work.

O5.13 If on-site containment cells are proposed:

- the notification in Condition O5.12 must include detailed designs prepared by an appropriately qualified and experienced person with experience in landfill design and construction; and
- at the completion of remediation works, the licensee must submit to EPA Waste Compliance a validation report prepared by an accredited site auditor, as required by condition C8 of Development Consent SSD 6766.

4 Monitoring and Recording Conditions

M1 Monitoring records

- M1.1 The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.
- M1.2 All records required to be kept by this licence must be:
- a) in a legible form, or in a form that can readily be reduced to a legible form;
 - b) kept for at least 4 years after the monitoring or event to which they relate took place; and
 - c) produced in a legible form to any authorised officer of the EPA who asks to see them.
- M1.3 The following records must be kept in respect of any samples required to be collected for the purposes of this licence:
- a) the date(s) on which the sample was taken;
 - b) the time(s) at which the sample was collected;
 - c) the point at which the sample was taken; and
 - d) the name of the person who collected the sample.

M2 Recording of pollution complaints

- M2.1 The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.
- M2.2 The record must include details of the following:
- a) the date and time of the complaint;
 - b) the method by which the complaint was made;
 - c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
 - d) the nature of the complaint;
 - e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
 - f) if no action was taken by the licensee, the reasons why no action was taken.
- M2.3 The record of a complaint must be kept for at least 4 years after the complaint was made.

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M2.4 The record must be produced to any authorised officer of the EPA who asks to see them.

M3 Telephone complaints line

M3.1 The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.

M3.2 Note: "operate" in Condition M3.1 means the licensee must ensure a telephone complaints line is operating.

M3.3 The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.

M3.4 The preceding two conditions do not apply until 18 August 2017 the date of the issue of this licence.

M3.5 Noise and Vibration Complaints

a) The licensee must investigate noise and vibration complaints received from the occupants of dwellings or the managers of noise sensitive premises other than dwellings:

(i) within two hours of the complaint being received; or

(ii) in accordance with any prior complaint management agreement the licensee may have made with the complainant.

b) The licensee must ensure that any investigation referred to in this condition that identifies works or activities being undertaken on the licensed premises as the likely source of the complaint, includes an offer to the complainant to undertake attended noise or vibration monitoring at their premises.

c) If the occupant of the dwelling or the management of a noise sensitive receiver other than a dwelling accepts the offer of attended noise or vibration monitoring the licensee must undertake that attended monitoring:

(i) as soon as practicable; or

(ii) at a time agreed with the complainant.

M3.6 Notifying Results of Complaint Investigation

The licensee must, in respect of each complaint made to the telephone complaints line required by Condition M3.1, advise each complainant of the results of its investigation of their complaint and any proposed remedial action.

M3.7 Authorised Licensee Representatives

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- a) When this licence is issued the licensee must ensure that two duly authorised representatives of the licensee are available for contact by the EPA at all times.
- b) The licensee must provide the EPA with up to date details of natural persons authorised to represent the licensee in respect of:
 - (i) answering general enquiries made by the EPA or its authorised officers;
 - (ii) speaking on behalf of the licensee;
 - (iii) signing on behalf of the licensee; and
 - (iv) acting as the licensee's 'out of hours' contact with authority to direct the licensee's employees, agents and contractors to undertake such action as may be necessary to ensure that construction work complies with this licence.
- c) The details required by Condition M3.6(b) must include:
 - (i) the full name of each authorised representative and the scope of their authority to represent the licensee;
 - (ii) that status and title of each authorised representative within the licensee Organisation; and
 - (iii) the direct landline telephone number, mobile telephone number, pager number, fax number, email address and postal address of each authorised representative.

M4 Other monitoring and recording conditions

M4.1 Requirement to monitor noise and vibration

- (a) The licensee must undertake noise and vibration monitoring as directed by an authorised officer of the EPA.
- (b) The licensee must monitor noise and vibration caused by construction works and activities to inform noise and vibration management and mitigation requirements.
- (c) The noise monitoring undertaken by the licensee must include, but not be limited to, monitoring of noise resulting from out of hours works permitted by Condition L3.3(d), Condition L3.3(e) Condition L3.3(f) and Condition L3.3(g).
- (d) Noise monitoring locations for out of hours works must include, but not be limited to, locations that provide a representative measure of the noise levels at residential receiver locations that are predicted to be affected by LAeq(15 minute) noise levels that exceed the relevant rating background level by more than 20 dB(A) during any evening or night time period or at any time on a Sunday or Public Holiday.

