APPENDIX 9 - JUSTIFICATION REPORT FOR NO STORMWATER DETENTION BASIN

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Briefing Note

To: Sam Millie

Cc: Malinda Facey, Lucinda Burchfield

From: Darren Lyons, Eliza Towndrow

Date: 19 December 2022

Subject: **Justification Report for No Detention**

1.0 Introduction

This assessment has been undertaken on behalf of Transport for NSW (TfNSW) to assess the requirement for provision of stormwater/flood detention infrastructure for the proposed Olympic Highway Intersection Upgrades (the Project). Specifically, the assessment considers the potential changes to existing stormwater runoff and flooding regimes and resulting impacts on receiving environments, and requirement for mitigation works to avoid or reduce adverse impacts.

Key features of the Project include:

- At the Old Narrandera Road (ONR) intersection:
    - Constructing a second right turn lane for traffic exiting Old Narrandera Road onto the Olympic Highway
    - Constructing a second southbound through lane on the Olympic Highway merging south of the intersection.
    - Constructing of a second northbound through lane on the Olympic Highway exiting at Boorooma Street.
    - Extending the existing culverts under the Olympic Highway and Old Narrandera Road to allow for the road widening.
- At the Travers Street (TS) intersection:
    - Relocating the intersection further south to allow for two southbound lanes on the Olympic Highway, providing increased intersection capacity.
    - Changing the Moorong Street northern connection onto the Olympic Highway to create a left-in left-out arrangement.
    - Constructing a northbound right turn lane from the Olympic Highway into Travers Street.
    - Changing the Olympic Highway northbound lanes south of the Travers Street intersections, with traffic merging into a single lane before the intersection and a new right turning lane.

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ABN 18 059 519 041

T| 1300 793 267
E| info@umwelt.com.au

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The Project principally entails construction at the relevant intersections, which include the below civil works components that potentially impact on local surface water runoff regimes:

- Pavement – proposed road widening and slip road construction increase the road pavement area providing for increased impervious area within the local catchment and potential for increased surface water runoff (peak flow and volume).
- Embankments – changes to the road formation provide for additional fill embankment constructed above natural surface providing a local barrier to overland flows and potential redistribution of surface water flows.
- Drainage – the road designs incorporate modification to existing stormwater drainage infrastructure (pits/pipes/culverts) modifying the collection and discharge of local rainfall runoff.

The consideration of detention basins is a requirement of the TfNSW Specification PS271 Hydrology and Drainage Design (TfNSW, 2020) and the City of Wagga Wagga Engineering Guidelines for Subdivisions and Development Standards (WWCC, 2017) which specifies the requirement for a detention basin if "an increase in stormwater runoff, from a new development site, has an adverse effect to the receiving stormwater system" due to an increase in impervious area.

2.0 Existing Drainage Environment

The location of the proposed works is shown in **Figure 2.1** with respect to the local waterway network and Murrumbidgee River floodplain. Shown for reference is the relevant extract of the City of Wagga Wagga Flood Planning Area (FPA) derived from the 1% Annual Exceedance Probability (1% AEP) flood level (Murrumbidgee River riverine flooding) plus 0.5m freeboard. The FPA defines the land area subject to flood planning and development controls in accordance with Council's Local Environmental Plan (LEP) and Development Control Plan (DCP).

The proposed works are located at the fringe of the 1% AEP Murrumbidgee River flood extent and have no influence of existing flood conditions. A detailed assessment of potential flood impact supported by flood modelling was incorporated in Appendix G Hydrology and Hydraulic Assessment of the Review of Environmental Factors (Umwelt, 2021).

The ONR intersection upgrade is located adjacent to Dukes Creek. Dukes Creek is an ephemeral watercourse that runs along the eastern side of the Olympic Highway near the Old Narrandera Road intersection. It flows into Gobbagombalin Lagoon, which has connectivity with the Murrumbidgee River where the two connect approximately 400m southeast of the intersection. Gobbagombalin Lagoon is a permanent oxbow lake associated with the nearby Murrumbidgee River. It is mapped in the GDE Atlas (BOM, 2021 c) as having a high potential to support aquatic GDEs.

Ecological assessments undertaken as part of the REF (Umwelt, 2021) found that the proposal was assessed as unlikely to significantly affect the ecological community or its habitats given the construction footprint has been designed to avoid the Gobbagombalin Lagoon and no direct impacts would occur. Potential indirect impacts from the proposal (e.g. associated with vegetation clearance and sedimentation) would be managed as per the identified safeguards and management measures defined in the REF.

The TS intersection upgrade drains directly to the Murrumbidgee River via local drainage infrastructure including the existing pit and pipe stormwater network and constructed open channel connecting to the river north of the intersection. A section of flood levee runs along the northern side of Travers Street, designed to provide flood protection to central Wagga Wagga. Flood gates on local stormwater drainage outlets (to prevent river backflow in times of flood) are incorporated into the flood levee protection system.

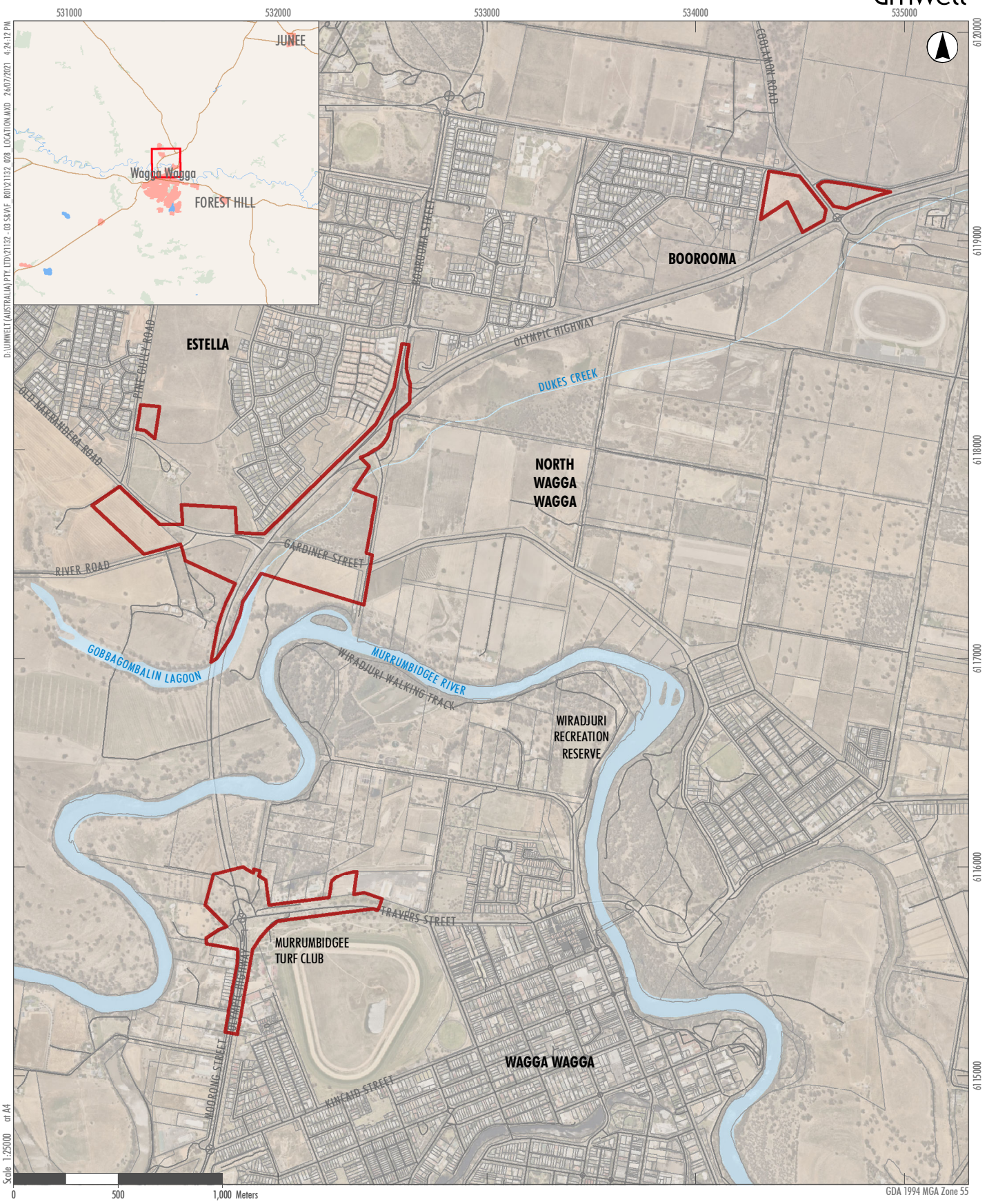

FIGURE 2-1

Location of the Proposal

Image Source: Nearmap (March 2021) Data source: NSW LPI (2020)

3.0 Project Works

The proposed road formations and associated stormwater drainage works are documented in the design drawings provided by TfNSW (TfNSW, 2021a and TfNSW, 2021b). The ONR intersection works largely incorporate a widening of the existing road embankment and corresponding extension of existing cross drainage culverts. Accordingly, the proposed works in principle maintain the configuration of the existing stormwater drainage system.

The proposed TS intersection works incorporates the new road embankment connecting Olympic Highway into Travers Street. The proposed drainage works incorporate a relocation of the existing stormwater drainage (pit and pipe network) to accommodate the road embankment. The existing upstream and downstream stormwater connections are maintained, such that the existing drainage system is essentially retained with the minor relocation of impacted pits and pipe reaches.

The proposed works at both intersections provide no material change to the local stormwater drainage systems and overland flow regimes. Other hydrological impact of the works to consider is the potential increase in stormwater runoff volume and peak flow associated with the increased pavement area with the road works. **Table 3.1** provides a summary of the existing and proposed pavement are at each intersection.

Table 3.1 Change in Catchment Area Pavement

	Old Narrandera Road Intersection	Travers Street Intersection
Existing pavement area (m^2)	21,700	7,753
Proposed pavement area (m^2)	25,635	9,268
Increase in pavement area (m^2)	3,935	1,515
Increase in pavement area (m^2)	18.1%	19.5%

4.0 Local Drainage and Flooding Impacts

4.1 Old Narrandera Road (ONR) Intersection

The ONR intersection is located in the lower reaches of the Dukes Creek catchment, just upstream of the discharge to Gobbagombalin Lagoon and the Murrumbidgee River. The Dukes Creek catchment area is approximately 40 km^2 and encompasses the localities of Estella, Boorooma, Charles Sturt University Cartwrights Hill, Bomen and Brucedale as shown in **Figure 4.1.**

The catchment land use is predominantly agricultural, with pockets of urban residential development at Estella and Boorooma the Charles Sturt University campus, and industrial area around Bomen. These combined urban and industrial development areas comprise approximately 10% of the total catchment area.

The increase in pavement area for the proposed ONR intersection works discharging directly to Dukes Creek represents a very small proportion of the total creek catchment area. Accordingly, any increase in local runoff from the widened road carriageway would not provide for any material increase in peak flow in Dukes Creek or total catchment runoff volume. Notwithstanding the insignificant change to existing peak discharges and volumes, any additional runoff from the works would have limited impact on the downstream receiving environment considering:

- the proposed works discharge directly to the broader Murrumbidgee River floodplain on land identified as subject to flooding in the 1% AEP event (dominant riverine flooding condition).

- there is no downstream property or infrastructure that may be directly impacted by the site discharge.
- the intersection works are located at the downstream end of Dukes Creek with local runoff from the works unlikely to coincide with peak flows from the larger upstream catchment.

Given the insignificant change to Dukes Creek flows from the proposed works and limited impact on the downstream receiving environment, it is considered there be no requirement for provision of flood detention.

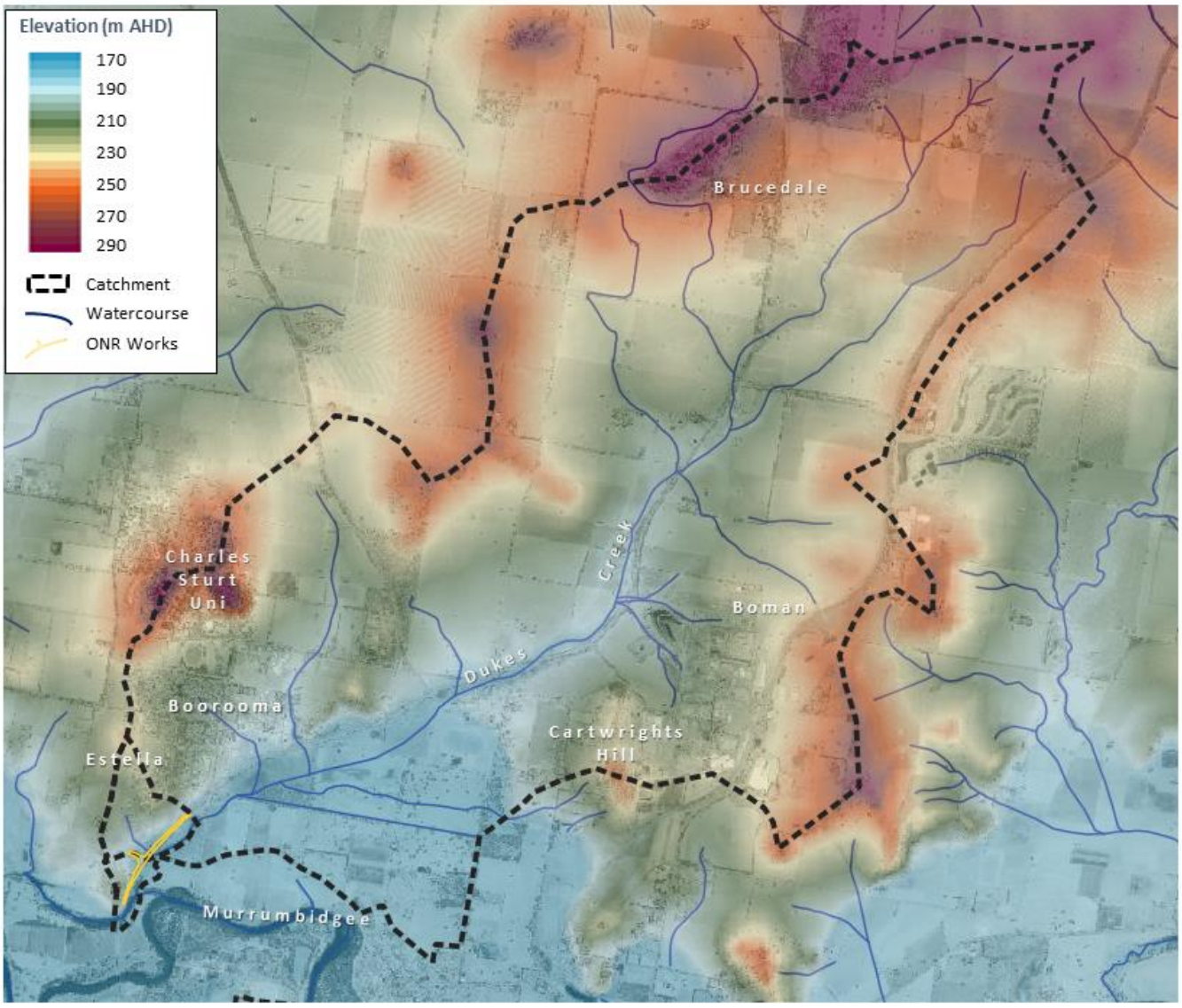

Figure 4.1 ONR Intersection Catchment (incorporating Dukes Creek).

4.2 Travers Street Intersection

The Travers Street intersection is located south of the Murrumbidgee River, within a local catchment area in the northern region of the Wagga Wagga township. There is no mapped watercourse within this catchment. The total local catchment area is approximately 1.1 km^2 consisting of a land use mix of urban residential, commercial and industrial development and the Wagga Wagga Racecourse as shown in **Figure** 4.2**.**

A section of the Wagga Wagga flood levee is located on the northern side of the TS intersection. Local catchment drainage is conveyed via the stormwater drainage network through the levee embankment to a constructed open channel that connects directly to the Murrumbidgee River.

The increase in pavement area for the proposed TS intersection works represents a small proportion of the local drainage catchment area and is located at the downstream end of the catchment discharging directly to the Murrumbidgee River floodplain. Similar to the ONR intersection, any additional runoff from the works would have limited impact on the downstream receiving environment considering:

- the proposed works discharge directly to the broader Murrumbidgee River floodplain on land identified as subject to flooding in the 1% AEP event (dominant riverine flooding condition).
- there is no downstream property or infrastructure that may be directly impacted by the site discharge.

It is considered no formal flood detention is required for the TS intersection works. It is noted that some storage capacity is formed between the elevated embankments of the new road formation, the existing Travers Street and Olympic Highway embankments. Accordingly, this may provide some flood detention function in lieu of formal flood detention works.

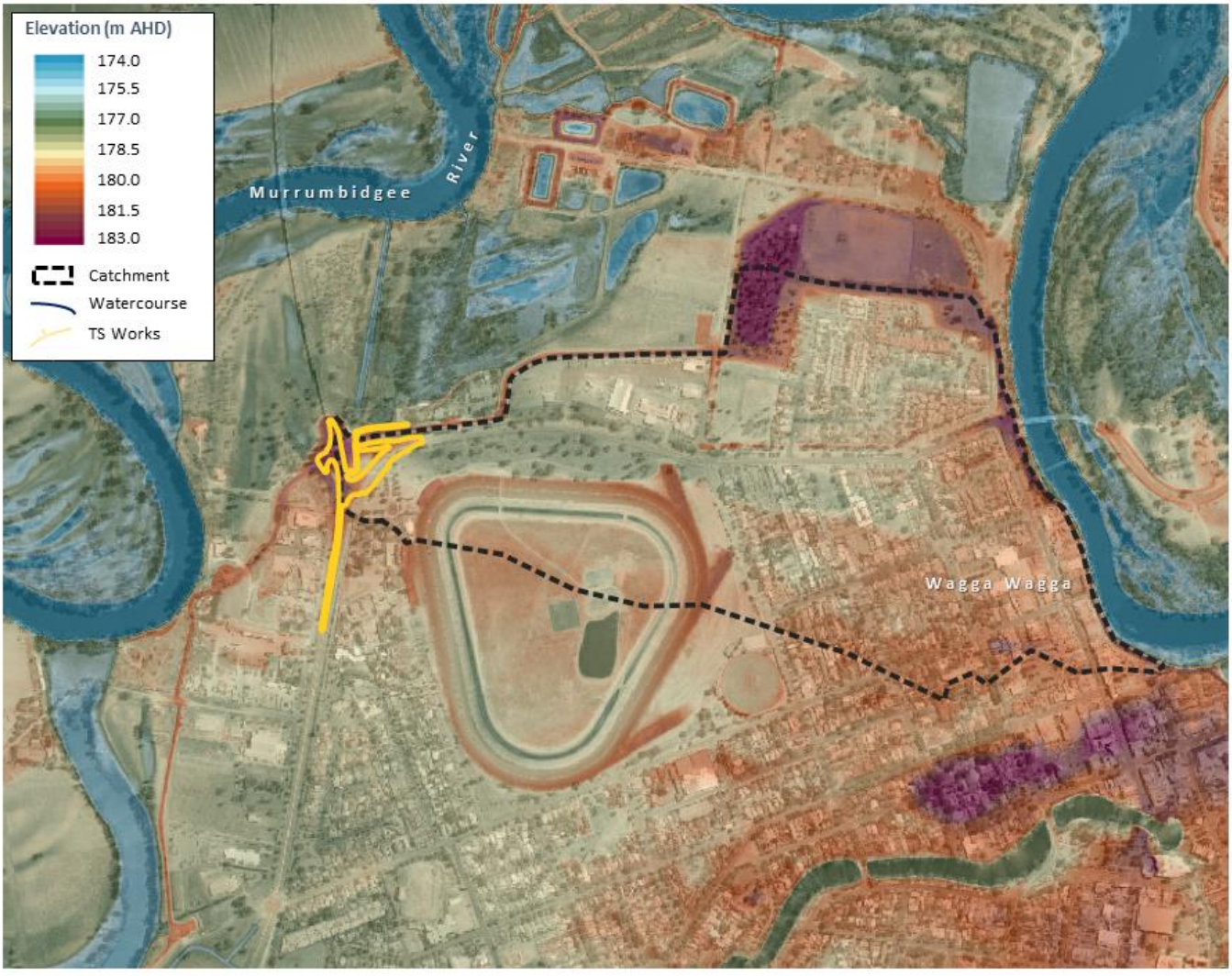

Figure 4.2 Travers Street Intersection Catchment Area

5.0 Conclusions and Recommendations

This assessment has been undertaken to consider the requirement for provision of stormwater/flood detention infrastructure for the proposed Olympic Highway Intersection Upgrades. The proposed works at both the Old Narrandera Road and Travers Street intersections provide no significant changes to local surface water runoff regimes, with existing drainage and discharge points being retained. Increases in impervious area through an increased pavement area are not considered sufficient to provide a material change to stormwater runoff peak flows and volumes, or to have an adverse impact considering the nature of the local catchments and downstream receiving environment. Accordingly, it is not considered that formal flood detention works are required for the Project.

We trust this information meets with your current requirements. Please do not hesitate to contact the undersigned should you require clarification or further information.

Yours sincerely

Darren Lyons,
National Leader, Water and Catchment Services

E | dlyons@umwelt.com.au
M | 0439 541 548

6.0 References

TfNSW, 2020. *Specification PS271 Hydrology and Drainage Design.* Transport for NSW, 2020.

TfNSW, 2021a. *Olympic Highway Intersection Improvement - Old Narrandera Road - 5.241km to 6.309km North of Wagga – Road Design – Concept Design.* Transport for NSW, 2021.

TfNSW, 2021b. *Olympic Highway Intersection Improvement – Travers Street - 3.455km to 3.970km North of Wagga Wagga – Road Design – Concept Design*. Transport For NSW, 2021.

Umwelt, 2021 *Olympic Highway Intersection Upgrades Review of Environmental Factors*. Transport For NSW, 2021.

Wagga Wagga City Council (WWCC), 2017. *Engineering Guidelines for Subdivisions and Development Standards.* https://wagga.nsw.gov.au/building-and-development/planning-and-development-services/engineering-guidelines-for-subdivisions. Wagga Wagga City Council, 2017.

APPENDIX 10 - RISK ASSESSMENT FOR NO SPILL BASIN

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Briefing Note

To: Sam Millie

Cc: Malinda Facey, Lucinda Burchfield

From: Darren Lyons, Eliza Towndrow

Date: 19 December 2022

Subject: **Risk Assessment for No Spill Basin**

1.0 Introduction

This assessment has been undertaken on behalf of Transport for NSW (TfNSW) to assess the requirement for provision of spill containment infrastructure for the proposed Olympic Highway Intersection Upgrades (the Project).

To identify whether a spill basin is required, the following factors were considered for the Old Narrandera Road intersection and Travers Street intersection upgrades, as per the TfNSW *Specification PS271 Hydrology and Drainage Design* (TfNSW, 2020):

- potential vehicle conflict areas (i.e. intersections, interchanges)
- road geometry
- heavy vehicle and / or dangerous goods route
- proximity of sensitive receiving environment
- impact on sensitive receiving environment
- topographical or man-made features which may enhance the spill reaching a sensitive area.

The aim of the intersection upgrades is to improve road safety and access between different areas of Wagga Wagga whilst catering for future traffic to reduce the potential of traffic accidents and growing population of Wagga Wagga.

2.0 Intersection Upgrades

The proposed upgrades at the Old Narrandera Road intersection includes a new second right turn lane for traffic exiting Old Narrandera Road, two southbound through lanes merging south of the intersection, and the existing right turn lane into Old Narrandera Road will be retained. **Figure 2.1** and **Figure 2.2** show the proposed upgrades for the Old Narrandera Road intersection.

Cross drainage and pavement drainage is typically in an easterly direction across the road embankment towards Dukes Creek. The proposed upgrade maintains the existing cross drainage with culvert extensions through the widened embankment. The existing highway does not incorporate spill containment or water quality treatment for pavement runoff.

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E| info@umwelt.com.au

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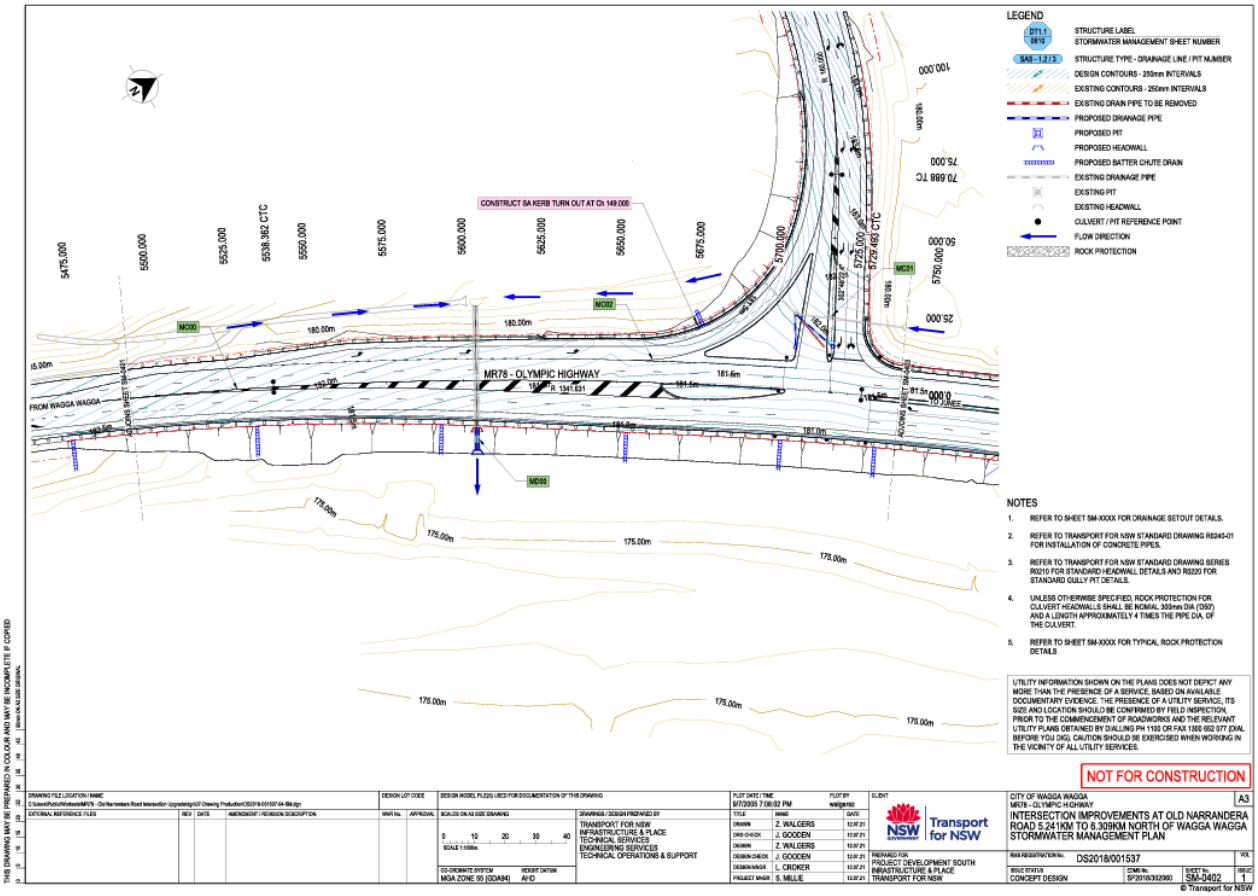

Figure 2.1 Drawing of Proposed Upgrades for Old Narrandera Road (TfNSW, 2021a)

Figure 2.2 Old Narrandera Road Intersection Proposed Upgrade (TfNSW, 2021c)

The proposed upgrades at the Travers Street intersection will be relocated south to allow for two southbound lanes, increasing the capacity of the intersection. Traffic directions will be changed, including northbound traffic merging into a single lane before the intersection, a right turning lane for vehicles entering Travers Street, with the existing Travers Street intersection to be removed, and a left in left out at Moorong Street. **Figure 3.1** and **Figure 3.2** show the proposed upgrades for the Travers Street intersection.

Drainage provisions maintain the existing subsurface stormwater drainage system which discharges in a northerly direction through the levee embankment to a constructed stormwater channel connecting to the Murrumbidgee River. The existing road configuration does not incorporate spill containment or water quality treatment for pavement runoff.

2.1 Safety Improvement

The upgrades at both intersections will improve the overall safety for all road users, aiming to reduce the likelihood of accidents and reduce congestion at each intersection, including for general traffic, as well as for heavy vehicles and vehicles carrying dangerous goods. The upgrades will increase the area of both intersections, as well as improving the interaction of traffic within the intersections. By improving the safety, and simplifying traffic flow within and surrounding the intersections, the risk of a spill occurring will be reduced.

3.0 Potential Environmental Impact

3.1 Old Narrandera Road Intersection

The Old Narrandera Road intersection upgrade is located adjacent to Dukes Creek. Dukes Creek is an ephemeral watercourse that runs along the eastern side of the Olympic Highway near the Old Narrandera Road intersection. It flows into Gobbagombalin Lagoon, which has connectivity with the Murrumbidgee River where the two connect approximately 400 m southeast of the intersection. Gobbagombalin Lagoon is a permanent oxbow lake associated with the nearby Murrumbidgee River. It is mapped in the Groundwater Dependent Ecosystem (GDE) Atlas (BOM, 2021 c) as having a high potential to support aquatic GDEs.

The existing and proposed pavement and cross drainage discharges directly to Dukes Creek and subsequently into Gobbagombalin Lagoon. Accordingly, in the event of a spill it is likely this receiving environment will be impacted. Further connectivity to the Murrumbidgee River is dependent on relative water levels in the Lagoon and River.

3.2 Travers Street Intersection

The Travers Street intersection upgrade drains directly to the Murrumbidgee River via local drainage infrastructure including the existing pit and pipe stormwater network and constructed open channel connecting to the river north of the intersection. A section of flood levee runs along the northern side of Travers Street, designed to provide flood protection to central Wagga Wagga. Flood gates on local stormwater drainage outlets (to prevent river backflow in times of flood) are incorporated into the flood levee protection system.

The existing and proposed pavement drainage is collected in the stormwater drainage network which discharges through the levee to the drainage channel and into the river. Accordingly, this drainage infrastructure provides a pathway for potential spills directly to the river. Some spill containment may be afforded by the existing drainage configuration through bunding of surface inlet pits and operation of the flood gate to prevent downstream discharge.

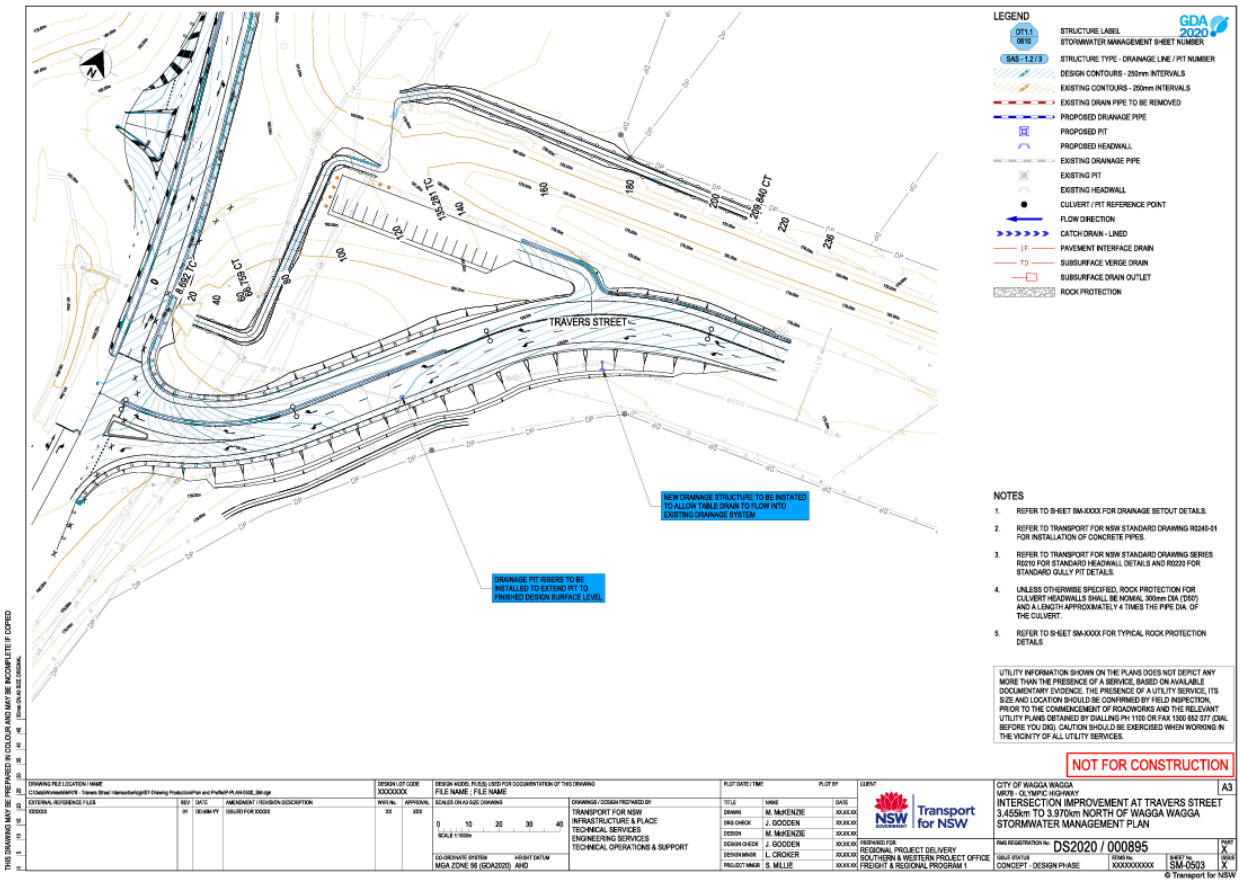

Figure 3.1 Drawing of Proposed Upgrades for Travers Street Intersection (TfNSW, 2021b)

Figure 3.2 Travers Street Intersection Proposed Upgrade (TfNSW, 2021c)

3.2.1 Recommendation on Potential Spill Containment Measures

There are no existing spill containment measures within the vicinity of the intersections. The impact of a potential spill would be reduced by inclusion of spill containment in the highway design, compared to the current situation where there is no existing spill containment present. However, the minor nature of the upgrades with respect to existing road formations, it is not expected that spill containment measures will be required to be implemented for the intersections.

Significantly, the likelihood of a potential spill of hazardous substances would be lessened as a result of the highway upgrade and the higher road design standards proposed.

The configuration of the local topography, waterway network and drainage provisions provide some opportunity for temporary containment. Existing depressions were identified west of the Old Narrandera Road intersection and southeast of the Travers Street intersection that have the potential to temporarily hold runoff in the event of a spill, together with the use of appropriate bunding to prevent runoff to nearby watercourses.

We trust this information meets with your current requirements. Please do not hesitate to contact the undersigned should you require clarification or further information.

Yours sincerely

Darren Lyons
National Leader, Water and Catchment Services

E | dlyons@umwelt.com.au
M | 0439 541 548

4.0 References

TfNSW, 2020. *Specification PS271 Hydrology and Drainage Design.* Transport for NSW, 2020.

TfNSW, 2021a. *Olympic Highway Intersection Improvement - Old Narrandera Road - 5.241km to 6.309km North of Wagga – Road Design – Concept Design.* Transport for NSW, 2021.

TfNSW, 2021b. Olympic Highway Intersection Improvement – Travers Street - 3.455km to 3.970km North of Wagga Wagga – Road Design – Concept Design. Transport For NSW, 2021.

TfNSW, 2021c. *Olympic Highway Intersection Upgrades.* https://roads-waterways.transport.nsw.gov.au/projects/olympic-highway-intersection-upgrades/index.html.

APPENDIX 11 - SOIL AND WATER QUALITY MANAGEMENT PLAN

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SOIL AND WATER QUALITY MANAGEMENT SUB-PLAN

Olympic Highway Intersection Upgrades

DRAFT

December 2022

SOIL AND WATER QUALITY MANAGEMENT SUB-PLAN

Olympic Highway Intersection Upgrades

DRAFT

Prepared by
Umwelt (Australia) Pty Limited
on behalf of
Transport for NSW

Technical Project Director:	Darren Lyons
Technical Project Manager:	Melissa Swan
Report No.	21132/R12
Date:	December 2022

This report was prepared using Umwelt's ISO 9001 certified Quality Management System.

Acknowledgement of Country

Umwelt would like to acknowledge the traditional custodians of the country on which we work and pay respect to their cultural heritage, beliefs, and continuing relationship with the land. We pay our respect to the Elders – past, present, and future.

