Tasmanian Government

DEPARTMENT OF STATE GROWTH

Dept. Ref MIG23/865
Critical Date 23 August 2023
MIN 23/24110

APPROVED/NOT APPROVED

SIGNED:

DATE: 23/8/23

MINUTE TO THE MINISTER FOR INFRASTRUCTURE AND TRANSPORT

SUBJECT: SOUTHERN OUTLET TRANSIT LANE – DELIVERY PRIORITISATION OF EARLY WORKS

Minister's notation:

Recommendation:

That you:

1. **Note that there is a significant shortfall in the funding allocation for the Transit lane and the total works required to alleviate congestion on the Southern Outlet Macquarie Davey Street corridor, such that the Southern Outlet Transit Lane cannot be delivered.**

2. **Note that the proposed early works and traffic demand management described herein are necessary before the commencement of the Southern Outlet Transit Lane works and can proceed before the budget shortfall is resolved.**

3. **Approve progressing the early works and the extended scope described herein on the basis of the funding breakdown in the table in this Minute.**

4. **Endorse the Department of State Growth continuing to pursue funding to fully deliver the Southern Outlet Transit Lane through future State Budget process and by seeking access to unallocated Australian Government funding in the Infrastructure Investment Program (IIP), assuming that it is retained post IIP review.**

Current Situation:

The detailed design phase of the Southern Outlet Transit Lane (transit lane) is nearing completion. With the finalisation of the design, the following key challenges have been identified:

a) **Unavoidable significant impacts to traffic during construction:** In order to minimise property acquisition impacts for the transit lane, there is a need to move the central retaining wall on the road to construct the transit lane. Several options for the construction methodology has been considered, however, the conclusion in all cases is that extended lane closures on the Southern Outlet are required for the construction to be completed efficiently and safely. Extended lane closures will result in significant traffic disruptions to the road users and further broader disruption to Hobart based business and community services including health and education.

b) **Rock Face stability concerns:** After extensive site investigations and further assessment of the rock face at the southern end of the works, a significant risk of rock fall during construction of the transit lane has been identified. The vibration and rock breaking work associated with construction of the transit lane is likely to result in rock fall that may enter the traffic lanes without further rock stability and rock fall protection works.

   Consequently, it is recommended that rockface excavation, rock stability and rock fall protection works be completed ahead of the construction of the transit lane and issued as a separate tender ahead of works on the lane due to its technical complexities. This is an addition to the original budget for the transit lane.

c) **Project Costs exceed available budget:** The most recent cost estimate, total project cost for the transit lane and Macquarie - Davey Street slip lane and bus priority measures is s38 which is well in excess of the original $51 million budget commitment allocated in 2018, comprising of $35 million for the Southern Outlet transit lane and $16 million for Macquarie Davey Streets.

   The Davey Street rehabilitation work was funded from the project with the expectation that the bus prioritisation would also be delivered. Unfortunately, significant latent conditions including managing tramlines and services added significantly to the cost.

   Additions to the original scope of the project are required to ensure the success of the Southern Outlet Transit lane implementation; including an additional lane between Macquarie and Davey Street, rockfall mitigation and Intelligent Transport Systems (ITS). The ITS will all be required for effective and safe functioning of the transit lane. Progressive cost estimate reviews undertaken during the final design identified the likely significant cost increase due to additional scope and submissions were made for budget increases in the 2023-24 Tasmanian and Australian Government budget development process.

   Additional funding of approximately $7.1 million has been made available through the Tasmanian Government's Targeting Congestion funding in the 2023-24 budget, however the Australian Government has not committed any funding at this stage.

To address the significant impacts to traffic during construction, the department is developing a Travel Demand Management (TDM) strategy.

The work to date on the TDM has clarified that early works are necessary to be undertaken before the Transit lane can proceed.

This TDM will identify interventions and mitigations to manage travel demand as required, to support construction traffic management across greater Hobart. The strategy will also consider the impact of multiple projects across Greater Hobart wider than the Southern Outlet project, such as the Tasman Bridge upgrade project, and how they may impact each other depending on its individual

construction schedules. The interventions and mitigations may include across network construction scheduling, travel time information and planning, detour route management, bus priority measures and promotion of both public transport and active transport options. The implementation of the TDM will require extensive communication which will include education campaigns to prepare the community for the impacts of construction and the changes and expected disruptions to travel.

The delivery of an effective education campaign and preparedness for delivery of numerous intervention strategies is not a short-term proposition but rather is anticipated to extend to six to nine months, and possibly beyond.

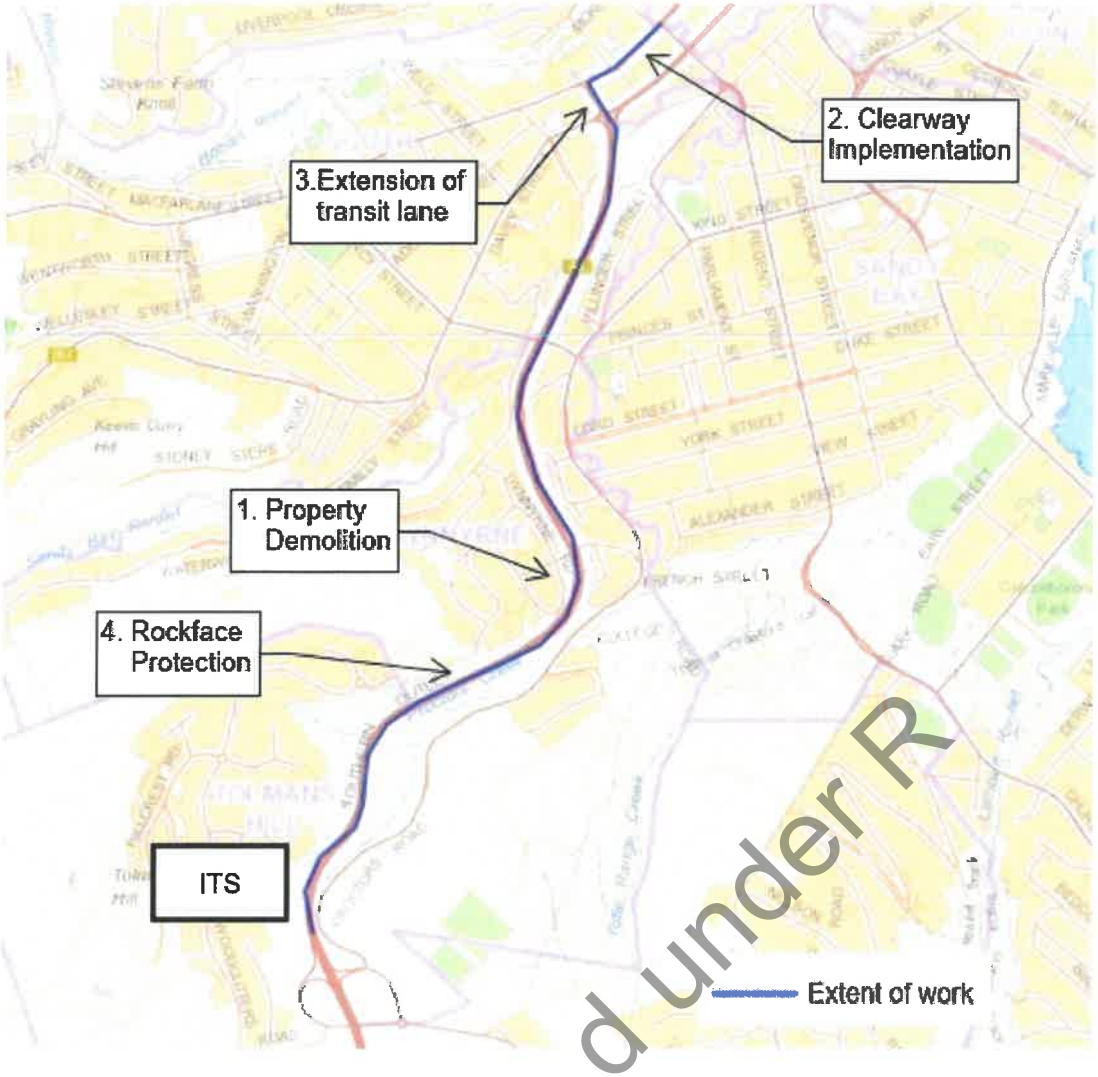
Further, noting that the department's approach to the Australian Government for a matching contribution was declined, further consideration and option development to address the budget challenges will be necessary before construction of the Southern Outlet Transit Lane can proceed. The Department of State Growth will continue to pursue funding through State Budget processes and from the Australian Government, however this will not be possible until the outcome of the Infrastructure Investment Program (IIP) Review is known. It is proposed to target the unallocated funding in the IIP assuming that it is retained post the IIP review which is now complete.

Early Works

In consideration of the construction impacts, the rockface stability concerns and budget challenges identified above which are delaying the commencement of construction of the transit lane, the department proposes staging of early works considered necessary to support the delivery of the transit lane.