M4.2 Standards and guidelines for noise and vibration monitoring

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(a) All noise monitoring must be undertaken in accordance with *Australian Standard AS 2659.1 – 1998: Guide to the use of sound measuring equipment – Portable sound level meters*, or any revisions of that standard which may be made by Standards Australia, and the compliance monitoring guidance provided in the *NSW Industrial Noise Policy* (EPA, 2000).

(b) All vibration monitoring must be undertaken in accordance with *Assessing vibration: a technical guideline* (DEC, 2006). All vibration monitoring results must be assessed and reported against the acceptable values of human exposure to vibration set out in Tables 2.2 and 2.4 of this guideline.

5 Reporting Conditions

R1 Annual return documents

R1.1 The licensee must complete and supply to the EPA an Annual Return in the approved form comprising:

1. a Statement of Compliance,
2. a Monitoring and Complaints Summary,
3. a Statement of Compliance - Licence Conditions,
4. a Statement of Compliance - Load based Fee,
5. a Statement of Compliance - Requirement to Prepare Pollution Incident Response Management Plan,
6. a Statement of Compliance - Requirement to Publish Pollution Monitoring Data; and
7. a Statement of Compliance - Environmental Management Systems and Practices.

At the end of each reporting period, the EPA will provide to the licensee a copy of the form that must be completed and returned to the EPA.

R1.2 An Annual Return must be prepared in respect of each reporting period, except as provided below.

Note: The term "reporting period" is defined in the dictionary at the end of this licence. Do not complete the Annual Return until after the end of the reporting period.

R1.3 Where this licence is transferred from the licensee to a new licensee:

- a) the transferring licensee must prepare an Annual Return for the period commencing on the first day of the reporting period and ending on the date the application for the transfer of the licence to the new licensee is granted; and
- b) the new licensee must prepare an Annual Return for the period commencing on the date the application for the transfer of the licence is granted and ending on the last day of the reporting period.

Note: An application to transfer a licence must be made in the approved form for this purpose.

R1.4 Where this licence is surrendered by the licensee or revoked by the EPA or Minister, the licensee must prepare an Annual Return in respect of the period commencing on the first day of the reporting period and ending on:

- a) in relation to the surrender of a licence - the date when notice in writing of approval of the surrender is given; or

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b) in relation to the revocation of the licence - the date from which notice revoking the licence operates.

- R1.5 The Annual Return for the reporting period must be supplied to the EPA via eConnect *EPA* or by registered post not later than 60 days after the end of each reporting period or in the case of a transferring licence not later than 60 days after the date the transfer was granted (the 'due date').
- R1.6 The licensee must retain a copy of the Annual Return supplied to the EPA for a period of at least 4 years after the Annual Return was due to be supplied to the EPA.
- R1.7 Within the Annual Return, the Statements of Compliance must be certified and the Monitoring and Complaints Summary must be signed by:
- a) the licence holder; or
 - b) by a person approved in writing by the EPA to sign on behalf of the licence holder.

R2 Notification of environmental harm

- R2.1 Notifications must be made by telephoning the Environment Line service on 131 555.

Note: The licensee or its employees must notify all relevant authorities of incidents causing or threatening material harm to the environment immediately after the person becomes aware of the incident in accordance with the requirements of Part 5.7 of the Act.

- R2.2 The licensee must provide written details of the notification to the EPA within 7 days of the date on which the incident occurred.

R3 Written report

- R3.1 Where an authorised officer of the EPA suspects on reasonable grounds that:
- a) where this licence applies to premises, an event has occurred at the premises; or
 - b) where this licence applies to vehicles or mobile plant, an event has occurred in connection with the carrying out of the activities authorised by this licence,
- and the event has caused, is causing or is likely to cause material harm to the environment (whether the harm occurs on or off premises to which the licence applies), the authorised officer may request a written report of the event.
- R3.2 The licensee must make all reasonable inquiries in relation to the event and supply the report to the EPA within such time as may be specified in the request.
- R3.3 The request may require a report which includes any or all of the following information:
- a) the cause, time and duration of the event;
 - b) the type, volume and concentration of every pollutant discharged as a result of the event;
 - c) the name, address and business hours telephone number of employees or agents of the licensee, or a specified class of them, who witnessed the event;
 - d) the name, address and business hours telephone number of every other person (of whom the licensee is aware) who witnessed the event, unless the licensee has been unable to obtain that information after making reasonable effort;
 - e) action taken by the licensee in relation to the event, including any follow-up contact with any

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complainants;

f) details of any measure taken or proposed to be taken to prevent or mitigate against a recurrence of such an event; and

g) any other relevant matters.