Document Status

Rev No.	Reviewer		Approved for Issue	
	Name	Date	Name	Date
V01	Darren Lyons	22 December 2022	Malinda Facey	22 December 2022

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Appendices

1.0 Introduction

1.1 Background

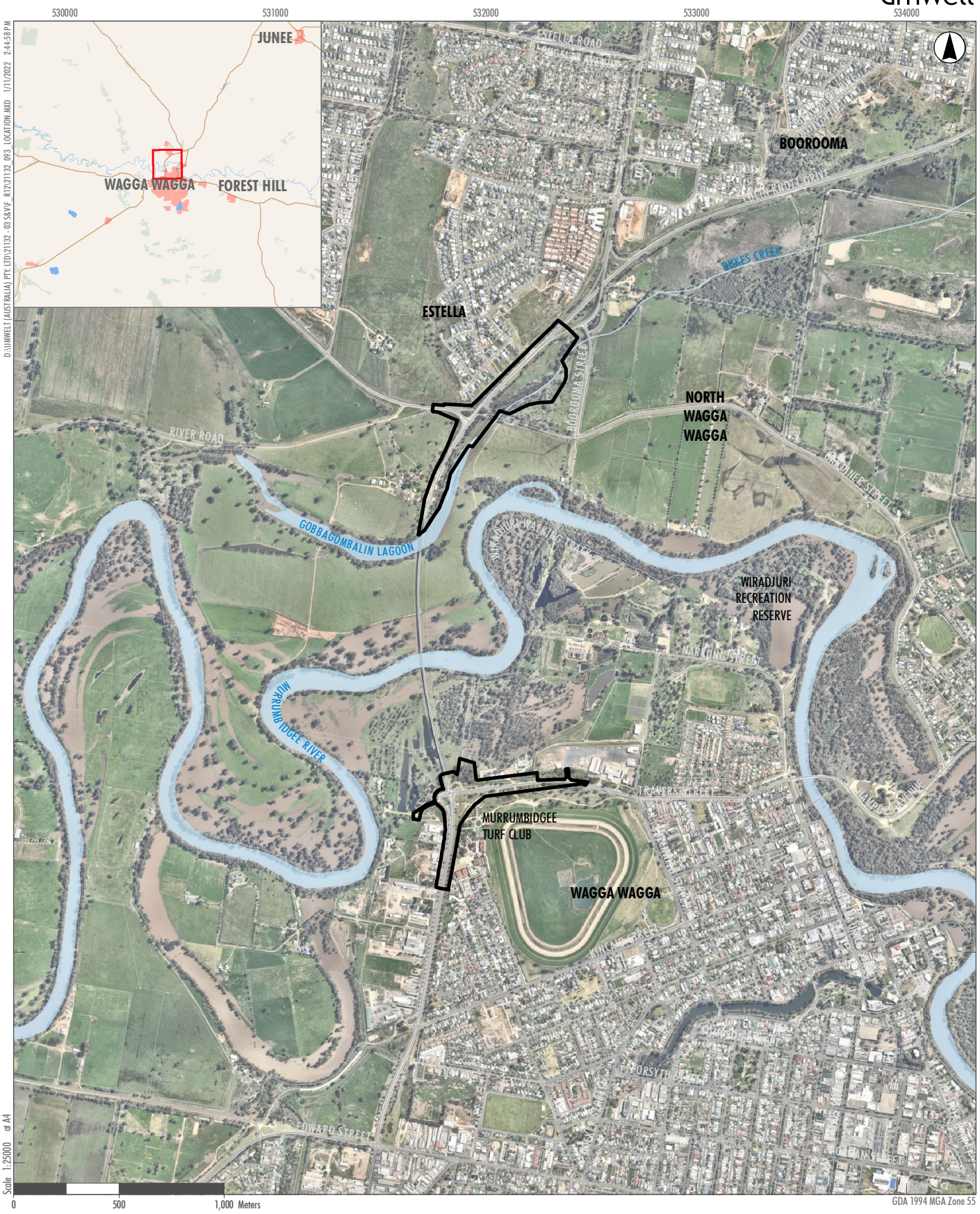
This Soil and Water Quality Management Sub-Plan (SWMP) has been prepared in support for the proposed upgrade to the two existing intersections of the Olympic Highway at Old Narrandera Road and Travers Street (the Project) proposed by Transport for New South Wales (TfNSW). The upgrades aim to improve driver safety, reduce commuter delays, as well as provide for future highway traffic. The Old Narrandera Road and Travers Street intersections are located within the Wagga Wagga City Council Local Government Area (LGA) in New South Wales (NSW), situated either side of the Gobbagombalin Bridge crossing over the Murrumbidgee River (**Figure 1.1**).

This SWMP has been prepared in accordance with Managing Urban Stormwater Soils and Construction Volume 1 (Landcom, 2004) (hereafter referred to as the 'Blue Book') on behalf of TfNSW. Where appropriate, reference to *Best Practise Erosion and Sediment Control* (International Erosion Control Association (Australasia) (IECA), 2008) (hereafter referred to as 'IEAC 2008') has been made. TfNSW specifies requirements for soil and water management and are listed in **Table 1.1.**

Table 1.1 TfNSW Soil and Water Management Requirements (TfNSW, 2020)

Section Number	Condition
2.1.2	The Soil and Water Management Plan (SWMP) must identify all risks relating to soil erosion, and pollution caused by sediments and other materials, and describes how these risks will be addressed during construction.
2.1.2	The SWMP must include details of the following, where relevant: (a) Purpose and objectives of SWMP. (b) Approvals, licence requirements and relevant legislation. (c) Site investigation and assessment of the following: (i) soil properties (including dispersion properties and presence of acid sulphate soils); (ii) rainfall records and design parameters; (iii) waterways and other water related sensitive environments; (iv) groundwater; (v) possibilities of, and limitations on, water extraction. (d) Environmental control measures, including: (i) responsibility for its implementation, including the names and contact details of the person(s) responsible; (ii) resources required for its construction, monitoring, maintenance and removal; (iii) implementation schedule for the measures, related to construction activities; (iv) monitoring and maintenance of the environmental controls. (e) Other associated plans, Environmental Work Method Statements (EWMS) and procedures. (f) Construction sediment retention basins, including details of the following: (i) design of the construction sediment retention basins, including any temporary modifications to the operational basins, providing details of the approach, standards, criteria and references used in the design of the basins; (ii) management of the basins; (iii) procedures for testing, treatment and discharge of water from the basins;

Section Number	Condition
	(iv) procedures for the periodic removal and disposal of the sediment collected within the basins. (g) Training, including: (i) site induction; (ii) environmental training; (iii) toolbox training. (h) Inspection and auditing.
2.2.2	The ESCP must include details of the following where relevant: (a) erosion and sediment control measures required: (i) before clearing and grubbing of the Site; (ii) before removal of topsoil and commencement of earthworks within the catchment area; (b) how upstream water will be managed so it is not polluted by the construction activities; (c) method of tree removal in intermittent watercourses, leaving grasses and small understorey species undisturbed wherever possible; (d) scour protection measures for haul roads and access tracks when these are an erosion hazard due to either their steepness, soil erodibility or potential for concentrating runoff flow; (e) measures for stabilising temporary drains; (f) measures to minimise erosion during construction of embankments; (g) measures to minimise erosion and control sedimentation from stockpiles; (h) methods of constructing batters to assist the retention of topsoil on the batter slopes; (i) measures to temporarily trap sediment in median areas at regular intervals; (j) controls in runoff flow paths to reduce flow velocities and minimise the potential for erosion; (k) measures for controlling waste water discharge on or around the Site from dewatering (refer to Clause 3.4), surface washing, grit blasting, saw cutting, drilling, washing vehicles and plant and any other activities which add pollutants to water; (l) measures to be put in place during an extended shut-down of the Site or when rainfall above a certain trigger level is predicted; (m) maintenance of erosion and sediment control structures including measures to restore their capacity; (n) inspection and auditing program for all erosion and sediment controls to ensure that no disturbed area is left without adequate erosion and sediment controls.
2.3	Include the following in the WQMP: (a) objectives of the monitoring (including EPA licence requirements); (b) map showing the water sampling locations; (c) sampling protocol, including sample collection, chain of custody information and sample preservation; (d) parameters to be monitored; (e) method for interpretation of field results and identifying exceedance of water quality criteria; (f) accountabilities, responsibilities and training required the meet the monitoring objectives; (g) method of comparison of results between sampling locations (e.g. upstream and downstream) and any water quality criteria and/or targets; (h) reporting and recording of the monitoring results; (i) responsibility for planning, implementing, checking and reviewing each element of the monitoring; (j) methodology for using monitoring results to assess and manage identified problems; (k) reporting requirements in the case the monitoring results exceed the set criteria.



Legend

- Proposal Area
- Roads
- Property Boundaries
- Watercourses
- Waterbody

FIGURE 1.1

Project Locality

Image Source: Nearmap (October 2022) Data source: NSW LPI (2020)

1.2 Purpose and Scope

This SWMP specifies erosion and sediment controls (ESCs) for all stages of the construction of the proposed upgrades to the Old Narrandera Road and Travers Street intersections on the Olympic Highway. The purpose of this SWMP is to:

- identify site constraints associated with the existing soil and water environment
- specify the appropriate design standard for erosion and sediment controls based on the anticipated soil, weather and construction conditions
- ensure erosion and sediment control requirements, site constraints and key environmental issues are considered and managed for the Project
- enable soils to be managed appropriately during the construction of the Project to mitigate potential environmental impacts from erosion and sedimentation
- ensure chemicals (e.g., hydrocarbons) and other potential pollution sources are managed to minimise the risk of release/spills to the environment
- be flexible and adaptive to accommodate any changes in site conditions and address any ESCs found to be ineffective in meeting performance standards

A conceptual Erosion and Sediment Control Plan (ESCP) drawing is attached in **Appendix A** (T.R.E.E.S., 2022) and provides detailed ESCs for all Project stages. Any revision to this SWMP and the ESCP figure, or the preparation of additional ESCP drawings, will be undertaken and/or reviewed and approved by a specialist soil conservationist (e.g., CPESC) in consultation with construction personnel.

2.0 Existing Environment

2.1 Catchment, Topography and Drainage

The proposed Project is located on the Murrumbidgee River floodplain, on land which is relatively low lying and of limited gradient. The hydrological context of the proposed Project is presented in **Figure 2.1**.

The Old Narrandera Road intersection is located north of the Murrumbidgee River and Gobbagombalin Lagoon. Dukes Creek runs parallel to the east of the Olympic Highway and flows into Gobbagombalin Lagoon. The Gobbagombalin Lagoon and Murrumbidgee River connect approximately 400 m southeast of the intersection. An unnamed first order stream is located northwest of the Old Narrandera Road intersection, and drains to the east, across Olympic Highway, to Dukes Creek.

The topography within the Project area of the Old Narrandera Road intersection ranges between 173 mAHD and 202 mAHD, with higher elevations occurring in the west of the Project area, along Old Narrandera Road, as well in the northwest of the Project area, along Boorooma Street. Runoff from the Old Narrandera Road intersection Project area will drain into Gobbagombalin Lagoon and Dukes Creek before flowing into the Murrumbidgee River.

Existing drainage features south of the Old Narrandera Road intersection include two culverts to convey runoff under the Olympic Highway, as well as two existing diversion drains and sediment traps on the eastern side of the highway. In the intersection there are two existing drainage pipes that transfer the water through the clean water diversion system and north of the intersection there are three existing culverts and one underpass located under the Olympic Highway. Existing drainage infrastructure is located within the vicinity of the Old Narrandera Road intersection to convey the runoff from the local catchment to Dukes Creek, Gobbagombalin Lagoon, which then discharges to the Murrumbidgee River. Both residential development and agricultural development are located upstream of the local catchment that drains towards the Old Narrandera Road intersection.

The Travers Street intersection is located south of the Murrumbidgee River and has a relatively flat topography. The surrounding area of the intersection has an average elevation of 178 mAHD, with the existing roundabout raised an additional 5 mAHD. The gentle sloping gradient north of the intersection directs runoff in a towards the Murrumbidgee River, as well as runoff draining to the south of the intersection, into streets adjected to the Olympic Highway. There are three existing culverts south of the intersection, and two to the east of the intersection which assist with drainage to the Murrumbidgee River.

As the intersection has a raised elevation in comparison to the surrounding environment, runoff is directed away from the intersection. The existing levee that surrounds Wagga Wagga, reduces the flooding impact from the Murrumbidgee River during flood events.

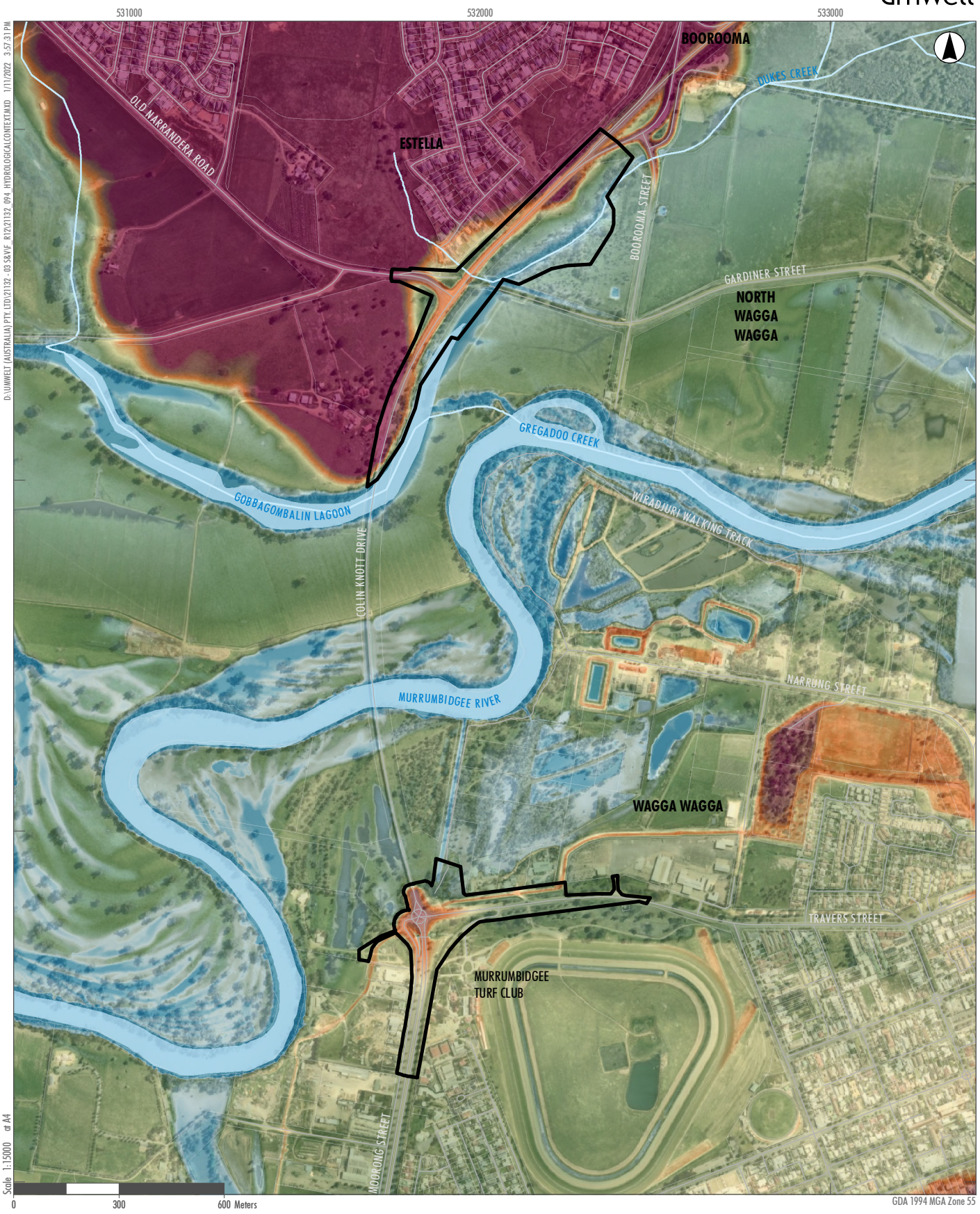


FIGURE 2.1

Hydrological Context

Image Source: Nearmap (October 2022) Data source: NSW LPI (2020)

2.2 Soils

A Geotechnical Investigation was undertaken on the Project site by TfNSW Wagga Wagga Pavements and Geotechnical Services, South West team (2021) which included the excavation of twenty-one (21) test pits up to three metres deep. The Geotechnical Investigation (TfNSW, 2021) indicated the following for soils across the Project site:

- most soils appeared to be fill that was mostly sandy clay with gravel
- Alluvial sub-soils were generally comprised of clayey sand.

The Project site soils mapped in the Project areas are sourced on the Office of Environment and Heritage (OEH) online mapping tool eSpade (OEH, 2021). The soils within the Old Narrandera Road intersection Project area are Farnham (8327fa), Glenmornon (8327gl) and East Bomen (8327eb). The soils have a moderate to high erosion hazard, acidic and have a high foundation hazard. The Farnham soil landscape is located around Gobbagombalin Lagoon, a small section of Dukes Creek and the intersection of the Project area. The soil has high plasticity and locally rapidly draining sandy soils. The Glenmornon soil landscape is located in the northern, southern and slightly west of the intersection, with soil landscape characteristics including steep slopes, rock outcrop and low fertility soil. The East Bomen soil landscape is located west of the intersection, incorporating Old Narrandera Road, and has locally shallow soil.

The soil landscape of the Travers Street intersection is with the Kurrajong Plain, the characteristics of the soil landscape are low fertility, hardsetting and sodicity in the topsoil, and high plasticity and low fertility in the subsoil. **Table 2.1** presents relevant modelled soil properties sourced from eSpade (OEH, 2021).

Table 2.1 eSpade Modelled Soil Properties (NSW OEH, 2021)

Parameter	Travers Street Intersection		Old Narrandera Road Intersection	
	0 – 30 cm Depth	30 – 100 cm Depth	0 – 30 cm Depth	30 – 100 cm Depth
Soil Erodibility, k factor (as used in the Revised Universal Soil Loss Equation (RUSLE))	0.041 – 0.047		0.029 – 0.056	
Soil Hydrologic Group	D		B	
Clay Percentage	14 – 18%	40 – 49%	10 – 31%	12 – 45%
Silt Percentage	24 – 28%	26 – 29%	10 – 25%	11 – 26%
Sand Percentage	33 – 39%	27 – 29%	34 – 75%	27 – 68%
pH ($CaCl_2$)	5.8 – 6.1	6.3 – 6.7	5.4 – 6.1	5.9 – 6.8
Electrical Conductivity (dS/m)	0.1	0.2	0.1	0.1 – 0.2
Cation Exchange Capacity ($cmol_c/kg$)	23 – 26	27 - 30	7 – 27	10 – 34
Soil Organic Carbon	1.3 – 1.4%	0.5%	0.7 – 1.6%	0.3 – 0.5%
Exchangeable Sodium Percentage (ESP)	2.4 – 3.4%	4.1 – 5.4%	1.9 – 5.7%	2.8 – 7.5%

The parameters presented in **Table 2.1** indicate the Project site soils:

- are highly erodible
- are fine in texture
- are moderately acidic
- are non-saline
- consists of topsoil with low Cation Exchange Capacity and Soil Organic Carbon which are likely to be low fertility
- topsoils are non-sodic (ESP<6%) and therefore unlikely to be dispersive
- subsoils are slightly sodic (ESP up to 7.5% at the Old Narrandera Road Intersection) and may exhibit some dispersion, however, this is expected to be limited.

2.3 Climate

The Bureau of Meteorology (BoM) daily rainfall gauge at Wagga Wagga AMO (Gauge 072150) provides a period of record spanning from 1941 to 2022. The recorded annual average rainfall over this period is 571 mm, with 2010 providing for the highest annual total of some 1019 mm.

Table 2.2 presents the average monthly rainfall depths for the Wagga Wagga AMO gauge and is considered representative of the Project site.

Table 2.2 Monthly Average Rainfall (mm), 1900 to 2022

Month	Average Rainfall Depth (mm)
January	40.9
February	39.9
March	46.0
April	40.1
May	50.9
June	50.7
July	53.5
August	51.1
September	49.2
October	56.8
November	48.6
December	45.7
Annual	571.4

presents the 1987 Australian Rainfall and Runoff Intensity Frequency Duration (IFD) rainfall intensities sourced from the BoM website for the Project site. The rainfall intensities and corresponding rainfall totals are to be used for sizing of drainage infrastructure (refer erosion-sediment controls **Section 3.1**).

Table 2.3 Project Site 2016 Intensity Frequency Duration Rainfall Intensities (mm/h)

Duration	1 Year	2 years	5 years	10 years	20 years	50 years	100 years
5 min	67.9	86.3	112.0	131.0	154.0	183.0	207.0
6 min	63.6	80.9	105.0	123.0	144.0	173.0	195.0
10 min	51.5	65.5	85.0	100.0	117.0	141.0	159.0
20 min	35.9	45.7	59.3	70.1	82.0	98.3	111.0
30 min	28.1	35.8	46.4	54.8	64.1	76.8	86.7
1 h	17.7	22.6	29.1	34.3	40.1	47.9	54.0
2 h	10.9	13.8	17.6	20.7	24.1	28.7	32.3
3 h	8.1	10.2	13.0	15.3	17.8	21.1	23.7
6 h	4.89	6.15	7.75	9.04	10.5	12.4	13.9
12 h	2.96	3.69	4.61	5.35	6.18	7.32	8.21
24 h	1.78	2.21	2.73	3.16	3.64	4.31	4.83
48 h	1.05	1.30	1.60	1.84	2.12	2.50	2.80
72 h	0.761	0.944	1.16	1.33	1.53	1.80	2.01

2.4 Site Constraints

No significant site constraints with respect to soil and water management have been identified for the Project.

3.0 Design Standard

The Primary / Generic Erosion and Sediment Control Plan / Strategy (T.R.E.E.S, 2022) was prepared in accordance with the TfNSW QA Specification G28 Soil and Water Management (TfNSW, 2020) and the Blue Book (Landcom, 2004). Further detail Erosion and Sediment Control Plan for the Project is provided in **Appendix A**.

3.1 Erosion Controls

3.1.1 Erosion Hazard Assessment

The Old Narrandera Road Intersection project site was identified as having a high erosion and sedimentation hazard due to the large upslope catchment which is undulating and urbanised, erodible soil type and proximity to Dukes Creek, Gobbagombalin Lagoon and the Murrumbidgee River (T.R.E.E.S., 2022).

The Travers Road Intersection project site was identified as having a low to moderate erosion hazard due to the relatively flat area (with the exception of the raised intersection), no drainage lines and existing levee banks (T.R.E.E.S., 2022).

An erosion hazard assessment has been undertaken in accordance with Chapter 4.4.1 of Volume 1 of the 'Blue Book'. The R-factor (rainfall erosivity) for the site was calculated using Equation (2) in Appendix A of Volume 1 of the 'Blue Book':

$$R = 164.74 \times 1.1177^{S} \times S^{0.6444}$$

where

S	**is the 2 year, 6 hour duration storm event intensity (refer to Table 2.3)**

$$R = 1{,}050$$

Plotting the average site slope, to be approximately 10% for the Old Narrandera Road intersection (T.R.E.E.S., 2022), and R-factor on Figure 4.6 from Volume 1 of the 'Blue Book' determines whether the site has a high or low erosion hazard. **Figure 3.1** presents the erosion hazard assessment plot which demonstrates that the site has a low erosion hazard.

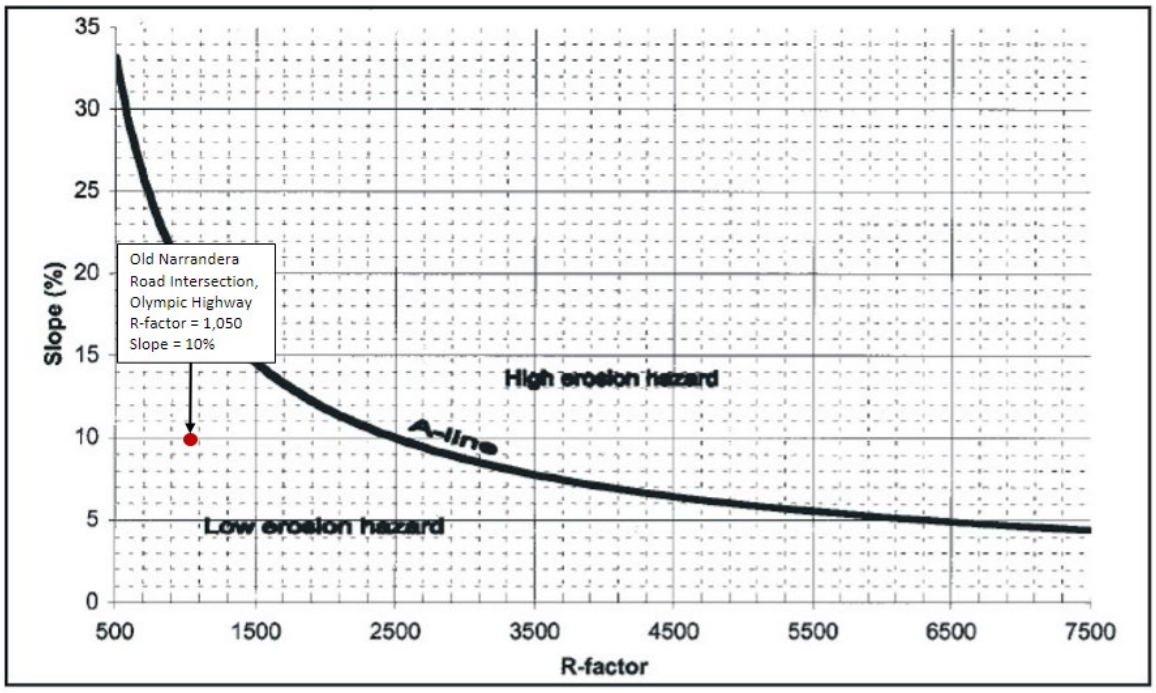


Figure 3.1 Erosion Hazard Assessment Plot

3.1.2 Soil Loss Class

The erosion hazard assessment indicates that the site has a low erosion hazard, an assessment of soil loss class is based on the annual Project site soil loss as calculated using the Revised Universal Soil Loss Equation (RUSLE) and Table 4.2 of Volume 1 of the 'Blue Book'. The annual Project site soil loss for the Project site has been estimated using RUSLE as presented below.

RUSLE:

$$A = R \times k \times LS \times C \times P$$

Where the parameters are defined in **Table 3.1**.

Table 3.1 Revised Universal Soil Loss Equation (RUSLE) Parameters

Parameter	Description	Value	Units
A	is the annual soil loss rate	to be calculated	tonnes/ha/year
R	is the annual average rainfall erosivity calculated based on the 2 year, 6 hour duration ARI storm event intensity (refer to **Section 2.3**)	1,050 (Old Narrandera Road)	-
k	is the soil erodibility (refer to **Table 2.1**)	0.05 (Old Narrandera Road	-

Parameter	Description	Value	Units
LS	is the slope length gradient factor sourced from Table A1 of *Managing Urban Stormwater Volume 1* (Landcom, 2004) and is dependent on the maximum slope length (use 80 m) and gradient (refer to **Section 3.1.1**)	2.81 (Old Narrandera Road)	-
C	is the ground cover factor sourced from Figure A5 of *Managing Urban Stormwater Volume 1* (Landcom, 2004) (no ground cover in this case)	1.0	-
P	is the erosion control practise factor sourced from Table A2 of *Managing Urban Stormwater Volume 1* (Landcom, 2004) and is dependent on level of compaction and roughness of the disturbed surface (assume Compacted and smooth)	1.3	-

Therefore, for the disturbed areas of the project, the annual soil loss rate is as follows:

For the Old Narrandera Road intersection (T.R.E.E.S., 2022);

$$A = 1{,}050 \times 0.05 \times 2.81 \times 1.0 \times 1.3$$

$A = 192 \frac{tonnes}{ha.year}$

Table 4.2 of Volume 1 of the 'Blue Book' the Project site provides for a soil loss class of 2 for the Old Narrandera Road intersection, with a low erosion hazard. Figure 4.9 of Volume 1 of the 'Blue Book' (Landcom, 2004) shows that the Project site is located in rainfall distribution zone 10. Table 4.3 of Volume 1 of the 'Blue Book' indicates that no construction works timing restrictions apply for sites in rainfall distribution zone 10 with soil loss class 2.

3.1.3 Drainage Controls

All temporary drainage controls are to be designed to have non-erosive hydraulic capacity to convey runoff from a 5-year Average Recurrence Interval (ARI) critical duration storm event.

3.2 Sediment Controls

The 'Blue Book' requires that sediment basins are used when the soil loss rate exceeds 150 m^3/year (approximately 200 tonnes/year) for the total area to be disturbed. Two potential sediment traps for the Project works at the Old Narrandera Road intersection are proposed by T.R.E.E.S. (2022). Conceptual sizing and location of sediment basins is included in Conceptual ESCP located in **Appendix A** (TREES, 2022).

The total disturbance area for the Project site, including spoil stockpiles, will be approximately 0.7 ha for the Old Narrandera Road intersection with a soil loss rate of 192 tonnes/ha/year for the Old Narrandera Road intersection, estimated using the RUSLE (refer to **Section 3.1.2**) (T.R.E.E.S., 2022). The soil loss rate is estimated to be approximately 134.4 tonnes/year.

All temporary sediment controls are to be able to be structurally sound during a 10-year Average Recurrence Interval (ARI) critical duration storm event based on a 6 month disturbance period and a sensitive receiving environment.

4.0 Works Staging

Table 4.1 and **Table 4.2** presents the anticipated works staging and the planned ESCs that will be established and maintained at each stage of construction for Old Narrandera Road and Travers Street. ESC locations are displayed on the Erosion and Sediment Control Plan drawing contained within **Appendix A** (referred to as the ESCP).

The proposed construction is likely to begin in 2023 and be completed by 2025.

Table 4.1 Works Staging and ESCs at Old Narrandera Road (T.R.E.E.S., 2022)

Stage	Activity(s)	ESCs
1	Site establishment • Establish ESCs	• Install sediment fence downslope and upslope of the Olympic Highway as per 'Blue Book' standard drawing *SD 6-8 Sediment Fence.* • Install stabilised access as per 'Blue Book' standard drawing *SD 6-14 Stabilised Site Access.* • Install upslope clean water diversions as per 'Blue Book' standard drawing *SD 5-5 Earth Bank Low Flow.* • Extension of culvert outlets on the eastern side of the Olympic Highway. • Stormwater pit inlets to be blocked to divert clean water flow. • Earth bunds to be lined with geotextile if required for diversion of stormwater discharge into culverts. • Existing 'hob' to be cleaned out as required. • Sediment traps to be constructed as per 'Blue Book' calculations. • Dirty water diversion to the constructed to divert runoff to sediment trap.
2	• Clearing	• Controls from Stage 1. • Mulch bund sediment trap to be installed. • Sediment fences to be completed where required now as access is provided by clearing, as per 'Blue Book' standard drawing *SD 6-8 Sediment Fence.*

Stage	Activity(s)	ESCs
3	• Bulk earthworks	• Controls from Stage 2. • Removal of the existing diversion bank/drain during works. • Existing sediment basin excavation to be infilled during works with wall retained. • Windrow to be established from armour rock, placed along the toe of fill batter and later replaced along the new fill batter. • Cut batter to be 'laid back'.

Table 4.2 Works Staging and ESCs at Travers Street (T.R.E.E.S., 2022)

Stage	Activity(s)	ESCs
1	Site establishment • Establish ESCs • Clearing	• Install sediment fence (sand/filter bags) around the existing stormwater pits as per 'Blue Book' standard drawing *SD 6-8 Sediment Fence.* • Trees to be removed. • Install stabilised access as per 'Blue Book' standard drawing *SD 6-14 Stabilised Site Access.* • Install upslope clean water diversions as per 'Blue Book' standard drawing *SD 5-5 Earth Bank Low Flow.* • Extension of culvert outlets on the eastern side of the Olympic Highway. • Stormwater pit inlets to be blocked to divert clean water flow. • Earth bunds to be lined with geotextile if required for diversion of stormwater discharge into culverts. • Existing 'hob' to be cleaned out as required. • Sediment traps to be constructed as per 'Blue Book' calculations. • Dirty water diversion to the constructed to divert runoff to sediment trap.
2	• Permanent drainage	• Controls from Stage 1. • Pipe extension from the existing stormwater pit to a new pit in the realigned channel to be constructed – geofabric lining to be secured over bare/disturbed areas prior to forecast rainfall with these areas revegetated (or similar) following completion of works. • Removal of existing stormwater pit under the new road footprint.
3	• Bulk earthworks	• Controls from Stage 2.

Stage	Activity(s)	ESCs
		• Install clean water diversions as per 'Blue Book' standard drawing *SD 5-5 Earth Bank Low Flow.* • Sediment trap to be installed at the existing stormwater pits. • Install sediment fence northeast of the intersection and along the southeast boundary as per 'Blue Book' standard drawing *SD 6-8 Sediment Fence.* • Channel to be realigned. • Geofabric lined earth bund to be installed to detail flows during realignment and stabilisation works. • Install stabilised access as per 'Blue Book' standard drawing *SD 6-14 Stabilised Site Access.*

5.0 Erosion and Sediment Controls

5.1 Progressive ESCPs

A conceptual Primary ESCP has been prepared for the project (T.R.E.E.S., 2022) and is presented within **Appendix A**. The Conceptual Primary ESCP is a document which describes the intentions and fundamental principles for erosion and sediment control for the duration of the Project. It contains conceptual ESCP drawings for both intersection upgrades for three stages of the Project (Early Works, Clearing and Main Earthworks).

This SWMP and the Conceptual ESCP will be complemented by the preparation of more detailed Progressive (site specific) Erosion and Sediment Control Plan Drawings for differing stages of construction and various work areas (e.g., offices and compounds) or any area of work not presently covered by the Conceptual ESCP.

The Progressive ESCPs will identify risk and be prepared in conjunction with the site construction team just prior to construction activities commencing in any given area and will indicate (where relevant):

- Catchment areas (within and outside the road reserve)
- Construction boundaries
- Exclusion zones and sensitive areas
- Contours and drainage paths
- Access points and tracks (e.g. haulage)
- Compounds and storage areas
- Temporary drainage line crossings
- Stockpile sites
- Temporary work areas
- Borrow pits
- Material processing areas
- Concrete washout pit sites
- Permanent and temporary controls (including order of implementation).

Further detail on the Progressive ESCPs can be found within **Appendix A**.

5.2 General Conditions

All ESCs are to be installed, managed and maintained in accordance with the 'Blue Book' (Landcom, 2004) to:

- Divert clean water around site
- Prevent sediment moving off-site and sediment laden water entering any watercourse, drainage line, or drain inlet
- Reduce water velocity and capture sediment on site
- Minimise the amount of material transported from site to surrounding pavement surfaces.

Additional ESC measures must be implemented and a revised SWMP must be prepared in the event that site conditions change significantly from those considered within this SWMP or the implemented works fail to achieve the desired objective of preventing environmental harm.

Where there is a high probability that serious or material environmental harm may occur as a result of sediment leaving the site, a new or amended SWMP must be submitted for approval. Only those works necessary to minimise or prevent environmental harm shall be conducted on-site prior to approval of the new or amended SWMP.

In circumstances where it is considered necessary to prepare an amended SWMP, and where the delivery of such an amended SWMP is not imminent, then all necessary new or modified erosion and sediment control works must be in accordance with the 'Blue Book' (Landcom, 2004). Upon approval of the amended SWMP, all works must be implemented in accordance with the amended plan.

There should be no release of dirty water into drainage lines and/or waterways. Dirty water captured in excavations shall be utilised for dust suppression within the Project site disturbance boundary or be removed by a suitably licenced waste contractor.

5.3 Key Management Strategies

Table 5.1 outlines the general erosion and sediment controls for site management for the Project, as detailed in the ESCP in **Appendix A**.

Table 5.1 General Site Management Erosion and Sediment Controls (T.R.E.E.S, 2022)

No.	Control
1	Engagement of a Professional Soil Conservationist with extensive experience in road construction and registered with TfNSW in Category S1: Erosion, Sedimentation and Soil Conservation Consultancy Services.
2	Training of workforce to highlight the importance of soil conservation during site inductions, scheduling awareness seminars for all personnel to communicate principles and techniques of erosion and sediment control. Erosion and sediment control issues will be discussed during regular 'toolbox' meetings during the course of the Project.

No.	Control
3	Minimise the extent and duration of disturbance throughout the Project by marking clearing limits, stage clearing operations and minimising disturbance of vegetation along the road corridor, with management of construction activities adjected to drainage lines.
4	Inspection and maintenance of the project sites to ensure the progressive and continual implementation of temporary erosion and sediment controls, ensure regular maintenance of all erosion and sediment control measures and arranging regular inspections by the Project Soil Conservationist (ie monthly) and construction personnel (ie weekly) to review and update control measures.
5	Documentation and recording of rainfall/climatic records, developing documentation and systems for recording erosion and sediment control activities and distributing internally to construction personnel.
6	Ensuring erosion and sediment controls are installed at all relevant sites.
7	Leaving temporary erosion and sediment controls in place until the disturbed catchments have over 70% vegetation cover
8	All fuels, chemicals and liquids are to be stored in an impervious bunded area, a minimum of 50 m away from: • any areas of concentrated water flow • flooded or poorly drained areas • slopes above 10%.
9	Refuelling of plant and equipment is to be undertaken in an impervious bunded area located a minimum of 50 m from drainage lines or waterways.
10	Emergency spill kits are to be kept on site at all times. All workers are to be made aware of the location of the spill kits and trained in their use.

5.4 Soil and Stockpile Management

Table 5.2 outlines the soil and stockpile management controls for the Project.

Table 5.2 Soil and Stockpile Management Controls (T.R.E.E.S., 2022)

No.	Control
1	Siting stockpiles of soil material in low-hazard areas clear of drainage lines.
2	Additional protection to be afforded with temporary vegetation, upslope diversion banks and downslope sediment control measures, if required.
3	Toe of stockpiled material to be at least 5 metres from a drain or trees to be retained.
4	Stockpiles no greater than 2 metres in height with batters no steeper than 2:1.
5	Spoil is to be placed in designated stockpile locations within the project disturbance boundary at locations determined by the site superintendent. Stockpiles are to have sediment fencing installed on the downslope side and a clean water diversion bund installed on the upslope side as per 'Blue Book' standard drawing *SD 4-1 Stockpiles* to protect from run-on water.

No.	Control
6	In the event that material is suspected of contamination (in the form of ash, staining, discolouration, odours, underground petroleum storage systems or suspected asbestos containing material) is exposed, all works shall stop immediately in that area and Council be contacted and works shall not recommence until approval has been received by Council. Any material that is confirmed to be contaminated shall be classified in accordance with the Waste Classification Guidelines (EPA NSW, 2014) and disposed of offsite to a licensed waste management facility and in accordance with any Council requirements.
7	Ensure stockpiles of erodible material that have the potential to cause environmental harm if displaced are appropriately located away from concentrated surface flow and excessive up-slope stormwater surface flows and covered if they are to be in place for more than 10 days.

5.5 Drainage and Erosion Controls

Table 5.3 outlines the drainage and erosion controls for the Project.

Table 5.3 Drainage and Erosion Controls (T.R.E.E.S., 2022)

No.	Control
1	Control of stormwater flows onto, through and from the site by separating 'clean' run-on water from 'dirty' construction area runoff, construction of permanent drainage structures early in the project, and maximising the diversion of 'dirty' runoff into sediment traps.
2	Erosion control measures to prevent onsite drainage, such as constructing a range of erosion controls within the various sub-catchments to reduce flow velocities and using geotextile to provide temporary surface protection of areas of concentrated flows.
3	Sediment control measures to prevent offsite damage, such as constructing control measures as close to the potential source of sediment as possible, managing water quality during de-watering activities (eg. dust suppression) and restricting plant and vehicle movements to designated routes and limiting vehicle speeds.
4	Wherever reasonable and practicable, "clean" surface waters must be diverted away from sediment control devices and any untreated, sediment-laden waters.
5	Limit construction equipment activity to disturbed areas. Minimise disturbance and retain as much existing ground cover as practicable. The disturbance boundary is to be clearly delineated with construction fencing or barrier tape.

5.6 Sediment Controls

Table 5.4 outlines the sediment controls for the Project.

Table 5.4 Sediment Controls

No.	Control
1	All runoff from the works is to be passed through sediment controls
2	Sediment traps should be located as close to the source of the sediment as practicable.
3	Sediment removed from any trapping device is to be disposed of in locations where further erosion and consequent pollution to downslope lands and waterways will not occur.
4	Temporary soil and water management structures are to be removed only after the Project site is stabilised appropriately in accordance with the requirements of this SWMP and the 'Blue Book' (Landcom, 2004).