These early works can be implemented before the full budget is resolved and will assist in preparing the community for the construction of the transit lane and its impacts, with some of the interventions and mitigations identified under the TDM to be developed and potentially trialled throughout the delivery of these early works.

The following map shows the location of the early works and proposed delivery sequence from one through four.



The early works are proposed to be delivered in the sequence as follows:

1. Property Demolition – **Commence August 2023**
   Three properties on Dynnyrne Road have been acquired. Demolition of these properties has been planned for the coming weeks. After demolition, the properties will become a greenfield site to allow for the construction of the transit lane. The demolition of these properties is necessary prior to commencement of construction of the transit lane and will be useful for locating site offices and laydown areas for the construction contractor.

2. Parking Removal and Clearway Implementation – **Commence November 2023**
   The Macquarie and Davey Streets bus improvements project will improve both Macquarie Street and Davey Street for buses, cyclists and pedestrians. The current design includes new and improved bus stops, removing and relocating parking to improve bus access, cycling, and traffic turning and through lane flow improvements. The early works will involve clearway extension during the AM and PM peaks, permanent removal of some parking, installing an uphill bicycle lane on Davey Street, between Sandy Bay Road and Linden Avenue, and changes to signage on side streets to provide additional supply for residential permit holders.

   The removal and relocation of on-street parking and the clearway implementation on Macquarie Street, from the Southern Outlet to Molle Street will ease the bottleneck on Macquarie Street during peak period and therefore ease some of the traffic congestion that will be experienced during the construction of the Southern Outlet transit lane. It is

therefore critical that this work is undertaken prior to the Southern Outlet transit lane construction.

3. Construction of the Extension of the Southern Outlet transit lane between Davey and Macquarie Street – **Commence January 2024**
   Working in parallel with the proposed clearway on Macquarie Street (between Macquarie Street and Molle Street), the extension of the transit lane between these two streets will ease the existing bottleneck and improve traffic flow between the end of the Southern Outlet and Macquarie Street.

   This extension along with the clearway on Macquarie Street can then be converted to a dedicated bus lane at some time in the future, which together with the Southern Outlet transit lane, will allow buses a prioritised run from the Southern Outlet all the way through to Molle Street. This will also support the future rollout of rapid buses across Greater Hobart, as the Southern Outlet and Macquarie / Davey Streets have been identified as part of the routes of the proposed rapid bus network.

4. Rockface protection works – **Commence March 2024**
   To address the identified risk of unintended rock fall resulting from the vibration and rock breaking work associated with construction of the transit lane, it is proposed to complete the rockface excavation, rock stability and rock fall protection works prior to construction of the transit lane. As the rockface excavation and protection requires a specialist contractor and it is preferable for the contractor to nominate specific excavation/blasting methodology, a separate tender for these works is proposed.

   The delivery of the Rockface protection works ahead of the construction of the transit lane will provide an opportunity to implement components of the TDM including promoting communications regarding traffic impacts associated with the project and trialling of the intervention measures.

It is further noted that completion of the above works will provide long-term congestion and network resilience benefits with or without the completion of the Southern Outlet Transit Lane.

In addition to the above initiatives the following further works will be progressed addressing congestion and contributing to the success of the delivery of the TDM and associated intervention measures mitigating the traffic impacts during transit lane construction.

Increased Bus Service Uptake
The department has implemented several measures under the Southern Projects, such as Kingborough park and ride and increased bus services in the southern region to promote the uptake of bus services.

With the bus service uptake, it is expected that the number of vehicles on the Southern Outlet will reduce and consequently easing traffic congestion during construction of the transit lane. This is an opportunity to achieve modal shift for commuters using the Southern Outlet before the construction of transit lane begins. The department will continue to develop measures under the TDM to encourage bus service uptake.

Southern Outlet Intelligent Transport System
The installation of additional ITS including a fibreoptic communications cable backbone along the southern Outlet, CCTV cameras, incident detection devices, variable speed limit signs and one additional Overhead Traffic Information Sign (OTIS) on Davey Street will assist in traffic management, incident response and managing congestion. This will complement the current

OTIS project that is about to commence with two signs to be installed on the Southern Outlet, and one each on the Channel and Huon Highways just south of Kingston.

With the ITS component in place prior to the construction of transit lane, traffic operations will have visibility on real time traffic conditions that will greatly assist the incident response during the construction of the transit lane and deployment of mitigation measures to address traffic queueing or facilitate emergency vehicles through the construction site.

The OTIS system will also provide commuters with information around their journey in real time and allow in-trip route planning, such that commuters can make decisions in choosing an alternative route, travel at an alternative time or avoid travel prior to travelling on the Southern Outlet.

The early works will provide greater capacity on the road for bus travel and in combination with bus priority measures and increased bus service frequencies would encourage a greater uptake of the bus services. This will also assist in alleviating the pressure on the road network in Hobart, during construction of the transit lane and beyond.

s27, s38

The implementation of the Travel Demand Management strategy is estimated to s27, s38 and will be developed and implemented throughout the early works and construction of the transit lane.

The cost for the Increased Bus Service Uptake will be developed following finalisation of the scope for these items.

The department will progress further consideration and option development to address the approximate s38 budget shortfall, based on a current P90 project estimate of s38 to deliver the southern outlet transit lane and Macquarie Davey Street bus priority, and ultimately facilitate the proposed rapid bus network.

Communications Strategy:

A communications plan will be developed advising of the key challenges identified and the response including the revised delivery strategy, that will allow for works to progress on delivering the transit lane concurrently with resolving the key challenges.

This communications plan will be delivered in parallel with the wider communications plan being developed under the TDM strategy to ensure consistency in the communications approach. This will also align with the proposed Keeping Hobart Moving campaign which aims to make the Greater Hobart community aware of the cohesive program of works that will ultimately give people a variety of options to move around Hobart, including easier, more convenient, and more efficient active and public transport options.

Background:

The Southern Projects, which is now part of a larger Keeping Hobart Moving program of works, is an end-to-end solution that will make bus travel more attractive, providing an easier ride for bus users all the way from Huntingfield, Kingston to the Hobart CBD.

The Southern Projects include:

- new park and ride facilities in Kingborough, connecting with increased bus services
- a new city-bound T3 transit lane for the Southern Outlet to encourage bus travel and carpooling
- easing the bottleneck on Macquarie and Davey Streets by adding new lanes and bus priority and cyclist improvements.

As part of the Southern Projects, the Southern Outlet Transit Lane includes the design for a northbound transit lane on the Southern Outlet between Olinda Grove and Macquarie Street. The lane will operate as a T3 lane for use by buses, private vehicles carrying three or more occupants, taxis and emergency service vehicles. Building an additional northbound lane will also improve access for public transport and emergency services along this critical road corridor. The Southern Outlet Transit Lane and Macquarie Davey Street bus priority will facilitate the proposed rapid bus network.

Together with the other sub projects under the Southern Projects (new park and ride facilities and the works on Macquarie and Davey Streets), the transit lane forms part of the end-to-end solution to:

- Achieve modal shift for commuters using the Southern Outlet
- Improve public transport travel reliability along the Southern Outlet corridor, and facilitate the proposed rapid bus network
- Encourage multiple occupancy of private vehicles during peak periods of travel
- Improve public transport and passenger experience for Kingborough and Huon residents.

APPROVED BY

Gary Swain
Acting Secretary

18 August 2023

Prepared by:		Cleared by:	
Position:	Project Manager	Position:	Director, Programming & Delivery
Email:	@stategrowth.tas.gov.au	Email:	@stategrowth.tas.gov.au
Date:	20 July 2023	Date:	20 July 2023
Phone:		Phone:	

Kingborough

Date: 31 August 2023

Our Ref: 13.74

Hon Michael Ferguson MP
Minister for Infrastructure and Transport
By email: Michael.Ferguson@dpac.tas.gov.au

Dear Minister

Southern Outlet Transit Lane

I am writing regarding the Hobart City Deal – Southern Projects, specifically progress made on the Southern Outlet Transit Lane project.

I understand that the project schedule outlined on the Transport Tas website is current with construction of the project anticipated to start this summer (2023/2024). With this in mind, it would be ideal for Council to be briefed on the traffic management plans as well as any steps which will be put in place to avoid congestion during the construction period.

We would anticipate increased pressure on Council roads and alternative routes from Kingston to Hobart during construction of this significant project and we are interested in working with the Department to ensure the best outcome for the Kingborough community.

Yours sincerely

Cr Paula Wriedt
MAYOR

Kingborough Council

Civic Centre, 15 Channel Highway, Kingston TAS 7050
Locked Bag 1, Kingston TAS 7050
(03) 6211 8200
kc@kingborough.tas.gov.au
www.kingborough.tas.gov.au

From: Ferguson, Minister
To: Cr.Paula Wriedt; kc@kingborough.tas.gov.au
Subject: Response to Cr Paula Wriedt, Mayor Kingborough Council - Southern Outlet Transit Lane
Attachments: image001.jpg
image002.jpg
Response to Cr Paula Wriedt, Mayor Kingborough Council - Southern Outlet Transit Lane.PDF

Dear Cr Wriedt

Please see attached correspondence from the Minister for Infrastructure and Transport, the Hon Michael Ferguson MP.