R3.4 The EPA may make a written request for further details in relation to any of the above matters if it is not satisfied with the report provided by the licensee. The licensee must provide such further details to the EPA within the time specified in the request.

R4 Other reporting conditions

R4.1 Daily Reports

a) The licensee must submit, by 12:00 pm the following business day from which the complaint was received, a report to the EPA that provides details of all complaints received in relation to construction activities regulated by the licence on the telephone complaints line required by Condition M3.1 or a complaints email address.

b) The report must:

(i) be submitted to the email address nominated from time to time by the EPA;

(ii) include a unique identifier number for each complaint together with the details required by condition M2.2;

(iii) include the date and time, as reported by the complainant, of the event or incident which is the subject of the complaint;

(iv) include an outline of the work or activity the subject of the complaint;

(v) include the complaints received between 12.00 pm on that day and 12.00pm on the previous business day; and

(vi) if the works have been carried out under Conditions L3.3(b), L3.3(c), L3.3(d), L3.3(e), L3.3(f) or L3.3(g), the report must include a copy of any assessments required by these conditions, unless previously provided to EPA, and details of how the requirements of these conditions have been met.

c) The licensee is not required to submit a report for any reporting period during which no complaints have been received.

R4.2 Noise and Vibration Reports

(a) When directed by an authorised officer of the EPA, the licensee must provide a Preliminary Noise Investigation Report prepared in accordance with Condition R4.2(b) and R4.2(c) within 48 hours of receiving that direction.

(b) The Preliminary Investigation Report provided pursuant to Condition R4.2(a) must detail the results of noise or vibration monitoring undertaken in accordance with Condition M4.1.

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(c) The Preliminary Investigation Report provided pursuant to Condition R4.2(a) must:

(i) include numerical and/or graphical representation of the noise and vibration monitoring results; and

(ii) highlight any detected exceedance of noise predictions, noise goals and noise limits specified in:

(1) this licence;

(2) relevant noise guidelines; and

(3) relevant noise modelling.

d) In the event of any exceedance of the noise predictions, goals or limits referred to in Condition R4.2(c), the licensee must:

(i) modify work practices and methods and implement all practicable and reasonable measures to prevent a recurrence of the exceedance; and

(ii) submit a Follow-up Noise Investigation Report to the EPA within 5 working days of receiving the direction to prepare the Preliminary Noise Investigation Report under Condition R4.2(a).

e) the Follow-up Noise Investigation Report must include:

(i) confirmation of whether or not noise monitoring has been undertaken in accordance with AS2659 and the compliance monitoring guidance provided in the NSW *Industrial Noise Policy* (EPA, 2000);

(ii) confirmation of whether or not vibration monitoring has been undertaken in accordance with the guidance provided in the *Assessing vibration: a technical guideline* (DEC, 2006);

(iii) details of the prevailing meteorological conditions during the period when the noise or vibration monitoring was undertaken;

(iv) a map of each noise and vibration monitoring location in relation to the noise source, including relevant distances;

(v) numerical and graphical representation of the noise and vibration monitoring results;

(vi) an analysis of the noise and vibration monitoring results;

(vii) details of any remedial action taken in relation to the matter; and

(viii) in cases not the subject of remedial action, detailed justification of the decision not to undertake remedial action.

6 General Conditions

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G1 Copy of licence kept at the premises or plant

G1.1 A copy of this licence must be kept at the premises to which the licence applies.

G1.2 The licence must be produced to any authorised officer of the EPA who asks to see it.

G1.3 The licence must be available for inspection by any employee or agent of the licensee working at the premises.