No.	Control
5	Sediment control devices must be de-silted and made fully operational as soon as reasonable and practicable after a sediment-producing event. Sediment traps should be maintained to ensure that no more than 30% of their design capacity is lost to accumulated sediment.
6	Materials, whether liquid or solid, removed from sediment control devices during maintenance or decommissioning, must be disposed of in a manner that does not cause ongoing soil erosion or environmental harm and in accordance with the Council approved Waste Management Plan.
7	Any concrete washout undertaken on site will be in a bunded area that is not on waterfront land and at least 10 m from drains.

5.6.1 Sediment Basins

T.R.E.E.S. (2022) identified two potential sediment basin sites at the Old Narrandera Road intersection, including the south side of the intersection at Ch 5685 and the south side of the proposed cut 'lay back' at CH 6050. No sediment basins were identified for the Travers Street intersection.

The sizing of the proposed sediment basins was calculated using the 'Blue Book'. T.R.E.E.S. (2022) propose to construct sized excavated sediment traps at these two locations. The locations of the proposed sediment traps are presented in **Appendix A.**

5.7 Works in Waters and on Waterfront Land

The eastern side of the proposed Old Narrandera Road intersection Project boundary is in proximity to Dukes Creek and Gobbagombalin Lagoon. Dukes Creek is a 2nd order watercourse and Gobbagombalin Lagoon is a 1st order watercourse. Works on waterfront land are considered controlled activities when proposed work is to be undertaken within the riparian corridor widths, as detailed in **Table 5.5**.

Table 5.5 Riparian Corridor Widths for Watercourses (NRAR, 2018)

Watercourse Type	Vegetated Riparian Zone
1st order	10 metres
2nd order	20 metres
3rd order	30 metres
4th order	40 metres

The proposed works at the Old Narrandera Road intersection are at least 20 m from Dukes Creek and 10 m from Gobbagombalin Lagoon and do not trigger as a controlled activity, as per the guidelines outlined by NRAR (2018).

5.8 Trenching

Table 5.6 outlines the controls for Trenching for the Project.

Table 5.6 Sediment Controls

No.	Control
1	Avoid trenching in areas where water flow is likely to concentrate. Alternatively, schedule work during periods when rainfall erosivity is low.
2	Ensure trench widths and depths are the minimum necessary. Limiting the width of the disturbed area within the easement is an important management tool, particularly in sensitive environments.
3	Divert surface water away from trench openings.
4	Use sandbags as plugs or bulkheads across trench inverts to shorten the length of sediment-laden water flow in the trench.
5	Leave excavations open for the minimum practical time (try to limit the time trenches are left open to fewer than three days). Avoid opening trenches whenever the risks of storms are high.
6	Organise service installations to enable progressive backfilling.
7	Ensure plugs, collars or trench stops are employed to control tunnel erosion after backfilling is completed (refer to **Figure 5.1**).
8	Provide an appropriate allowance for settling of uncompacted backfill material (e.g., 10%) (refer to **Figure 5.1**).
9	After backfilling, remove excess or unsuitable spoil from the site. Then, replace topsoil and vegetate (if area is to be vegetated) to match surrounding ground levels and vegetation species as soon as possible.

Different measures need to be considered for trenches running:

- across grade (where the trench runs parallel with the surrounding contours)
- down grade (where the trench runs perpendicular to the surrounding contours)
- obliquely across grade.

Trenches running across grade

Soil from the trench excavation should be placed and compacted on the uphill side of the trench to form an earth bank (refer to **Figure 5.1**) to prevent polluted stormwater from accumulating by directing water around and away from the open trench.

The earth banks should be placed and formed so that they effectively act as catch drains that do not trap pools of water at their bases or cause erosion at their outlets.

Trenches running down grade

Adequate measures should be taken to capture any sediment-laden waters downstream. These measures may include a silt fence erected on the downstream side, or trench stops (refer to **Figure 5.2**).

Care should be taken in the backfilling operation to prevent the trench operating as a subsoil drain. The backfill should therefore be properly compacted and trench stops installed across the trench line where gradients are steep (refer to **Figure 5.1**).

Trenches running obliquely across grade

Where the trench will run obliquely across the grade, soil from the excavation should be heaped on the uphill side of the trench to form an earth bank as for trenches running across grade. Trench stops may also be required.

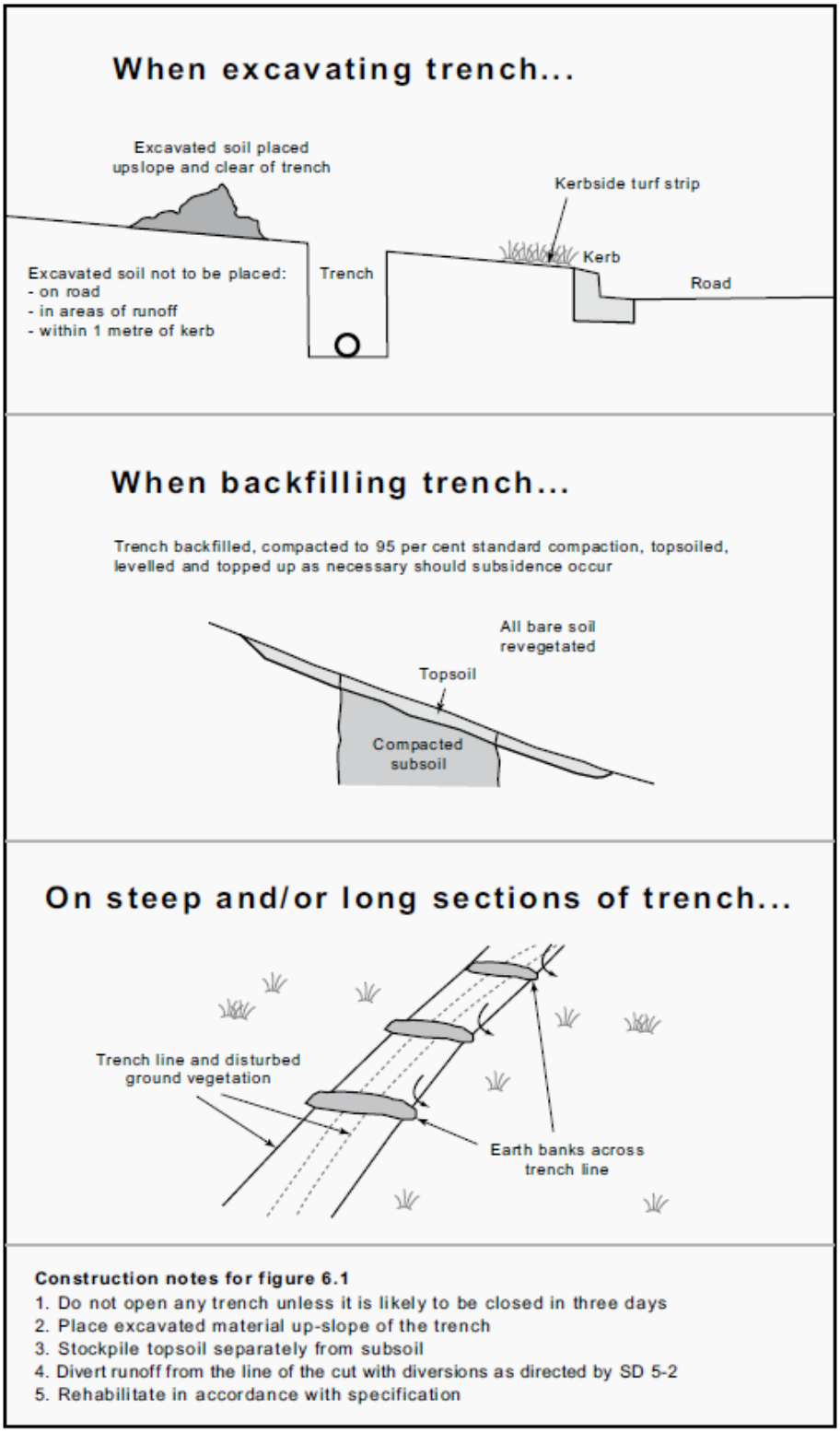


Figure 5.1 Erosion and Sediment Control During Trenching

Source: Managing Urban Stormwater Volume 2A Installation of Services (DECC, 2008)

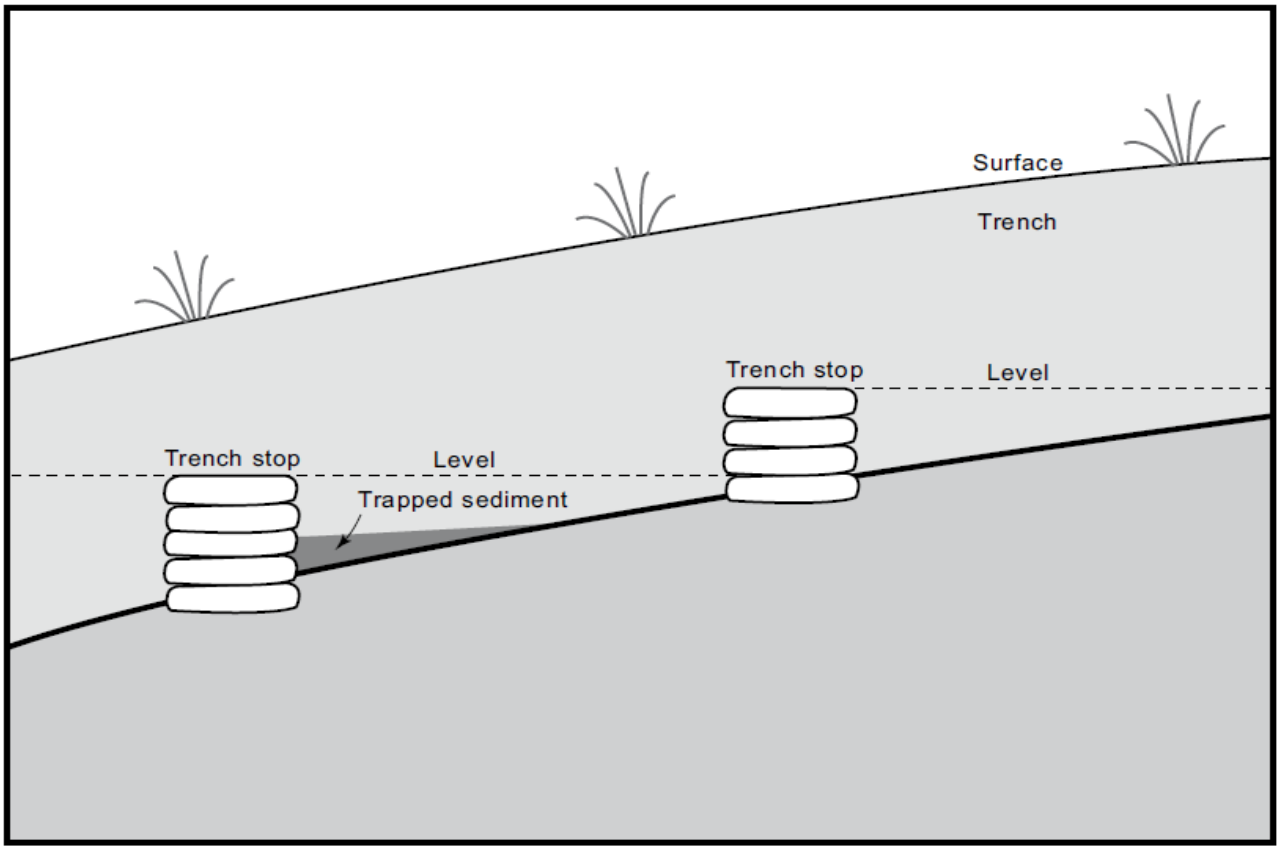


Figure 5.2 Typical Trench Stop Details

Source: Managing Urban Stormwater Volume 2A Installation of Services (DECC, 2008)

5.9 Dust Suppression

Table 5.7 outlines the controls for dust suppression for the Project.

Table 5.7 Dust Suppression Controls

No.	Control
1	Where construction works generate dust, all reasonable and practicable measures are to be undertaken to prevent dust.
2	Areas are to be stripped progressively and only where it is necessary for works to occur.
3	Disturbed areas are to be stabilised as soon as practical.
4	Disturbed areas are to be dampened with a light water spray as required.
5	Vehicle movements are to be restricted to designated access roads.
6	All loads are to be covered when transporting material where practical.

5.10 Site Stabilisation

Table 5.8 outlines the site stabilisation controls for the Project.

Table 5.8 Site Stabilisation Controls

No.	Control
1	Stabilise disturbed areas by sealing or revegetation in accordance with the Project Concept Landscape Plan to achieve a C-factor of 0.05 (approximately 70% groundcover) within 60 days following the completion of construction activities.
2	All ESC measures shall be maintained in a functioning condition during construction until all construction activities are complete and full stabilisation of the site is achieved (i.e., complete sealing of the whole of the disturbed area with asphalt).

6.0 Water Quality Monitoring Plan

6.1.1 Proposed Surface Water Monitoring Program

The following surface water aspects as listed in **Table 6.1** will be monitored throughout the operation of the Project. All monitoring results will be recorded on a register including units of measurement for each parameter monitored at the frequency specified in **Table 6.1**.

Table 6.1 Proposed Surface Water Monitoring

Parameter	Frequency	Method
Discharge Water Quality	Discharge Based	Monitoring to be undertaken via grab sample of discharge water from each sediment basin during each discharge event. Parameters to be monitored include: • Total Suspended Solids (TSS) - 50 mg/L • pH – 6.5 - 8.5 • Oil and Grease – no visible trace.
Upstream and Downstream Water Quality	Monthly	Monitoring points are to be established upstream and downstream of the Project site to monitor background water quality pre-construction, during construction and during rehabilitation of the site. Monitoring is to be undertaken via grab sample of discharge water at the monitoring location. Parameters to be monitored include: • Total Suspended Solids (TSS) - <50 mg/L • pH – 6.5 - 8.5 • Oil and Grease – no visible trace.
Rainfall	Daily	Rainfall Gauge volumes to be recorded at the same time daily.
Water Usage	As completed	Watercart fill log or transfer volume to be recorded after each water transfer.

7.0 Spill and Discharge Management Plan

7.1 Legal Duty to Notify

A pollution incident is defined in the Protection of Environment Operations Act (POEO Act) as an incident or set of circumstances during or as a consequence of which there is or is likely to be a leak, spill or other escape or deposit of a substance, as a result of which pollution has occurred, is occurring or is likely to occur.

In the case of an environmental incident, prior to any other action, the site must contact Fire and Rescue NSW (000) if the incident presents an immediate threat to human health or property. Fire and Rescue NSW are the first responders, as they are responsible for controlling and containing incidents.

Where there is no threat to human health or services, Fire and Rescue NSW must still be contacted for information purposes, but as the last point of contact as detailed in **Section 7.3.2**.

7.2 Incident Management

7.2.1 Spill Response and Management

All possible actions should be taken to control the pollution incident in order to minimise health, safety and environmental consequences. These actions, to the maximum extent possible, aim to:

- provide for the safety of people at and within the vicinity of the site, and
- contain the pollution incident, for example though the use of bunding or sand.

The following actions are to be implemented in the event of an incident including:

1. Secure the scene and contain the incident.
2. Undertake notification of material harm incident (as required).
3. Gather information (i.e., environmental monitoring).
4. Undertake investigation into the cause of the incident.
5. Review and classify information from investigation and identify any ongoing actions.
6. Implement those actions identified.

7.2.2 Spill Prevention and Mitigation

The following prevention and mitigation measures will be implemented to manage the risks associated with chemical, hydrocarbon or any other hazardous substance spills:

- to minimise the risk of fuel spills, and the impact of spills should they occur, refuelling equipment consists of a fuel tank, spill catch tray and spill kit. Additional mobile spill kits will be located at designated locations across the site to enable prompt clean up in the event of a spill during refuelling activities.
- daily pre-start checks and regular ongoing vehicle and equipment maintenance in accordance with manufacturer's instructions will be undertaken to reduce the risk of fuel and oil leaks from vehicles, equipment and machinery.

7.2.3 Spill Response Procedure

The following actions shall be undertaken in the event of a spill (including hydrocarbons, greases, oils etc) resulting in the potential for land or water contamination:

First Responder

1. Alert nearby personnel if spill has created a hazard (e.g., fumes, fire/explosion risk) and instruct/assist them as required to evacuate the area.
2. Remove ignition sources from the area where possible (e.g., vehicles, electrical equipment) if spill has created a fire/explosion risk.
3. Consult the material safety data sheet for the product to determine material specific measure for managing spills.
4. If safe to do so, attempt to contain the spill, in particular, preventing the spilled liquid entering drainage lines, by:
    a. Using equipment in spill kits available at the construction compounds, O&M Facility or work site
    b. Constructing temporary earth bunds.
5. Notify your works area supervisor or the Chief Warden/Deputy Chief Warden of the spill providing the following information:
    a. The location of the spill
    b. If there are any injured employees or visitors
    c. If the area has been evacuated
    d. The chemical that has been spilled if known
    e. If the spill has entered a drainage line.

Chief Warden and Deputy Chief Warden Response

1. Assess whether the spill can be locally contained and if not call emergency services on 000 and provide the following information:
   a. Your name
   b. The type of incident – Fire
   c. The company name, address, and nearest cross street
      - Transport for NSW
      - Old Narrandera Road/Travers Street and Olympic Highway Intersection
   d. The types of injuries, if any
   e. Any other information you believe is relevant to the spill situation. E.g., flammable liquid ignition risk, spill has entered drainage line).
7. Initiate the Emergency Evacuation Procedure if the scale and nature of the spill requires.
8. Coordinate the containment of the spill, remediation of any contaminated areas and appropriate classification and disposal of contaminated materials, including any contaminated soil.
9. Ensure relevant agencies are notified as required (e.g., NSW EPA, WorkSafe NSW) (refer to **Section 7.3.2**).

7.3 Notification Procedures

7.3.1 Definition of Material Harm

Following containment of the incident, immediate action must be taken to determine if the incident can be classified as a 'material harm incident'. As defined by Section 147 of the POEO Act, a material harm incident has occurred if the incident:

- involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or
- results in actual or potential loss (including all reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment) or property damage of an amount, or amounts in aggregate, exceeding $10,000.00 (or such other amount as is prescribed by the regulations).

It is possible for a material harm incident to occur on land that is within the boundary of the Project. The determination of a material harm incident will be made by the Site Manager at the time of the incident.

7.3.2 Internal and External Notification for Material Harm Incidents

Notification of an environmental incident is the responsibility of all site personnel and contractors. In the event of a 'material harm incident', response and notification must be undertaken as per **Table 7.1**.

Table 7.1 Spill & Contamination Plan Notification Requirements for a Material Harm Incident

Agency	Contact Details
To be contacted immediately in order of priority	
Fire and Rescue NSW	000 To be contacted first if the incident presents an immediate threat to human health or property and emergency services are required Fire and rescue to be contacted last if emergency response is not required
Environment Protection Authority – Environment Line	131 555
Ministry of Health – Albury Public Health Unit (Murrumbidgee and Southern NSW LHD)	(02) 6053 4800 After Hours: (02) 6053 4800 or 1300 066 055
SafeWork NSW	13 10 50
Wagga Wagga City Council	(02) 6926 9100
To be contacted within 24 hours of incident	
Department of Planning and Environment	Via Planning Portal or 1300 305 695
TransGrid	1800 027 253

On the identification of an environmental incident or hazard, personnel will report the issue immediately to their supervisor, who in turn shall report it to the Project Manager on site during construction. Immediately is taken to mean 'promptly and without delay'.

The decision on whether to notify the incident in accordance with Part 5.7 of the POEO Act should not delay immediate actions to provide for the safety of people or contain a pollution incident. However, incident notification will be made as soon as it is safe to do so.

After initial notification of a 'material harm incident', it will be the responsibility of the Project Manager on site during construction to liaise with any authority listed in **Table 7.1** that requests additional information or is providing directions for management of the 'material harm incident'. This may include preparation and provision of incident investigation reports and ongoing environmental monitoring results.

7.3.3 Notification to Local Landholders and Community

Community notification shall be undertaken if required and at the determination of the Project Manager or Fire and Rescue NSW (when on site) and may be based on environmental monitoring results.

The following notification methodology is proposed to be utilised as required:

- early warnings: same day telephone notification to landholders who may be affected by the incident over the subsequent 24-hour period, and
- updates: follow up phone calls to all landholders who received an early warning notification or now require notification will be undertaken by relevant personnel. Updates are to be provided, as considered necessary, to the broader local community in affected areas via information sheets or newsletters, community meetings, media statements or any other strategy as determined appropriate by the Project Manager.

Information provided to the community will be relevant to the incident and will include the following details:

- type of incident that has occurred
- potential impacts on the local landholders and the community
- site contact details, and
- any advice or recommendations for local landholders based on the incident type and scale (for example remediation which may be required to be undertake on landholder land or personal management requirements in relation to local landholder water usage).

8.0 Training, Inspection and Maintenance

8.1 Training

The contents of this document will be included in site inductions. All site personnel and contractors shall be:

- made aware of their reporting requirements with regards to environmental incidents
- trained in the process of environmental incident response and in the use of spill kits
- made aware of the importance of soil conservation issues during site inductions
- attend scheduled awareness seminars early in the project for all personnel involved in construction
- continually address relevant matters at regular 'toolbox' meetings during the Project.

8.2 Site Monitoring

8.2.1 General

If a discharge of dirty water occurs, Council is to be notified as soon as practicable and the incident investigated to identify appropriate corrective actions or updates to ESC measures required.

Visual monitoring of local water quality (i.e., turbidity, hydrocarbon spills/slicks) in any local drains adjacent to the project site is to be undertaken weekly, after rainfall events of greater than 10 mm in 24 hours and as required to identify any potential spills or deficient erosion and sediment controls.

All ESCs are to be inspected:

- weekly
- prior to forecasted rainfall events greater than or equal to 10 mm in a 24-hour period
- after rainfall events greater than or equal to 10 mm in a 24-hour period.

All inspections are to be documented on a check sheet (refer to **Appendix A**) and all actions identified are to be closed out within a reasonable and practical time frame. The check sheet requires:

- recording the condition of every sediment control employed
- recording maintenance requirements (if any) for each sediment control
- recording the volumes of sediment removed from sediment retention systems, where applicable
- recording the site where the sediment is disposed.

A signed duplicate of the completed check sheet will be provided to the Site Project manager for their information.

8.3 Site Maintenance

All ESCs, including drainage control measures, must be maintained in proper working order at all times during their operational lives. All ESCs shall be maintained in a functioning condition during construction until all construction activities are completed, and full stabilisation of the site is achieved.

Sediment removed from sediment traps and places of sediment deposition must be disposed of in a lawful manner that does not cause ongoing soil erosion or environmental harm.

Required repairs to all controls, including remediation of areas where revegetation and stabilisation has been unsuccessful, are to be undertaken immediately where practical. Ensure controls are put back in place if they are moved for any reason (e.g., to allow crane access).

All sediment fences and detention systems are to be kept in good working condition. In particular, attention is to be given to:

- recent works to ensure they have not resulted in diversion of sediment laden water away from them
- degradable products (e.g., sediment fence) to ensure they are replaced as required
- sediment removal as required.

9.0 Revision and Update of SWMP

This SWMP is to be updated as required if the site conditions change or if installed controls are not operating effectively. Additional erosion and/or sediment control works are to be constructed as necessary to ensure the desired protection is given to downslope lands and waterways, i.e., making ongoing changes to this SWMP where it proves inadequate in practice or is subject to changes in conditions at the work site or elsewhere in the catchment.

Where required, updates to the SWMP will also be made:

- Within one month following a spill or discharge event to implement any changes to the preparedness and response measures identified in the incident report.
- Within one month following a spill and discharge training event to implement any changes to the preparedness and response measures identified in the training event debrief.

10.0 References

IECA, 2008. *Best Practice Erosion and Sediment Control*, International Erosion Control Association, 2008

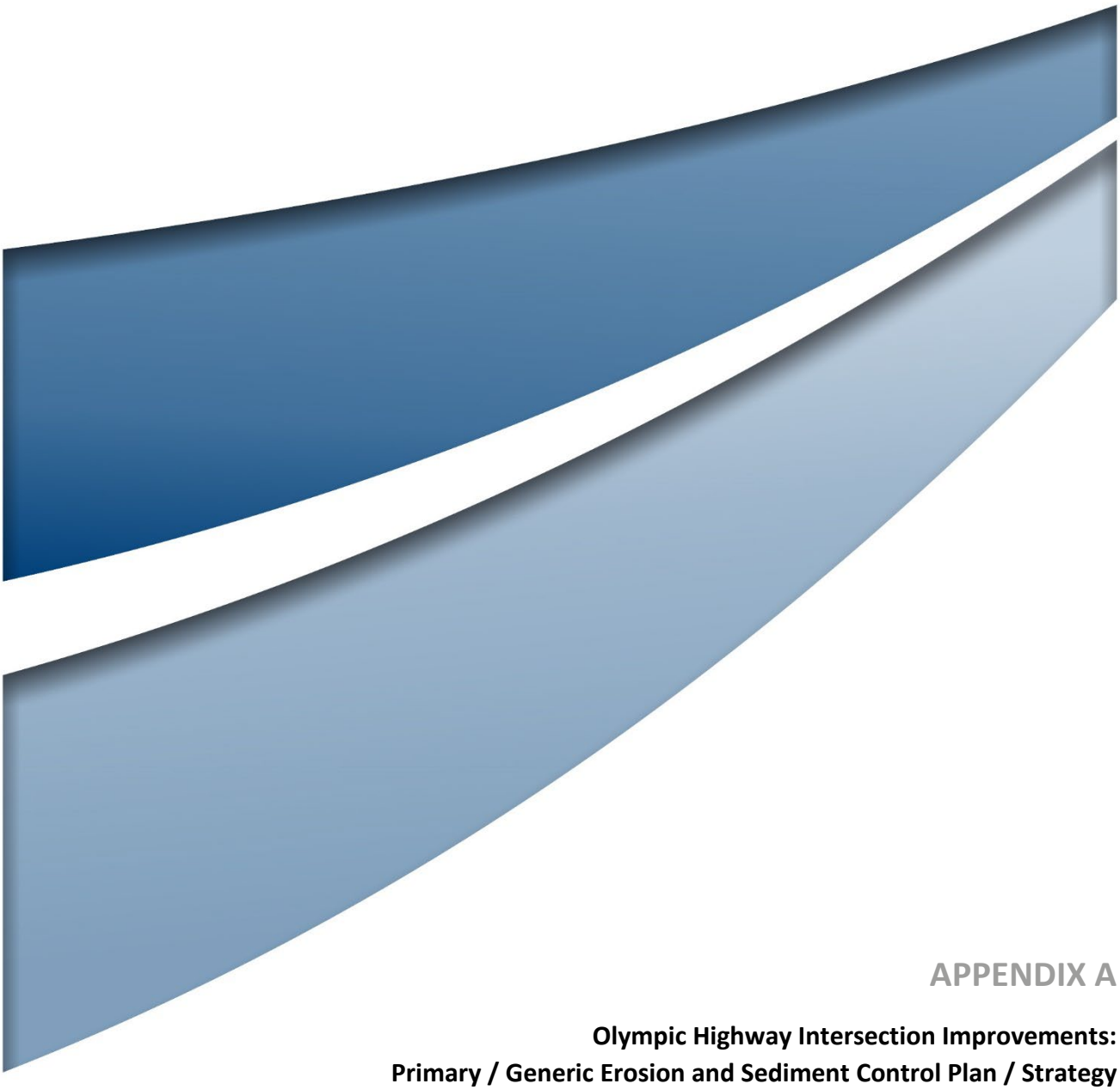
Landcom, 2004. *Managing Urban Storm Water – Soils and Construction Volume 1*, Landcom, 4th Edition 2004

Natural Resources Access Regulator (NRAR), 2018. *Guidelines for controlled activities on waterfront land—Riparian corridors.* https://www.dpie.nsw.gov.au/__data/assets/pdf_file/0003/367392/NRAR-Guidelines-for-controlled-activities-on-waterfront-land-Riparian-corridors.pdf.

NSW DECC, 2008. *Managing Urban Storm Water – Soils and Construction Volume 2*, NSW Department of Environment and Climate Change, 2008

TfNSW, 2020. *Soil and Water Management*. Transport for NSW, 2020.

TfNSW, 2021. *Wagga Wagga City Council MR78 Olympic Highway Intersection Upgrades - Travers St and Old Narrandera Road Intersections - Geotechnical Investigation Factual Report*. Transport for NSW, 2021.



APPENDIX A

Olympic Highway Intersection Improvements:
Primary / Generic Erosion and Sediment Control Plan / Strategy
T.R.E.E.S October 2022

MR78 – OLYMPIC HIGHWAY
INTERSECTION IMPROVEMENTS
AT
OLD NARRANDERA ROAD
5.241 KM TO 6.309 KM NORTH OF WAGGA WAGGA

AND

INTERSECTION IMPROVEMENTS
AT
TRAVERS STREET
3.455 KM TO 3.971 KM NORTH OF WAGGA WAGGA

PRIMARY / GENERIC
EROSION AND SEDIMENT
CONTROL PLAN / STRATEGY

OCTOBER 2022

FOR

TRANSPORT FOR NEW SOUTH WALES

PREPARED BY TREES P/L

Head Office | 94 Toepfers Road | WYEE NSW 2259 | P 02 4357 1112 | E info@treespl.com

TABLE OF CONTENTS

ATTACHMENTS

1.0 INTRODUCTION

1.1 Purpose of Plan

The purpose of this Primary / Generic Erosion and Sediment Control Plan / Strategy is to be:

- Included as an Appendix of the Soil and Water Management Plan (SWMP).
- A 'stand alone' document.

1.2 Impacts of Erosion and Sedimentation

The construction activities to be undertaken on this project have the potential to impact on soil and water resources. Land to be disturbed or cleared of vegetation is potentially subject to erosion by stormwater and wind action.

Generally, soil particles eroded by stormwater runoff have the potential to be transported downslope, to settle in rivers, watercourses and wetlands etc (ie sedimentation). This may result in many adverse environmental impacts including:

- Reduction in water quality, increased turbidity and nutrient enrichment of water bodies.
- Damage to vegetation communities.
- Disturbance to aquatic flora and fauna.
- Increased potential for flooding.
- Reduction in recreational values.
- Reduction in aesthetic values.
- Increased maintenance costs.
- Promotion of weed growth.

Additionally, erosion may be caused by wind moving unprotected soil particles. This action may result in adverse impacts including:

- Loss of valuable soil (eg topsoil).
- Safety on and off site (eg traffic hazards).
- Inundation of urban / industrial and other areas with severe nuisance value.

This Plan / Strategy will form the initial document in an ongoing process to minimise on-site erosion and off-site sedimentation and therefore reduce adverse environmental impact.

2.0 SCOPE OF THIS PLAN / STRATEGY

This Plan / Strategy is a document which describes intentions and fundamental principles for the duration of the entire project.

A Concept Plan / Strategy utilising design drawings is contained in this document at Attachment 1 for the Old Narrandera Road Intersection Upgrade and at Attachment 2 for the Travers Street Intersection Upgrade – both 3 stages.

This Plan / Strategy will be complimented by the preparation of more detailed Progressive (Site Specific) Erosion and Sediment Control Plans (ESCP) prepared for:

- The different stages of construction (eg Early Works, Clearing, Main Earthworks).
- Various work areas (eg offices and compounds, etc).

The Progressive ESCPs will identify risk and be prepared just prior to construction activity and indicate (were relevant):

- Catchment areas (ie within and outside the road reserve).
- Construction boundaries.
- Exclusion zones and sensitive areas.
- Contours and drainage paths.
- Access points and tracks (eg haulage).
- Compounds and storage areas.
- Temporary drainage line crossings.
- Stockpile sites.
- Temporary work areas.
- Borrow pits.
- Material processing areas.
- Concrete washout pit sites.
- Permanent and temporary controls (including order of implementation).

Progressive ESCPs will be prepared jointly by the Project Soil Conservationist and the environmental and construction personnel to formulate practical documents for field reference. Additionally, Plans will be developed in consideration of other environmental aspects (eg sensitive vegetation).

The Progressive Plans will be entered onto a register (refer to Attachment 3) and placed behind this ESCP to create a 'living' record of erosion and sediment control.

The Progressive ESCPs will be prepared according to TfNSW QA Specification G38 (Soil and Water Management) and are to be read in conjunction with this Plan / Strategy.

Additionally, the Plans will provide design criteria for erosion and sediment controls in accordance with the requirements of the Blue Book (Volumes 1 & 2D) and TfNSW QA Specification G38 in relation to the Design Average Recurrence Intervals in the G38/E Annexure where relevant (eg sediment traps, diversion banks) – refer to Attachment 4.

3.0 EROSION AND SEDIMENTATION HAZARD

The Old Narrandera Road Intersection site has a high erosion and sedimentation hazard due to:

- The large upslope catchment which is undulating and significantly urbanised.
- The significant earthworks scale.
- The pipes (2) and box (1) culvert extension works requiring the separation of 'clean' and 'dirty' or construction flows.
- The erodible soil type together with the sometimes storm events.
- The proximity beside Dukes Creek which flow to the nearby Gobbagombalin Lagoon and the Murrumbidgee River.
- The flooding potential.

The Travers Road Intersection site has a generally low to moderate erosion hazard as:

- The general area is relatively flat apart from the raised road formation.
- There are no natural drainage lines.
- The site is protected from flooding by levee banks.

4.0 SUPPORTING DOCUMENTATION

This Erosion and Sedimentation Control Plan / Strategy is based on the requirements and guidelines contained in the following manuals / documents:

- Department of Housing (1998), Managing Urban Stormwater: Soils and Construction, Vol 1, 4th Edition (ie Blue Book).
- Department of Environment and Climate Change (2008), Managing Urban Stormwater: Soils and Construction, Vol 2D, Main Road Construction (ie Blue Book).
- CSIRO, Urban Stormwater – Best Practice Environmental Management Guidelines.
- RTA Road Design Guide, Section 8: Erosion and Sedimentation.
- RMS Code of Practice for Water Management.
- RMS Erosion and Sedimentation Management Procedure.
- TfNSW QA Specification G38 – Soil and Water Management.
- TfNSW (September 2021), Review of Environmental Factors, Olympic Highway Intersection Upgrades.

The strategies and techniques detailed in the above documents are appropriate for the protection of the adjacent environment of this project.

5.0 KEY MANAGEMENT STRATEGIES

The following list outlines principles and control measures that will be implemented on this project for minimising erosion and sedimentation. They have been identified as key issues and techniques to control erosion and sedimentation on many road construction projects over the last 30 years. These points collectively fulfil the principles of sound soil conservation practice as detailed in the previously mentioned manuals/documents. This will ensure a 'preventative' rather than a 'cosmetic or remedial' approach to erosion and sediment control.

Major emphasis will be placed on:

5.1 Professional Expertise

- The engagement of a Professional Soil Conservationist with extensive experience in road construction and registered with TfNSW in Category S1: Erosion, Sedimentation and Soil Conservation Consultancy Services.

5.2 Training

- Highlighting the importance of soil conservation issues during site inductions.
- Scheduling half-day awareness seminars early in the project for all personnel involved in construction. The program will cover:
  - Environmental impacts;
  - Relevant legislation;
  - Principles of erosion and sediment control;
  - Techniques of erosion and sediment control.

  More details on the program appear in Attachment 5.
- Continually addressing relevant matters at regular 'toolbox' meetings during the course of the project (eg maintenance of temporary controls).

5.3 Minimising Extent and Duration of Disturbance

- Marking clearing limits.

- Staging of clearing operations where practical.
- Initially clearing and grubbing to leave the soil surface in a reasonably rough condition with some surface vegetative cover.
- Minimising disturbance of vegetation along the road corridor with special emphasis on management of construction activities adjacent to drainage lines / areas of concentrated flow (eg drains / channels).

5.4 Control of Stormwater Flows onto, through and from the Site

- Separating 'clean' run-on water from 'dirty' (eg turbid) construction area run-off.
- Constructing permanent drainage structures early in the project including:
  - Pipe culvert extensions and the associated outlet protection (dissipators) – Old Narrandera Road Intersection;
  - Stormwater line extensions to new pits – Travers Street Intersection.
- Maximising the diversion of 'dirty' construction runoff into sediment traps and other controls.
- Controlling run-off during the construction of embankments (eg fill shaping and the construction of temporary bunds and batter drains).
- Diverting formation run-off through sediment traps and into pits and the stormwater drainage system as soon as practical to reduce surface flow lengths and velocities.
- Constructing temporary crossings over watercourses.

5.5 Erosion Control Measures to Prevent On-Site Damage

- Constructing a range of erosion controls within the various road sub-catchments to reduce flow velocities and to compliment and increase the effectiveness and efficiency of sediment controls in the lower areas (eg slope breaks, diversion banks, progressive revegetation).
- Using geotextile or similar linings to provide temporary surface protection in areas of concentrated flows (eg batter drains, culvert construction, drains etc).
- Siting stockpiles of soil material in low-hazard areas clear of drainage lines. Additional protection to be afforded with temporary vegetation, upslope diversion banks and downslope sediment control measures, if required. Toe of stockpiled material to be at least 5 metres from a drain or trees to be retained.
- Stockpiles no greater than 2 metres in height with batters no steeper than 2:1.

5.6 Sediment Control Measures to Prevent Off-Site Damage

- Constructing control measures as close to the potential source of sediment as possible (eg sediment fences, mulch bund sediment traps).
- Ensuring excavated sediment trap management of 'dirty' water within 24 hours after rain with one or a combination of:
  - Pump-out for construction purposes or dust control – priority;
  - Flocculation with gypsum (or approved alternative flocculant).
- Managing water quality during de-watering activities (eg dust suppression, flocculation with gypsum, pumping for treatment into an excavated sediment trap).
- Controlling the deposition of mud and soil material onto local roads (eg Olympic Highway, Travers Street, Gardiner Street).
- Dust suppression via water carts, restricting plant and vehicle movements to designated routes and limiting vehicle speeds etc.

- Initiating a water quality monitoring program in the adjacent drainage lines with results analysed to determine the efficiency and effectiveness of implemented controls.

5.7 Stabilisation and Revegetation

- Ensuring the success of the later revegetation program by utilising a good topsoil management program.
- Keying of topsoil to batters. Topsoil depth to be 5 to 10 cms.
- Progressively revegetating disturbed areas utilising appropriate species.
- Controlling dust through progressive revegetation techniques.

5.8 Inspection and Maintenance

- Ensuring the progressive and continual implementation of temporary erosion and sediment controls (eg sediment fences, diversion banks, diversion drains, sediment traps).
- Initiating a program to ensure regular maintenance of all erosion and sediment control measures. Sediment cleaned from structures, including excavated sediment traps, to be deposited in a secure location where further pollution will not occur.
- Arranging regular inspections by the Project Soil Conservationist (ie monthly) and construction personnel (ie weekly) to review and update control measures. Additional inspections will be conducted:
  - During significant rainfall events exceeding 10mm and during prolonged rainfall to monitor the functioning of controls.
  - Within 24 hours of cessation of a rainfall event causing runoff to occur on or from the project.