Thank you

Office of the Hon Michael Ferguson MP
Deputy Premier of Tasmania
Treasurer
Minister for Infrastructure and Transport
Minister for Planning
Liberal Member for Bass
A: Level 10, Executive Building, 15 Murray Street, Hobart
A: Public Buildings, 53 St John Street, Launceston

Tasmanian Government
www.premier.tas.gov.au

Deputy Premier
Treasurer
Minister for Infrastructure and Transport
Minister for Planning

Level 10, Executive Building, 15 Murray Street, Hobart
Public Buildings, 53 St John Street, Launceston
GPO Box 123, Hobart TAS 7001
Phone: (03) 6165 7701; Email: Michael.Ferguson@dpac.tas.gov.au

Tasmanian Government

26 SEP 2023

Cr Paula Wriedt
Mayor
Kingborough Council
Locked Bag 1
Kingston TAS 7050

Dear Cr Wriedt Paula

Thank you for your letter dated 31 August 2023 seeking an update on the state of progress of the Southern Outlet Transit Lane project.

The Tasmanian Government's Hobart Transport Vision seeks to provide Greater Hobart residents and visitors with a reliable and cost-effective alternative transport system with a focus on prioritising passenger transport as an alternative to private car travel.

As you know, Southern Projects is a suite of coordinated transport projects to help deliver this vision to make bus travel more attractive, providing an easier ride for bus users all the way from Huntingfield to Molle Street in Hobart's CBD.

The government has already delivered a number of improvements as part of the Southern Projects program such as the launch of additional express bus services to Hobart and new park and ride facilities at Huntingfield and Firthside to give Kingborough residents more reason to take the bus. These are proving to be very popular.

The Southern Outlet Transit Lane is a key component of the Southern Projects program. The Department of State Growth advises me that it is considering a number of factors, such as reducing traffic impacts from construction of the Transit Lane, as part of continued planning work for this project.

When this work is completed, it would be the government's intention to work closely with key stakeholders on how best to implement a range of possible traffic management options during construction. I therefore thank you for indicating Kingborough Council's desire to work with the department on this important project.

I have asked the department to arrange a briefing for your Council on next steps for the projects at the earliest opportunity.

Finally, with regard to the information on the Transport website, the department has advised it will shortly be updating the website with further information about the next steps in the Southern Projects program to ensure the Tasmanian community is kept informed of progress.

I trust this information clarifies the matter you have raised.

Yours sincerely Regards

Michael Ferguson

Michael Ferguson MP
Deputy Premier
Minister for Infrastructure and Transport

Document 4

From: secretariat
To: Ferguson, Stategrowth
Cc: secretariat
Subject: FW: ADVICE - Southern Outlet Transit Lane correspondence
Date: Tuesday, 29 August 2023 3:24:33 PM

out of scope

From: Ministerials State Roads Division <MinisterialsStateRoads.Division@stategrowth.tas.gov.au>
Sent: Tuesday, 29 August 2023 11:14 AM
To: secretariat <secretariat@stategrowth.tas.gov.au>
Subject: ADVICE - Southern Outlet Transit Lane correspondence

Hi team,

A State Roads consultant has received this email:

> *Dear Southern Outlet project team,*
> *I'm contacting you on behalf of the Hon. Meg Webb MLC, Member for Nelson, who is interested in the latest available information regarding the planned Southern Outlet Transit Lane. Of particular interest is any potential impacts for Olinda Grove, and any assessed changed road traffic flows for traffic between Hobart and Mt Nelson, particularly in relation to Proctors Road and environs.*
> *Although we have viewed the content available on the State Growth Southern Outlet transit lane webpage the particular query we are seeking to answer is the degree to which any impact the planned project may have in regard to changed road traffic flows to and from Hobart at Mt Nelson in relation to proctors road , the bends, the college and Upper Nelson road, has been assessed?*
> *Can you please provide any current information on this project additional to that already available on the website? Further, if an impact assessment on traffic flows between Mt Nelson and Hobart has been undertaken can that also please be provided?*
> *Kind regards,*

On behalf of
The Hon. Meg Webb MLC

Office of Meg Webb MLC | Independent Member for Nelson
Parliament of Tasmania
P: *| **E:*** *@parliament.tas.gov.au*
Suite 3, 32 Channel Hwy Kingston 7050 | PO Box 694, Kingston TAS 7051
www.megwebb.com.au

out of scope

| Communications Support Officer
State Roads Division | Department of State Growth
Level 2, 4 Salamanca Place Hobart TAS 7000 | GPO Box 536, Hobart TAS 7001
Phone:
www.stategrowth.tas.gov.au
Courage to make a difference through

TEAMWORK | INTEGRITY | RESPECT | EXCELLENCE

In recognition of the deep history and culture of this island, I acknowledge and pay my respects to all Tasmanian Aboriginal people; the past, and present custodians of the Land.

Document 5

Deputy Premier
Treasurer
Minister for Infrastructure and Transport
Minister for Planning

Level 10, Executive Building, 15 Murray Street, Hobart
Public Buildings, 53 St John Street, Launceston
GPO Box 123, Hobart TAS 7001
Phone: (03) 6165 7701; Email: Michael.Ferguson@dpac.tas.gov.au

Tasmanian Government

2 OCT 2023

Hon Meg Webb MLC
Member for Nelson
By email: meg.webb@parliament.tas.gov.au

Dear Ms Webb

I refer to an email of 29 August 2023 from your Electorate Officer, [redacted] which was directed to the Southern Outlet project team and forwarded to my office for a response.

The Tasmanian Government's Hobart Transport Vision seeks to provide Greater Hobart residents and visitors with a reliable and cost-effective alternative transport system with a focus on prioritising passenger transport as a competitive alternative to private car travel.

Southern Projects is a suite of coordinated transport projects to help deliver this vision to make bus travel more attractive, providing an easier ride for bus users all the way from Huntingfield to Molle Street.

The government has already delivered a number of improvements as part of the Southern Projects program such as the launch of additional express bus services to Hobart and new park and ride facilities at Huntingfield and Firthside to give Kingborough residents more reason to take the bus. These are proving to be very popular.

The Department of State Growth advises me that it is considering a number of factors, such as reducing traffic impacts from construction of the Transit Lane, as part of continued planning work for this project. With regard to the information on the Transport website, the department has advised it will update the website with further information about the Southern Projects to ensure the Tasmanian community is kept informed of progress.

Finally, can I ask that future requests for information on this, or any government matter, be made directly to my office as is the normal protocol.

I trust the above information is of assistance to you.

Yours sincerely

Michael Ferguson MP
Deputy Premier
Minister for Infrastructure and Transport

PT issues and questions on Southern Outlet construction delays

The tables below outline some key points about the Southern Outlet transit lane project and the impacts on capacity of the road network. For example, a minor rock fall caused one lane to be closed for a comparatively small distance on the Southern Outlet which created chaotic delay.

Capacity

	Capacity	***PT comments***

Existing volumes	- ~8,500 vehicles (2-6pm)
	- ~2,500 vehicles (hourly)
		- 62 general access bus services scheduled to operate between 3-7pm on weekdays during school term (see D22/227484)
		- **Bus is fleet fully allocated during peak periods**
		  o At least 6-12+ months required to procure extra buses
		- Bus timetables are integrated, and driver duties are spread across Hobart (e.g. bus originating in Kingston may end up operating its next service to Glenorchy and vice versa)
		  o **Re-timetabling services is a significant undertaking and requires at least 6+ months**

Expected capacity	- <1,100 vehicles (hourly)	- The theoretical capacity of a single uphill lane is less than half of the two-lane capacity, which allows for adjustments to cater for all slow-moving heavy vehicles holding up vehicles behind them. - Therefore, realistically **need to cut the total volume by more than half**. *Best case* - There will still be traffic delays within an acceptable level (e.g., is this 5 – 10 minutes?) *Medium case* - Delays exceeding an acceptable level (e.g. greater than 10 minutes?)

Questions

Issue	***Question***	***State Roads / GHD answer***
Level of service	What is the current level of service on Davey St and the Southern Outlet during the AM and PM peaks?	
	What will the level of service be during construction?	
Travel time	What is the current estimated travel time from the start of Davey Street to the start of the Southern Outlet during the PM peak?	
	What is the current estimated travel time from the start of the Southern Outlet to perhaps Olinda Grove (southbound)?	
	What will travel times be during construction?	