G2 Other general conditions

G2.1 Environmental Induction

a) The licensee must ensure that before any construction work is undertaken all personnel involved in undertaking that work receive environmental induction training.

b) The induction training must:

(i) clearly identify the location of all noise sensitive receivers likely to be affected by noise or vibration generated during the course of work undertaken by those personnel; and

(ii) highlight the licence requirements to minimise noise and vibration impacts on noise sensitive receivers.

7 Special Conditions

E1 Construction Impact Assessment

E1.1 The licensee must undertake works at the Premises in accordance with the report titled, "Moorebank Precinct East Stage 1 RALP No. 1 - Glenfield Waste Services Construction Impact Assessment Report" dated 7 September 2018 and prepared by Coffey Geotechnics Pty Ltd (the CIAR).

E1.2 The licensee must install a GCL barrier system over the waste-filled areas generally:

1. between chainage 40,400m and 40,740m as detailed in the CIAR;
2. in accordance with Figure 1 of the 27 March 2018 memo, provided as an attachment to the CIAR;
3. in accordance with Sections 5.5.1 and 5.5.2 of the document, "CPB Contractors Moorebank Intermodal Rail Link Ground Treatment Design between Ch 40,440 and Ch 40,740 (MB2S) Coffey Services Australia Pty Ltd, 10 July 2018" provided as an attachment to the CIAR.

E1.3 The GCL barrier system referred to in condition E1.2 must:

1. include a cushion geotextile, a textured HDPE geomembrane and a geosynthetic clay liner (GCL); and

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2. be in accordance with Section 1.1 of the 27 March 2018 memo provided as an attachment to the CIAR.

- E1.4 The specifications of the cushion geotextile, textured HDPE geomembrane and geosynthetic clay liner (GCL) referred to in condition E1.3 must be in accordance with the minimum standards specified in Sections 1.6, 1.2 and 1.3 respectively of the "Environmental Guidelines Solid Waste Landfills, second edition, EPA, 2016" (the Landfill Guidelines).
- E1.5 Prior to and during the installation of the GCL barrier system referred to in condition E1.2, the licensee must implement the measures outlined in Section 11.1 of the Landfill Guidelines titled, "Construction Quality Assurance: geosynthetic materials".
- E1.6 Within 3 months of the completion of the GCL barrier system referred to in condition E1.2, the licensee must, in accordance with Sections 11.2 and 11.3 of the Landfill Guidelines, provide the EPA with a Construction Quality Assurance Report (CQA Report).

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Dictionary

General Dictionary

3DGM [in relation to a concentration limit]	Means the three day geometric mean, which is calculated by multiplying the results of the analysis of three samples collected on consecutive days and then taking the cubed root of that amount. Where one or more of the samples is zero or below the detection limit for the analysis, then 1 or the detection limit respectively should be used in place of those samples
Act	Means the Protection of the Environment Operations Act 1997
activity	Means a scheduled or non-scheduled activity within the meaning of the Protection of the Environment Operations Act 1997
actual load	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
AM	Together with a number, means an ambient air monitoring method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .
AMG	Australian Map Grid
anniversary date	The anniversary date is the anniversary each year of the date of issue of the licence. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
annual return	Is defined in R1.1
Approved Methods Publication	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
assessable pollutants	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
BOD	Means biochemical oxygen demand
CEM	Together with a number, means a continuous emission monitoring method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .
COD	Means chemical oxygen demand
composite sample	Unless otherwise specifically approved in writing by the EPA, a sample consisting of 24 individual samples collected at hourly intervals and each having an equivalent volume.
cond.	Means conductivity
environment	Has the same meaning as in the Protection of the Environment Operations Act 1997
environment protection legislation	Has the same meaning as in the Protection of the Environment Administration Act 1991
EPA	Means Environment Protection Authority of New South Wales.
fee-based activity classification	Means the numbered short descriptions in Schedule 1 of the Protection of the Environment Operations (General) Regulation 2009.
general solid waste (non-putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997