5.9 Documentation and Recording

- Rainfall / climatic records.
- Developing documentation and systems for recording erosion and sediment control activities via:
  - Progressive ESCPs;
  - Inspection reports completed by the Project Soil Conservationist. An example of the format for this report appears in Attachment 6 and includes sections for location, control, recommendations / comment, priority, action, close out date and photograph;
  - Register for Inspections and Maintenance to include volumes of sediment removed and method of disposal etc.
- Site notes distributed internally between environmental and construction personnel.
- Dewatering procedure and records.
- Air Quality / Dust Management Plan.
- Meeting minutes.
- Formal correspondence (eg Environment Protection Authority, Wagga Wagga City Council).
- Water quality monitoring results.

5.10 General

- Monitoring weather forecasts for planning and site 'securing' purposes.
- Ensuring erosion and sediment controls are installed at all relevant sites associated with construction activities which might include:
  - Office and compound sites;
  - Access and haulage roads and tracks;
  - Stockpile areas;
  - Workshop areas;
  - Temporary work areas.
- Leaving temporary erosion and sediment controls in place until the disturbed catchments have over 70% vegetation cover (ie beyond pavements).
- Generally implementing controls as per TfNSW QA Specification G38.

6.0 SEDIMENT TRAPS / EXCAVATED SEDIMENT TRAPS

Two (2) potential sediment basin sites were selected during an inspection on 14 & 20 June 2022 at the following locations:

- Old Narrandera Road – south side of intersection at Ch 5685.
- Old Narrandera Road – south side of proposed cut 'lay back' at Ch 6050.

No sediment basin sites were selected at the Travers Road Intersection.

'Blue Book' Design Calculations for these structures are included at Attachment 7. These calculations show a soil loss significantly less then the >150 cubic metre per year requirement from a catchment for a sediment basin at both sites.

Therefore, it is proposed to construct sized excavated sediment traps at these locations. These locations will appear on the Concept Erosion and Sediment Control Plans at Attachment 1.

Additionally, it is proposed to reuse all 'dirty' trap water for dust suppression and construction purposes. A sample 'Procedure for Water Quality Management in Sediment Basins is contained at Attachment 8 in the event water requires treatment prior to discharge from the project.

7.0 COMPOUNDS

Compounds with the following controls are proposed at:

- South side of Old Narrandera Road – controls shown on the Concept ESCPs at Attachment 1.
- Gardiner Street – controls shown on the Concept ESCP at Attachment 3 to consist of:
  - Piped access over the 'clean' water table drain,
  - Access stabilised to control mud / soil tracking,
  - Compound area bunded with topsoil and seeded,
  - Hardstand placed over compound area and graded to a sediment trap,
  - Compound area returned to original condition at the end of the project (ie revegetated).

8.0 CONCLUSION

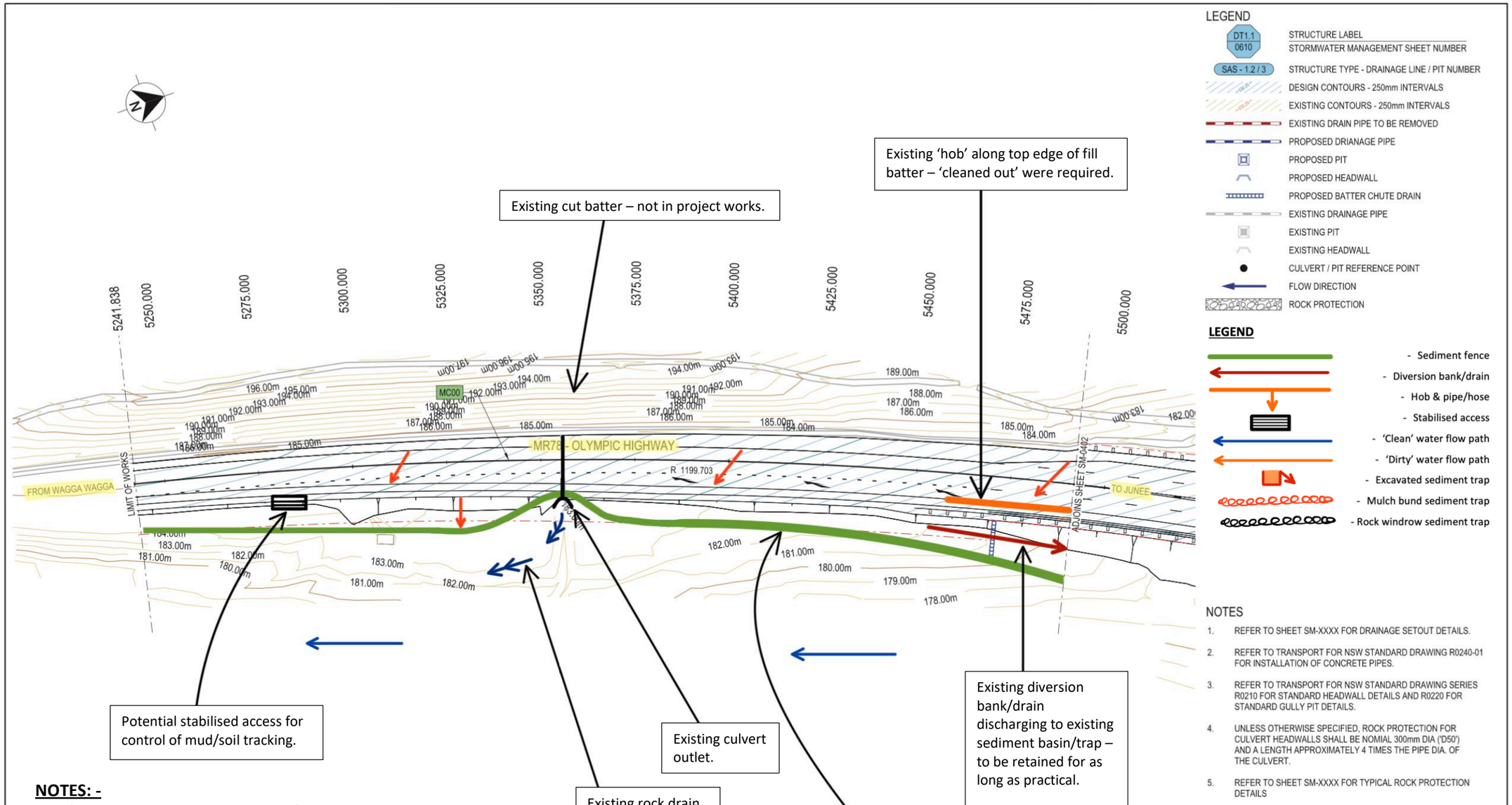
The strategies presented in this Plan / Strategy are considered to appropriately address all issues relevant to erosion and sediment control and to minimise potential impact.

Forward planning, adherence to a system of documentation and training will be key elements to ensure sound performance in the field.

9.0 ACKNOWLEDGEMENTS

- T.R.E.E.S. P/L (October 2020), Barton Highway Upgrade Package 1, Duplication from ACT Border towards Murrumbatemen, Primary / Generic Erosion and Sedimentation Control Plan / Strategy.
- Department of Housing (1998), Management Urban Stormwater: Soils and Construction, Vol 1, 4th Edition (ie Blue Book).
- Department of Environmental and Climate Change (2008), Management Urban Stormwater: Soils and Construction, Vol 2D, Main Road Construction (ie Blue Book).

ATTACHMENT 1



LEGEND

DT1.1 0610 — STRUCTURE LABEL / STORMWATER MANAGEMENT SHEET NUMBER
SAS - 1.2 / 3 — STRUCTURE TYPE - DRAINAGE LINE / PIT NUMBER
DESIGN CONTOURS - 250mm INTERVALS
EXISTING CONTOURS - 250mm INTERVALS
EXISTING DRAIN PIPE TO BE REMOVED
PROPOSED DRIANAGE PIPE
PROPOSED PIT
PROPOSED HEADWALL
PROPOSED BATTER CHUTE DRAIN
EXISTING DRAINAGE PIPE
EXISTING PIT
EXISTING HEADWALL
CULVERT / PIT REFERENCE POINT
FLOW DIRECTION
ROCK PROTECTION

LEGEND

- Sediment fence
- Diversion bank/drain
- Hob & pipe/hose
- Stabilised access
- 'Clean' water flow path
- 'Dirty' water flow path
- Excavated sediment trap
- Mulch bund sediment trap
- Rock windrow sediment trap

NOTES

1. REFER TO SHEET SM-XXXX FOR DRAINAGE SETOUT DETAILS.
2. REFER TO TRANSPORT FOR NSW STANDARD DRAWING R0240-01 FOR INSTALLATION OF CONCRETE PIPES.
3. REFER TO TRANSPORT FOR NSW STANDARD DRAWING SERIES R0210 FOR STANDARD HEADWALL DETAILS AND R0220 FOR STANDARD GULLY PIT DETAILS.
4. UNLESS OTHERWISE SPECIFIED, ROCK PROTECTION FOR CULVERT HEADWALLS SHALL BE NOMIAL 300mm DIA ('D50') AND A LENGTH APPROXIMATELY 4 TIMES THE PIPE DIA. OF THE CULVERT.
5. REFER TO SHEET SM-XXXX FOR TYPICAL ROCK PROTECTION DETAILS

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NOTES: -

1) Olympic highway works consist of widening on the east side.
2) The locations of controls are indicative with exact siting during works.
3) Clearing on this sheet is only at the north end.
4) Cleared vegetation to be mulched & used for mulch bund sediment traps.

MR 78 OLYMPIC HIGHWAY – OLD NARRANDERA ROAD INTERSECTION UPGRADE.
CONCEPT EROSION & SEDIMENT CONTROL PLAN/ STRATEGY – STAGE 1 (EARLY WORKS)

NOT FOR CONSTRUCTION

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DRAWING FILE LOCATION / NAME	C:\Data\Worksets\MR78 - Old Narrandera Road Intersection Upgrade\dgn\07-Drawing Production\DS2018-001537-04-SM.dgn
DESIGN LOT CODE	
DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING	
PLOT DATE / TIME	9/7/2005 7:08:02 PM
PLOT BY	walgersz
EXTERNAL REFERENCE FILES	
REV / DATE / AMENDMENT / REVISION DESCRIPTION	
WVR No. / APPROVAL	
SCALES ON A3 SIZE DRAWING	0 10 20 30 40 SCALE 1:1000m
CO-ORDINATE SYSTEM	MGA ZONE 55 (GDA94)
HEIGHT DATUM	AHD
DRAWINGS / DESIGN PREPARED BY	TRANSPORT FOR NSW INFRASTRUCTURE & PLACE TECHNICAL SERVICES ENGINEERING SERVICES TECHNICAL OPERATIONS & SUPPORT

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TITLE		
DRAWN	Z. WALGERS	12.07.21
DRG CHECK	J. GOODEN	12.07.21
DESIGN	Z. WALGERS	12.07.21
DESIGN CHECK	J. GOODEN	12.07.21
DESIGN MNGR	L. CROKER	12.07.21
PROJECT MNGR	S. MILLIE	12.07.21

CLIENT: NSW GOVERNMENT Transport for NSW

PREPARED FOR: PROJECT DEVELOPMENT SOUTH INRASTRUCTURE & PLACE TRANSPORT FOR NSW

CITY OF WAGGA WAGGA
MR78 - OLYMPIC HIGHWAY
INTERSECTION IMPROVEMENTS AT OLD NARRANDERA ROAD 5.241KM TO 6.309KM NORTH OF WAGGA WAGGA STORMWATER MANAGEMENT PLAN
MR78 - OLYMPIC HIGHWAY - MC00 - CH.5241.838 TO CH.5491.838

A3

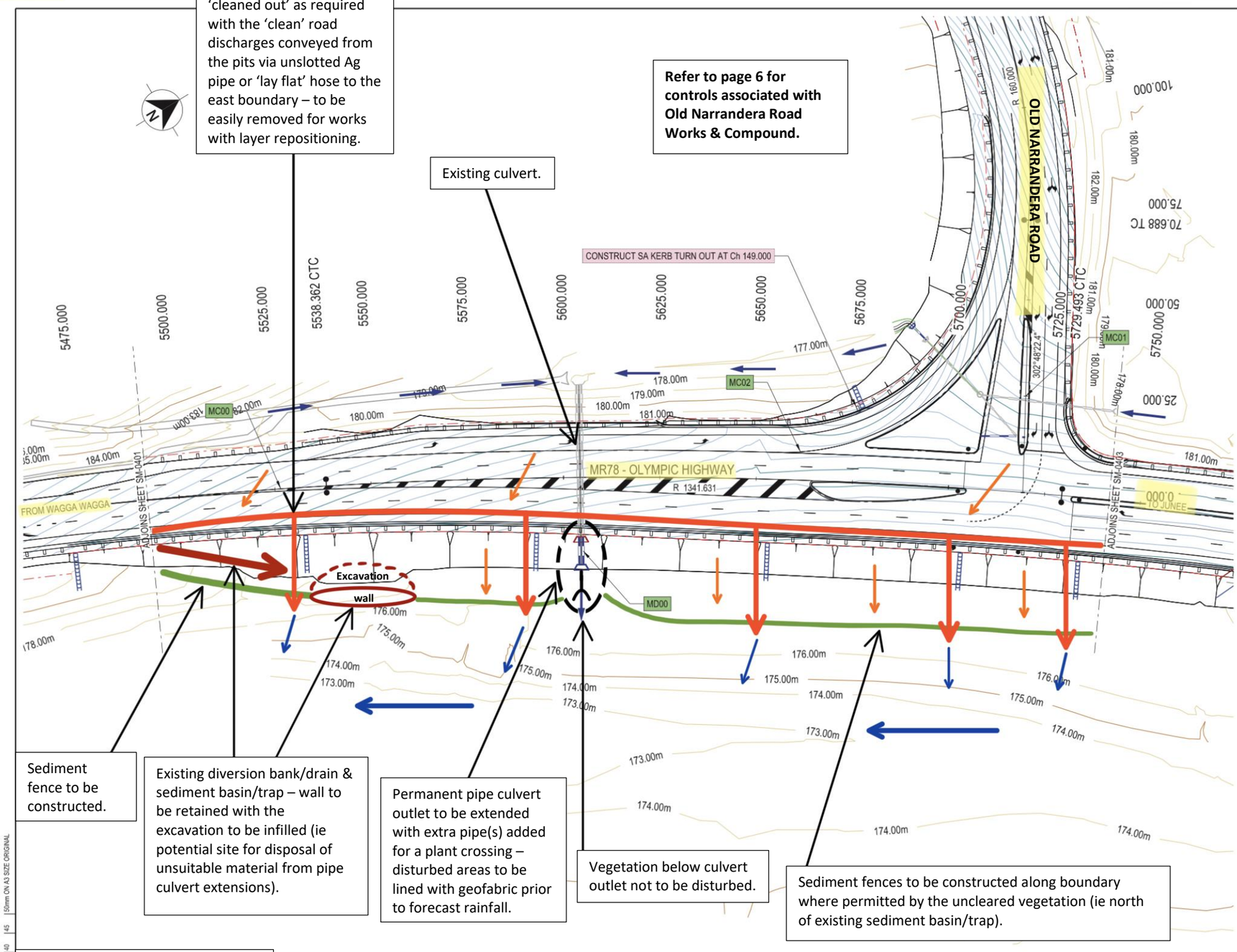
RMS REGISTRATION No.			VOL
DS2018/001537			
ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
CONCEPT DESIGN	SF2018/302060	SM-0401	1

T.R.E.E.S. P/L
Soil Conservation & Environmental Consultants

Existing 'hob' along top edge of fill batter to be 'cleaned out' as required with the 'clean' road discharges conveyed from the pits via unslotted Ag pipe or 'lay flat' hose to the east boundary – to be easily removed for works with layer repositioning.

Refer to page 6 for controls associated with Old Narrandera Road Works & Compound.

Existing culvert.



LEGEND

- DT1.1 / 0610 — STRUCTURE LABEL / STORMWATER MANAGEMENT SHEET NUMBER
- SAS - 1.2 / 3 — STRUCTURE TYPE - DRAINAGE LINE / PIT NUMBER
- DESIGN CONTOURS - 250mm INTERVALS
- EXISTING CONTOURS - 250mm INTERVALS
- EXISTING DRAIN PIPE TO BE REMOVED
- PROPOSED DRIANAGE PIPE
- PROPOSED PIT
- PROPOSED HEADWALL
- PROPOSED BATTER CHUTE DRAIN
- EXISTING DRAINAGE PIPE
- EXISTING PIT
- EXISTING HEADWALL
- CULVERT / PIT REFERENCE POINT
- FLOW DIRECTION
- ROCK PROTECTION

LEGEND

- Sediment fence
- Diversion bank/drain
- Hob & pipe/hose
- Stabilised access
- 'Clean' water flow path
- 'Dirty' water flow path
- Excavated sediment trap
- Mulch bund sediment trap
- Rock windrow sediment trap

Sediment fence to be constructed.

Existing diversion bank/drain & sediment basin/trap – wall to be retained with the excavation to be infilled (ie potential site for disposal of unsuitable material from pipe culvert extensions).

Permanent pipe culvert outlet to be extended with extra pipe(s) added for a plant crossing – disturbed areas to be lined with geofabric prior to forecast rainfall.

Vegetation below culvert outlet not to be disturbed.

Sediment fences to be constructed along boundary where permitted by the uncleared vegetation (ie north of existing sediment basin/trap).

NOTES

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STAGE 1 – EARLY WORKS

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		CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94)	HEIGHT DATUM: AHD
DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ENGINEERING SERVICES, TECHNICAL OPERATIONS & SUPPORT			

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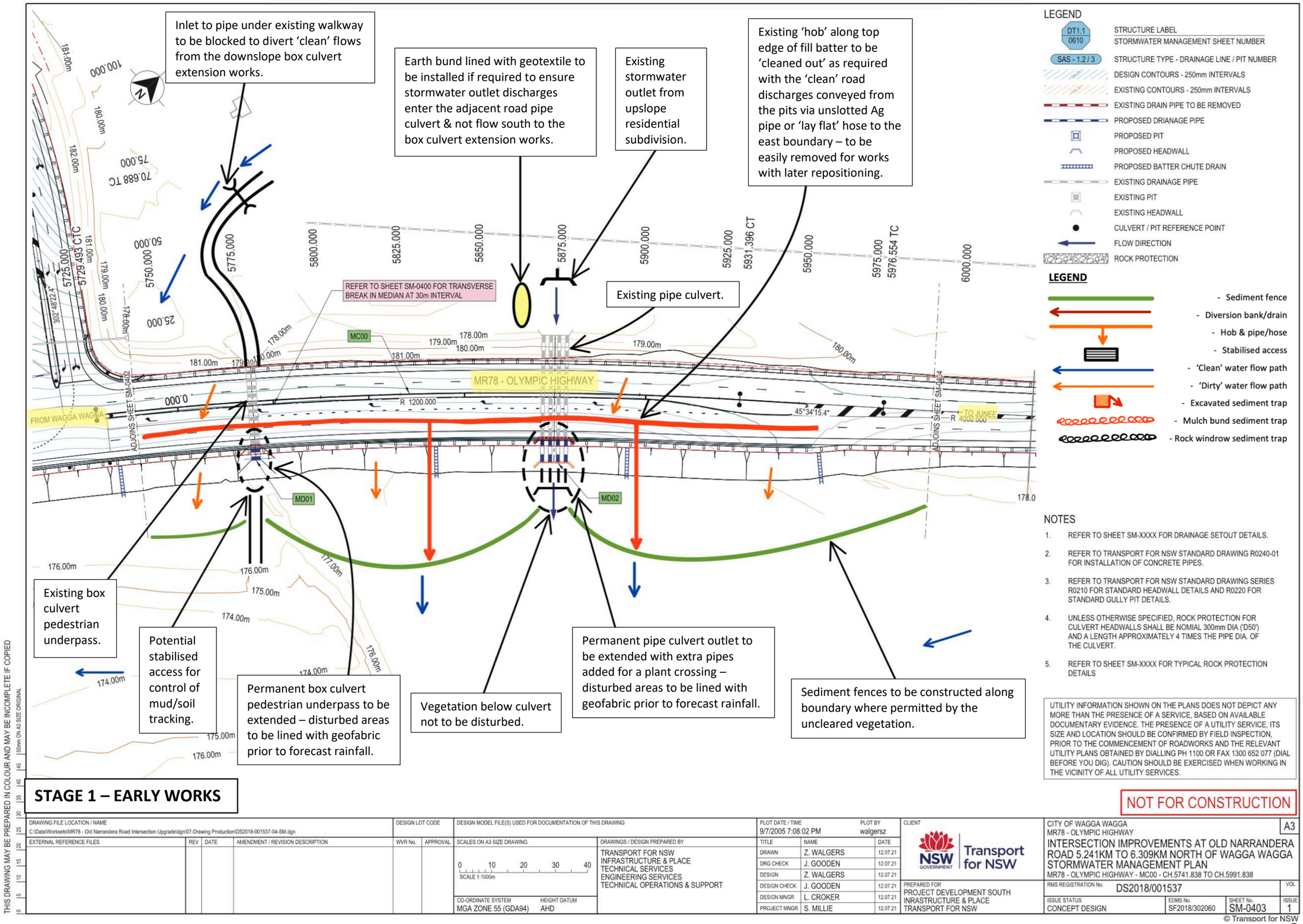
CLIENT: NSW GOVERNMENT Transport for NSW

PREPARED FOR: PROJECT DEVELOPMENT SOUTH, INRASTRUCTURE & PLACE, TRANSPORT FOR NSW

CITY OF WAGGA WAGGA
MR78 - OLYMPIC HIGHWAY
A3
INTERSECTION IMPROVEMENTS AT OLD NARRANDERA ROAD 5.241KM TO 6.309KM NORTH OF WAGGA WAGGA
STORMWATER MANAGEMENT PLAN
MR78 - OLYMPIC HIGHWAY - MC00 - CH.5491.838 TO CH.5741.838

RMS REGISTRATION No. DS2018/001537				VOL
ISSUE STATUS: CONCEPT DESIGN	EDMS No.: SF2018/302060	SHEET No.: SM-0402	ISSUE: 1	


Inlet to pipe under existing walkway to be blocked to divert 'clean' flows from the downslope box culvert extension works.
Earth bund lined with geotextile to be installed if required to ensure stormwater outlet discharges enter the adjacent road pipe culvert & not flow south to the box culvert extension works.
Existing stormwater outlet from upslope residential subdivision.
Existing 'hob' along top edge of fill batter to be 'cleaned out' as required with the 'clean' road discharges conveyed from the pits via unslotted Ag pipe or 'lay flat' hose to the east boundary – to be easily removed for works with later repositioning.
REFER TO SHEET SM-0400 FOR TRANSVERSE BREAK IN MEDIAN AT 30m INTERVAL
Existing pipe culvert.
MR78 - OLYMPIC HIGHWAY
MC00
MD01
MD02
FROM WAGGA WAGGA
TO JUNEE
ADJOINS SHEET SM-0402
ADJOINS SHEET SM-0404
Existing box culvert pedestrian underpass.
Potential stabilised access for control of mud/soil tracking.
Permanent box culvert pedestrian underpass to be extended – disturbed areas to be lined with geofabric prior to forecast rainfall.
Vegetation below culvert not to be disturbed.
Permanent pipe culvert outlet to be extended with extra pipes added for a plant crossing – disturbed areas to be lined with geofabric prior to forecast rainfall.
Sediment fences to be constructed along boundary where permitted by the uncleared vegetation.
LEGEND
DT1.1 0610 STRUCTURE LABEL / STORMWATER MANAGEMENT SHEET NUMBER
SAS - 1.2 / 3 STRUCTURE TYPE - DRAINAGE LINE / PIT NUMBER
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PROPOSED PIT
PROPOSED HEADWALL
PROPOSED BATTER CHUTE DRAIN
EXISTING DRAINAGE PIPE
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CULVERT / PIT REFERENCE POINT
FLOW DIRECTION
ROCK PROTECTION
LEGEND
- Sediment fence
- Diversion bank/drain
- Hob & pipe/hose
- Stabilised access
- 'Clean' water flow path
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- Mulch bund sediment trap
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STAGE 1 – EARLY WORKS
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CITY OF WAGGA WAGGA
MR78 - OLYMPIC HIGHWAY
A3
INTERSECTION IMPROVEMENTS AT OLD NARRANDERA ROAD 5.241KM TO 6.309KM NORTH OF WAGGA WAGGA
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MR78 - OLYMPIC HIGHWAY - MC00 - CH.5741.838 TO CH.5991.838
EXTERNAL REFERENCE FILES | REV | DATE | AMENDMENT / REVISION DESCRIPTION | WVR No. | APPROVAL
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DESIGN MNGR L. CROKER 12.07.21
PROJECT MNGR S. MILLIE 12.07.21
PREPARED FOR: PROJECT DEVELOPMENT SOUTH, INRASTRUCTURE & PLACE, TRANSPORT FOR NSW
RMS REGISTRATION No. DS2018/001537
VOL
ISSUE STATUS: CONCEPT DESIGN
EDMS No. SF2018/302060
SHEET No. SM-0403
ISSUE 1
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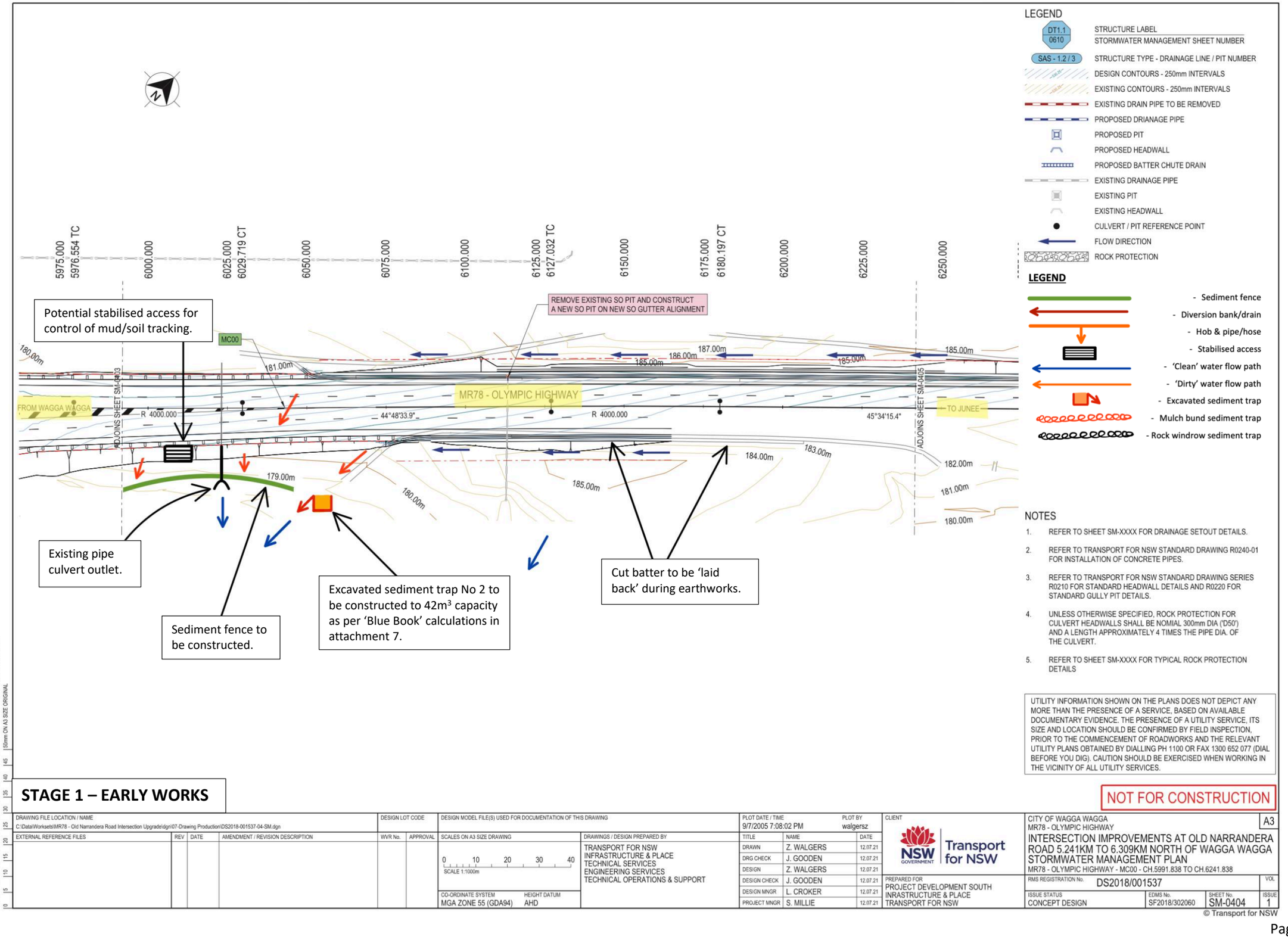

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- CULVERT / PIT REFERENCE POINT
- FLOW DIRECTION
- ROCK PROTECTION

LEGEND

- Sediment fence
- Diversion bank/drain
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STAGE 1 – EARLY WORKS

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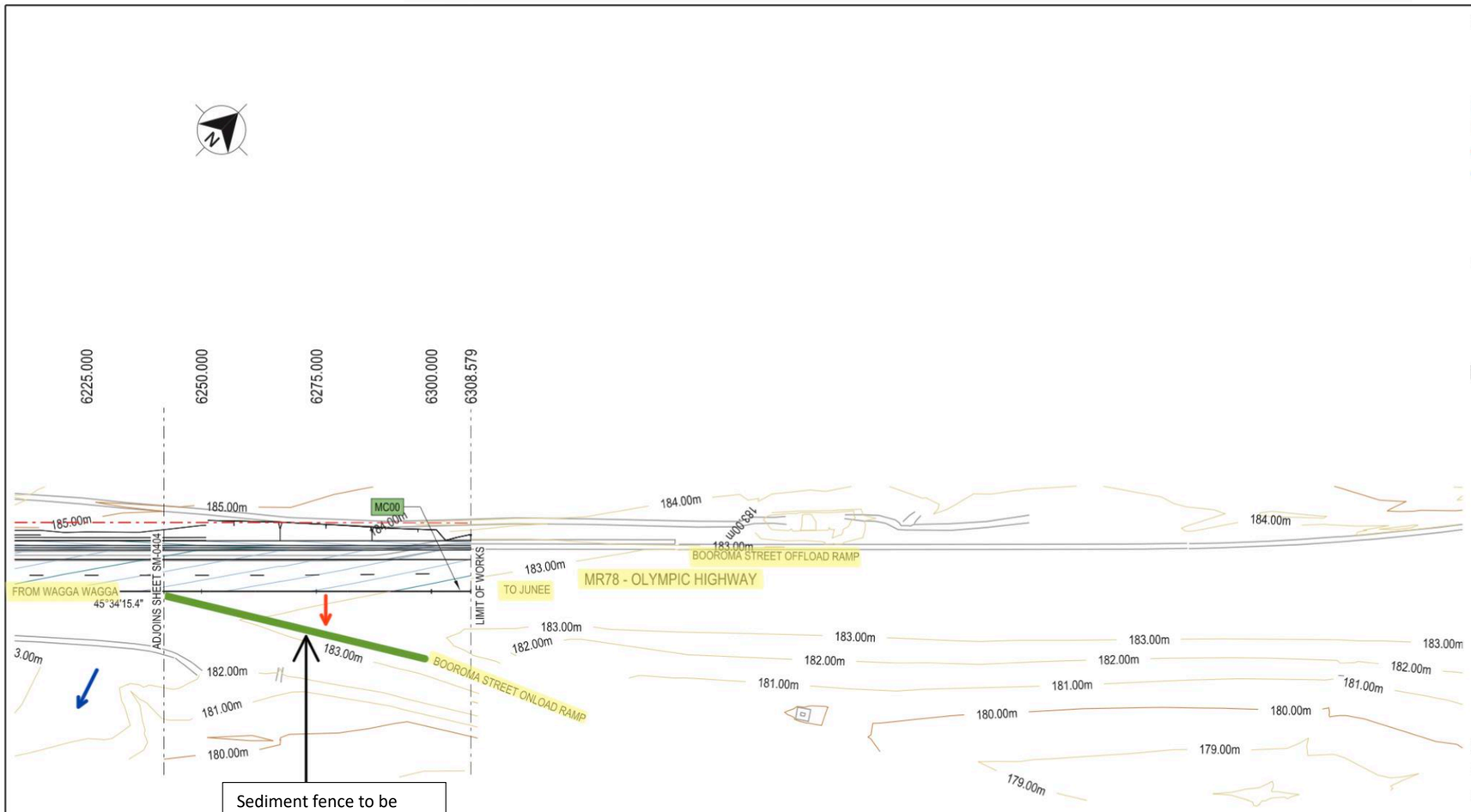
CLIENT: NSW GOVERNMENT Transport for NSW

PREPARED FOR: PROJECT DEVELOPMENT SOUTH, INRASTRUCTURE & PLACE, TRANSPORT FOR NSW

CITY OF WAGGA WAGGA
MR78 - OLYMPIC HIGHWAY
A3

INTERSECTION IMPROVEMENTS AT OLD NARRANDERA ROAD 5.241KM TO 6.309KM NORTH OF WAGGA WAGGA
STORMWATER MANAGEMENT PLAN
MR78 - OLYMPIC HIGHWAY - MC00 - CH.5991.838 TO CH.6241.838

RMS REGISTRATION No. DS2018/001537				VOL.
ISSUE STATUS: CONCEPT DESIGN	EDMS No.: SF2018/302060	SHEET No.: SM-0404	ISSUE: 1	



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- EXISTING DRAINAGE PIPE
- EXISTING PIT
- EXISTING HEADWALL
- CULVERT / PIT REFERENCE POINT
- FLOW DIRECTION
- ROCK PROTECTION

LEGEND

- Sediment fence
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STAGE 1 – EARLY WORKS

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PREPARED FOR: PROJECT DEVELOPMENT SOUTH, INRASTRUCTURE & PLACE, TRANSPORT FOR NSW

CITY OF WAGGA WAGGA
MR78 - OLYMPIC HIGHWAY
A3

INTERSECTION IMPROVEMENTS AT OLD NARRANDERA ROAD 5.241KM TO 6.309KM NORTH OF WAGGA WAGGA STORMWATER MANAGEMENT PLAN

MR78 - OLYMPIC HIGHWAY - MC00 - CH.6241.838 TO CH.6308.579

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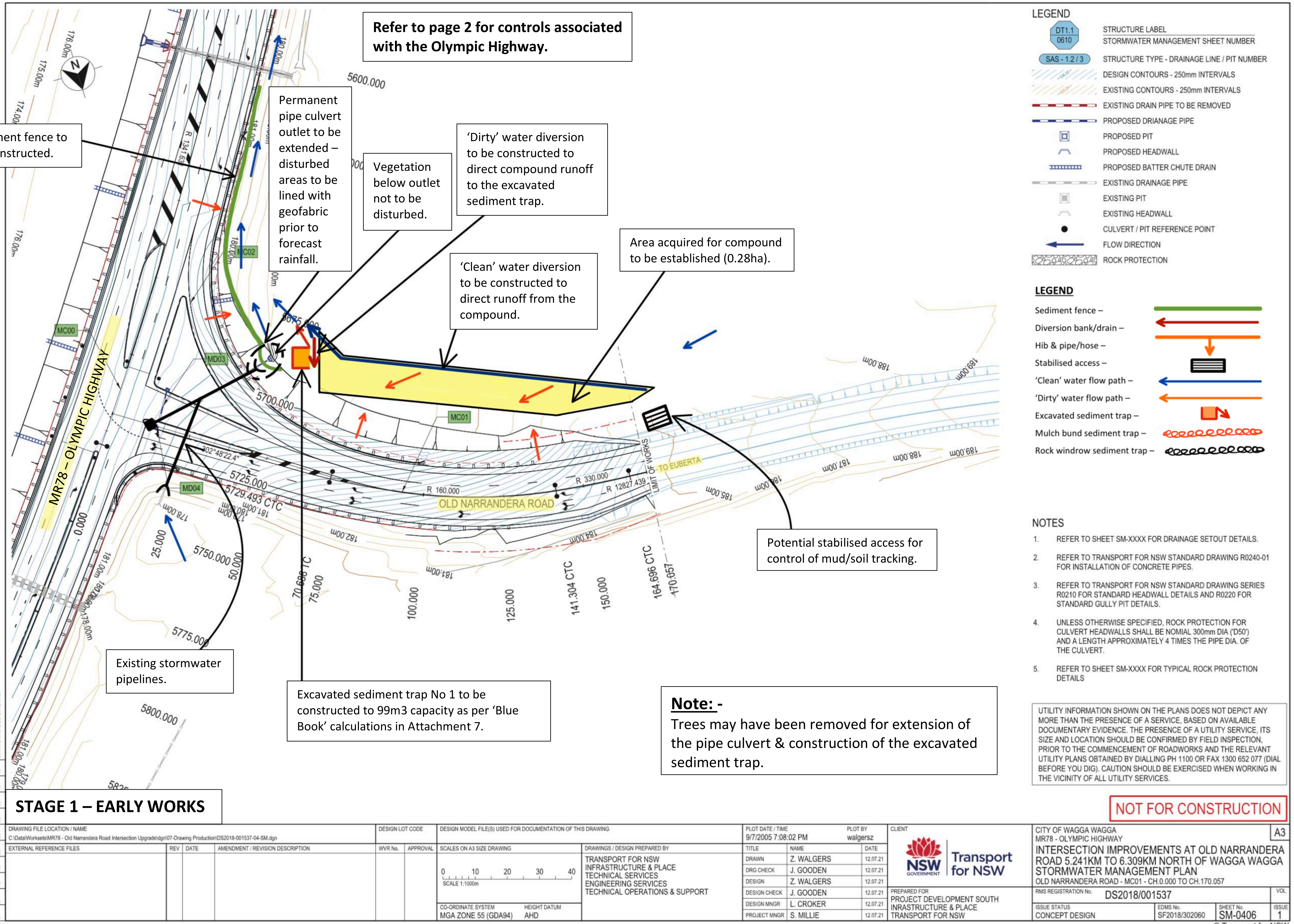