Issue	*Question*	*State Roads / GHD answer*
	Interested to know level of delays based on a sliding scale, e.g. if we can only get x% off cars of the road, what is the delay? And if we reach the target number of cars off the road, would there still be a delay? Please advise of work zone speed limits (northbound and southbound) and the extent of the works	
Alternative routes	As motorists seek an alternative route there will be potential delays on Sandy Bay Road and Channel Highway, which will impact Sandy Bay, Taroona and Kingston (Summerleas) bus services. What is the current estimated travel time between Sandy Bay Road to Channel Highway Kingston?	
Alternative solutions to closing one southbound lane	Can a peak flow lane similar to the Tasman Hwy be put in place? The AM peak flow lane on the Tasman Hwy extends from the Tasman Bridge to Liverpool St and is supported by removable traffic markers. With a traffic management plan and some minor works could this be accommodated to provide two south bound lanes in the PM peak, or from midday to 9pm for example? Maybe such an arrangement can be used for bus priority?	
Stakeholder engagement	Has State Roads / GHD considered establishing a traffic and transport liaison group for the project? The Bridgewater Bridge TTLG is a forum to keep PT, operators, emergency services and other key road user groups aware of construction stages and travel time delays before and during the project. The Bridgewater project also has a good traffic monitoring system with variable message boards to be in place for general traffic and real time info refreshed every 15 min.	

7 July 2023

Department of State Growth
The Crown in Right of Tasmania
C/- Department of State Growth
4 Salamanca Place
HOBART TAS 7000
@stategrowth.tas.gov.au

Dear

NR1445 - SOUTHERN OUTLET TRANSIT LANE

OPTIONS STUDY FOR CONSTRUCTION SCHEDULING

Please find attached the Construction Scheduling options study for the above project based off the revised documentation received in May 2023.

The Services to be supplied:

The services (the Services) to be supplied by the WT to the Principal in accordance with the agreed fee proposal are as follows:

The development and delivery of a report that considers options associated with the Southern Outlet Transit Lane, which are based on the most recent design concepts and constructability report (by GHD), and which primarily avoids full lane closures on the Southern Outlet.

Yours sincerely

State Director
WT

WT REF: PR-018142-02

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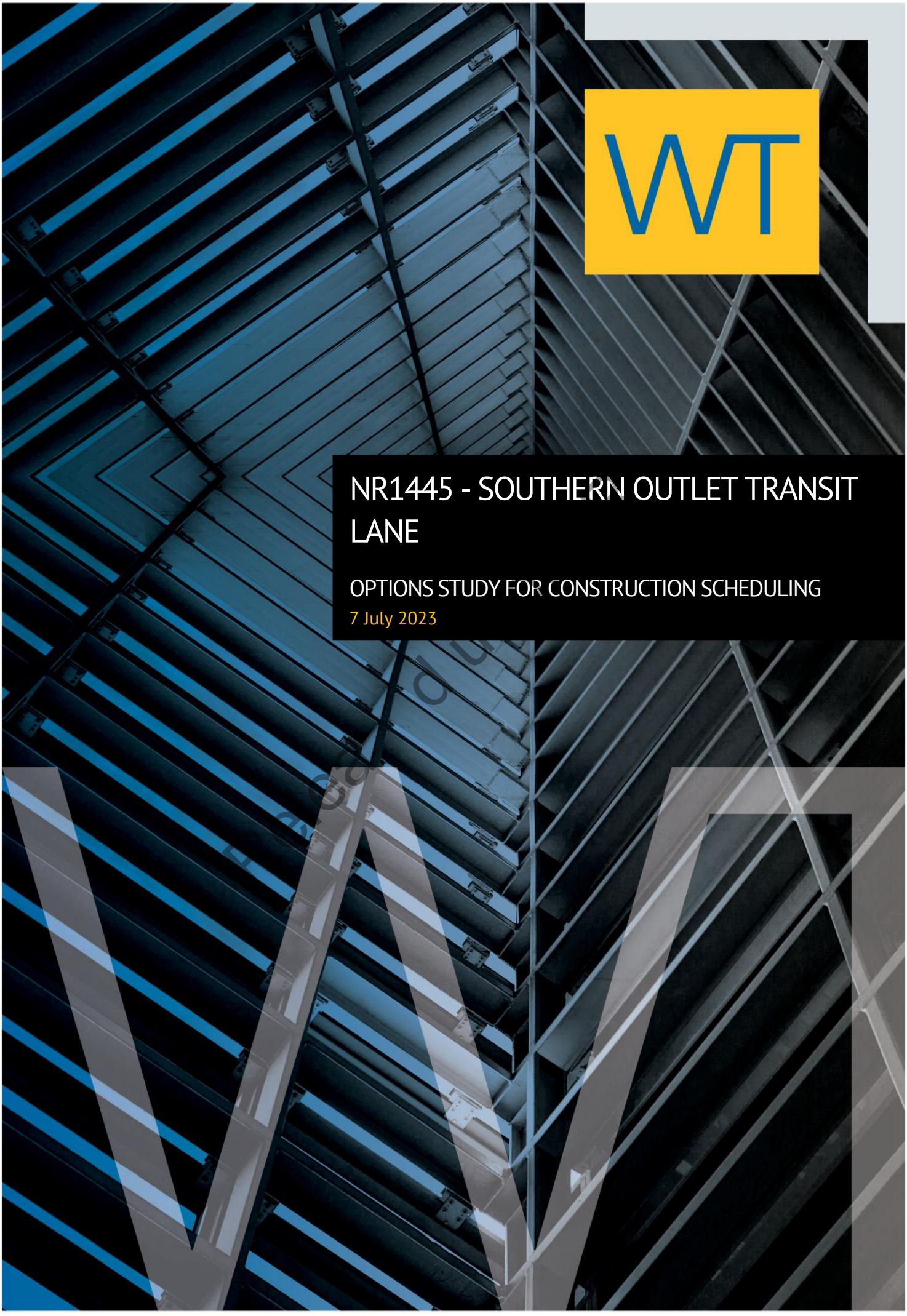

NR1445 - SOUTHERN OUTLET TRANSIT LANE

OPTIONS STUDY FOR CONSTRUCTION SCHEDULING

7 July 2023

CONTENTS

APPENDICES

CONTACT

DETAIL	DESCRIPTION
Name of Company/Trading Name	WTP Australia Pty Ltd
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DOCUMENT STATUS	NAME	DATE
PREPARED BY	out of scope	22 June 2023
REVIEWED BY		26 June 2023
E-SIGNATURE APPROVED		7 July 2023

REVISION NO.	REVISION DATE	DRAFT.FINAL
0	25/05/2023	Draft
1	7 July 2023	Final

1 SUMMARY

The project site is located at Davey Street to Olinda Grove Intersection, Hobart, Tasmania. The project has 2 stages and Stage 2 works include:

- Removal of the existing retaining wall at the median and construction of a new retaining wall
- Construction of a new retaining wall at northbound of Southern Outlet Highway
- Widening of the northbound of Southern Outlet Highway to construct a transit lane.
- Peak hour traffic has been considered, there are no night works allowed.

WT have been requested to prepare a construction programme based off revised information received in May 2023.

Figure 1: Plan view – Southern Outlet Highway

1.1 DURATIONS & IMPORTANT DATES & MILESTONES

1.1.1 OPTION 1 (ALTERNATIVE TO THE FULL TIME LANE CLOSURES CONSIDERED IN OPTION 2)

ACTIVITY	DURATION (W/DAYS)	START	FINISH
Pre-Construction	170	23.01.2023	25.09.2023
Construction	1044	25.09.2023	21.02.2026
Defect Period	14	29.07.2025	09.08.2025
Contingency – P90	82	09.08.2025	16.10.2025
Inclement Weather	153	16.10.2025	21.02.2026

MILESTONE	DATE
Award	04.04.2023
SCEP Approval	21.02.2026
Services relocation completion	25.09.2023

MILESTONE	DATE
Completion of Ch. 11100 - Ch. 11500	02.06.2025
Completion of Ch. 10830 - Ch. 11100	15.08.2024
Completion of Ch. 11500 - Ch. 11770	29.07.2025
Completion of Ch. 11100 - Ch. 11500	29.05.2025
Practical Completion	29.07.2025
Handover	21.02.2026

1.1.2 OPTION 2 (IN ACCORDANCE WITH GHD CONSTRUCTABILITY REPORT)

ACTIVITY	DURATION (W/DAYS)	START	FINISH
Pre-Construction	170	23.01.2023	25.09.2023
Construction	1455	25.09.2023	01.02.2027
Defect Period	14	23.04.2026	05.05.2026
Contingency – P90	114	05.05.2026	06.08.2026
Inclement Weather	213	06.08.2026	01.02.2027

MILESTONE	DATE
Award	04.04.2023
SCEP Approval	21.02.2026
Services relocation completion	25.09.2023
Completion of Ch. 11100 - Ch. 11500	30.12.2025
Completion of Ch. 10830 - Ch. 11100	25.11.2024
Completion of Ch. 11500 - Ch. 11770	23.04.2026
Completion of Ch. 11100 - Ch. 11500	01.11.2025
Practical Completion	23.04.2026
Handover	01.02.2027

2 INFORMATION RECEIVED

- On 09.05.2023
  - SOTL_Constructability Report_Mar23
  - SOTL_Detailed design drawing_Feb23
  - SOTL_Project Risk Register_Nov22
- On 31.05.2023
  - 32-12556430-T003
  - 32-12556430-T003_DC
  - 12556430 - Stage 1 BOQ – Blank
  - 12556430 - Stage 2 BOQ – Blank
  - Final Detail Design Issue - 20230525 Combined Stage 1 and 2
- On 06.12.2023
  - Southern Outlet Transit Lane - Stage 2 (from Olinda Grove) Display Plan
  - Southern Outlet - DRAFT construction program

3 METHODOLOGY

The following methodology attempts to account for the schedule viability and the inherent uncertainty and risk events that could affect the project during execution to Practical Completion.