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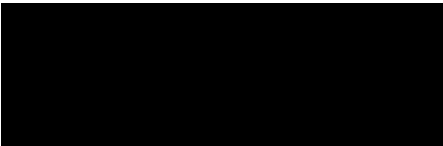
flow weighted composite sample	Means a sample whose composites are sized in proportion to the flow at each composites time of collection.
general solid waste (putrescible)	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
grab sample	Means a single sample taken at a point at a single time
hazardous waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
licensee	Means the licence holder described at the front of this licence
load calculation protocol	Has the same meaning as in the Protection of the Environment Operations (General) Regulation 2009
local authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
material harm	Has the same meaning as in section 147 Protection of the Environment Operations Act 1997
MBAS	Means methylene blue active substances
Minister	Means the Minister administering the Protection of the Environment Operations Act 1997
mobile plant	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
motor vehicle	Has the same meaning as in the Protection of the Environment Operations Act 1997
O&G	Means oil and grease
percentile [in relation to a concentration limit of a sample]	Means that percentage [eg.50%] of the number of samples taken that must meet the concentration limit specified in the licence for that pollutant over a specified period of time. In this licence, the specified period of time is the Reporting Period unless otherwise stated in this licence.
plant	Includes all plant within the meaning of the Protection of the Environment Operations Act 1997 as well as motor vehicles.
pollution of waters [or water pollution]	Has the same meaning as in the Protection of the Environment Operations Act 1997
premises	Means the premises described in condition A2.1
public authority	Has the same meaning as in the Protection of the Environment Operations Act 1997
regional office	Means the relevant EPA office referred to in the Contacting the EPA document accompanying this licence
reporting period	For the purposes of this licence, the reporting period means the period of 12 months after the issue of the licence, and each subsequent period of 12 months. In the case of a licence continued in force by the Protection of the Environment Operations Act 1997, the date of issue of the licence is the first anniversary of the date of issue or last renewal of the licence following the commencement of the Act.
restricted solid waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
scheduled activity	Means an activity listed in Schedule 1 of the Protection of the Environment Operations Act 1997
special waste	Has the same meaning as in Part 3 of Schedule 1 of the Protection of the Environment Operations Act 1997
TM	Together with a number, means a test method of that number prescribed by the <i>Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales</i> .

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TSP	Means total suspended particles
TSS	Means total suspended solids
Type 1 substance	Means the elements antimony, arsenic, cadmium, lead or mercury or any compound containing one or more of those elements
Type 2 substance	Means the elements beryllium, chromium, cobalt, manganese, nickel, selenium, tin or vanadium or any compound containing one or more of those elements
utilisation area	Means any area shown as a utilisation area on a map submitted with the application for this licence
waste	Has the same meaning as in the Protection of the Environment Operations Act 1997
waste type	Means liquid, restricted solid waste, general solid waste (putrescible), general solid waste (non - putrescible), special waste or hazardous waste



(By Delegation)

Date of this edition: 18-August-2017

End Notes		
2	Licence varied by notice	1567038 issued on 26-Sep-2018
3	Licence varied by notice	1570510 issued on 28-Sep-2018
4	Licence varied by notice	1572821 issued on 12-Dec-2018
5	Licence varied by notice	1573971 issued on 25-Feb-2019

Moorebank - RALP No.1

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MAIL TYPE

General Correspondence

REFERENCE NUMBER

QubePMS-GCOR-002862

MAIL NUMBER

ENVW-GCOR-000014

Re: Lead contaminated material GWS - approach

From

To

Cc (3)

Sent

Friday, 7 June 2019

MESSAGE

[REDACTED]

I have reviewed the proposed handling of the lead contaminated material, and can am satisfied that the placement would be appropriate from a site audit perspective.

If you require any further input please let me know otherwise I look froward to the revised RAP detailing the removal of the lead impacted material from the site audit site, the validation of the removal and how the placement into the Cell will be documented in lieu of the usual landfill or disposal dockets.

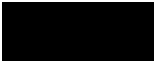
Regards,

[REDACTED]

NSW EPA Accredited Contaminated Land Site Auditor
Enviroview Pty Limited

[REDACTED]

From: [REDACTED]**Sent:** 31/05/2019 8:59:22 AM AEST (GMT +10:00)**To:** [REDACTED]**Cc:** [REDACTED]**Mail Number:** QubePMS-GCOR-002862**Subject:** Lead contaminated material GWS - approach



Please see attached memos from CPB regarding the proposed handling of the lead contaminated material excavated from the GWS site. Can you please review and confirm if satisfied? Once satisfied, we will amend the RAP and submit for approval/.

This information was issued to GWS this morning for acceptance. CPB will issue the information to the EPA this afternoon.

Kind regards,