Refer to page 2 for controls associated with the Olympic Highway.
Sediment fence to be constructed.
Permanent pipe culvert outlet to be extended – disturbed areas to be lined with geofabric prior to forecast rainfall.
Vegetation below outlet not to be disturbed.
'Dirty' water diversion to be constructed to direct compound runoff to the excavated sediment trap.
Area acquired for compound to be established (0.28ha).
'Clean' water diversion to be constructed to direct runoff from the compound.
Potential stabilised access for control of mud/soil tracking.
Existing stormwater pipelines.
Excavated sediment trap No 1 to be constructed to 99m3 capacity as per 'Blue Book' calculations in Attachment 7.
Note: -
Trees may have been removed for extension of the pipe culvert & construction of the excavated sediment trap.
MR78 – OLYMPIC HIGHWAY
OLD NARRANDERA ROAD
TO EUBERTA
LIMIT OF WORKS
STAGE 1 – EARLY WORKS
LEGEND
STRUCTURE LABEL
STORMWATER MANAGEMENT SHEET NUMBER
STRUCTURE TYPE - DRAINAGE LINE / PIT NUMBER
DESIGN CONTOURS - 250mm INTERVALS
EXISTING CONTOURS - 250mm INTERVALS
EXISTING DRAIN PIPE TO BE REMOVED
PROPOSED DRAINAGE PIPE
PROPOSED PIT
PROPOSED HEADWALL
PROPOSED BATTER CHUTE DRAIN
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EXISTING PIT
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FLOW DIRECTION
ROCK PROTECTION
LEGEND
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Diversion bank/drain –
Hib & pipe/hose –
Stabilised access –
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CITY OF WAGGA WAGGA
MR78 - OLYMPIC HIGHWAY
INTERSECTION IMPROVEMENTS AT OLD NARRANDERA ROAD 5.241KM TO 6.309KM NORTH OF WAGGA WAGGA
STORMWATER MANAGEMENT PLAN
OLD NARRANDERA ROAD - MC01 - CH.0.000 TO CH.170.057
A3
TRANSPORT FOR NSW
INFRASTRUCTURE & PLACE
TECHNICAL SERVICES
ENGINEERING SERVICES
TECHNICAL OPERATIONS & SUPPORT
DRAWN Z. WALGERS
DRG CHECK J. GOODEN
DESIGN Z. WALGERS
DESIGN CHECK J. GOODEN
DESIGN MNGR L. CROKER
PROJECT MNGR S. MILLIE
PREPARED FOR PROJECT DEVELOPMENT SOUTH INRASTRUCTURE & PLACE TRANSPORT FOR NSW
RMS REGISTRATION No. DS2018/001537
ISSUE STATUS CONCEPT DESIGN
EDMS No. SF2018/302060
SHEET No. SM-0406
ISSUE 1
CO-ORDINATE SYSTEM MGA ZONE 55 (GDA94)
HEIGHT DATUM AHD
SCALE 1:1000m
PLOT DATE / TIME 9/7/2005 7:08:02 PM
PLOT BY walgersz
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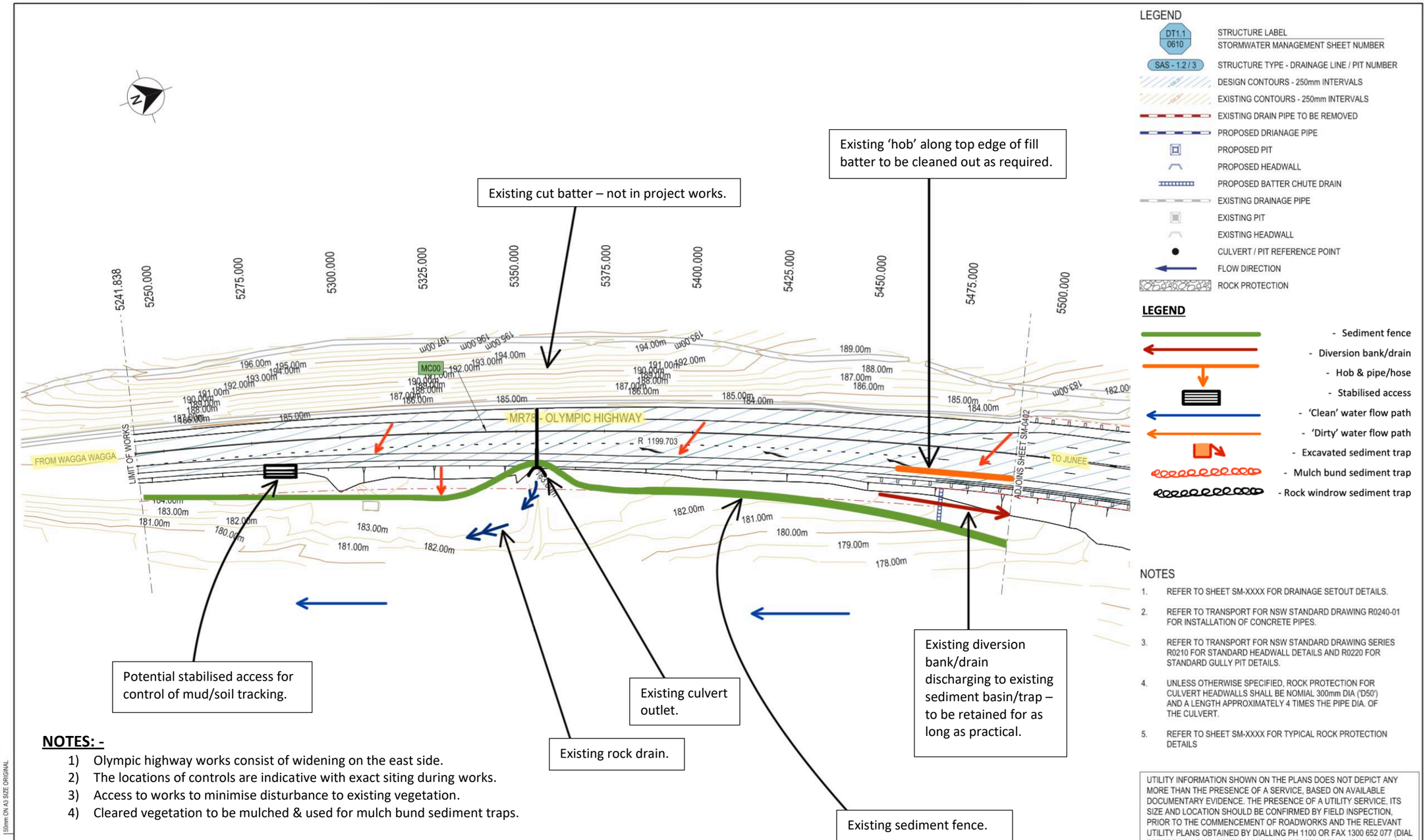

LEGEND

- DT1.1 / 0610 — STRUCTURE LABEL / STORMWATER MANAGEMENT SHEET NUMBER
- SAS - 1.2 / 3 — STRUCTURE TYPE - DRAINAGE LINE / PIT NUMBER
- DESIGN CONTOURS - 250mm INTERVALS
- EXISTING CONTOURS - 250mm INTERVALS
- EXISTING DRAIN PIPE TO BE REMOVED
- PROPOSED DRIANAGE PIPE
- PROPOSED PIT
- PROPOSED HEADWALL
- PROPOSED BATTER CHUTE DRAIN
- EXISTING DRAINAGE PIPE
- EXISTING PIT
- EXISTING HEADWALL
- CULVERT / PIT REFERENCE POINT
- FLOW DIRECTION
- ROCK PROTECTION

LEGEND

- Sediment fence
- Diversion bank/drain
- Hob & pipe/hose
- Stabilised access
- 'Clean' water flow path
- 'Dirty' water flow path
- Excavated sediment trap
- Mulch bund sediment trap
- Rock windrow sediment trap

NOTES

1. REFER TO SHEET SM-XXXX FOR DRAINAGE SETOUT DETAILS.
2. REFER TO TRANSPORT FOR NSW STANDARD DRAWING R0240-01 FOR INSTALLATION OF CONCRETE PIPES.
3. REFER TO TRANSPORT FOR NSW STANDARD DRAWING SERIES R0210 FOR STANDARD HEADWALL DETAILS AND R0220 FOR STANDARD GULLY PIT DETAILS.
4. UNLESS OTHERWISE SPECIFIED, ROCK PROTECTION FOR CULVERT HEADWALLS SHALL BE NOMIAL 300mm DIA ('D50') AND A LENGTH APPROXIMATELY 4 TIMES THE PIPE DIA. OF THE CULVERT.
5. REFER TO SHEET SM-XXXX FOR TYPICAL ROCK PROTECTION DETAILS

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NOTES: -

1) Olympic highway works consist of widening on the east side.
2) The locations of controls are indicative with exact siting during works.
3) Access to works to minimise disturbance to existing vegetation.
4) Cleared vegetation to be mulched & used for mulch bund sediment traps.

MR 78 OLYMPIC HIGHWAY – OLD NARRANDERA ROAD INTERSECTION UPGRADE.
CONCEPT EROSION & SEDIMENT CONTROL PLAN/ STRATEGY – STAGE 2 (CLEARNG)

NOT FOR CONSTRUCTION

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DRAWING FILE LOCATION / NAME: C:\Data\Worksets\MR78 - Old Narrandera Road Intersection Upgrade\dgn\07-Drawing Production\DS2018-001537-04-SM.dgn	DESIGN LOT CODE	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING	PLOT DATE / TIME: 9/7/2005 7:08:02 PM — PLOT BY: walgersz
CLIENT: NSW GOVERNMENT Transport for NSW	CITY OF WAGGA WAGGA MR78 - OLYMPIC HIGHWAY INTERSECTION IMPROVEMENTS AT OLD NARRANDERA ROAD 5.241KM TO 6.309KM NORTH OF WAGGA WAGGA STORMWATER MANAGEMENT PLAN MR78 - OLYMPIC HIGHWAY - MC00 - CH.5241.838 TO CH.5491.838		A3

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL

SCALES ON A3 SIZE DRAWING: 0 10 20 30 40 — SCALE 1:1000m
CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) — HEIGHT DATUM: AHD

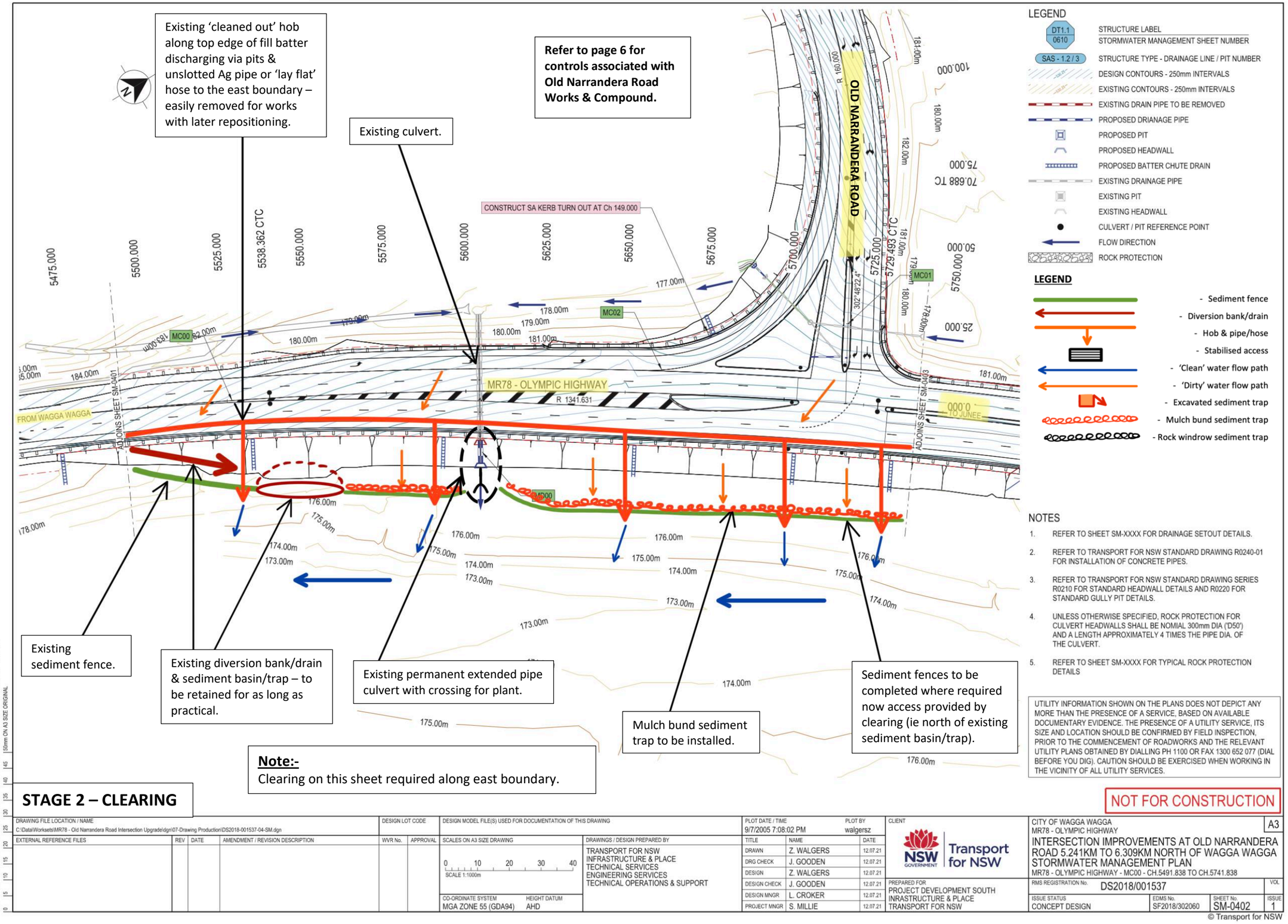
DRAWINGS / DESIGN PREPARED BY:
TRANSPORT FOR NSW
INFRASTRUCTURE & PLACE
TECHNICAL SERVICES
ENGINEERING SERVICES
TECHNICAL OPERATIONS & SUPPORT

	NAME	DATE
TITLE		
DRAWN	Z. WALGERS	12.07.21
DRG CHECK	J. GOODEN	12.07.21
DESIGN	Z. WALGERS	12.07.21
DESIGN CHECK	J. GOODEN	12.07.21
DESIGN MNGR	L. CROKER	12.07.21
PROJECT MNGR	S. MILLIE	12.07.21

PREPARED FOR: PROJECT DEVELOPMENT SOUTH, INRASTRUCTURE & PLACE, TRANSPORT FOR NSW

RMS REGISTRATION No.	VOL
DS2018/001537	

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
CONCEPT DESIGN	SF2018/302060	SM-0401	1


Existing 'cleaned out' hob along top edge of fill batter discharging via pits & unslotted Ag pipe or 'lay flat' hose to the east boundary – easily removed for works with later repositioning.
Existing culvert.
Refer to page 6 for controls associated with Old Narrandera Road Works & Compound.
OLD NARRANDERA ROAD
CONSTRUCT SA KERB TURN OUT AT Ch 149.000
MR78 - OLYMPIC HIGHWAY
R 1341.631
MC00
MC01
MC02
FROM WAGGA WAGGA
TO JUNEE
ADJOINS SHEET SM-0401
ADJOINS SHEET SM-0403
Existing sediment fence.
Existing diversion bank/drain & sediment basin/trap – to be retained for as long as practical.
Existing permanent extended pipe culvert with crossing for plant.
Mulch bund sediment trap to be installed.
Sediment fences to be completed where required now access provided by clearing (ie north of existing sediment basin/trap).
Note:-
Clearing on this sheet required along east boundary.
LEGEND
STRUCTURE LABEL
STORMWATER MANAGEMENT SHEET NUMBER
STRUCTURE TYPE - DRAINAGE LINE / PIT NUMBER
DESIGN CONTOURS - 250mm INTERVALS
EXISTING CONTOURS - 250mm INTERVALS
EXISTING DRAIN PIPE TO BE REMOVED
PROPOSED DRIANAGE PIPE
PROPOSED PIT
PROPOSED HEADWALL
PROPOSED BATTER CHUTE DRAIN
EXISTING DRAINAGE PIPE
EXISTING PIT
EXISTING HEADWALL
CULVERT / PIT REFERENCE POINT
FLOW DIRECTION
ROCK PROTECTION
LEGEND
- Sediment fence
- Diversion bank/drain
- Hob & pipe/hose
- Stabilised access
- 'Clean' water flow path
- 'Dirty' water flow path
- Excavated sediment trap
- Mulch bund sediment trap
- Rock windrow sediment trap
NOTES
1. REFER TO SHEET SM-XXXX FOR DRAINAGE SETOUT DETAILS.
2. REFER TO TRANSPORT FOR NSW STANDARD DRAWING R0240-01 FOR INSTALLATION OF CONCRETE PIPES.
3. REFER TO TRANSPORT FOR NSW STANDARD DRAWING SERIES R0210 FOR STANDARD HEADWALL DETAILS AND R0220 FOR STANDARD GULLY PIT DETAILS.
4. UNLESS OTHERWISE SPECIFIED, ROCK PROTECTION FOR CULVERT HEADWALLS SHALL BE NOMIAL 300mm DIA ('D50') AND A LENGTH APPROXIMATELY 4 TIMES THE PIPE DIA. OF THE CULVERT.
5. REFER TO SHEET SM-XXXX FOR TYPICAL ROCK PROTECTION DETAILS
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NOT FOR CONSTRUCTION
STAGE 2 – CLEARING
DRAWING FILE LOCATION / NAME
C:\Data\Worksets\MR78 - Old Narrandera Road Intersection Upgrade\dgn\07-Drawing Production\DS2018-001537-04-SM.dgn
DESIGN LOT CODE
DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING
PLOT DATE / TIME 9/7/2005 7:08:02 PM
PLOT BY walgersz
EXTERNAL REFERENCE FILES
REV | DATE | AMENDMENT / REVISION DESCRIPTION | WVR No. | APPROVAL
SCALES ON A3 SIZE DRAWING
0 10 20 30 40
SCALE 1:1000m
CO-ORDINATE SYSTEM MGA ZONE 55 (GDA94)
HEIGHT DATUM AHD
DRAWINGS / DESIGN PREPARED BY
TRANSPORT FOR NSW
INFRASTRUCTURE & PLACE
TECHNICAL SERVICES
ENGINEERING SERVICES
TECHNICAL OPERATIONS & SUPPORT
TITLE | NAME | DATE
DRAWN Z. WALGERS 12.07.21
DRG CHECK J. GOODEN 12.07.21
DESIGN Z. WALGERS 12.07.21
DESIGN CHECK J. GOODEN 12.07.21
DESIGN MNGR L. CROKER 12.07.21
PROJECT MNGR S. MILLIE 12.07.21
CLIENT
NSW GOVERNMENT Transport for NSW
PREPARED FOR
PROJECT DEVELOPMENT SOUTH
INRASTRUCTURE & PLACE
TRANSPORT FOR NSW
CITY OF WAGGA WAGGA
MR78 - OLYMPIC HIGHWAY
A3
INTERSECTION IMPROVEMENTS AT OLD NARRANDERA ROAD 5.241KM TO 6.309KM NORTH OF WAGGA WAGGA
STORMWATER MANAGEMENT PLAN
MR78 - OLYMPIC HIGHWAY - MC00 - CH.5491.838 TO CH.5741.838
RMS REGISTRATION No. DS2018/001537
VOL
ISSUE STATUS CONCEPT DESIGN
EDMS No. SF2018/302060
SHEET No. SM-0402
ISSUE 1
THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
50mm ON A3 SIZE ORIGINAL
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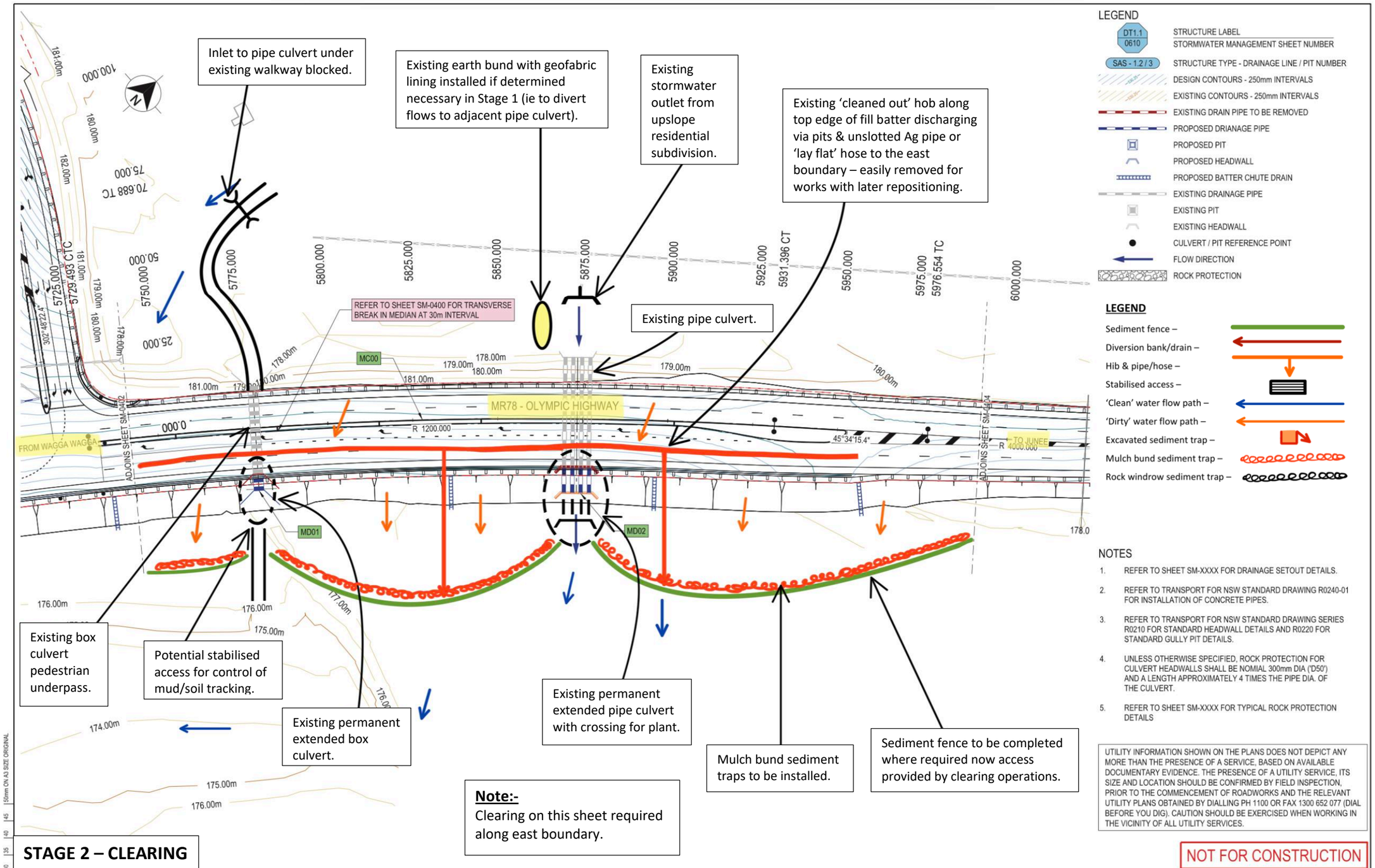
Inlet to pipe culvert under existing walkway blocked.
Existing earth bund with geofabric lining installed if determined necessary in Stage 1 (ie to divert flows to adjacent pipe culvert).
Existing stormwater outlet from upslope residential subdivision.
Existing 'cleaned out' hob along top edge of fill batter discharging via pits & unslotted Ag pipe or 'lay flat' hose to the east boundary – easily removed for works with later repositioning.
Existing pipe culvert.
REFER TO SHEET SM-0400 FOR TRANSVERSE BREAK IN MEDIAN AT 30m INTERVAL
MR78 - OLYMPIC HIGHWAY
MC00
MD01
MD02
FROM WAGGA WAGGA
TO JUNEE
ADJOINS SHEET SM-0402
ADJOINS SHEET SM-0404
Existing box culvert pedestrian underpass.
Potential stabilised access for control of mud/soil tracking.
Existing permanent extended box culvert.
Existing permanent extended pipe culvert with crossing for plant.
Mulch bund sediment traps to be installed.
Sediment fence to be completed where required now access provided by clearing operations.
Note:-
Clearing on this sheet required along east boundary.
LEGEND
STRUCTURE LABEL
STORMWATER MANAGEMENT SHEET NUMBER
STRUCTURE TYPE - DRAINAGE LINE / PIT NUMBER
DESIGN CONTOURS - 250mm INTERVALS
EXISTING CONTOURS - 250mm INTERVALS
EXISTING DRAIN PIPE TO BE REMOVED
PROPOSED DRIANAGE PIPE
PROPOSED PIT
PROPOSED HEADWALL
PROPOSED BATTER CHUTE DRAIN
EXISTING DRAINAGE PIPE
EXISTING PIT
EXISTING HEADWALL
CULVERT / PIT REFERENCE POINT
FLOW DIRECTION
ROCK PROTECTION
LEGEND
Sediment fence –
Diversion bank/drain –
Hib & pipe/hose –
Stabilised access –
'Clean' water flow path –
'Dirty' water flow path –
Excavated sediment trap –
Mulch bund sediment trap –
Rock windrow sediment trap –
NOTES
1. REFER TO SHEET SM-XXXX FOR DRAINAGE SETOUT DETAILS.
2. REFER TO TRANSPORT FOR NSW STANDARD DRAWING R0240-01 FOR INSTALLATION OF CONCRETE PIPES.
3. REFER TO TRANSPORT FOR NSW STANDARD DRAWING SERIES R0210 FOR STANDARD HEADWALL DETAILS AND R0220 FOR STANDARD GULLY PIT DETAILS.
4. UNLESS OTHERWISE SPECIFIED, ROCK PROTECTION FOR CULVERT HEADWALLS SHALL BE NOMIAL 300mm DIA ('D50') AND A LENGTH APPROXIMATELY 4 TIMES THE PIPE DIA. OF THE CULVERT.
5. REFER TO SHEET SM-XXXX FOR TYPICAL ROCK PROTECTION DETAILS
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NOT FOR CONSTRUCTION
STAGE 2 – CLEARING
THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
50mm ON A3 SIZE ORIGINAL
DRAWING FILE LOCATION / NAME
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EXTERNAL REFERENCE FILES
REV
DATE
AMENDMENT / REVISION DESCRIPTION
DESIGN LOT CODE
WVR No.
APPROVAL
DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING
SCALES ON A3 SIZE DRAWING
0 10 20 30 40
SCALE 1:1000m
CO-ORDINATE SYSTEM
MGA ZONE 55 (GDA94)
HEIGHT DATUM
AHD
DRAWINGS / DESIGN PREPARED BY
TRANSPORT FOR NSW
INFRASTRUCTURE & PLACE
TECHNICAL SERVICES
ENGINEERING SERVICES
TECHNICAL OPERATIONS & SUPPORT
PLOT DATE / TIME
9/7/2005 7:08:02 PM
PLOT BY
walgersz
TITLE / NAME / DATE
DRAWN Z. WALGERS 12.07.21
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DESIGN MNGR L. CROKER 12.07.21
PROJECT MNGR S. MILLIE 12.07.21
CLIENT
NSW GOVERNMENT Transport for NSW
PREPARED FOR
PROJECT DEVELOPMENT SOUTH
INRASTRUCTURE & PLACE
TRANSPORT FOR NSW
CITY OF WAGGA WAGGA
MR78 - OLYMPIC HIGHWAY
A3
INTERSECTION IMPROVEMENTS AT OLD NARRANDERA ROAD 5.241KM TO 6.309KM NORTH OF WAGGA WAGGA
STORMWATER MANAGEMENT PLAN
MR78 - OLYMPIC HIGHWAY - MC00 - CH.5741.838 TO CH.5991.838
RMS REGISTRATION No. DS2018/001537
VOL
ISSUE STATUS CONCEPT DESIGN
EDMS No. SF2018/302060
SHEET No. SM-0403
ISSUE 1
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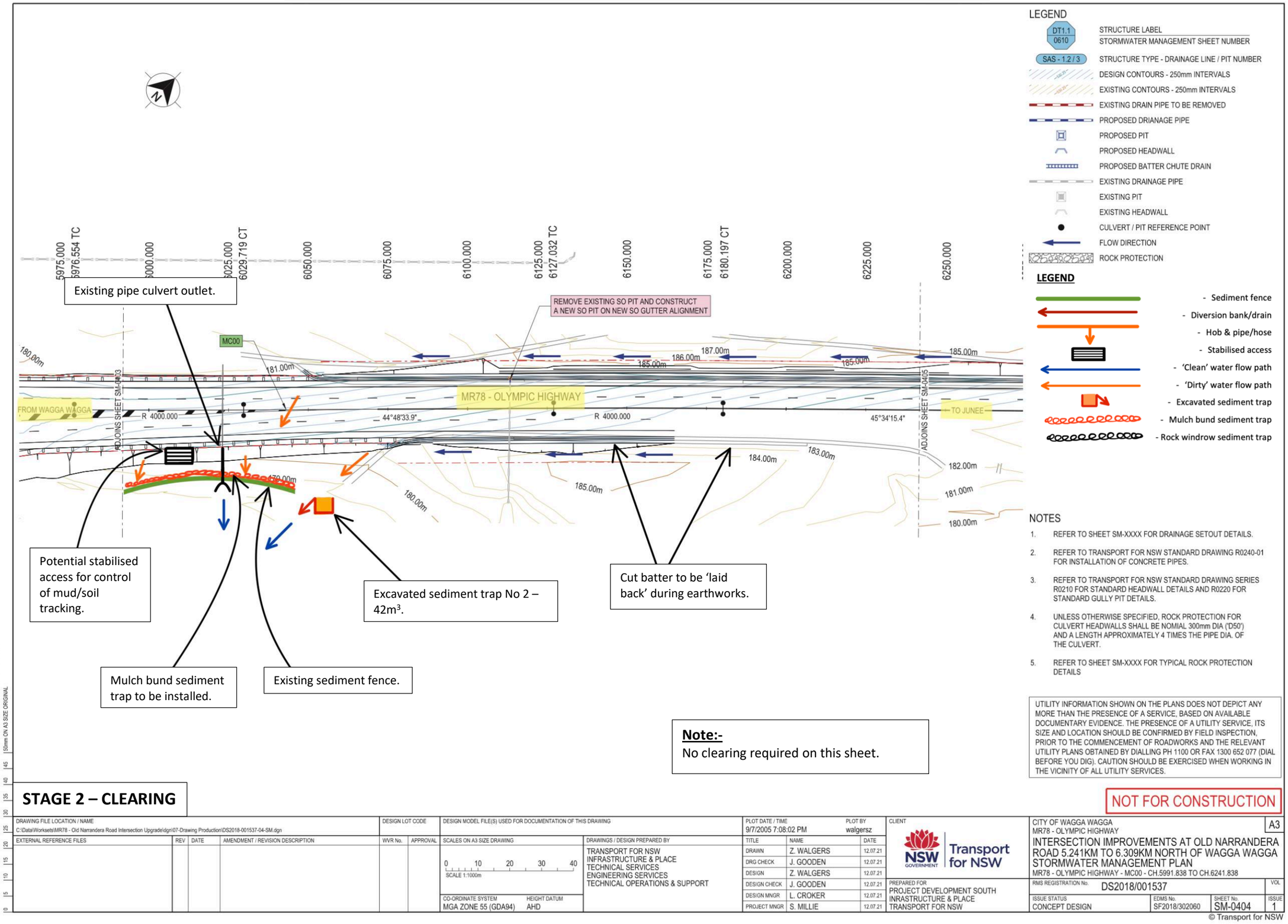
LEGEND
DT1.1 0610
STRUCTURE LABEL
STORMWATER MANAGEMENT SHEET NUMBER
SAS - 1.2 / 3
STRUCTURE TYPE - DRAINAGE LINE / PIT NUMBER
DESIGN CONTOURS - 250mm INTERVALS
EXISTING CONTOURS - 250mm INTERVALS
EXISTING DRAIN PIPE TO BE REMOVED
PROPOSED DRIANAGE PIPE
PROPOSED PIT
PROPOSED HEADWALL
PROPOSED BATTER CHUTE DRAIN
EXISTING DRAINAGE PIPE
EXISTING PIT
EXISTING HEADWALL
CULVERT / PIT REFERENCE POINT
FLOW DIRECTION
ROCK PROTECTION
LEGEND
- Sediment fence
- Diversion bank/drain
- Hob & pipe/hose
- Stabilised access
- 'Clean' water flow path
- 'Dirty' water flow path
- Excavated sediment trap
- Mulch bund sediment trap
- Rock windrow sediment trap
5975.000
5976.554 TC
6000.000
6025.000
6029.719 CT
6050.000
6075.000
6100.000
6125.000
6127.032 TC
6150.000
6175.000
6180.197 CT
6200.000
6225.000
6250.000
Existing pipe culvert outlet.
REMOVE EXISTING SO PIT AND CONSTRUCT A NEW SO PIT ON NEW SO GUTTER ALIGNMENT
MC00
180.00m
181.00m
185.00m
186.00m
187.00m
185.00m
185.00m
FROM WAGGA WAGGA
ADJOINS SHEET SM-0403
R 4000.000
44°48'33.9"
MR78 - OLYMPIC HIGHWAY
R 4000.000
45°34'15.4"
ADJOINS SHEET SM-0405
TO JUNEE
179.00m
180.00m
185.00m
184.00m
183.00m
182.00m
181.00m
180.00m
Potential stabilised access for control of mud/soil tracking.
Excavated sediment trap No 2 – 42m3.
Cut batter to be 'laid back' during earthworks.
Mulch bund sediment trap to be installed.
Existing sediment fence.
NOTES
1. REFER TO SHEET SM-XXXX FOR DRAINAGE SETOUT DETAILS.
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Note:-
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STAGE 2 – CLEARING
NOT FOR CONSTRUCTION
THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
50mm ON A3 SIZE ORIGINAL
DRAWING FILE LOCATION / NAME
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DESIGN LOT CODE
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A3
INTERSECTION IMPROVEMENTS AT OLD NARRANDERA ROAD 5.241KM TO 6.309KM NORTH OF WAGGA WAGGA
STORMWATER MANAGEMENT PLAN
MR78 - OLYMPIC HIGHWAY - MC00 - CH.5991.838 TO CH.6241.838
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DS2018/001537
VOL
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CONCEPT DESIGN
EDMS No.
SF2018/302060
SHEET No.
SM-0404
ISSUE
1
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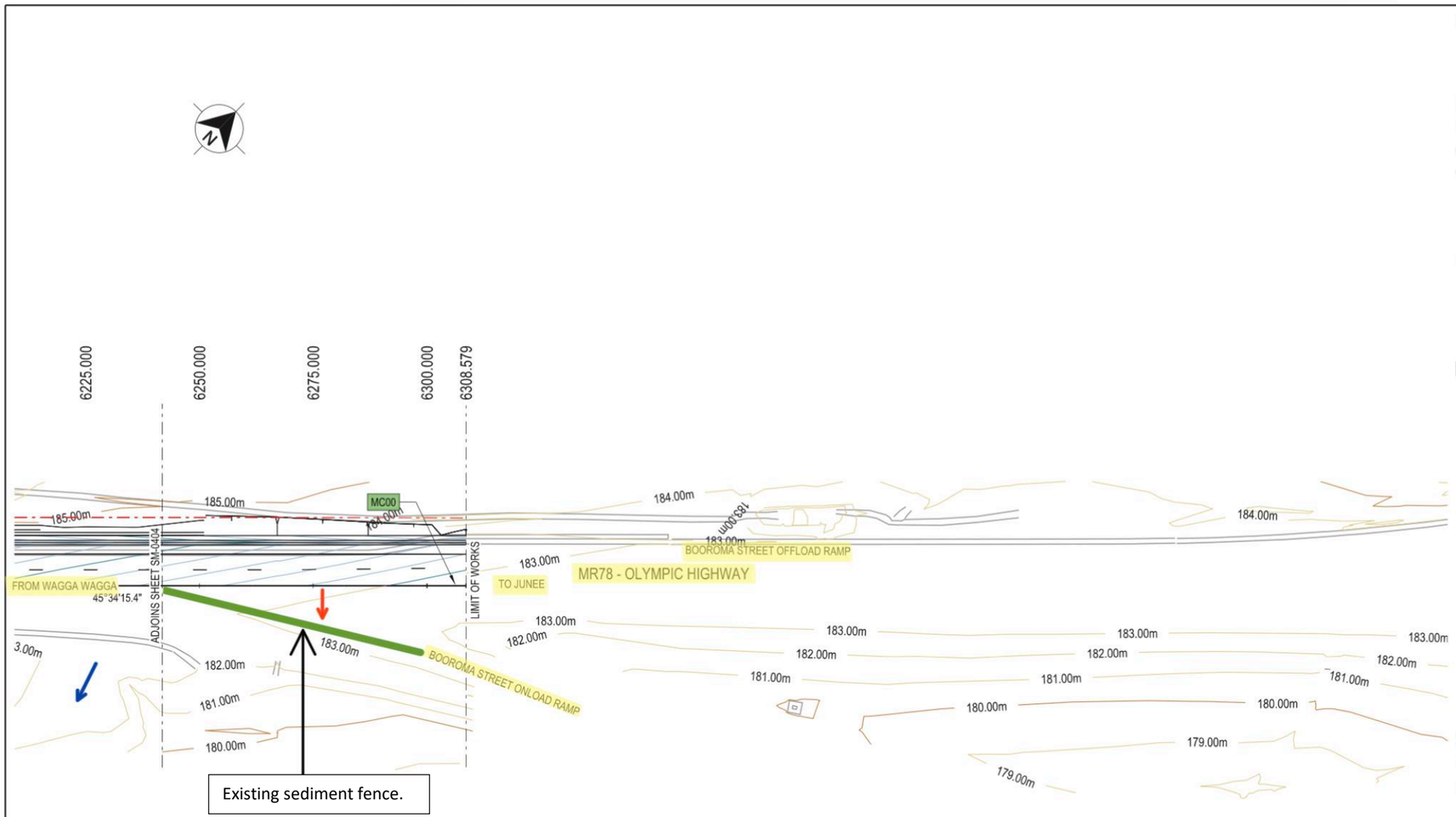

LEGEND

- DT1.1 / 0610 — STRUCTURE LABEL / STORMWATER MANAGEMENT SHEET NUMBER
- SAS - 1.2 / 3 — STRUCTURE TYPE - DRAINAGE LINE / PIT NUMBER
- DESIGN CONTOURS - 250mm INTERVALS
- EXISTING CONTOURS - 250mm INTERVALS
- EXISTING DRAIN PIPE TO BE REMOVED
- PROPOSED DRIANAGE PIPE
- PROPOSED PIT
- PROPOSED HEADWALL
- PROPOSED BATTER CHUTE DRAIN
- EXISTING DRAINAGE PIPE
- EXISTING PIT
- EXISTING HEADWALL
- CULVERT / PIT REFERENCE POINT
- FLOW DIRECTION
- ROCK PROTECTION

LEGEND

- Sediment fence
- Diversion bank/drain
- Hob & pipe/hose
- Stabilised access
- 'Clean' water flow path
- 'Dirty' water flow path
- Excavated sediment trap
- Mulch bund sediment trap
- Rock windrow sediment trap

NOTES

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5. REFER TO SHEET SM-XXXX FOR TYPICAL ROCK PROTECTION DETAILS

Note:-
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STAGE 2 – CLEARING

NOT FOR CONSTRUCTION

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DRAWING FILE LOCATION / NAME: C:\Data\Worksets\MR78 - Old Narrandera Road Intersection Upgrade\dgn\07-Drawing Production\DS2018-001537-04-SM.dgn	DESIGN LOT CODE	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING	PLOT DATE / TIME: 9/7/2005 7:08:02 PM; PLOT BY: walgersz
EXTERNAL REFERENCE FILES	REV / DATE / AMENDMENT / REVISION DESCRIPTION	WVR No. / APPROVAL	SCALES ON A3 SIZE DRAWING: 0 10 20 30 40, SCALE 1:1000m; CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94); HEIGHT DATUM: AHD
			DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ENGINEERING SERVICES, TECHNICAL OPERATIONS & SUPPORT

TITLE	NAME	DATE
DRAWN	Z. WALGERS	12.07.21
DRG CHECK	J. GOODEN	12.07.21
DESIGN	Z. WALGERS	12.07.21
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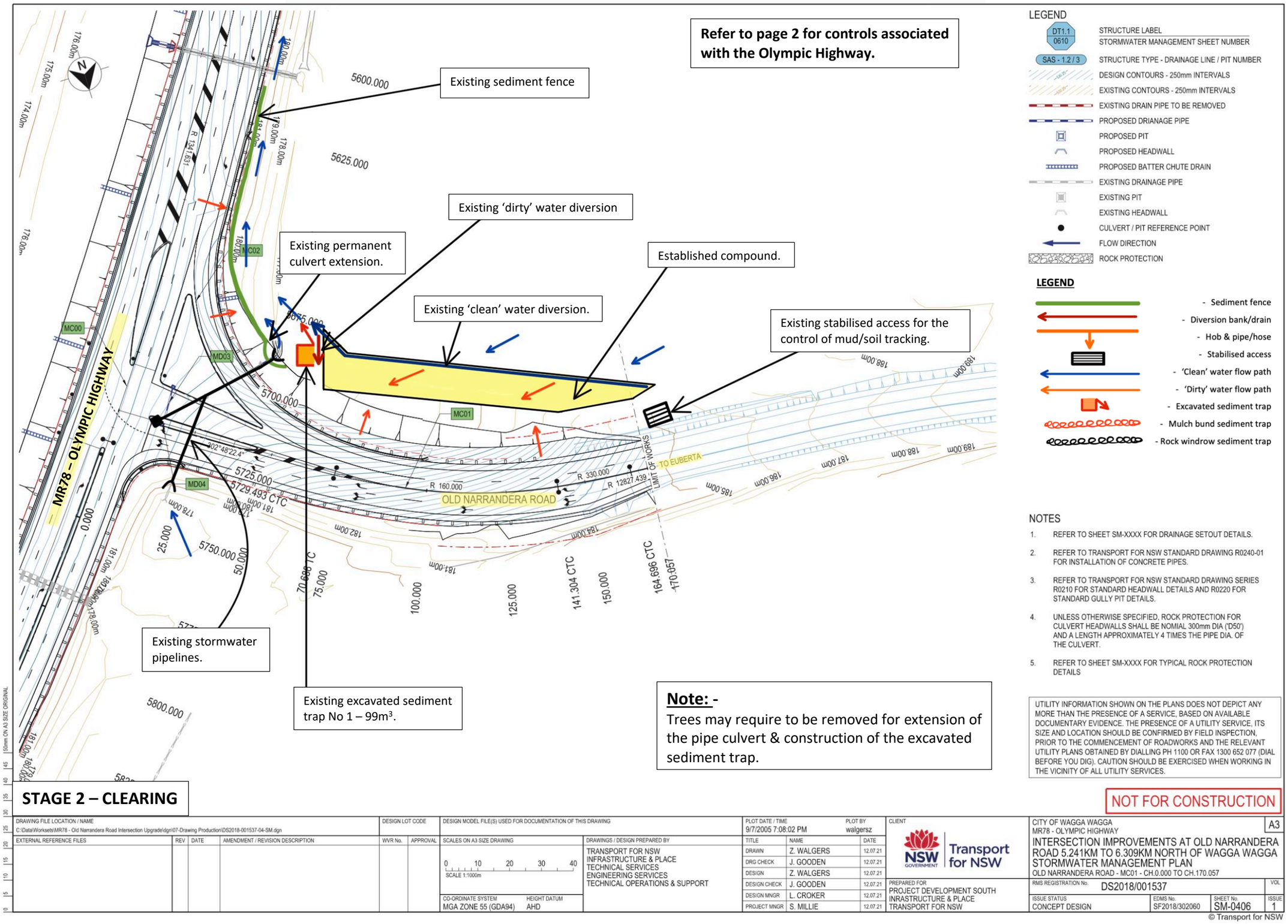
DESIGN MNGR	L. CROKER	12.07.21
PROJECT MNGR	S. MILLIE	12.07.21

CLIENT: NSW GOVERNMENT Transport for NSW
PREPARED FOR: PROJECT DEVELOPMENT SOUTH, INRASTRUCTURE & PLACE, TRANSPORT FOR NSW

CITY OF WAGGA WAGGA — A3
MR78 - OLYMPIC HIGHWAY
INTERSECTION IMPROVEMENTS AT OLD NARRANDERA ROAD 5.241KM TO 6.309KM NORTH OF WAGGA WAGGA
STORMWATER MANAGEMENT PLAN
MR78 - OLYMPIC HIGHWAY - MC00 - CH.6241.838 TO CH.6308.579

RMS REGISTRATION No.	VOL.
DS2018/001537	

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
CONCEPT DESIGN	SF2018/302060	SM-0405	1



Note: -
Trees may require to be removed for extension of the pipe culvert & construction of the excavated sediment trap.