The employed methodology is similar to the traditional Critical Path Method (CPM) analysis with the distinction of activities having a range of duration and not a single duration value, typically described as a three-point estimate with a minimum, maximum and most likely duration. The CPM analysis is then run thousands of times, sampling values from defined ranges of each activity with each run. The uncertainty simulation engine running enough iterations so that, within statistical reasonableness, one ends up with a range of results with varying degrees of confidence.

The results offer dates ranging from 0% confidence (P0) to 100% confidence (P100). For the purposes of the anticipated Practical Completion given the information available at the time of publication; WT are staking our opinion on the P90 date for our forecast on Schedule Risk Analysis (SRA).

The schedule software employs Monte Carlo analysis which is reliant on the input data; it is therefore important to note that inaccurate inputs such as unreasonable uncertainty coefficients will result in defunct output data.

4 INPUT METHODOLOGY

4.1 BASELINE

4.1.1 SCHEDULE QUALITY

It is crucial to the credibility of the predictive analysis to run the Baseline (BSL) schedule through a series of diagnostic checks to validate the quality of the plan.

The BSL schedule scored 80% on the quality Health Check which is approximately 5% higher than industry best practice expectations for a BSL schedule. The BSL plan is therefore considered to be a good foundation for SRA process.

4.2 HISTORIC DATA

Considering the schedule provided is a pre-tender schedule, there is no historic data to map-track and trace delivery trend.

4.2.1 CONTINGENCY

The pre-tender schedule is a wet schedule and the calendars employed and appropriated have taken account of inclement weather including seasonality through individual months for the specific to the location of the project, refer to Basis of Schedule Section 6.

5 UNCERTAINTY

Any schedule even though it may be low risk, still has inherit uncertainty in its duration estimates and uncertainty analysis is therefore based on Process and Performance which excludes risk events. It is better to qualify duration estimates using probability distributions such as a triangular probability distribution from a three-point pessimistic-most likely-optimistic estimate over the single-point deterministic duration estimate. WT has therefore opted to use a three-point estimate and the Monte Carlo simulation to find a more realistic schedule duration outcome.

In-order to reduce estimated durations, dependencies and assumptions, WT has elected the top-down approach to adding risk, this is also known as the uncertainty factor approach and comprises two aspects:

- Grouping activities into hierarchical list so that uncertainty assignments are done at the group level, rather than on each activity.
- Using a common template for uncertainty assignments rather than asking the team to manually define the minimum, most likely and maximum values.

5.1 GROUPING ACTIVITIES - WORK BREAKDOWN STRUCTURE

The schedule comprises the following main Work Breakdown Structure (WBS), namely:

- Construction SCEP
- Preconstruction stakeholder activities
- 1 - Service Relocation
- Section 2A - Ch. 10830 - Ch. 11500
  - Ch. 11100 - Ch. 11500
  - Ch. 10830 - Ch. 11100
- Section 2B - Ch. 11500 - Ch. 11770
  - Ch. 11500 - Ch. 11770
- Section 2C - Ch. 11770 - Ch. 12190
  - Ch. 11770 - Ch. 12190

WT has focussed on Construction with a primary focus on Earthworks, Pavement and Retaining Wall Construction.

5.2 GENERAL

Both Option 1 & 2 schedules have 142 No. total activities, including 9 No. milestones.

Both Option 1 & 2 schedules are built on Critical Path Method (CPM) and have a total of 39 No. activities identified as critical activities with total float value as zero (0). The Schedule settings are as follows:

- Float Type: Float = Late Finish – Early Finish
- Scheduling Mode: Retained Logic
- Critical Activity Definition: Total Float Less or Equal to NIL No. days
- WT opine that the schedule settings are appropriate.

A single Critical Path has been observed and generally comprise of: (**ref: Appendix – A**)

5.3 UNCERTAINTY – COMMON TEMPLATE

WT opted to utilise a six-category uncertainty envelope as depicted in the table below which helps provide consistency across scoring.

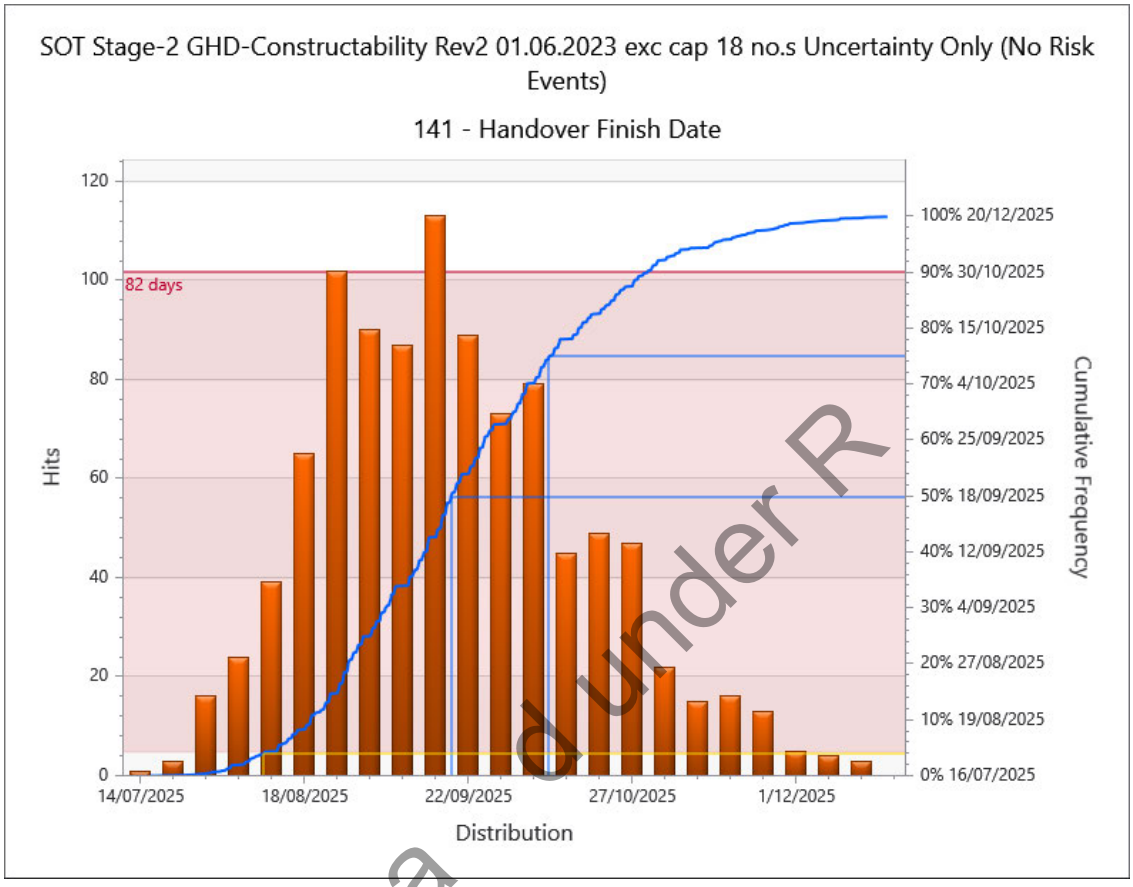
NAME	TYPE	MIN	MOST LIKELY	MAX
Extremely Conservative	Triangle	25%	100%	100%
Very Conservative	Triangle	50%	100%	100%
Conservative	Triangle	75%	100%	105%
Realistic	Triangle	90%	100%	110%
Aggressive	Triangle	95%	100%	125%
Very Aggressive	Triangle	100%	100%	150%

5.4 UNCERTAINTY CALCULATED

Utilising the six-category uncertainty envelope, WT initially marked up all activities as realistic which ensured that the original program dates remained unaltered. WT examined the durations employed through the WBS and based on scope uncertainty, complexity and duration uncertainty, as a team, we marked up activities / WBS according to our independent assessment to their respective delivery expectations. Where the team estimated that an activity will push out by 50% from the BSL forecast over the duration period, we considered this to be very aggressive and the maximum uncertainty will therefore be 150% with the most likely and minimum being 100%. Conversely, where an activity or group of activities pulled back from BSL forecast over the duration period, we marked this at conservative with a maximum and most likely duration at 100% and a minimum being 75%.