NOTES

1. REFER TO SHEET SM-XXXX FOR DRAINAGE SETOUT DETAILS.
2. REFER TO TRANSPORT FOR NSW STANDARD DRAWING R0240-01 FOR INSTALLATION OF CONCRETE PIPES.
3. REFER TO TRANSPORT FOR NSW STANDARD DRAWING SERIES R0210 FOR STANDARD HEADWALL DETAILS AND R0220 FOR STANDARD GULLY PIT DETAILS.
4. UNLESS OTHERWISE SPECIFIED, ROCK PROTECTION FOR CULVERT HEADWALLS SHALL BE NOMIAL 300mm DIA ('D50') AND A LENGTH APPROXIMATELY 4 TIMES THE PIPE DIA. OF THE CULVERT.
5. REFER TO SHEET SM-XXXX FOR TYPICAL ROCK PROTECTION DETAILS

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STAGE 2 – CLEARING

NOT FOR CONSTRUCTION

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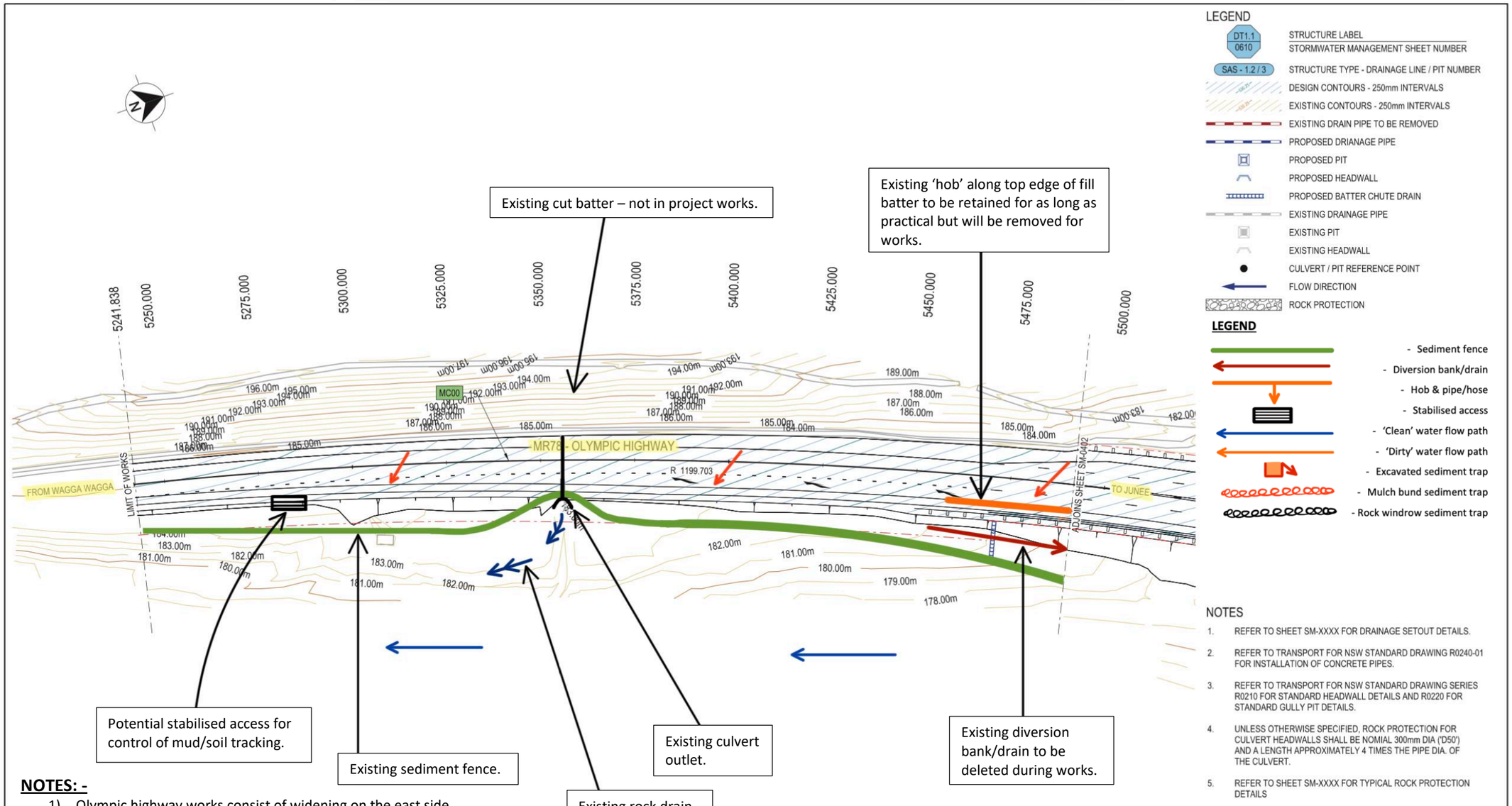
DRAWING FILE LOCATION / NAME: C:\Data\Worksets\MR78 - Old Narrandera Road Intersection Upgrade\dgn\07-Drawing Production\DS2018-001537-04-SM.dgn	DESIGN LOT CODE	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING	PLOT DATE / TIME: 9/7/2005 7:08:02 PM; PLOT BY: walgersz
EXTERNAL REFERENCE FILES	REV / DATE / AMENDMENT / REVISION DESCRIPTION	WVR No. / APPROVAL	SCALES ON A3 SIZE DRAWING: 0 10 20 30 40, SCALE 1:1000m; CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94); HEIGHT DATUM: AHD
		DRAWINGS / DESIGN PREPARED BY	TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ENGINEERING SERVICES, TECHNICAL OPERATIONS & SUPPORT

TITLE	NAME	DATE
DRAWN	Z. WALGERS	12.07.21
DRG CHECK	J. GOODEN	12.07.21
DESIGN	Z. WALGERS	12.07.21
DESIGN CHECK	J. GOODEN	12.07.21
DESIGN MNGR	L. CROKER	12.07.21
PROJECT MNGR	S. MILLIE	12.07.21

CLIENT: NSW GOVERNMENT Transport for NSW
PREPARED FOR: PROJECT DEVELOPMENT SOUTH, INRASTRUCTURE & PLACE, TRANSPORT FOR NSW

CITY OF WAGGA WAGGA — A3
MR78 - OLYMPIC HIGHWAY
INTERSECTION IMPROVEMENTS AT OLD NARRANDERA ROAD 5.241KM TO 6.309KM NORTH OF WAGGA WAGGA
STORMWATER MANAGEMENT PLAN
OLD NARRANDERA ROAD - MC01 - CH.0.000 TO CH.170.057

RMS REGISTRATION No. DS2018/001537				VOL
ISSUE STATUS: CONCEPT DESIGN	EDMS No.: SF2018/302060	SHEET No.: SM-0406	ISSUE: 1	



LEGEND

- DT1.1 / 0610 — STRUCTURE LABEL / STORMWATER MANAGEMENT SHEET NUMBER
- SAS - 1.2 / 3 — STRUCTURE TYPE - DRAINAGE LINE / PIT NUMBER
- DESIGN CONTOURS - 250mm INTERVALS
- EXISTING CONTOURS - 250mm INTERVALS
- EXISTING DRAIN PIPE TO BE REMOVED
- PROPOSED DRIANAGE PIPE
- PROPOSED PIT
- PROPOSED HEADWALL
- PROPOSED BATTER CHUTE DRAIN
- EXISTING DRAINAGE PIPE
- EXISTING PIT
- EXISTING HEADWALL
- CULVERT / PIT REFERENCE POINT
- FLOW DIRECTION
- ROCK PROTECTION

LEGEND

- Sediment fence
- Diversion bank/drain
- Hob & pipe/hose
- Stabilised access
- 'Clean' water flow path
- 'Dirty' water flow path
- Excavated sediment trap
- Mulch bund sediment trap
- Rock windrow sediment trap

NOTES: -

1) Olympic highway works consist of widening on the east side.
2) The locations of controls are indicative with exact siting during works.
3) Progressive revegetation, upper zone road works (eg sealing etc), miscellaneous works (eg batter drains) to be carried out following bulk earth works (ie finishing works).

NOTES

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MR 78 OLYMPIC HIGHWAY – OLD NARRANDERA ROAD INTERSECTION UPGRADE.
CONCEPT EROSION & SEDIMENT CONTROL PLAN/ STRATEGY – STAGE 3 (BULK EARTHWORKS)

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\MR78 - Old Narrandera Road Intersection Upgrade\dgn\07-Drawing Production\DS2018-001537-04-SM.dgn	DESIGN LOT CODE	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING	PLOT DATE / TIME: 9/7/2005 7:08:02 PM; PLOT BY: walgersz
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			DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ENGINEERING SERVICES, TECHNICAL OPERATIONS & SUPPORT

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DESIGN	Z. WALGERS	12.07.21	
DESIGN CHECK	J. GOODEN	12.07.21	
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CLIENT: NSW GOVERNMENT Transport for NSW
PREPARED FOR: PROJECT DEVELOPMENT SOUTH, INRASTRUCTURE & PLACE, TRANSPORT FOR NSW

CITY OF WAGGA WAGGA
MR78 - OLYMPIC HIGHWAY
A3
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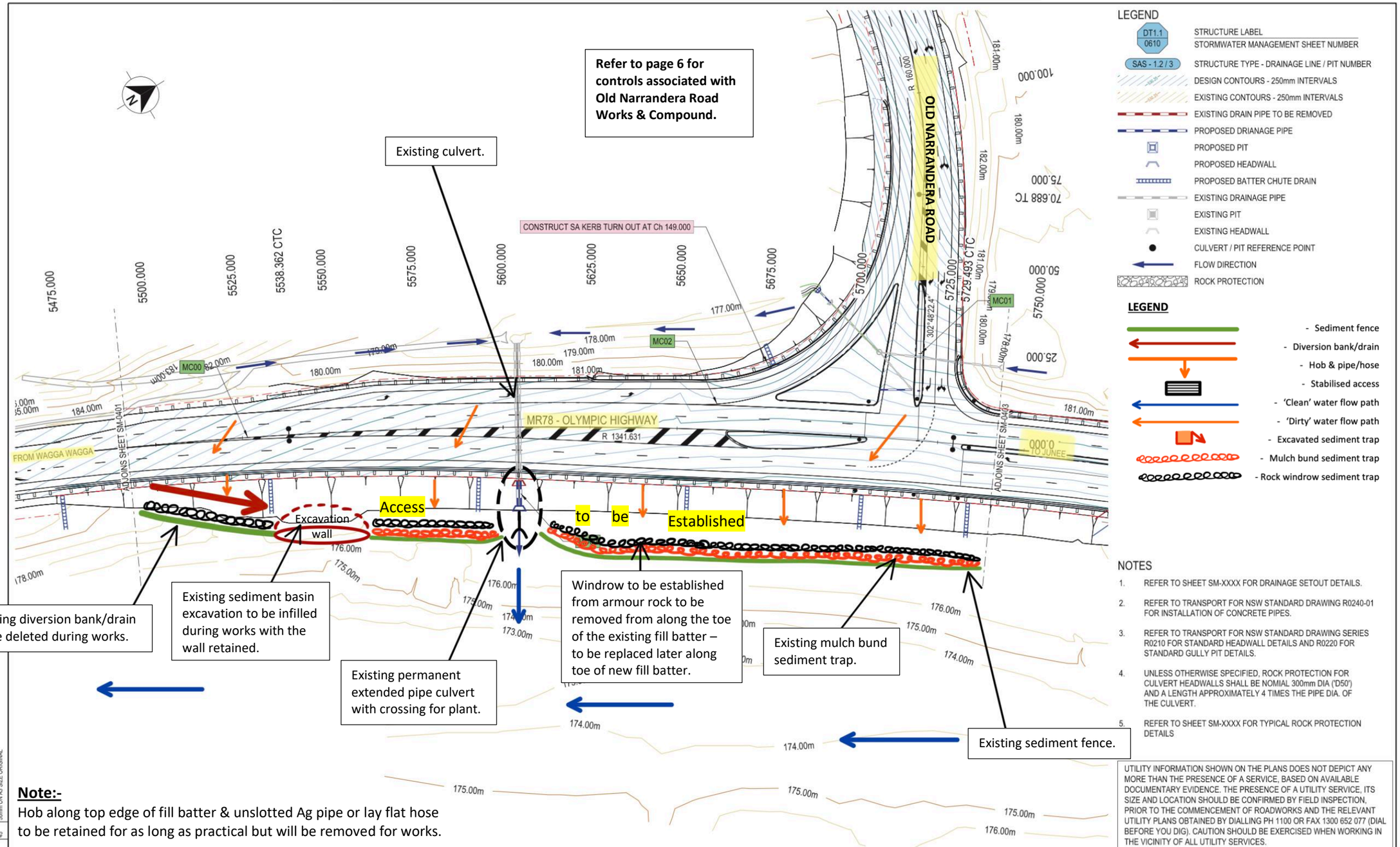
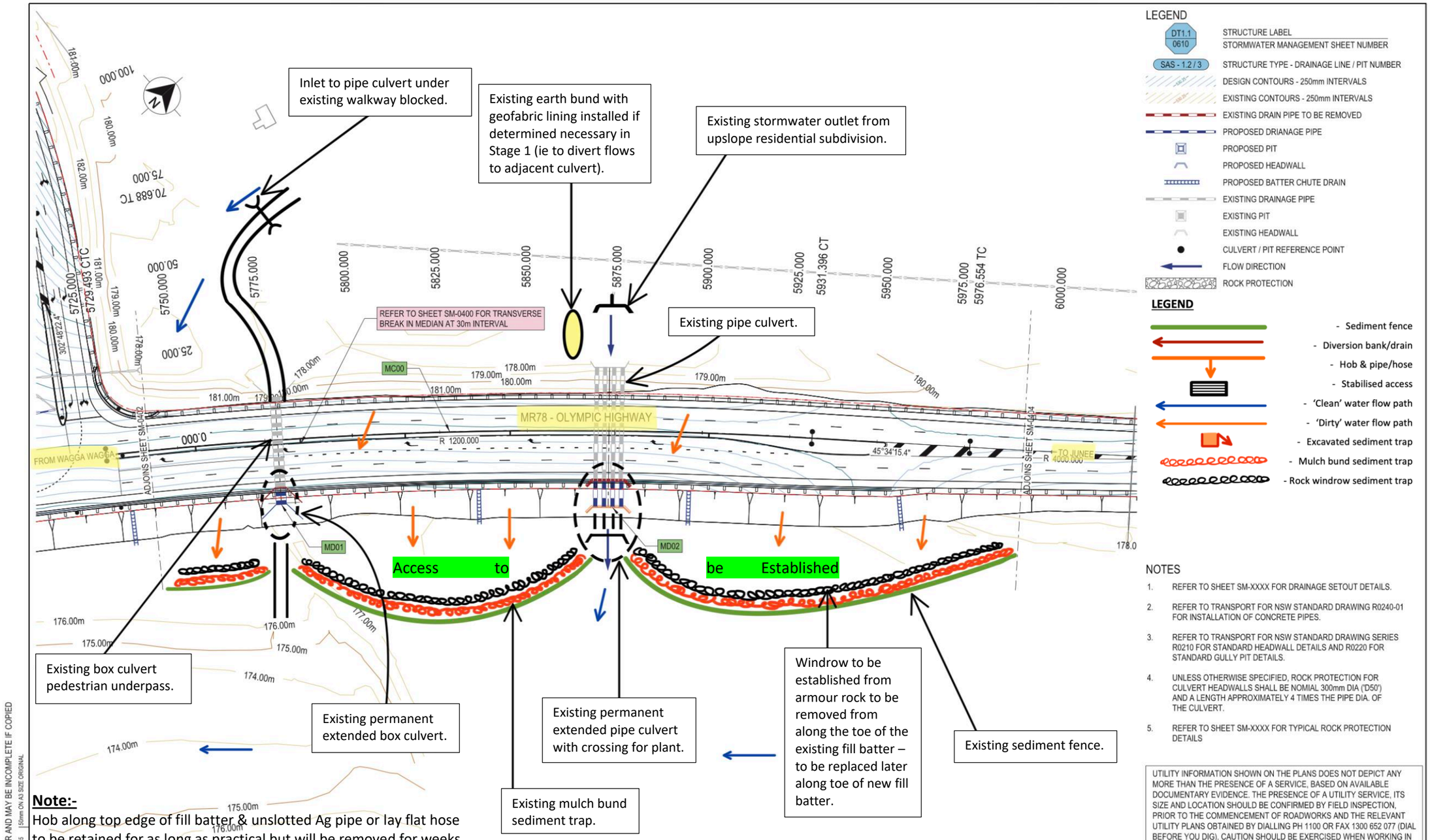
MR78 - OLYMPIC HIGHWAY - MC00 - CH.5241.838 TO CH.5491.838

RMS REGISTRATION No. DS2018/001537				VOL
ISSUE STATUS: CONCEPT DESIGN	EDMS No.: SF2018/302060	SHEET No.: SM-0401	ISSUE: 1	



Note:-
Hob along top edge of fill batter & unslotted Ag pipe or lay flat hose to be retained for as long as practical but will be removed for works.

STAGE 3 – BULK EARTHWORKS



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- EXISTING DRAINAGE PIPE
- EXISTING PIT
- EXISTING HEADWALL
- CULVERT / PIT REFERENCE POINT
- FLOW DIRECTION
- ROCK PROTECTION

LEGEND

- Sediment fence
- Diversion bank/drain
- Hob & pipe/hose
- Stabilised access
- 'Clean' water flow path
- 'Dirty' water flow path
- Excavated sediment trap
- Mulch bund sediment trap
- Rock windrow sediment trap

NOTES

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Note:-
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STAGE 3 – BULK EARTHWORKS

NOT FOR CONSTRUCTION

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EXTERNAL REFERENCE FILES	REV / DATE / AMENDMENT / REVISION DESCRIPTION	WVR No. / APPROVAL	SCALES ON A3 SIZE DRAWING: 0 10 20 30 40, SCALE 1:1000m
		CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94)	HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ENGINEERING SERVICES, TECHNICAL OPERATIONS & SUPPORT

	NAME	DATE
TITLE		
DRAWN	Z. WALGERS	12.07.21
DRG CHECK	J. GOODEN	12.07.21
DESIGN	Z. WALGERS	12.07.21
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DESIGN MNGR	L. CROKER	12.07.21
PROJECT MNGR	S. MILLIE	12.07.21

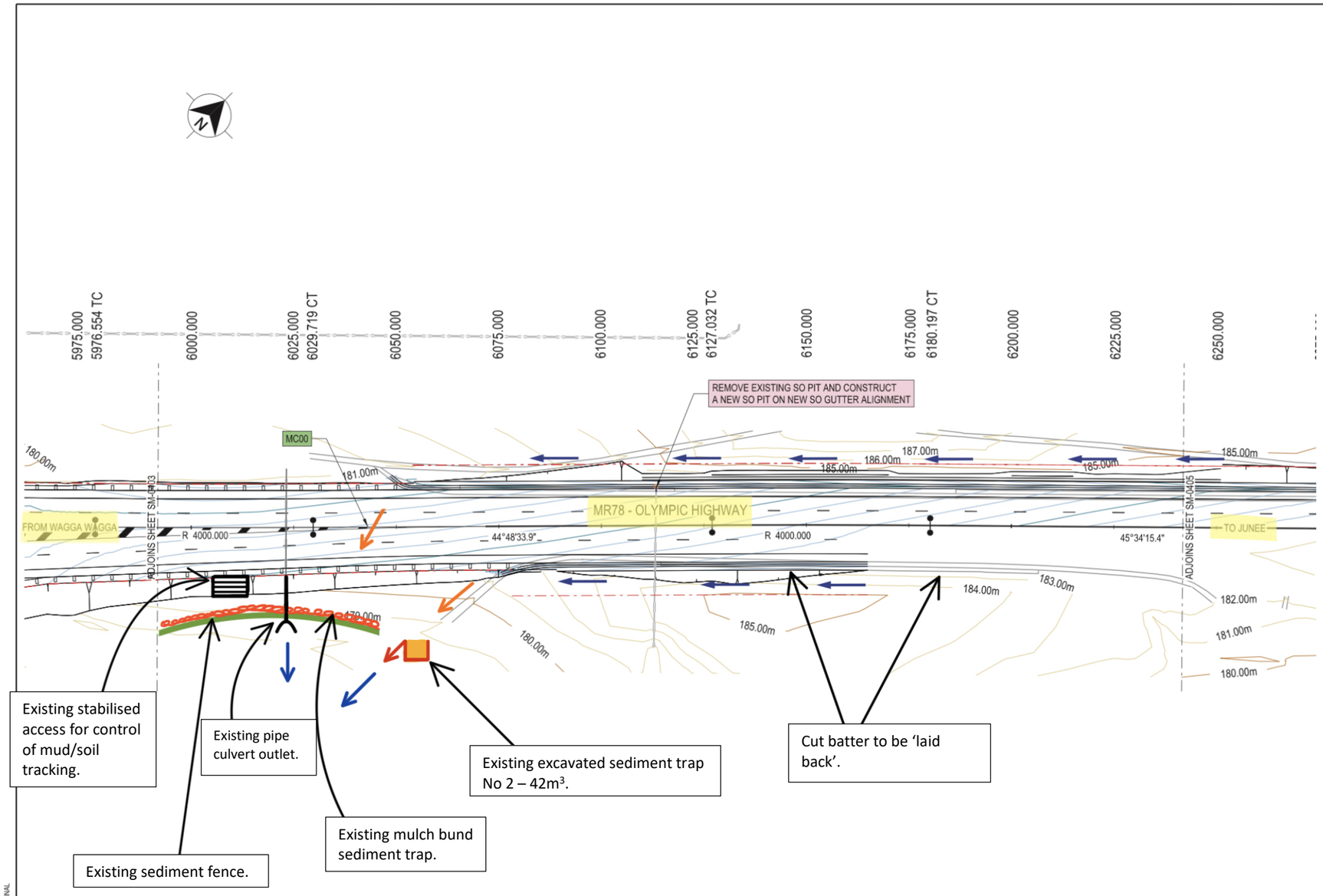
CLIENT: NSW GOVERNMENT Transport for NSW

PREPARED FOR: PROJECT DEVELOPMENT SOUTH, INRASTRUCTURE & PLACE, TRANSPORT FOR NSW

CITY OF WAGGA WAGGA
MR78 - OLYMPIC HIGHWAY
INTERSECTION IMPROVEMENTS AT OLD NARRANDERA ROAD 5.241KM TO 6.309KM NORTH OF WAGGA WAGGA
STORMWATER MANAGEMENT PLAN
MR78 - OLYMPIC HIGHWAY - MC00 - CH.5741.838 TO CH.5991.838

A3

RMS REGISTRATION No. DS2018/001537				VOL
ISSUE STATUS: CONCEPT DESIGN	EDMS No.: SF2018/302060	SHEET No.: SM-0403	ISSUE: 1	



LEGEND

- DT1.1 / 0610 — STRUCTURE LABEL / STORMWATER MANAGEMENT SHEET NUMBER
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- EXISTING PIT
- EXISTING HEADWALL
- CULVERT / PIT REFERENCE POINT
- FLOW DIRECTION
- ROCK PROTECTION

LEGEND

- Sediment fence
- Diversion bank/drain
- Hob & pipe/hose
- Stabilised access
- 'Clean' water flow path
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- Mulch bund sediment trap
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NOTES

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STAGE 3 – BULK EARTHWORKS

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DESIGN LOT CODE	
DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING	
PLOT DATE / TIME	9/7/2005 7:08:02 PM
PLOT BY	walgersz
CLIENT	NSW GOVERNMENT Transport for NSW
CITY OF WAGGA WAGGA	A3
MR78 - OLYMPIC HIGHWAY	
INTERSECTION IMPROVEMENTS AT OLD NARRANDERA ROAD 5.241KM TO 6.309KM NORTH OF WAGGA WAGGA STORMWATER MANAGEMENT PLAN	
MR78 - OLYMPIC HIGHWAY - MC00 - CH.5991.838 TO CH.6241.838	

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL

SCALES ON A3 SIZE DRAWING: 0 10 20 30 40 — SCALE 1:1000m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA94) — HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY:
TRANSPORT FOR NSW
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	NAME	DATE
TITLE		
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PROJECT MNGR	S. MILLIE	12.07.21

PREPARED FOR
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INRASTRUCTURE & PLACE
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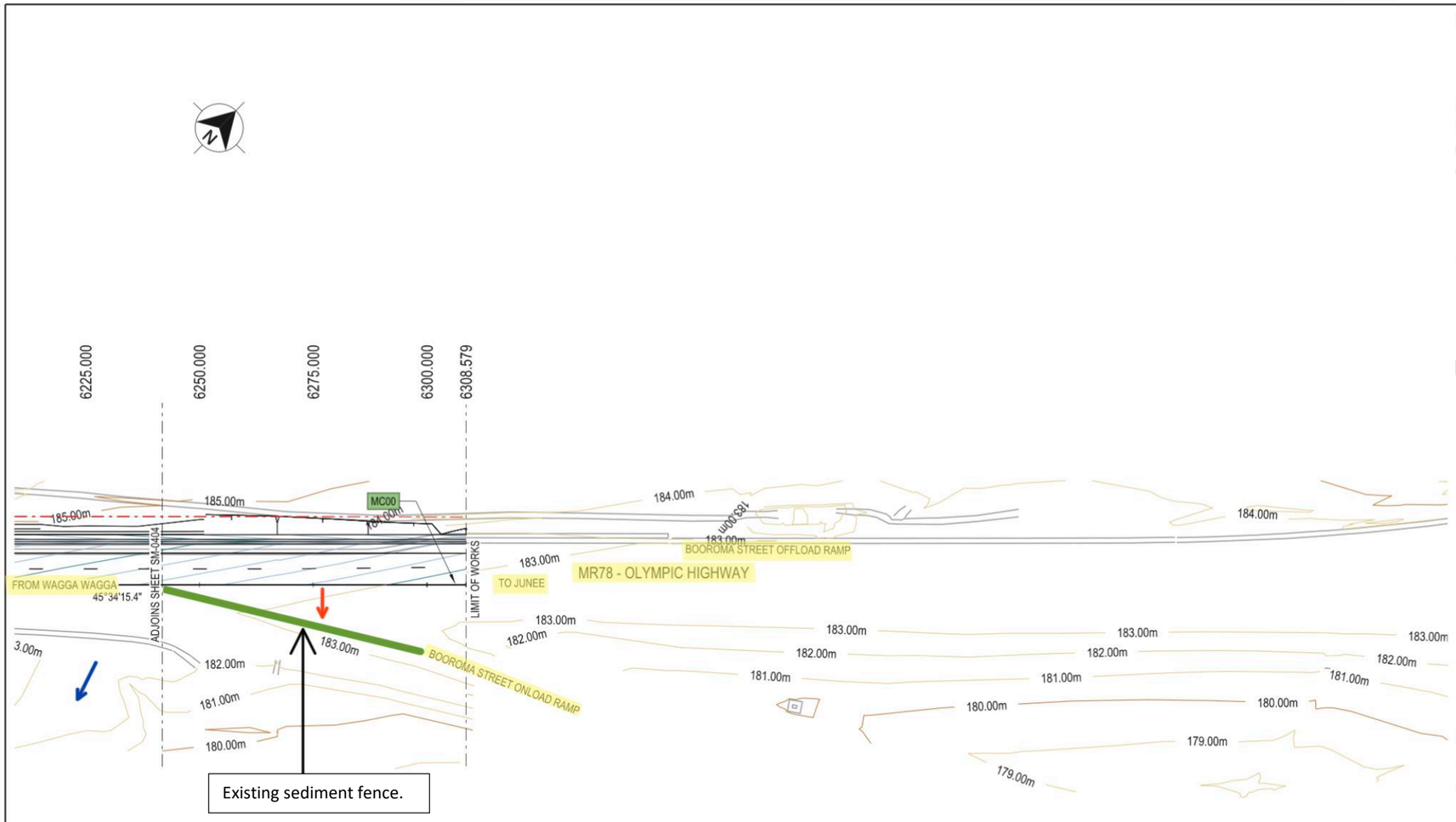
RMS REGISTRATION No.	VOL.
DS2018/001537	

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
CONCEPT DESIGN	SF2018/302060	SM-0404	1



LEGEND

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- PROPOSED DRIANAGE PIPE
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- CULVERT / PIT REFERENCE POINT
- FLOW DIRECTION
- ROCK PROTECTION

LEGEND

- Sediment fence
- Diversion bank/drain
- Hob & pipe/hose
- Stabilised access
- 'Clean' water flow path
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STAGE 3 – BULK EARTHWORKS

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0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\MR78 - Old Narrandera Road Intersection Upgrade\dgn\07-Drawing Production\DS2018-001537-04-SM.dgn	DESIGN LOT CODE	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING	PLOT DATE / TIME: 9/7/2005 7:08:02 PM; PLOT BY: walgersz
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DRAWINGS / DESIGN PREPARED BY:
TRANSPORT FOR NSW
INFRASTRUCTURE & PLACE
TECHNICAL SERVICES
ENGINEERING SERVICES
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PREPARED FOR: PROJECT DEVELOPMENT SOUTH, INRASTRUCTURE & PLACE, TRANSPORT FOR NSW

CITY OF WAGGA WAGGA
MR78 - OLYMPIC HIGHWAY
A3

INTERSECTION IMPROVEMENTS AT OLD NARRANDERA ROAD 5.241KM TO 6.309KM NORTH OF WAGGA WAGGA
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MR78 - OLYMPIC HIGHWAY - MC00 - CH.6241.838 TO CH.6308.579

RMS REGISTRATION No.: DS2018/001537 — VOL.

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
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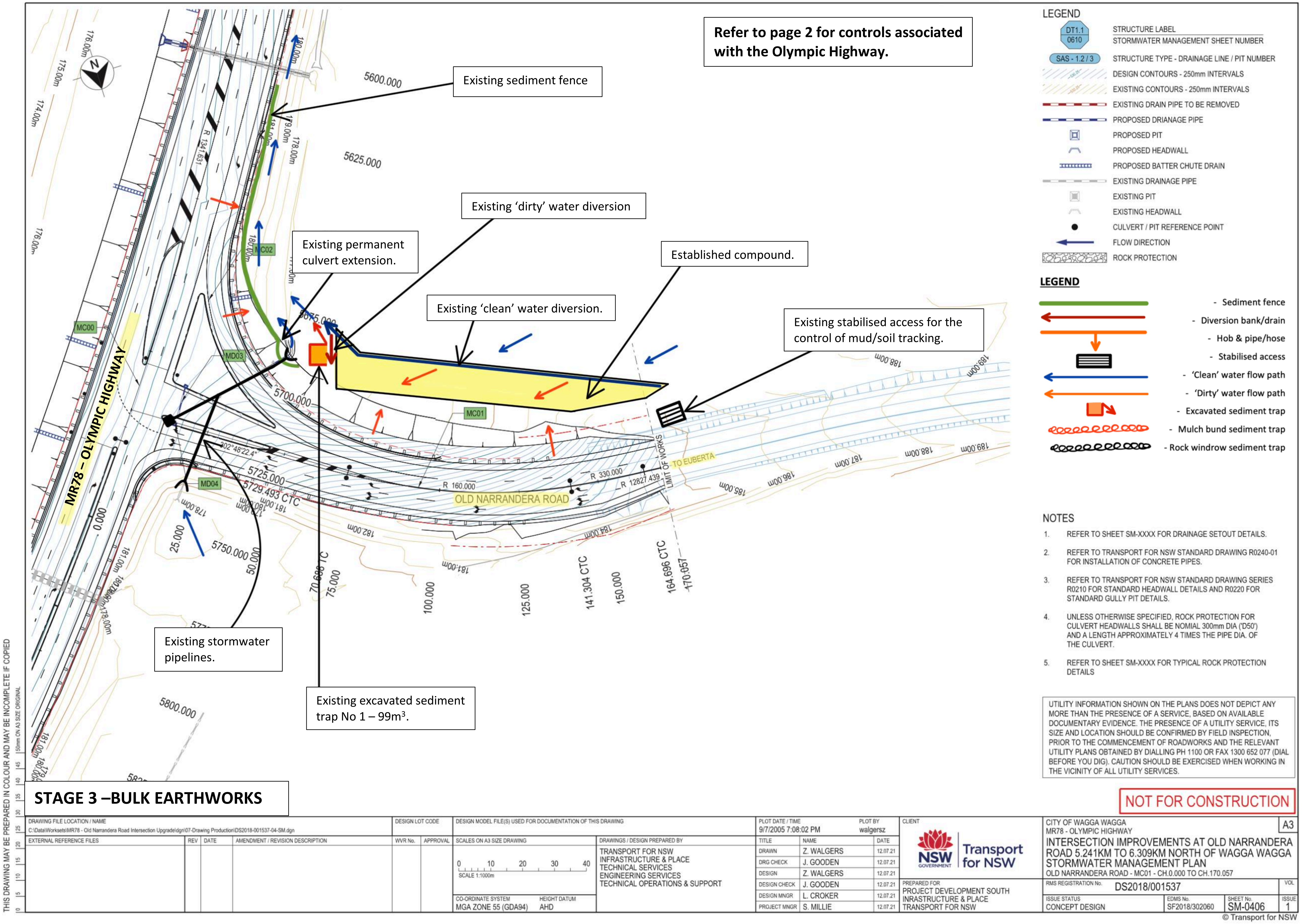
Refer to page 2 for controls associated with the Olympic Highway.
Existing sediment fence
Existing 'dirty' water diversion
Existing permanent culvert extension.
Established compound.
Existing 'clean' water diversion.
Existing stabilised access for the control of mud/soil tracking.
Existing stormwater pipelines.
Existing excavated sediment trap No 1 – 99m³.
MR78 – OLYMPIC HIGHWAY
OLD NARRANDERA ROAD
TO EUBERTA
LIMIT OF WORKS
MC00
MC01
MC02
MD03
MD04
STAGE 3 –BULK EARTHWORKS
LEGEND
STRUCTURE LABEL
STORMWATER MANAGEMENT SHEET NUMBER
STRUCTURE TYPE - DRAINAGE LINE / PIT NUMBER
DESIGN CONTOURS - 250mm INTERVALS
EXISTING CONTOURS - 250mm INTERVALS
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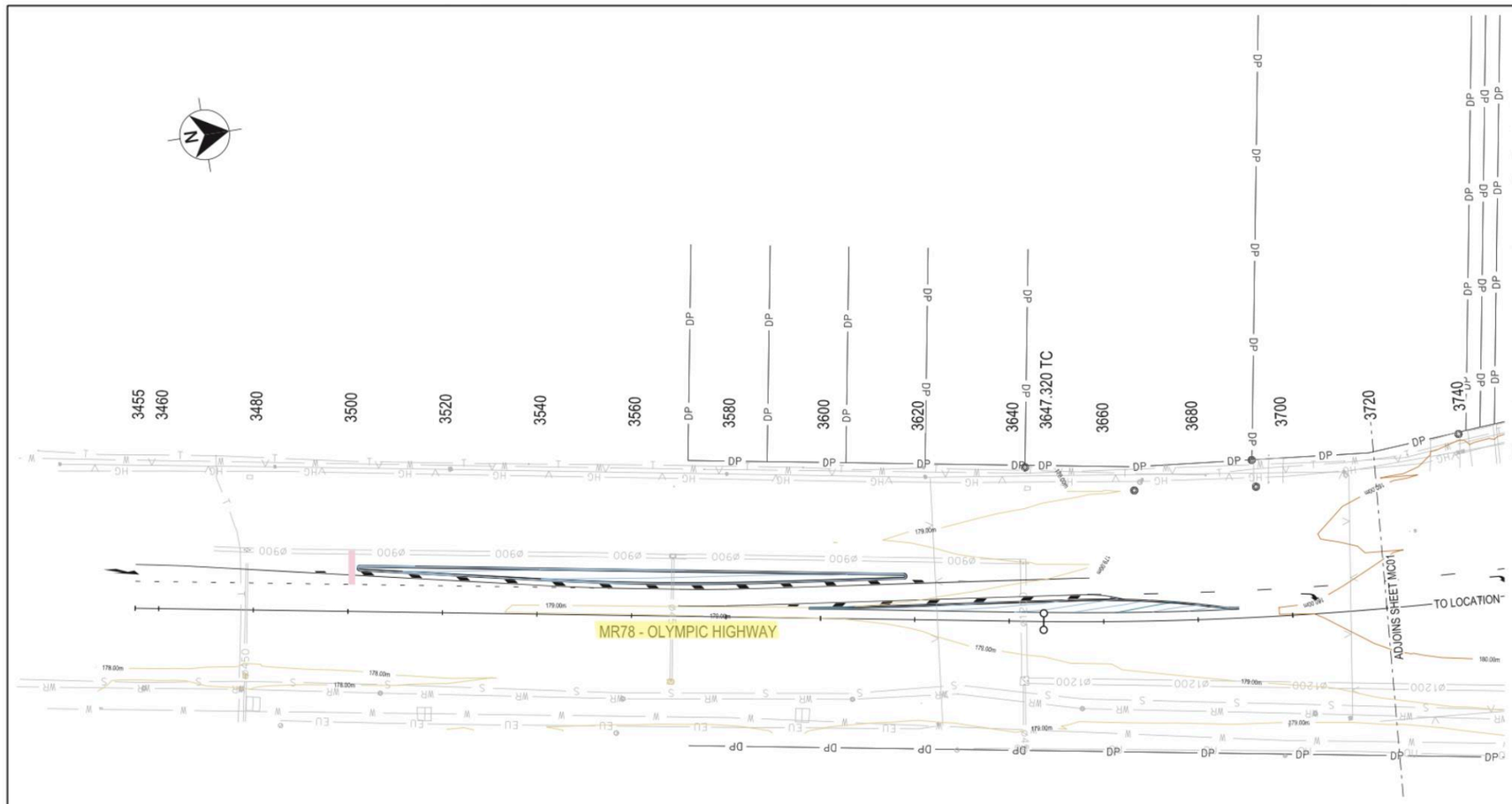
DESIGN CHECK J. GOODEN 12.07.21
DESIGN MNGR L. CROKER 12.07.21
PROJECT MNGR S. MILLIE 12.07.21
CO-ORDINATE SYSTEM MGA ZONE 55 (GDA94)
HEIGHT DATUM AHD
SCALE 1:1000m
PLOT DATE / TIME 9/7/2005 7:08:02 PM
PLOT BY walgersz
NSW GOVERNMENT Transport for NSW
PREPARED FOR PROJECT DEVELOPMENT SOUTH INRASTRUCTURE & PLACE TRANSPORT FOR NSW
CITY OF WAGGA WAGGA
MR78 - OLYMPIC HIGHWAY
INTERSECTION IMPROVEMENTS AT OLD NARRANDERA ROAD 5.241KM TO 6.309KM NORTH OF WAGGA WAGGA
STORMWATER MANAGEMENT PLAN
OLD NARRANDERA ROAD - MC01 - CH.0.000 TO CH.170.057
A3
RMS REGISTRATION No. DS2018/001537
ISSUE STATUS CONCEPT DESIGN
EDMS No. SF2018/302060
SHEET No. SM-0406
ISSUE 1
© Transport for NSW

ATTACHMENT 2



LEGEND

GDA 2020

- DT1.1 / 0610 — STRUCTURE LABEL / STORMWATER MANAGEMENT SHEET NUMBER
- SAS - 1.2 / 3 — STRUCTURE TYPE - DRAINAGE LINE / PIT NUMBER
- DESIGN CONTOURS - 250mm INTERVALS
- EXISTING CONTOURS - 250mm INTERVALS
- EXISTING DRAIN PIPE TO BE REMOVED
- PROPOSED DRIANAGE PIPE
- PROPOSED PIT
- PROPOSED HEADWALL
- EXISTING DRAINAGE PIPE
- EXISTING PIT
- EXISTING HEADWALL
- CULVERT / PIT REFERENCE POINT
- FLOW DIRECTION
- CATCH DRAIN - LINED
- IF — PAVEMENT INTERFACE DRAIN
- TD — SUBSURFACE VERGE DRAIN
- SUBSURFACE DRAIN OUTLET
- ROCK PROTECTION

LEGEND

- Sediment fence
- Diversion (clean water)
- 'Clean' water flow path
- 'Dirty' water flow path
- Stabilised Access
- Existing pit
- Pit to be installed
- Earth bund lined with geofabric
- Sand bag
- Area of tree removal

NOTES

1. REFER TO SHEET SM-XXXX FOR DRAINAGE SETOUT DETAILS.
2. REFER TO TRANSPORT FOR NSW STANDARD DRAWING R0240-01 FOR INSTALLATION OF CONCRETE PIPES.
3. REFER TO TRANSPORT FOR NSW STANDARD DRAWING SERIES R0210 FOR STANDARD HEADWALL DETAILS AND R0220 FOR STANDARD GULLY PIT DETAILS.
4. UNLESS OTHERWISE SPECIFIED, ROCK PROTECTION FOR CULVERT HEADWALLS SHALL BE NOMIAL 300mm DIA ('D50') AND A LENGTH APPROXIMATELY 4 TIMES THE PIPE DIA. OF THE CULVERT.
5. REFER TO SHEET SM-XXXX FOR TYPICAL ROCK PROTECTION DETAILS

NOTE:-
No clearing required on this sheet.

UTILITY INFORMATION SHOWN ON THE PLANS DOES NOT DEPICT ANY MORE THAN THE PRESENCE OF A SERVICE, BASED ON AVAILABLE DOCUMENTARY EVIDENCE. THE PRESENCE OF A UTILITY SERVICE, ITS SIZE AND LOCATION SHOULD BE CONFIRMED BY FIELD INSPECTION, PRIOR TO THE COMMENCEMENT OF ROADWORKS AND THE RELEVANT UTILITY PLANS OBTAINED BY DIALLING PH 1100 OR FAX 1300 652 077 (DIAL BEFORE YOU DIG). CAUTION SHOULD BE EXERCISED WHEN WORKING IN THE VICINITY OF ALL UTILITY SERVICES.

MR78 OLYMPIC HIGHWAY – TRAVERS STREET INTERSECTION UPGRADE.
CONCEPT EROSION & SEDIMENT CONTROL PLAN/STRATEGY – STAGE 1 (CLEARING)

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
0 5 10 15 20 25 30 35 40 45 50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\MR78 - Travers Street Intersection\dgn\07-Drawing Production\Plan and Profile\P-PLAN-0500_SM.dgn
DESIGN LOT CODE: XXXXXXX
DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING: FILE NAME ; FILE NAME

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
XXXXXX	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 10 20 30 40 — SCALE 1:1000m
CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA2020) HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY:
TRANSPORT FOR NSW
INFRASTRUCTURE & PLACE
TECHNICAL SERVICES
ENGINEERING SERVICES
TECHNICAL OPERATIONS & SUPPORT

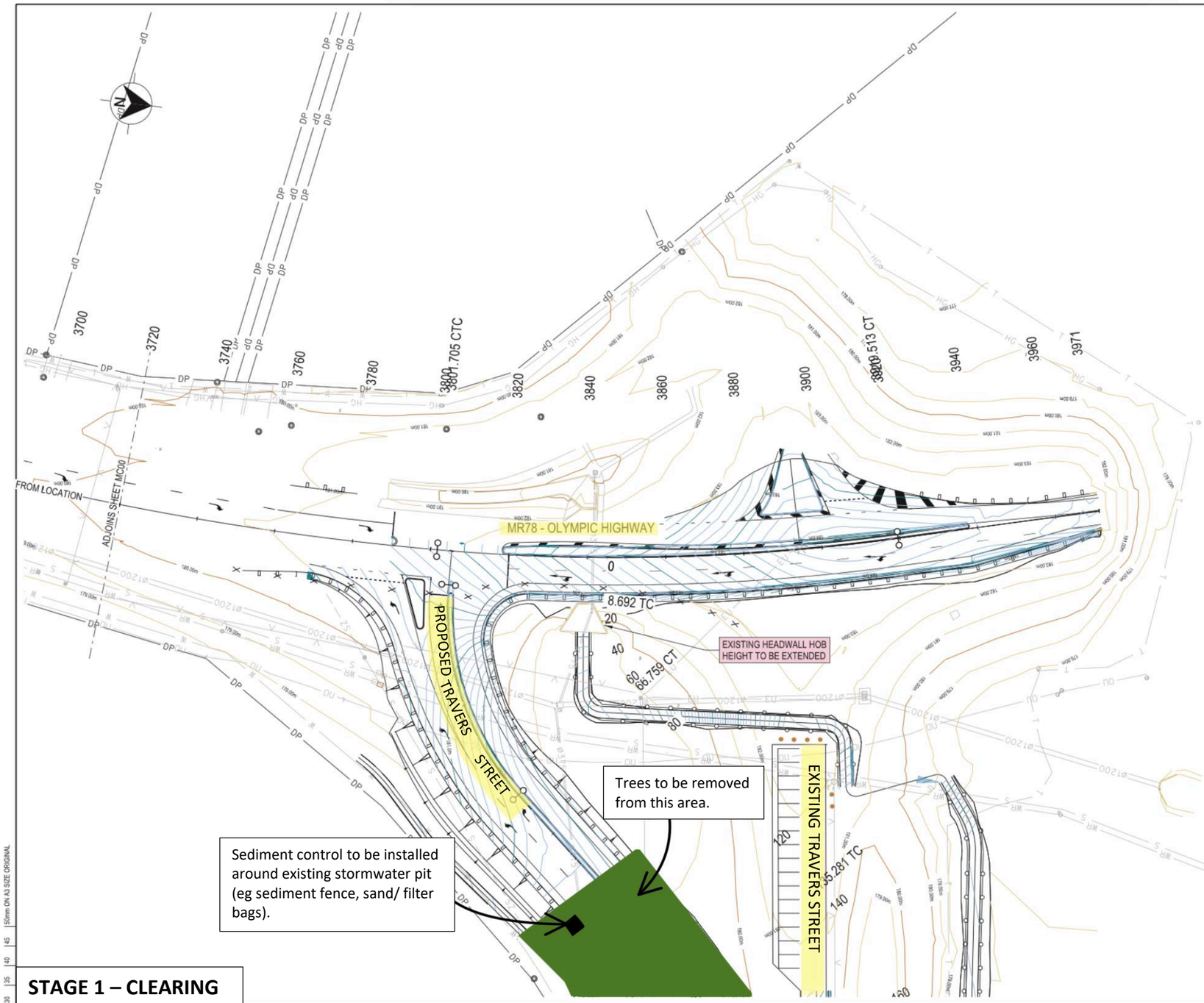
PLOT DATE / TIME	NAME	DATE
DRAWN	M. McKENZIE	02.09.21
DRG CHECK	J. GOODEN	02.09.21
DESIGN	M. McKENZIE	02.09.21
DESIGN CHECK	J. GOODEN	02.09.21
DESIGN MNGR	L. CROKER	02.09.21
PROJECT MNGR	S. MILLIE	02.09.21

PLOT BY

CLIENT: NSW GOVERNMENT Transport for NSW
PREPARED FOR: REGIONAL PROJECT DELIVERY SOUTHERN & WESTERN PROJECT OFFICE FREIGHT & REGIONAL PROGRAM 1

CITY OF WAGGA WAGGA — A3
MR78 - OLYMPIC HIGHWAY
INTERSECTION IMPROVEMENT AT TRAVERS STREET 3.455km TO 3.971km NORTH OF WAGGA WAGGA
STORMWATER MANAGEMENT PLAN

RMS REGISTRATION No. DS2020 / 000895 — PART
ISSUE STATUS: CONCEPT - DESIGN PHASE | EDMS No.: A38244626 | SHEET No.: SM-0501 | ISSUE: 1



LEGEND

GDA 2020

- DT1.1 / 0610 — STRUCTURE LABEL / STORMWATER MANAGEMENT SHEET NUMBER
- SAS - 1.2 / 3 — STRUCTURE TYPE - DRAINAGE LINE / PIT NUMBER
- DESIGN CONTOURS - 250mm INTERVALS
- EXISTING CONTOURS - 250mm INTERVALS
- EXISTING DRAIN PIPE TO BE REMOVED
- PROPOSED DRIANAGE PIPE
- PROPOSED PIT
- PROPOSED HEADWALL
- EXISTING DRAINAGE PIPE
- EXISTING PIT
- EXISTING HEADWALL
- CULVERT / PIT REFERENCE POINT
- FLOW DIRECTION
- CATCH DRAIN - LINED
- IF — PAVEMENT INTERFACE DRAIN
- TD — SUBSURFACE VERGE DRAIN
- SUBSURFACE DRAIN OUTLET
- ROCK PROTECTION

LEGEND

- Sediment fence
- Diversion (clean water)
- 'Clean' water flow path
- 'Dirty' water flow path
- Stabilised Access
- Existing pit
- Pit to be installed
- Earth bund lined with geofabric
- Sand bag
- Area of tree removal

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2. REFER TO TRANSPORT FOR NSW STANDARD DRAWING R0240-01 FOR INSTALLATION OF CONCRETE PIPES.
3. REFER TO TRANSPORT FOR NSW STANDARD DRAWING SERIES R0210 FOR STANDARD HEADWALL DETAILS AND R0220 FOR STANDARD GULLY PIT DETAILS.
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NOT FOR CONSTRUCTION

STAGE 1 – CLEARING

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
50mm ON A3 SIZE ORIGINAL

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\MR78 - Travers Street Intersection\dgn\07-Drawing Production\Plan and Profile\P-PLAN-0500_SM.dgn				DESIGN LOT CODE: XXXXXXX	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING: FILE NAME ; FILE NAME		
EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL	SCALES ON A3 SIZE DRAWING	DRAWINGS / DESIGN PREPARED BY
XXXXXX	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX	0 10 20 30 40 SCALE 1:1000m	TRANSPORT FOR NSW INFRASTRUCTURE & PLACE TECHNICAL SERVICES ENGINEERING SERVICES TECHNICAL OPERATIONS & SUPPORT
						CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA2020)	HEIGHT DATUM: AHD

PLOT DATE / TIME		PLOT BY
TITLE	NAME	DATE
DRAWN	M. McKENZIE	02.09.21
DRG CHECK	J. GOODEN	02.09.21
DESIGN	M. McKENZIE	02.09.21
DESIGN CHECK	J. GOODEN	02.09.21
DESIGN MNGR	L. CROKER	02.09.21
PROJECT MNGR	S. MILLIE	02.09.21

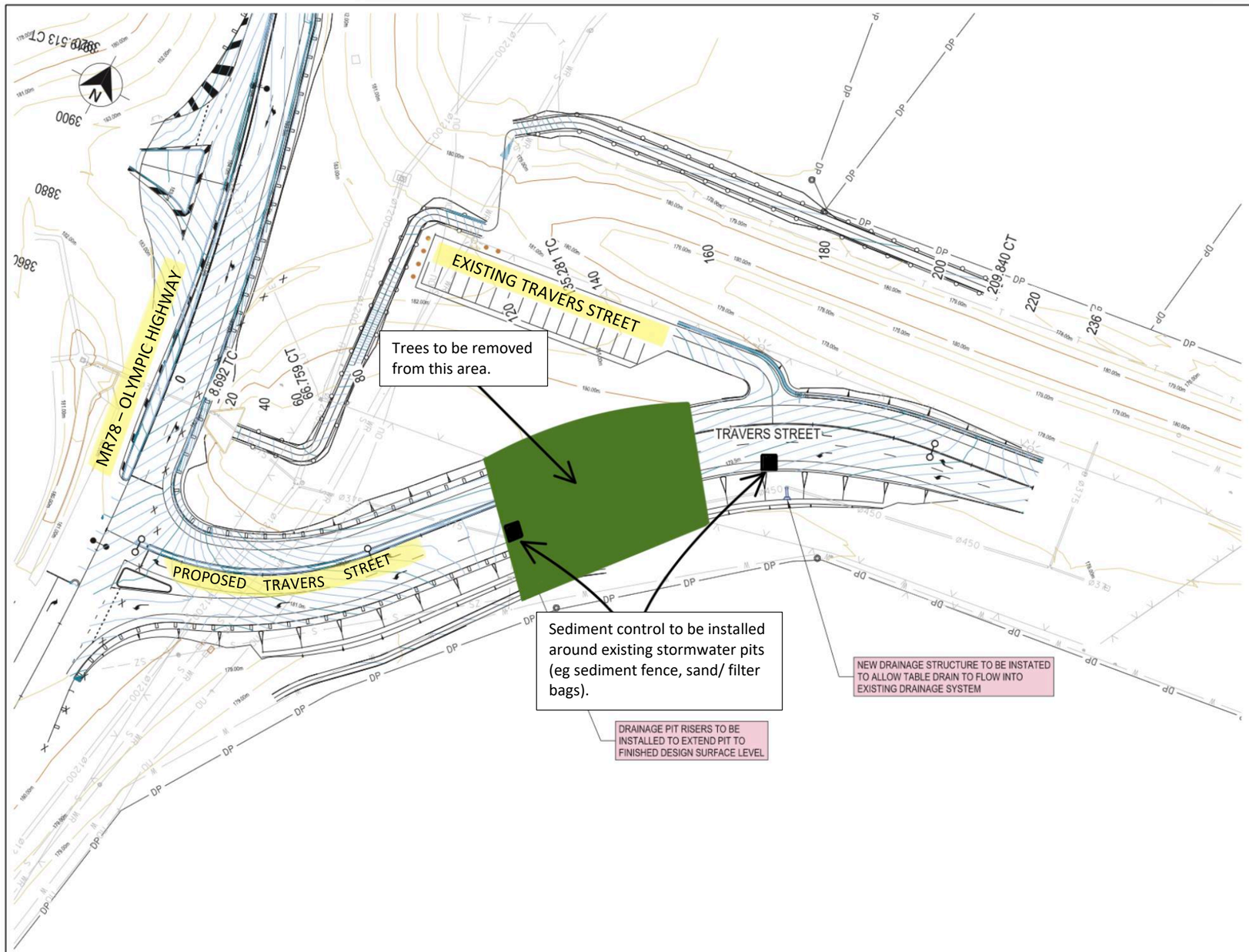
CLIENT: NSW GOVERNMENT Transport for NSW

PREPARED FOR: REGIONAL PROJECT DELIVERY, SOUTHERN & WESTERN PROJECT OFFICE, FREIGHT & REGIONAL PROGRAM 1

CITY OF WAGGA WAGGA — A3
MR78 - OLYMPIC HIGHWAY
INTERSECTION IMPROVEMENT AT TRAVERS STREET
3.455km TO 3.971km NORTH OF WAGGA WAGGA
STORMWATER MANAGEMENT PLAN

RMS REGISTRATION No.: DS2020 / 000895 — PART

ISSUE STATUS	EDMS No.	SHEET No.	ISSUE
CONCEPT - DESIGN PHASE	A38244626	SM-0502	1



LEGEND

GDA 2020

- DT1.1 / 0610 — STRUCTURE LABEL / STORMWATER MANAGEMENT SHEET NUMBER
- SAS - 1.2 / 3 — STRUCTURE TYPE - DRAINAGE LINE / PIT NUMBER
- DESIGN CONTOURS - 250mm INTERVALS
- EXISTING CONTOURS - 250mm INTERVALS
- EXISTING DRAIN PIPE TO BE REMOVED
- PROPOSED DRIANAGE PIPE
- PROPOSED PIT
- PROPOSED HEADWALL
- EXISTING DRAINAGE PIPE
- EXISTING PIT
- EXISTING HEADWALL
- CULVERT / PIT REFERENCE POINT
- FLOW DIRECTION
- CATCH DRAIN - LINED
- IF — PAVEMENT INTERFACE DRAIN
- TD — SUBSURFACE VERGE DRAIN
- SUBSURFACE DRAIN OUTLET
- ROCK PROTECTION

LEGEND

- Sediment fence
- Diversion (clean water)
- 'Clean' water flow path
- 'Dirty' water flow path
- Stabilised Access
- Existing pit
- Pit to be installed
- Earth bund lined with geofabric
- Sand bag
- Area of tree removal

NOTES

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STAGE 1 – CLEARING

NOT FOR CONSTRUCTION

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

DRAWING FILE LOCATION / NAME: C:\Data\Worksets\MR78 - Travers Street Intersection\dgn\07-Drawing Production\Plan and Profile\P-PLAN-0500_SM.dgn				DESIGN LOT CODE: XXXXXXX	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING: FILE NAME ; FILE NAME
EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
XXXXXX	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 10 20 30 40 — SCALE 1:1000m

CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA2020) HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY:
TRANSPORT FOR NSW
INFRASTRUCTURE & PLACE
TECHNICAL SERVICES
ENGINEERING SERVICES
TECHNICAL OPERATIONS & SUPPORT

PLOT DATE / TIME		PLOT BY
TITLE	NAME	DATE
DRAWN	M. McKENZIE	02.09.21
DRG CHECK	J. GOODEN	02.09.21
DESIGN	M. McKENZIE	02.09.21
DESIGN CHECK	J. GOODEN	02.09.21
DESIGN MNGR	L. CROKER	02.09.21
PROJECT MNGR	S. MILLIE	02.09.21

CLIENT: NSW GOVERNMENT Transport for NSW

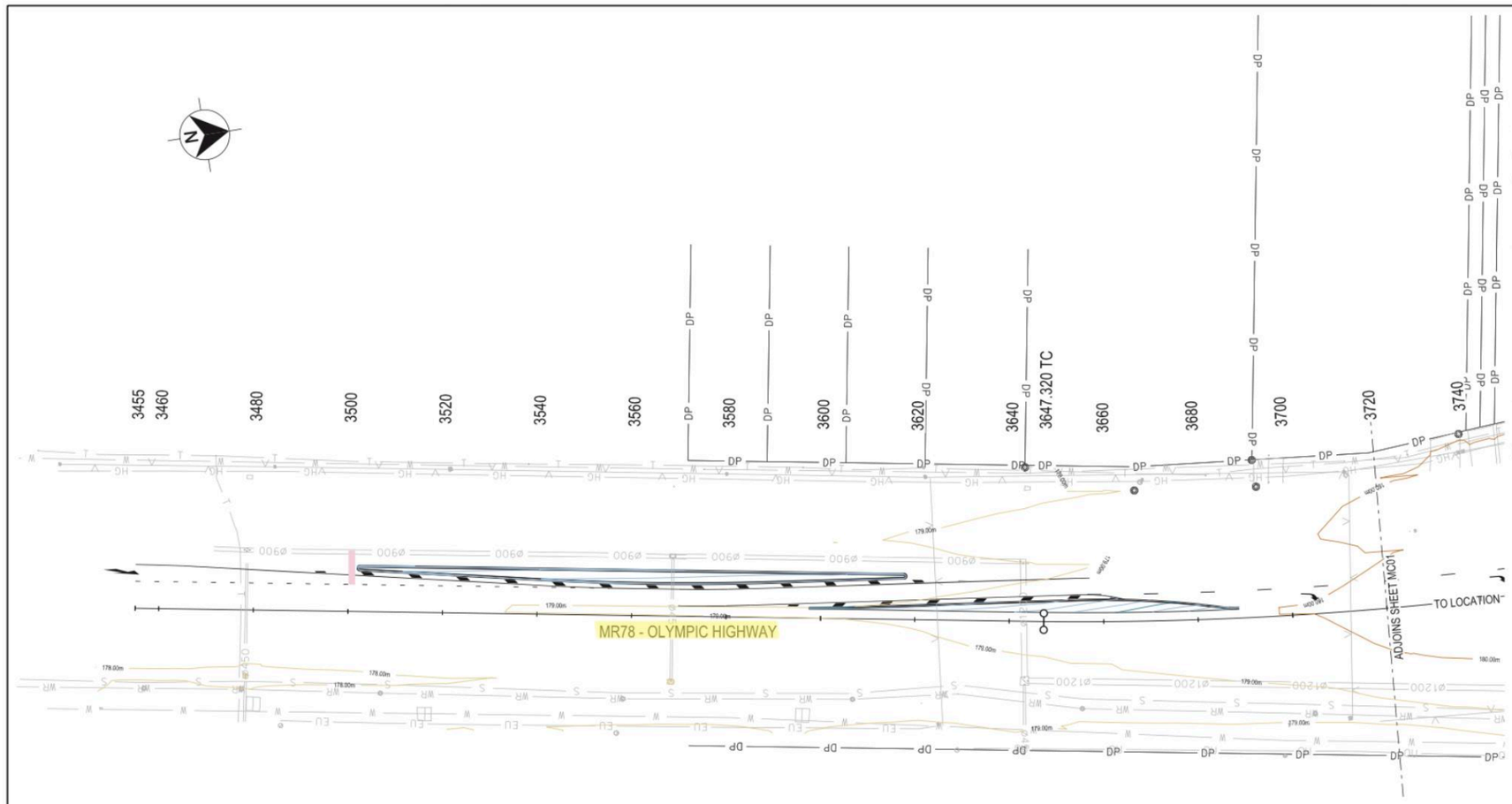
PREPARED FOR: REGIONAL PROJECT DELIVERY, SOUTHERN & WESTERN PROJECT OFFICE, FREIGHT & REGIONAL PROGRAM 1

CITY OF WAGGA WAGGA
MR78 - OLYMPIC HIGHWAY
INTERSECTION IMPROVEMENT AT TRAVERS STREET
3.455km TO 3.971km NORTH OF WAGGA WAGGA
STORMWATER MANAGEMENT PLAN

A3

RMS REGISTRATION No. DS2020 / 000895 — PART

ISSUE STATUS: CONCEPT - DESIGN PHASE | EDMS No.: A38244626 | SHEET No.: SM-0503 | ISSUE: 1



LEGEND

GDA 2020

DT1.1 / 0610 - STRUCTURE LABEL / STORMWATER MANAGEMENT SHEET NUMBER
SAS - 1.2 / 3 - STRUCTURE TYPE - DRAINAGE LINE / PIT NUMBER
DESIGN CONTOURS - 250mm INTERVALS
EXISTING CONTOURS - 250mm INTERVALS
EXISTING DRAIN PIPE TO BE REMOVED
PROPOSED DRIANAGE PIPE
PROPOSED PIT
PROPOSED HEADWALL
EXISTING DRAINAGE PIPE
EXISTING PIT
EXISTING HEADWALL
CULVERT / PIT REFERENCE POINT
FLOW DIRECTION
CATCH DRAIN - LINED
IF - PAVEMENT INTERFACE DRAIN
TD - SUBSURFACE VERGE DRAIN
SUBSURFACE DRAIN OUTLET
ROCK PROTECTION

LEGEND

- Sediment fence
- Diversion (clean water)
- 'Clean' water flow path
- 'Dirty' water flow path
- Stabilised Access
- Existing pit
- Pit to be installed
- Earth bund lined with geofabric
- Sand bag
- Area of tree removal

NOTES

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5. REFER TO SHEET SM-XXXX FOR TYPICAL ROCK PROTECTION DETAILS

NOTE:-
No permanent drainage proposed on this sheet (ie stormwater pits & pipelines).

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NOT FOR CONSTRUCTION

MR78 OLYMPIC HIGHWAY – TRAVERS STREET INTERSECTION UPGRADE.
CONCEPT EROSION & SEDIMENT CONTROL PLAN/STRATEGY – STAGE 2 (PERMANENT DRAINAGE)

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED
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DRAWING FILE LOCATION / NAME: C:\Data\Worksets\MR78 - Travers Street Intersection\dgn\07-Drawing Production\Plan and Profile\P-PLAN-0500_SM.dgn
DESIGN LOT CODE: XXXXXXX
DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING: FILE NAME ; FILE NAME

EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL
XXXXXX	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX

SCALES ON A3 SIZE DRAWING: 0 10 20 30 40 — SCALE 1:1000m
CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA2020) HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY:
TRANSPORT FOR NSW
INFRASTRUCTURE & PLACE
TECHNICAL SERVICES
ENGINEERING SERVICES
TECHNICAL OPERATIONS & SUPPORT

PLOT DATE / TIME	NAME	DATE
DRAWN	M. McKENZIE	02.09.21
DRG CHECK	J. GOODEN	02.09.21
DESIGN	M. McKENZIE	02.09.21
DESIGN CHECK	J. GOODEN	02.09.21
DESIGN MNGR	L. CROKER	02.09.21
PROJECT MNGR	S. MILLIE	02.09.21

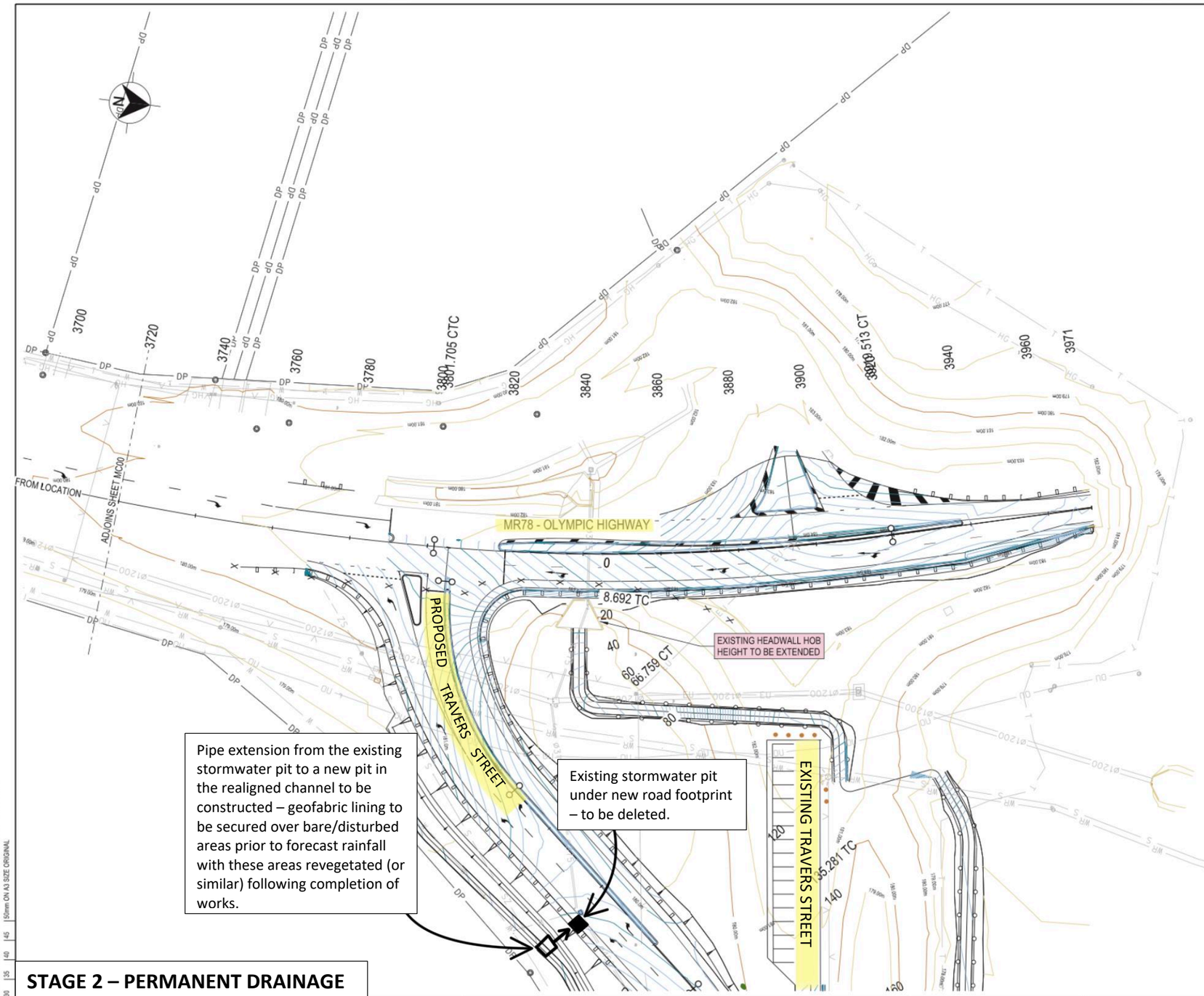
PLOT BY

CLIENT: NSW GOVERNMENT Transport for NSW
PREPARED FOR: REGIONAL PROJECT DELIVERY SOUTHERN & WESTERN PROJECT OFFICE FREIGHT & REGIONAL PROGRAM 1

CITY OF WAGGA WAGGA
MR78 - OLYMPIC HIGHWAY
INTERSECTION IMPROVEMENT AT TRAVERS STREET 3.455km TO 3.971km NORTH OF WAGGA WAGGA STORMWATER MANAGEMENT PLAN

A3

RMS REGISTRATION No. DS2020 / 000895 — PART
ISSUE STATUS: CONCEPT - DESIGN PHASE
EDMS No.: A38244626
SHEET No.: SM-0501
ISSUE: 1



LEGEND

GDA 2020

- DT1.1 / 0610 — STRUCTURE LABEL / STORMWATER MANAGEMENT SHEET NUMBER
- SAS - 1.2 / 3 — STRUCTURE TYPE - DRAINAGE LINE / PIT NUMBER
- DESIGN CONTOURS - 250mm INTERVALS
- EXISTING CONTOURS - 250mm INTERVALS
- EXISTING DRAIN PIPE TO BE REMOVED
- PROPOSED DRIANAGE PIPE
- PROPOSED PIT
- PROPOSED HEADWALL
- EXISTING DRAINAGE PIPE
- EXISTING PIT
- EXISTING HEADWALL
- CULVERT / PIT REFERENCE POINT
- FLOW DIRECTION
- CATCH DRAIN - LINED
- IF — PAVEMENT INTERFACE DRAIN
- TD — SUBSURFACE VERGE DRAIN
- SUBSURFACE DRAIN OUTLET
- ROCK PROTECTION

LEGEND

- Sediment fence
- Diversion (clean water)
- 'Clean' water flow path
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NOTES

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STAGE 2 – PERMANENT DRAINAGE

NOT FOR CONSTRUCTION

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DRAWING FILE LOCATION / NAME: C:\Data\Worksets\MR78 - Travers Street Intersection\dgn\07-Drawing Production\Plan and Profile\P-PLAN-0500_SM.dgn	DESIGN LOT CODE: XXXXXXX	DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING: FILE NAME ; FILE NAME	PLOT DATE / TIME / PLOT BY
EXTERNAL REFERENCE FILES: XXXXXX	REV: 01 — DATE: DD-MM-YY — AMENDMENT / REVISION DESCRIPTION: ISSUED FOR XXXXX — WVR No.: XX — APPROVAL: XXX	SCALES ON A3 SIZE DRAWING: 0 10 20 30 40 SCALE 1:1000m	DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ENGINEERING SERVICES, TECHNICAL OPERATIONS & SUPPORT
		CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA2020) — HEIGHT DATUM: AHD	

PLOT DATE / TIME		
TITLE	NAME	DATE
DRAWN	M. McKENZIE	02.09.21
DRG CHECK	J. GOODEN	02.09.21
DESIGN	M. McKENZIE	02.09.21
DESIGN CHECK	J. GOODEN	02.09.21
DESIGN MNGR	L. CROKER	02.09.21
PROJECT MNGR	S. MILLIE	02.09.21