5.5 UNCERTAINTY (INHERENT RISK): NO CONTINGENT RISK

5.5.1 OPTION 1



METRIC	VALUE
Deterministic – 4%	09.08.2025
Mean (P54)	22.09.2025
P0 -Best Case	16.07.2025
P50	18.09.2025
P75	09.10.2025
P90 Contingency	82 Days
P100 – Worst Case	20.12.2025
Risk Range Factor	17%
Range	157 Days

The deterministic Date for Handover is 09 August 2025. There is 82 No. c/d Contingency required from the deterministic date 09 August 2025 to the P100 date of 20 December 2025, being the worst case. The best case P0 date for Handover is 16 July 2025 which is 24 No. c/d earlier than the NET current schedule forecast. **The P100 date is 20 December 2025 including 99 No. c/d uncertainty but excluding risk with a range of 157 No. c/d from the P0 best case date.**

6 BASIS OF SCHEDULE

6.1 PRODUCTIVITIES

6.1.1 EARTHWORKS

ACTIVITY	PRODUCTIVITY	UNIT	NOTES
Rock Cut*	0.2	m3/hr	▪ Rock type assumed as Dolerite which is common at the project location. ▪ Assumed that each team (excavator) to work 30m apart and without exceeding 18 No. excavators at the same time. ▪ Breaking rock and removal spoil considered when building the productivity rate.
Soil Cut	3	m3/hr	▪ Assumed that each team (excavator) to work 30m apart and without exceeding 18 No. excavators at the same time. ▪ Cutting soil and removal spoil considered when building the productivity rate. ▪ Removal of existing retaining wall at the median is calculated together with soil cutting by multiplying 0.4 factor considering the difficulty.
Backfill	22.5	m3/d	▪ Assumed that each team (excavator) to work 30m apart. ▪ Compaction is considered when building up the rate.

6.1.2 RETAINING WALL CONSTRUCTION

LOCATION	PRODUCTIVITY	UNIT	NOTES
Median	0.3	d/m	▪ One panel is 5m long. ▪ Retaining wall footing and barrier footing are in-situ, retaining wall panel and barrier are precast. ▪ When building the rates, compaction, blinding concrete, formwork, reo and concrete pouring works are considered for in-situ elements. ▪ Precast panel installation and stitches are considered. ▪ Assumed that each team to work 70m apart.
Northbound	0.1	d/m	▪ One panel is 5m long. ▪ Retaining wall footing is in-situ, panel is precast. ▪ When building the rates, compaction, blinding concrete, formwork, reo and concrete pouring works are considered for in-situ elements. ▪ Precast panel installation and stitches are considered. ▪ Assumed that each team to work 50m apart. ▪ New noise barrier and fence installation works are considered.

6.1.3 PAVEMENT WORKS

ACTIVITY	PRODUCTIVITY	UNIT	NOTES
Seal removal	5	m/h	▪ Road/lane dimensions assumed as 3.5m x 0.04m x 1m
Pavement Construction	6	M2/h	▪ Productivity rate includes drain and kerb construction, base and subbase construction, new seal, barrier installation and line marking (unless separated) for one lane with 3.5m width.
New seal	100	M2/h	▪ Productivity rate includes spread and compact for one lane with 3.5m x 0.4m x 1m.

6.2 CALENDARS

2 different calendars are employed in the schedule having consideration in respect to DGS' request of only day shift works due to light pollution.

CALENDAR	ACTIVITIES
Standard	Authorities, Approvals, Design, Engineering, services relocation (5 days, 8 hours/day + public holidays)
SOT Day Shift	6 days, 12 hours/day + public holidays + RDOs

As per DSG's advice, peak hours are considered:

Monday to Friday: 06:30 am – 09:30 am & 15:30 pm – 18:30 pm

Saturday: 10:00 am – 18:30 pm

Sunday: 12:00 pm – 18:30 pm

WT considered net working hours (assumed 1 hour to mobilize and 1 hour to demobilize including road open & close):

- 10:30 am – 14:30 am, **4 hours per day during week**
- 11:00 am – 17:30 pm, **6.5 hours on Saturdays**
- 13:00 pm – 17:30 pm and **4.5 hours on Sundays**

WT did not employ a separate calendar for off-peak hour works, instead, decreased the productivity of mentioned works by multiplying a productivity coefficient calculated as below:

- 1 day shift week = 6 days x 12 h = 72 hours
- 1 off-peak shift week = (5 weekdays x 4 h) + (6.5 h) + (4.5 h) = 31 hours
- Productivity coefficient when calculating off-peak hours = 31 hours / 72 hours = **0.4**
- Productivity coefficient when calculating only plant & material access during off-peak hours assumed = (1 + 0.4)/2 = **0.7**

6.3 STRATEGY

Stage 2 works are divided into three sections; (refer to "SOTL_Constructability Report_Mar23" for further details)

- Section 2A – Ch. 10 830 to Ch. 11 500; consists of a new central retaining wall, minor pavement widening, and pavement overlay. The works in this section forms the first half of the critical path and rock cutting works at the northbound is expected to be challenging considering the rock amount.

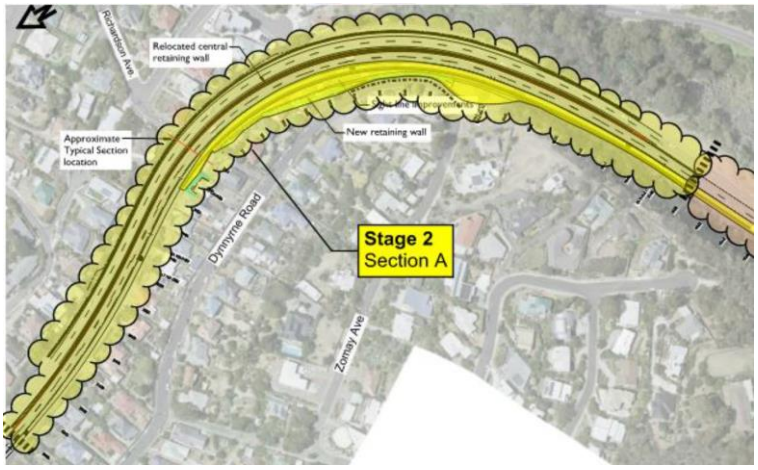


Figure: Section 2A

- Section 2B – Ch. 11 500 to Ch. 11 770; consists of pavement widening and existing pavement replacement works. There is also a significant amount of rock cut at the northbound which forms the second half of the critical path.

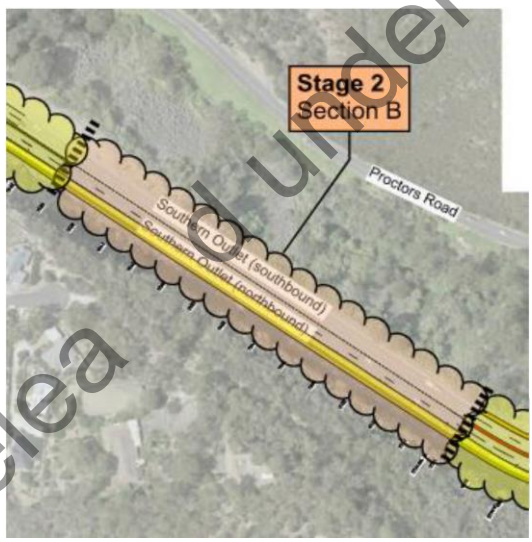


Figure: Section 2B

- Section 2C – Ch. 11 770 to Ch. 12 190; consists of minor pavement widening, rock cut at northbound, soil cut at southbound and existing pavement replacement works.

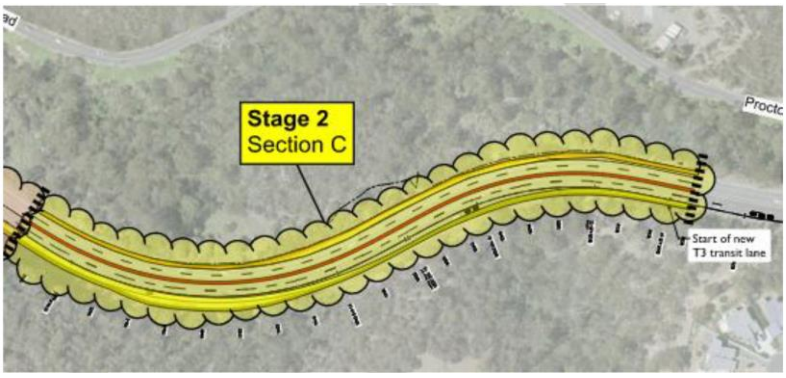


Figure: Section 2C

WT limited the maximum concurrent number of excavators to 18 No. s to keep the construction programme feasible. Considering the limited number of resources and the significant amount of rock cutting works, the construction programme is divided into 2 stages; (See Staging Plan below)

- Stage 1: Construction works to commence simultaneously at Ch. 11 500 and at Ch. 11 100 of Section 2A utilizing maximum 18 No. s of excavators concurrently.
- Stage 2: After completion of rock cutting works between Ch. 11 500 – Ch. 11 100, Section 2A (Median works at Ch. 11 500 – Ch. 11 100), Section 2B and Section 2C rock and soil cutting works to commence simultaneously utilizing maximum 15 No. s of excavators concurrently.