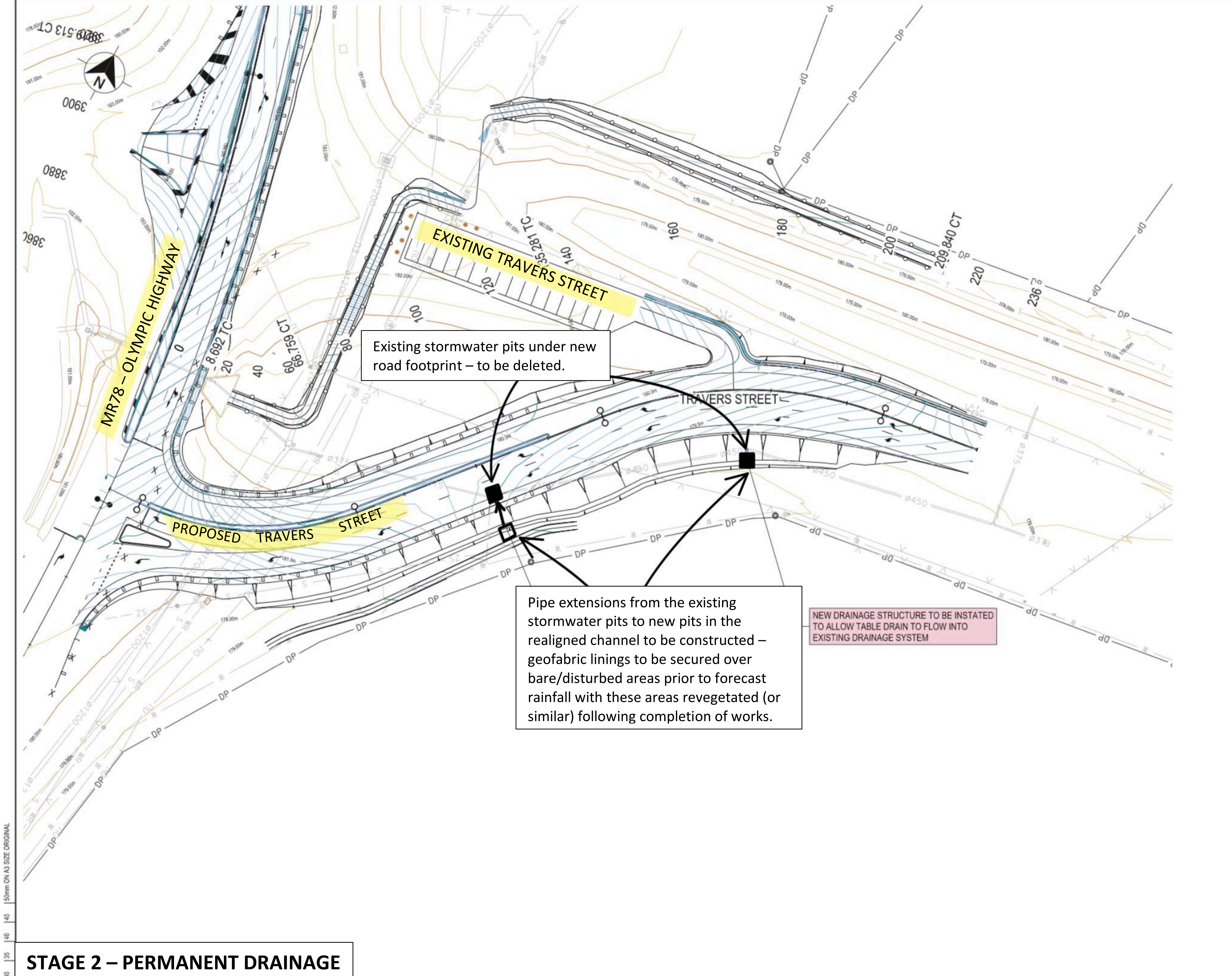
CLIENT: NSW GOVERNMENT Transport for NSW

PREPARED FOR: REGIONAL PROJECT DELIVERY, SOUTHERN & WESTERN PROJECT OFFICE, FREIGHT & REGIONAL PROGRAM 1

CITY OF WAGGA WAGGA — A3
MR78 - OLYMPIC HIGHWAY
INTERSECTION IMPROVEMENT AT TRAVERS STREET
3.455km TO 3.971km NORTH OF WAGGA WAGGA
STORMWATER MANAGEMENT PLAN

RMS REGISTRATION No.: DS2020 / 000895 — PART:

ISSUE STATUS: CONCEPT - DESIGN PHASE — EDMS No.: A38244626 — SHEET No.: SM-0502 — ISSUE: 1



LEGEND

GDA 2020

- DT1.1 / 0610 – STRUCTURE LABEL / STORMWATER MANAGEMENT SHEET NUMBER
- SAS - 1.2 / 3 – STRUCTURE TYPE - DRAINAGE LINE / PIT NUMBER
- DESIGN CONTOURS - 250mm INTERVALS
- EXISTING CONTOURS - 250mm INTERVALS
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- PROPOSED DRIANAGE PIPE
- PROPOSED PIT
- PROPOSED HEADWALL
- EXISTING DRAINAGE PIPE
- EXISTING PIT
- EXISTING HEADWALL
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- FLOW DIRECTION
- CATCH DRAIN - LINED
- PAVEMENT INTERFACE DRAIN
- SUBSURFACE VERGE DRAIN
- SUBSURFACE DRAIN OUTLET
- ROCK PROTECTION

LEGEND

- Sediment fence
- Diversion (clean water)
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STAGE 2 – PERMANENT DRAINAGE

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CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA2020) HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY: TRANSPORT FOR NSW, INFRASTRUCTURE & PLACE, TECHNICAL SERVICES, ENGINEERING SERVICES, TECHNICAL OPERATIONS & SUPPORT

TITLE	NAME	DATE
DRAWN	M. McKENZIE	02.09.21
DRG CHECK	J. GOODEN	02.09.21
DESIGN	M. McKENZIE	02.09.21
DESIGN CHECK	J. GOODEN	02.09.21
DESIGN MNGR	L. CROKER	02.09.21
PROJECT MNGR	S. MILLIE	02.09.21

CLIENT: NSW GOVERNMENT Transport for NSW

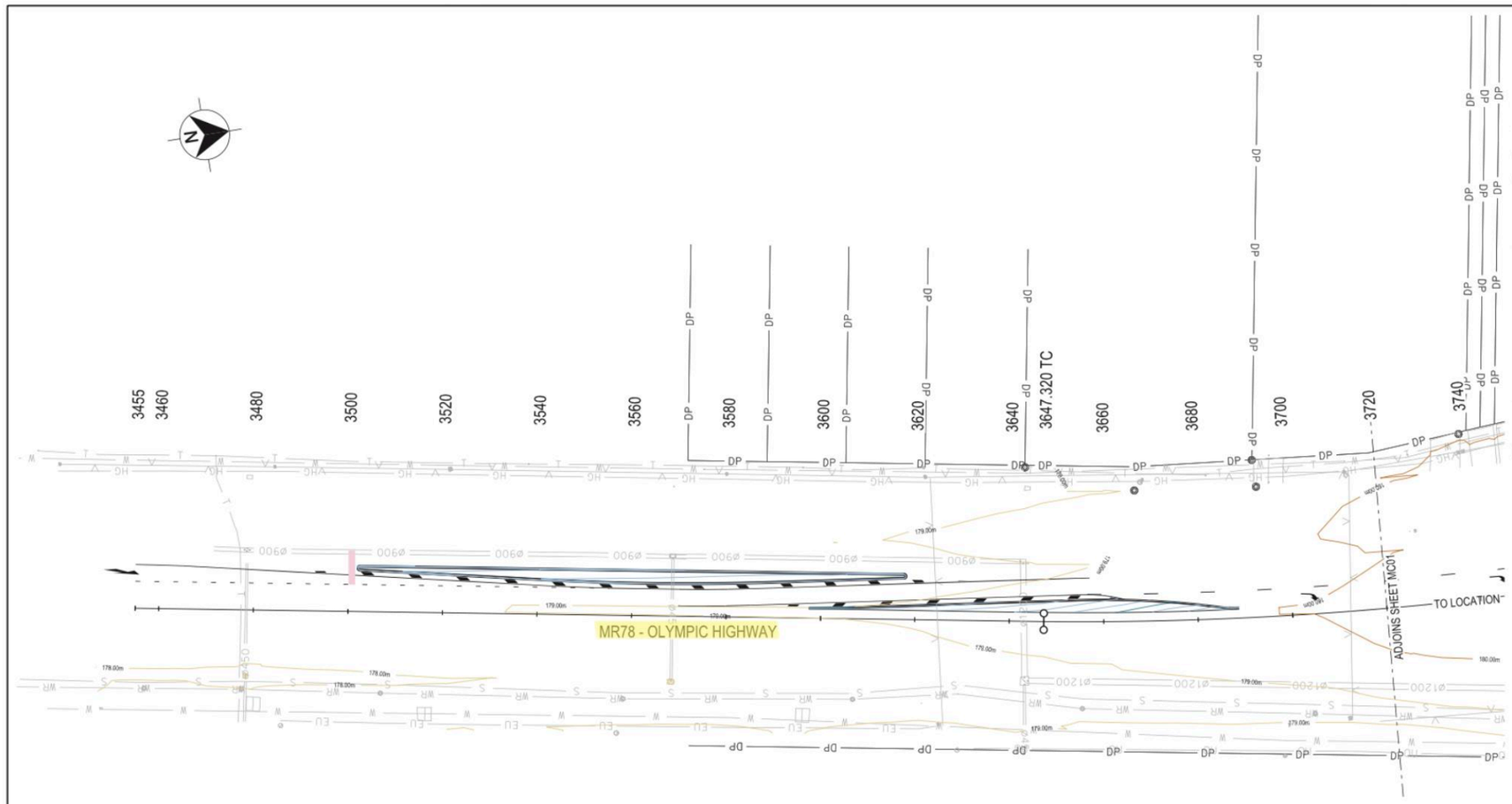
PREPARED FOR: REGIONAL PROJECT DELIVERY, SOUTHERN & WESTERN PROJECT OFFICE, FREIGHT & REGIONAL PROGRAM 1

CITY OF WAGGA WAGGA
MR78 - OLYMPIC HIGHWAY
INTERSECTION IMPROVEMENT AT TRAVERS STREET
3.455km TO 3.971km NORTH OF WAGGA WAGGA
STORMWATER MANAGEMENT PLAN

A3

RMS REGISTRATION No. DS2020 / 000895

ISSUE STATUS: CONCEPT - DESIGN PHASE | EDMS No. A38244626 | SHEET No. SM-0503 | ISSUE 1



LEGEND

GDA 2020

- DT1.1 / 0610 — STRUCTURE LABEL / STORMWATER MANAGEMENT SHEET NUMBER
- SAS - 1.2 / 3 — STRUCTURE TYPE - DRAINAGE LINE / PIT NUMBER
- DESIGN CONTOURS - 250mm INTERVALS
- EXISTING CONTOURS - 250mm INTERVALS
- EXISTING DRAIN PIPE TO BE REMOVED
- PROPOSED DRIANAGE PIPE
- PROPOSED PIT
- PROPOSED HEADWALL
- EXISTING DRAINAGE PIPE
- EXISTING PIT
- EXISTING HEADWALL
- CULVERT / PIT REFERENCE POINT
- FLOW DIRECTION
- CATCH DRAIN - LINED
- IF — PAVEMENT INTERFACE DRAIN
- TD — SUBSURFACE VERGE DRAIN
- SUBSURFACE DRAIN OUTLET
- ROCK PROTECTION

LEGEND

- Sediment fence
- Diversion (clean water)
- 'Clean' water flow path
- 'Dirty' water flow path
- Stabilised Access
- Existing pit
- Pit to be installed
- Earth bund lined with geofabric
- Sand bag
- Area of tree removal

NOTES

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2. REFER TO TRANSPORT FOR NSW STANDARD DRAWING R0240-01 FOR INSTALLATION OF CONCRETE PIPES.
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NOTE:-

1) Minor temporary controls to be installed as required during works (eg sand bag sediment traps & diversions, geofabric linings etc).
2) Controls to be removed & reinstalled to suit works progress.

NOT FOR CONSTRUCTION

MR78 OLYMPIC HIGHWAY – TRAVERS STREET INTERSECTION UPGRADE.
CONCEPT EROSION & SEDIMENT CONTROL PLAN/STRATEGY – STAGE 3 (BULK EARTHWORKS)

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SCALES ON A3 SIZE DRAWING: 0 10 20 30 40 — SCALE 1:1000m
CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA2020) HEIGHT DATUM: AHD

DRAWINGS / DESIGN PREPARED BY:
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PLOT DATE / TIME	NAME	DATE
DRAWN	M. McKENZIE	02.09.21
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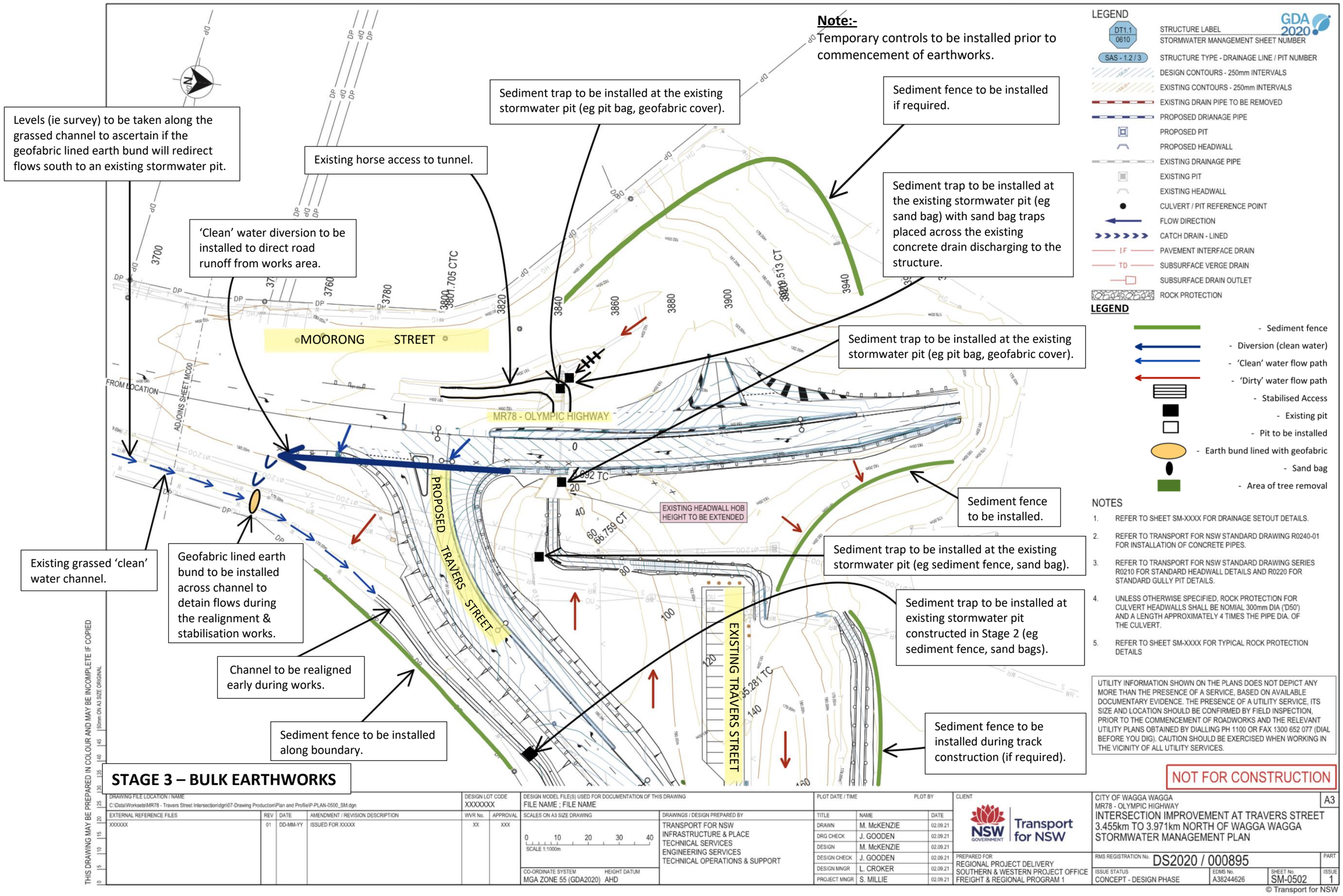
DESIGN CHECK	J. GOODEN	02.09.21
DESIGN MNGR	L. CROKER	02.09.21
PROJECT MNGR	S. MILLIE	02.09.21

PLOT BY

CLIENT: NSW GOVERNMENT Transport for NSW
PREPARED FOR: REGIONAL PROJECT DELIVERY SOUTHERN & WESTERN PROJECT OFFICE FREIGHT & REGIONAL PROGRAM 1

CITY OF WAGGA WAGGA — A3
MR78 - OLYMPIC HIGHWAY
INTERSECTION IMPROVEMENT AT TRAVERS STREET 3.455km TO 3.971km NORTH OF WAGGA WAGGA
STORMWATER MANAGEMENT PLAN

RMS REGISTRATION No. DS2020 / 000895 — PART
ISSUE STATUS: CONCEPT - DESIGN PHASE | EDMS No.: A38244626 | SHEET No.: SM-0501 | ISSUE: 1


Note:-
Temporary controls to be installed prior to commencement of earthworks.
Levels (ie survey) to be taken along the grassed channel to ascertain if the geofabric lined earth bund will redirect flows south to an existing stormwater pit.
Existing horse access to tunnel.
Sediment trap to be installed at the existing stormwater pit (eg pit bag, geofabric cover).
Sediment fence to be installed if required.
'Clean' water diversion to be installed to direct road runoff from works area.
Sediment trap to be installed at the existing stormwater pit (eg sand bag) with sand bag traps placed across the existing concrete drain discharging to the structure.
Sediment trap to be installed at the existing stormwater pit (eg pit bag, geofabric cover).
MOORONG STREET
MR78 - OLYMPIC HIGHWAY
PROPOSED TRAVERS STREET
EXISTING TRAVERS STREET
EXISTING HEADWALL HOB HEIGHT TO BE EXTENDED
Sediment fence to be installed.
Sediment trap to be installed at the existing stormwater pit (eg sediment fence, sand bag).
Sediment trap to be installed at existing stormwater pit constructed in Stage 2 (eg sediment fence, sand bags).
Existing grassed 'clean' water channel.
Geofabric lined earth bund to be installed across channel to detain flows during the realignment & stabilisation works.
Channel to be realigned early during works.
Sediment fence to be installed along boundary.
Sediment fence to be installed during track construction (if required).
LEGEND
STRUCTURE LABEL
STORMWATER MANAGEMENT SHEET NUMBER
STRUCTURE TYPE - DRAINAGE LINE / PIT NUMBER
DESIGN CONTOURS - 250mm INTERVALS
EXISTING CONTOURS - 250mm INTERVALS
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ROCK PROTECTION
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STAGE 3 – BULK EARTHWORKS
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FILE NAME ; FILE NAME
EXTERNAL REFERENCE FILES
XXXXXX
REV 01 DATE DD-MM-YY AMENDMENT / REVISION DESCRIPTION ISSUED FOR XXXXX WVR No. XX APPROVAL XXX
SCALES ON A3 SIZE DRAWING
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SCALE 1:1000m
CO-ORDINATE SYSTEM MGA ZONE 55 (GDA2020) HEIGHT DATUM AHD
DRAWINGS / DESIGN PREPARED BY
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INFRASTRUCTURE & PLACE
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ENGINEERING SERVICES
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A3
RMS REGISTRATION No. DS2020 / 000895
PART
ISSUE STATUS CONCEPT - DESIGN PHASE
EDMS No. A38244626
SHEET No. SM-0502
ISSUE 1
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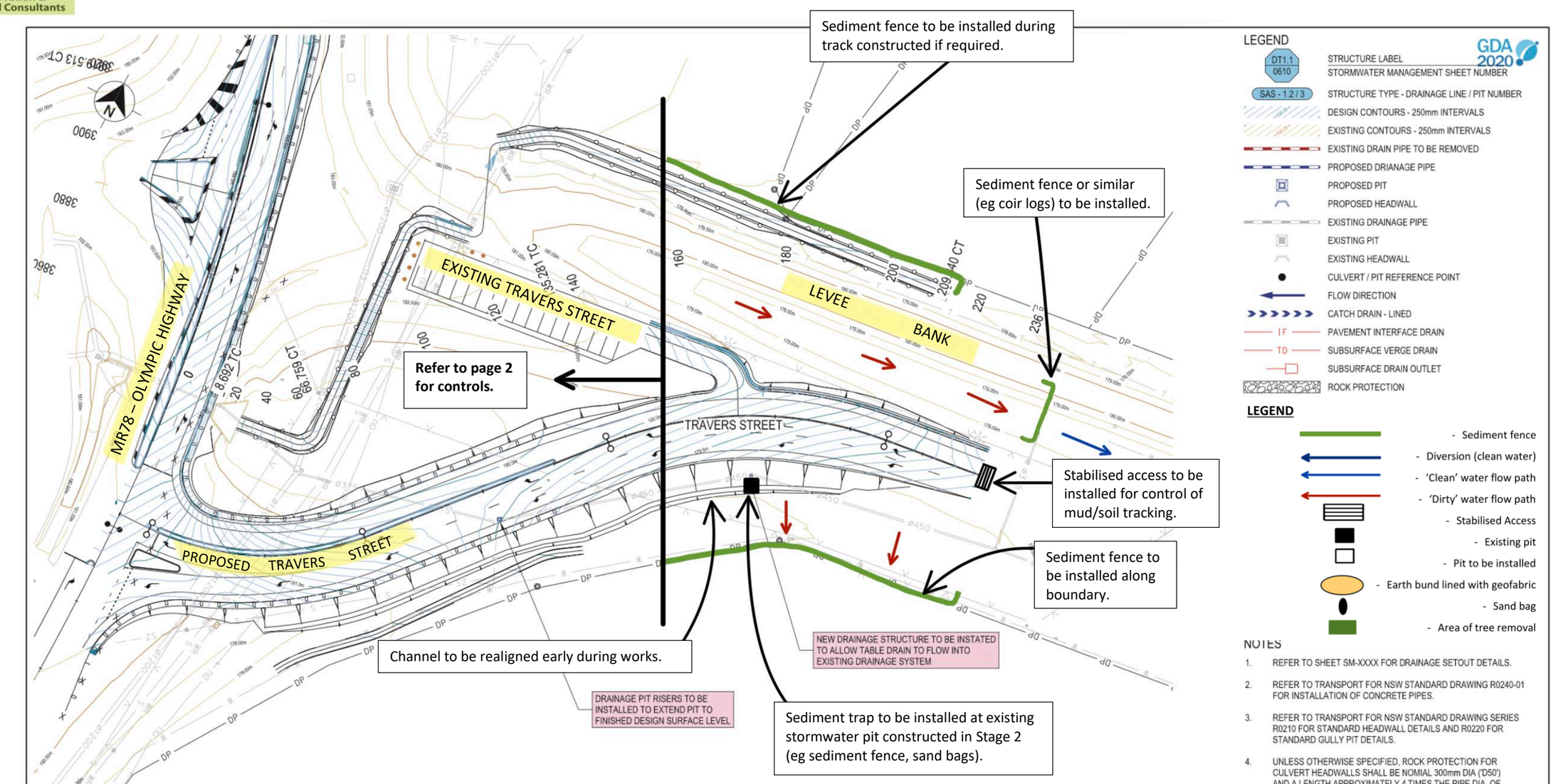

Note:-
Temporary controls to be installed prior to commencement of earthworks.

NOTES

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STAGE 3 – PERMANENT DRAWING

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EXTERNAL REFERENCE FILES	REV	DATE	AMENDMENT / REVISION DESCRIPTION	WVR No.	APPROVAL	SCALES ON A3 SIZE DRAWING	DRAWINGS / DESIGN PREPARED BY	TITLE	NAME	DATE	NSW GOVERNMENT Transport for NSW	A3
XXXXXX	01	DD-MM-YY	ISSUED FOR XXXXX	XX	XXX	0 10 20 30 40 SCALE 1:1000m	TRANSPORT FOR NSW INFRASTRUCTURE & PLACE TECHNICAL SERVICES ENGINEERING SERVICES TECHNICAL OPERATIONS & SUPPORT	DRAWN	M. McKENZIE	02.09.21		
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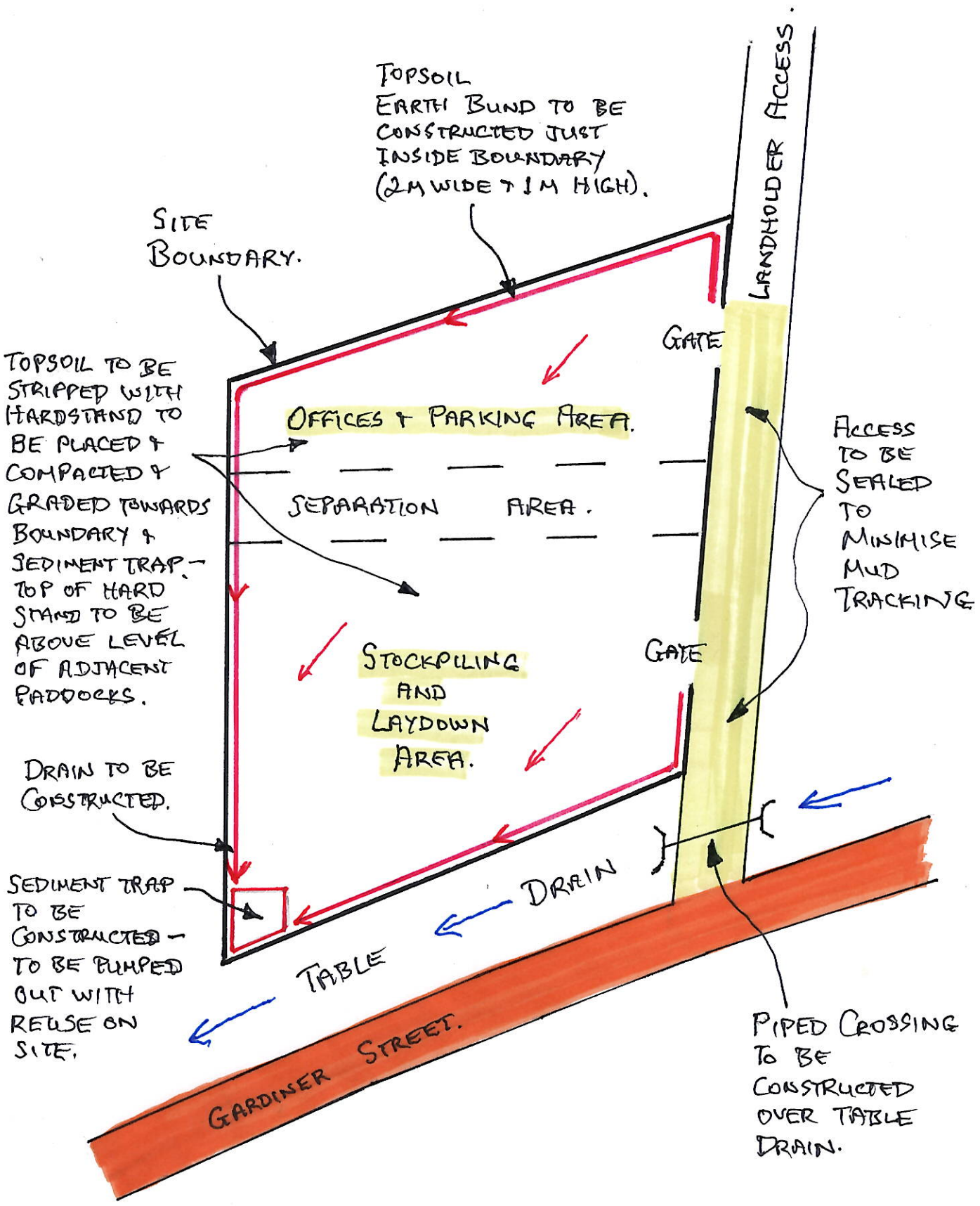
								DESIGN CHECK	J. GOODEN	02.09.21	PREPARED FOR REGIONAL PROJECT DELIVERY SOUTHERN & WESTERN PROJECT OFFICE FREIGHT & REGIONAL PROGRAM 1	RMS REGISTRATION No. DS2020 / 000895 — PART
						CO-ORDINATE SYSTEM: MGA ZONE 55 (GDA2020)	HEIGHT DATUM: AHD	DESIGN MNGR	L. CROKER	02.09.21		
								PROJECT MNGR	S. MILLIE	02.09.21	ISSUE STATUS: CONCEPT - DESIGN PHASE	EDMS No. A38244626 — SHEET No. SM-0503 — ISSUE 1

ATTACHMENT 3

OLYMPIC HIGHWAY INTERSECTION UPGRADES - CONCEPT ESCP - GARDINER STREET OFFICE & COMPOUND SITE.



ATTACHMENT 4

PROJECT: **OLYMPIC HIGHWAY INTERSECTION UPGRADE**

REGISTER – PROGRESSIVE EROSION AND SEDIMENT CONTROL PLANS

PLAN NO	CHAINAGE / DESCRIPTION	PERSONNEL INVOLVED IN PREPARATION	DATE OF PREPARATION	SOIL CONSERVATIONIST INITIALS & DATE	ENVIRONMENTAL MANAGER INITIALS & DATE	SUPERCEDED BY PLAN NO / COMMENT

ATTACHMENT 5

ANNEXURE G38/E – DESIGN AVERAGE RECURRENCE INTERVALS

Refer to Clause 2.4.

Control Measure	Estimated Design Life	
	0 – 12 months	> 12 months
	Design Average Recurrence Interval (ARI) (years)	
Diversion bank	10	20/100 *
Level spreader	10	20/100 *
Waterway	10	20/100 *
Sediment basin:		
Primary outlet	5	10
Emergency outlet (overflow)	20	100
Sediment trap	5	10
Outlet protection	20	50
Grade stabilising structure	20	50
Detention basin:		
Primary outlet	5	10
Emergency outlet (overflow)	20	100
Waterway diversion	2	5/100 *

* **Note**: Where two ARI values are shown, the first number refers to the minor flow and the second to the major flow as defined in ARR.

ATTACHMENT 6

PROGRAM

OLYMPIC HIGHWAY INTERSECTION UPGRADE

EROSION AND SEDIMENT CONTROL

AWARENESS SEMINAR – HALF DAY

1 Introduction

2 Environmental Impacts – This session focuses upon the on-site and off-site environmental impacts of erosion and sedimentation (eg water quality, fauna, flora etc). It concludes with an exercise listing all impacts.

3 Environmental Legislation – This session examines:
- Relevant legislation (P.O.E.O. Act).
- Practical application in the field.

4 Principles of Erosion and Sediment Control – This session covers nine (9) principles which include:
- Investigation of site features
- Planning
- Minimum disturbance
- Topsoil
- Control of run-off
- Minimisation of erosion
- Trapping sediment
- Progressive rehabilitation
- Maintenance

5 Techniques of Erosion and Sediment Control – This session includes the most common techniques. Aspects covered include:
- Clearing
- Topsoil management
- Drainage and installation of permanent structures (eg culverts, catch drains etc)
- Diversions banks
- Drains and channels
- Batter protection
- Revegetation
- Sediment basins and management
- Sediment traps
- Sand bags and their application
- Maintenance
- Miscellaneous matters (eg mud on local roads, dewatering, dust etc).

6 Field Inspection – This session examines techniques constructed in the field together with associated discussions on Impacts, Legislation and Principles.

ATTACHMENT 7

EROSION AND SEDIMENT CONTROL REPORT

REPORT DATE		**REPORT No:**	
CLIENT	**Transport for New South Wales**		
PROJECT	**Olympic Highway Intersection Upgrade**		
DATE OF INSPECTION			
WEATHER CONDITIONS			
ATTENDEES			
REPORT TO			
REPORT BY	**John Wright – Senior Soil Conservationist, T.R.E.E.S. P/L M: 0418 434 516 E: john@treespl.com**		

No.	LOCATION	CONTROL	RECOMMENDATION / COMMENT	PRIORITY	ACTION	CLOSE OUT DATE	PHOTOGRAPH
1							
2							

ATTACHMENT 8

1. Erosion Hazard and Sediment Basins

Site Name: Olympic Highway Intersection Upgrades

Site Location: Old Narrandera Road Site

Precinct/Stage:

Other Details:

Site area	Sub-catchment or Name of Structure						Notes
	1	2					
Total catchment area (ha)	0.7	0.3					
Disturbed catchment area (ha)	0.7	0.3					

Soil analysis (enter sediment type if known, or laboratory particle size data)

Sediment Type (C, F or D) if known:	D	D	D	D	D	D	From Appendix C (if known)
% sand (fraction 0.02 to 2.00 mm)							Enter the percentage of each soil fraction. E.g. enter 10 for 10%
% silt (fraction 0.002 to 0.02 mm)							
% clay (fraction finer than 0.002 mm)							
Dispersion percentage							E.g. enter 10 for dispersion of 10%
% of whole soil dispersible							See Section 6.3.3(e). Auto-calculated
Soil Texture Group	D	D	D	D	D	D	Automatic calculation from above

Rainfall data

Design rainfall depth (no of days)	5	5					See Section 6.3.4 and, particularly, Table 6.3 on pages 6-24 and 6-25.
Design rainfall depth (percentile)	85	85					
x-day, y-percentile rainfall event (mm)	23.4	23.4					
Rainfall R-factor (if known)	1050	1050					Only need to enter one or the other here
IFD: 2-year, 6-hour storm (if known)							

RUSLE Factors

Rainfall erosivity (*R*-factor)	1050	1050					Auto-filled from above
Soil erodibility (*K*-factor)	0.05	0.05					
Slope length (m)	80	80					
Slope gradient (%)	10	10					RUSLE LS factor calculated for a high rill/interrill ratio.
Length/gradient (*LS*-factor)	2.81	2.81					
Erosion control practice (*P*-factor)	1.3	1.3	1.3	1.3	1.3	1.3	
Ground cover (*C*-factor)	1	1	1	1	1	1	

Sediment Basin Design Criteria (for Type D/F basins only. Leave blank for Type C basins)

Storage (soil) zone design (no of months)	2	2					Minimum is generally 2 months
Cv (Volumetric runoff coefficient)	0.5	0.5					See Table F2, page F-4 in Appendix F

Calculations and Type D/F Sediment Basin Volumes

Soil loss (t/ha/yr)	192	192					
Soil Loss Class	2	2					See Table 4.2, page 4-13
Soil loss (m^3/ha/yr)	147	147					Conversion to cubic metres
Sediment basin storage (soil) volume (m^3)	17	7					See Sections 6.3.4(i) for calculations
Sediment basin settling (water) volume (m^3)	82	35					See Sections 6.3.4(i) for calculations
Sediment basin total volume (m^3)	99	42					

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

ATTACHMENT 9

OLYMPIC HIGHWAY INTERSECTION UPGRADE

SAMPLE PROCEDURE FOR WATER QUALITY MANAGEMENT IN SEDIMENT BASINS

WHY SEDIMENT BASIN MANAGEMENT IS REQUIRED?

An important component of water quality control is effective management of sediment basins from the construction phase through to their conversion to chemical spill traps or water quality ponds post construction.

There is a legal responsibility to ensure that runoff leaving a construction site has an acceptable water quality standard including that water being discharged from sediment basins after storm events.

It is assumed the parameters and limits to be monitored in the management of sediment basins include:

- Total Suspended Solids (T.S.S.) - <50mg/l;
- pH – 6.5 to 8.5;
- Oil and grease – maximum 10mg/l.

It is these water quality parameters that are addressed in this Procedure.

PROCEDURE

To effectively manage the sediment basins the following procedure should be undertaken:

1 All sediment basins to be inspected for capacity and water quality immediately following cessation of a rain period. A marker should indicate the top of the sediment storage zone and the bottom of the settling zone.

2 If water is to be used for construction purposes (eg compaction, dust control) no treatment is required. However, the water should be removed at least from the settling zone routinely within 4 days.

3 If the capacity of the sediment storage zone has been reduced by 60% or more by sediment then desilting to be immediately scheduled with water treatment as per the procedure below.

4 If the water level is above the sediment storage zone the parameters of pH, T.S.S. and oil and grease to be tested and addressed as follows:

i. <u>pH</u>
   - Test basin water with meter.
   - No action if pH reading between 6.5 and 8.5.
   - Lime to be added if pH below 6.5.
   - Hydrochloric Acid (32% Muriatic) to be added if pH above 8.5.
   - Determine volume of water in basin.

- Determine percentage of lime or acid required by taking a 10 litre sample of basin water and adding a known amount of lime or acid (initially 0.004%). If the pH is still not acceptable, vary the amount of lime or acid until within the limits.
- Once the required percentage has been determined, calculate the actual amount of lime or acid to be added by multiplying the volume of water in the basin by the determined percentage.
- Add the required amount of lime or acid to the basin.
- Mix the water in the sediment basin well.
- Treat for pH prior to T.S.S.

ii. T.S.S

- Test basin water by comparing with water samples contained in jars with representative readings up to 100mg/l created through laboratory testing. This will enable a relatively accurate comparison which will be verified by laboratory testing approximately every six (6) rainfall events.
- No action if T.S.S. reading <50mg/l.
- If basins require flocculation (eg T.S.S. >50mg/l), bulk gypsum as a flocculant to be immediately applied evenly across the top of the water at an acceptable rate (i.e. trial and error as different for each basin). Methods of application to include:
  a) broadcast by shovels on small basins (ie <200m^3);
  b) mixing in a drum with water and pumping through a hose on large basins (ie >200m^3).

iii. Oil and Grease

- Examine surface of water for evidence (eg sheen, discolouration).
- No action if no visual contamination.
- Oil absorbent material to be spread if there is contamination (eg cell-u-sorb).

5 Leave basins to compensate for 24 to 48 hours.

6 After retesting, and once the above field tests indicate the water quality is acceptable discharge water from basin ensuring water quality is not compromised.

7 The process at points 4 and 5 and the retesting at point 6 may need to be repeated if acceptable water quality is not achieved initially.

8 Records to be kept of the rainfall events, inspections undertaken, field tests undertaken, dosage rates and when basin water is released etc (refer to the attached checklist).

9 The whole process of water quality management in sediment basins should be completed routinely within 4 days of cessation of a rain period.

Document No:

PROJECT: OLYMPIC HIGHWAY INTERSECTION UPGRADE

SEDIMENT BASIN MANAGEMENT

Rainfall Event mm:
Days:

Allowable Limits:

T.S.S.	<50mg/l
pH	6.5 to 8.5
Oil & Grease	max. 10mg/l (by observation)
Desilting	>30% reduction in design capacity

BASIN NO	DESIGN CAPACITY M3	IS WATER TO BE USED FOR CONSTRUCTION	WATER QUALITY BEFORE TREATMENT			RATE OF LIME ADDED	RATE OF ACID ADDED	RATE OF GYPSUM ADDED	OIL ABSOR BENT ADDED	WATER QUALITY AFTER TREATMENT			DATE VALVE OPENED	DATED VALVE CLOSED	DESILTING REQUIRED	DATE DESILTED	COMMENTS
			T.S.S	pH	OIL & GREASE					T.S.S.	pH	OIL & GREASE					

Inspected By / Position Date Environmental Manager Date

umwelt
Environmental & Social
Consultants

Umwelt (Australia) Pty Limited

T| 1300 793 267 E| info@umwelt.com.au www.umwelt.com.au

23.047 978-1-922875-73-0

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