  Note: WT based their calculations on 30t excavators working 30m apart from each other.

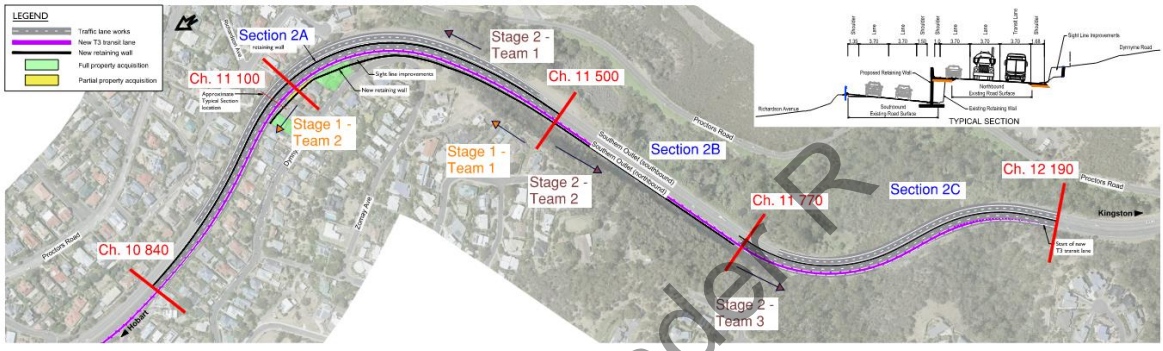


Figure: Staging plan

6.4 ASSUMPTIONS/CONSIDERATIONS

- Services relocations are allowed in the programme for each section for 5 w/days including clearing and grubbing and minor earthworks to allow for services relocations. However, services relocations were also included in the programme as part of pre-construction activities as stated in "Southern Outlet - DRAFT construction program" received from DSG.
- Commencement of construction activities are linked to "1.5.6. Services relocation completion" which is the last activity/milestone of pre-construction phase.
- The WBS of the construction programme was based on GHD's constructability report (SOTL_Constructability Report_Mar23).
- Retaining wall productivity calculated considering a whole cycle for 5 meters. (From blinding concrete to installation of precast barriers)
- Removal of existing retaining wall located at median is considered in soil excavation, however, productivity of this activity was multiplied with 0.4 to reflect the difficulty of existing footing removal.
- A distance of 70 meters was considered between two teams when constructing retaining walls.
- In terms of road drainage, WT only considered surface and subsoil drains including kerbs. Culverts and end walls were excluded due to their exclusion from the constructability report. It was assumed that the mentioned activities were part of pre-construction activities which forms the first phase of the construction programme.
- Spoil transfer to stockpile assumed within 10km radius range.

- Duration of Activity "Removing existing islands and paving them where required for future traffic staging." allowed as 3 w/days for each chainage. Asphalt removal is also considered as a separate activity where it occurs.
- WT calculated approximate quantities when preparing the construction programme. These quantities were then compared to the quantities received from DSG (12556430 - Stage 2 BOQ – Blank). General overview of the quantity comparison is as below:
- WT have utilized the GHD Quantities

MATERIAL	WT - QUANTITY	GHD - QUANTITY	UNIT
Rock cut	9,100	9,000	m3
Soil Excavation*	8,540	21,250	m3
Bituminous Surfacing (Asphalt)**	18,820	36,715	m2

* WT only considered soil excavation for the excess material above design level. DSG amount is noted as "Excavation in all materials".

** WT considered final design documentation (Final Detail Design Issue - 20230525 Combined Stage 1 and 2) when calculating total new pavement surface, regarding the typical sections for each chainage. WT is unable to see the location of DSG quantities, however, this difference may not impact the overall duration as the excavation works form the critical path.

- WT calculated and allowed inclement weather in the programme. Inclement weather is calculated as follows:
  - Getting the average rainfall data of past 30 years from the closest meteorology bureau station to the project location (094029 Hobart (Ellerslie Road) TAS).
  - Average annual rainfall from 1993 to 2022 calculated as 573.5 mm per year.
  - Average daily rainfall from 1993 to 2022 calculated as 1.6 mm per year.
  - The average number of days from 1993 to 2022 with rainfall above 1.6mm per day are calculated as 68.3, and **68 c/days** are included in the schedules with pro rata based on the total construction length.
  - Total 270 number of w/days assumed per year. Inclement weather allowance of 68 c/days are converted to **51 w/days** per year by multiplying 0.74 (270/365).
  - Considering total construction duration (excluding contingency and inclement weather allowance),
    - Inclement weather allowance = Total Construction Duration x inclement weather in days per year / total w/days per year
    - **Option 1** inclement weather is calculated as:
      - Inclement weather = 809 x (51/270) = **153 w/days**
    - **Option 2** inclement weather is calculated as:
      - Inclement weather = 1128 x (51/270) = **213 w/days**

6.5 COMPARISON OF OPTION 1 & 2

Option 1 suggests partial lane closures except tying in existing pavements which will be conducted during off-peak hours.

WT allowed an additional 2 No. w/d days to cover tie-in works for each pavement construction activity.

WT considered installation of traffic barriers to occur during off-peak times and multiplied the productivity of mentioned works with 0.4 to reflect the productivity loss as noted in "SOTL_Constructability Report_Mar23", page 13.

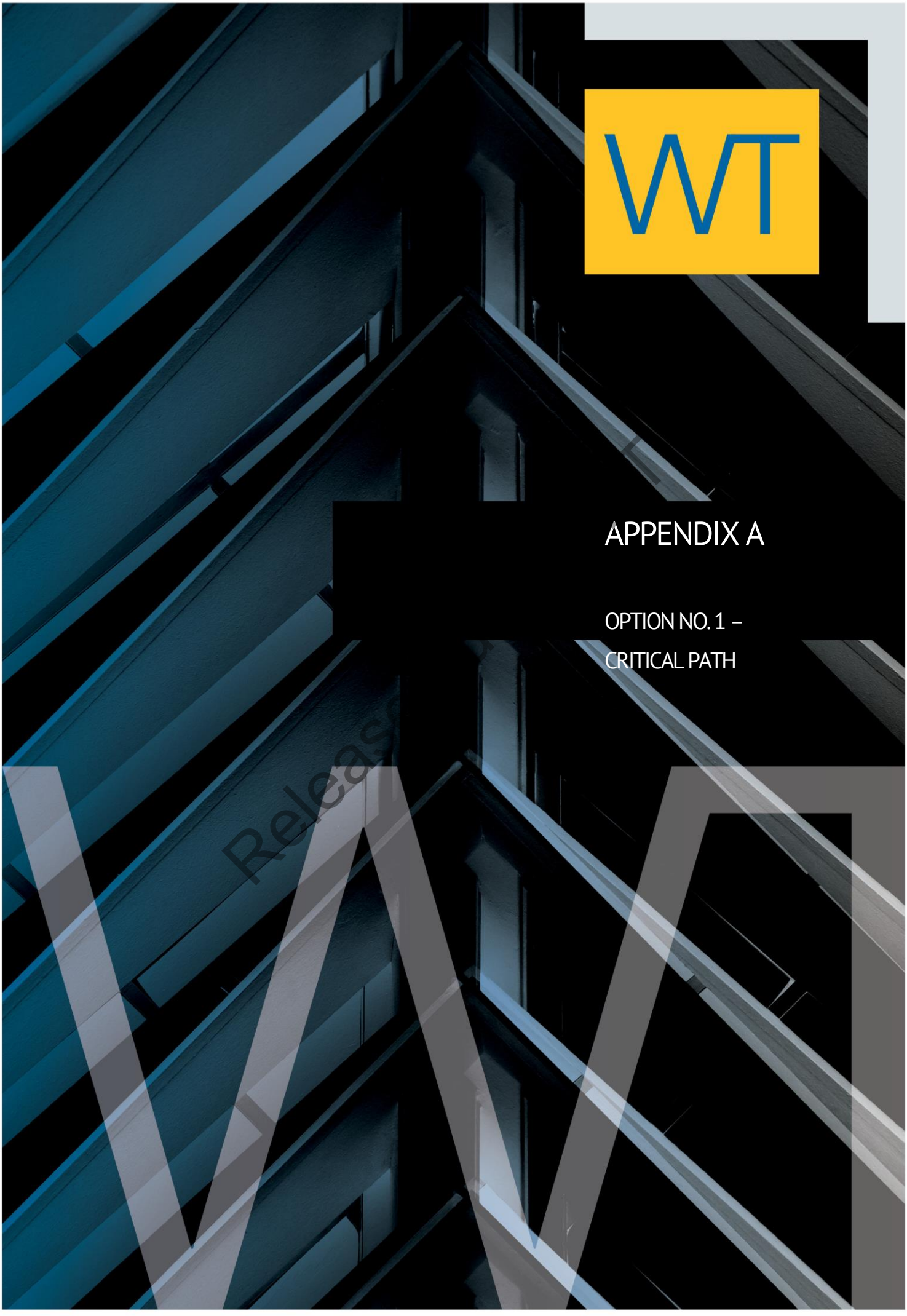
Option 2 consists of an alternative construction staging and sequencing strategy which was produced to provide an alternative to full-time lane closures in accordance with GHD Report. (Ref: SOTL_Constructability Report_Mar23, page 32)

WT considered the following activities to be conducted only during the off-peak hours:

- Median retaining wall works (Section 2A – 11 100)
- Northbound inner pavement works (Section 2A – 11 100)
- Southbound inner pavement works (Section 2A – 11 100)
- Northbound retaining wall works (Section 2A – 11 300)
- Northbound outer pavement works (Section 2A – 11 300)
- Median retaining wall works (Section 2A – 11 300)
- Northbound inner pavement works (Section 2A – 11 300)
- Southbound inner pavement works (Section 2A – 11 300)
- Cutting works at north of northbound (Section 2B)
- Northbound outer pavement works (Section 2B)

7 RECOMMENDATIONS/FURTHER STEPS

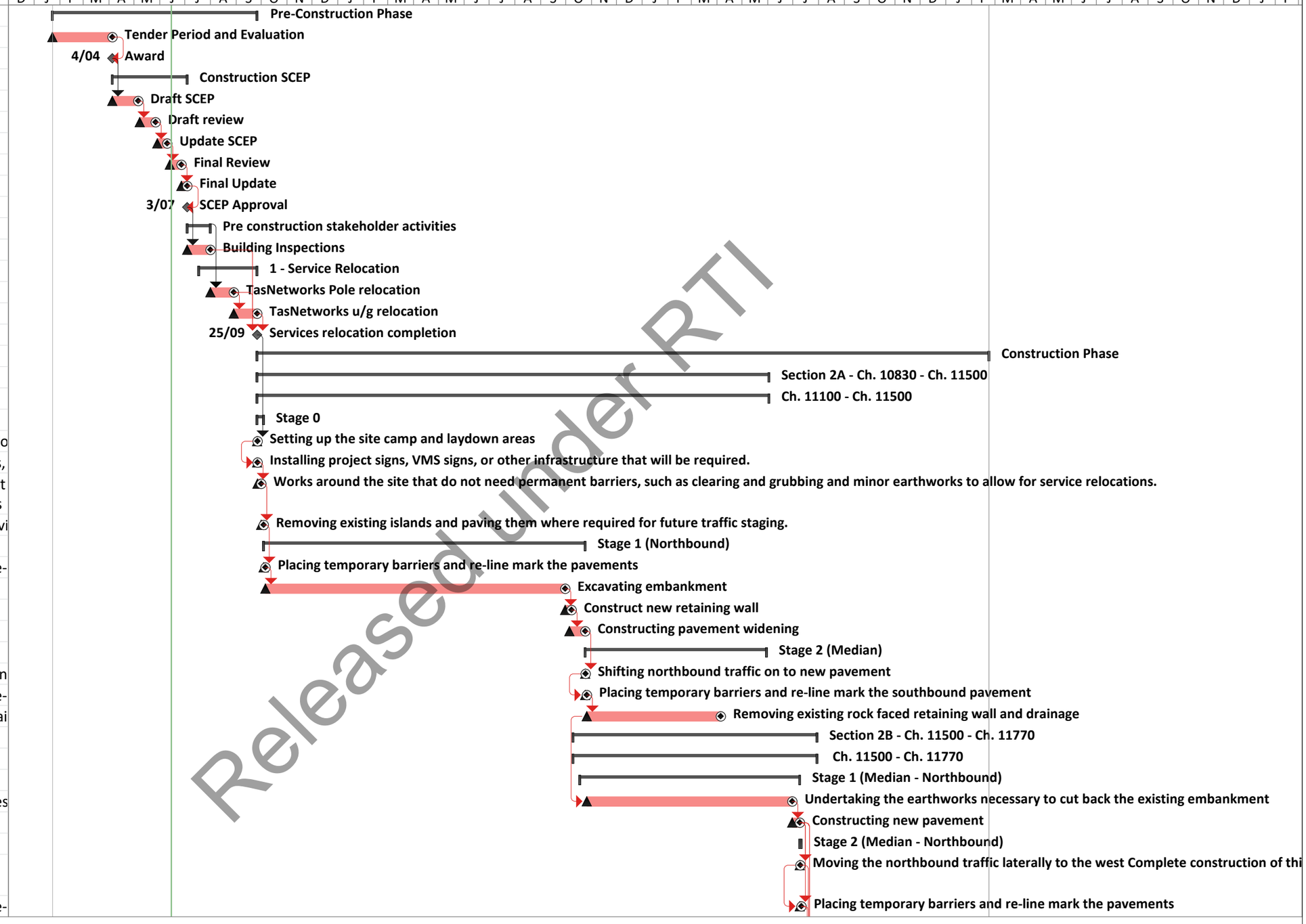
- WT recommend that the tender response return (respondent's) tender returns including proposed schedules are provided in native file format. WT are then able to provide a detailed like for like analysis and advise DSG in respect to excessive concurrent works, over optimistic resourcing, calendar and inclement weather allowances and appropriation as well as contingency provisions, float vs. criticality and risk within the respective schedules.



APPENDIX A

OPTION NO. 1 – CRITICAL PATH

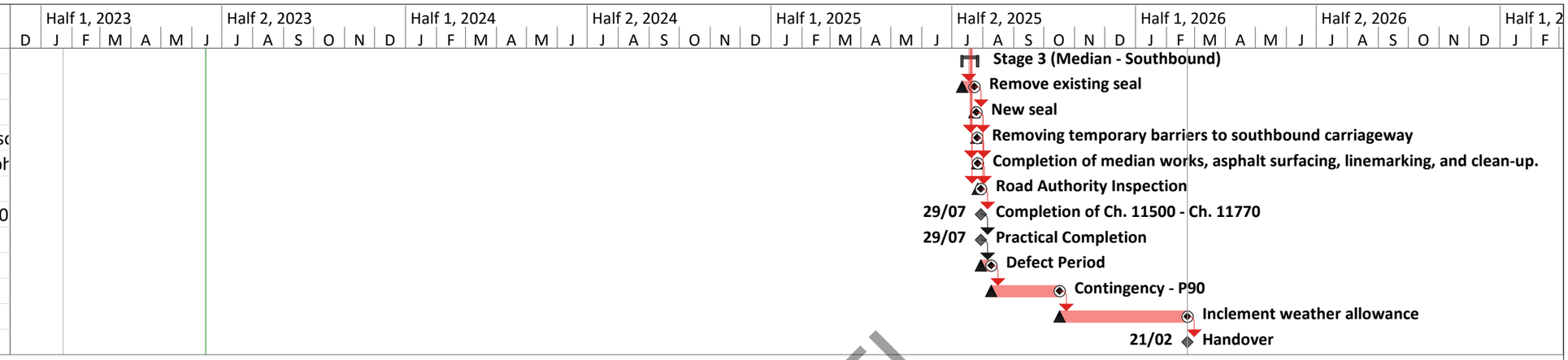
ID	Task Name
1	**Pre-Construction Phase**
2	Tender Period and Evaluation
3	Award
4	**Construction SCEP**
5	Draft SCEP
6	Draft review
7	Update SCEP
8	Final Review
9	Final Update
10	SCEP Approval
11	**Pre construction stakeholder activities**
15	Building Inspections
16	**1 - Service Relocation**
19	TasNetworks Pole relocation
20	TasNetworks u/g relocation
22	Services relocation completion
23	**Construction Phase**
24	**Section 2A - Ch. 10830 - Ch. 11500**
25	**Ch. 11100 - Ch. 11500**
26	**Stage 0**
27	Setting up the site camp and laydo
28	Installing project signs, VMS signs,
29	Works around the site that do not need permanent barriers, such as
30	Removing existing islands and pavi
32	**Stage 1 (Northbound)**
33	Placing temporary barriers and re-
34	Excavating embankment
35	Construct new retaining wall
36	Constructing pavement widening
37	**Stage 2 (Median)**
38	Shifting northbound traffic on to n
39	Placing temporary barriers and re-
40	Removing existing rock faced retai
86	**Section 2B - Ch. 11500 - Ch. 11770**
87	**Ch. 11500 - Ch. 11770**
93	**Stage 1 (Median - Northbound)**
96	Undertaking the earthworks neces
97	Constructing new pavement
98	**Stage 2 (Median - Northbound)**
99	Moving the northbound traffic laterally to the west Complete
100	Placing temporary barriers and re-



Project: SoT Transit Lane Stage-2
Date: Thu 15/06/23

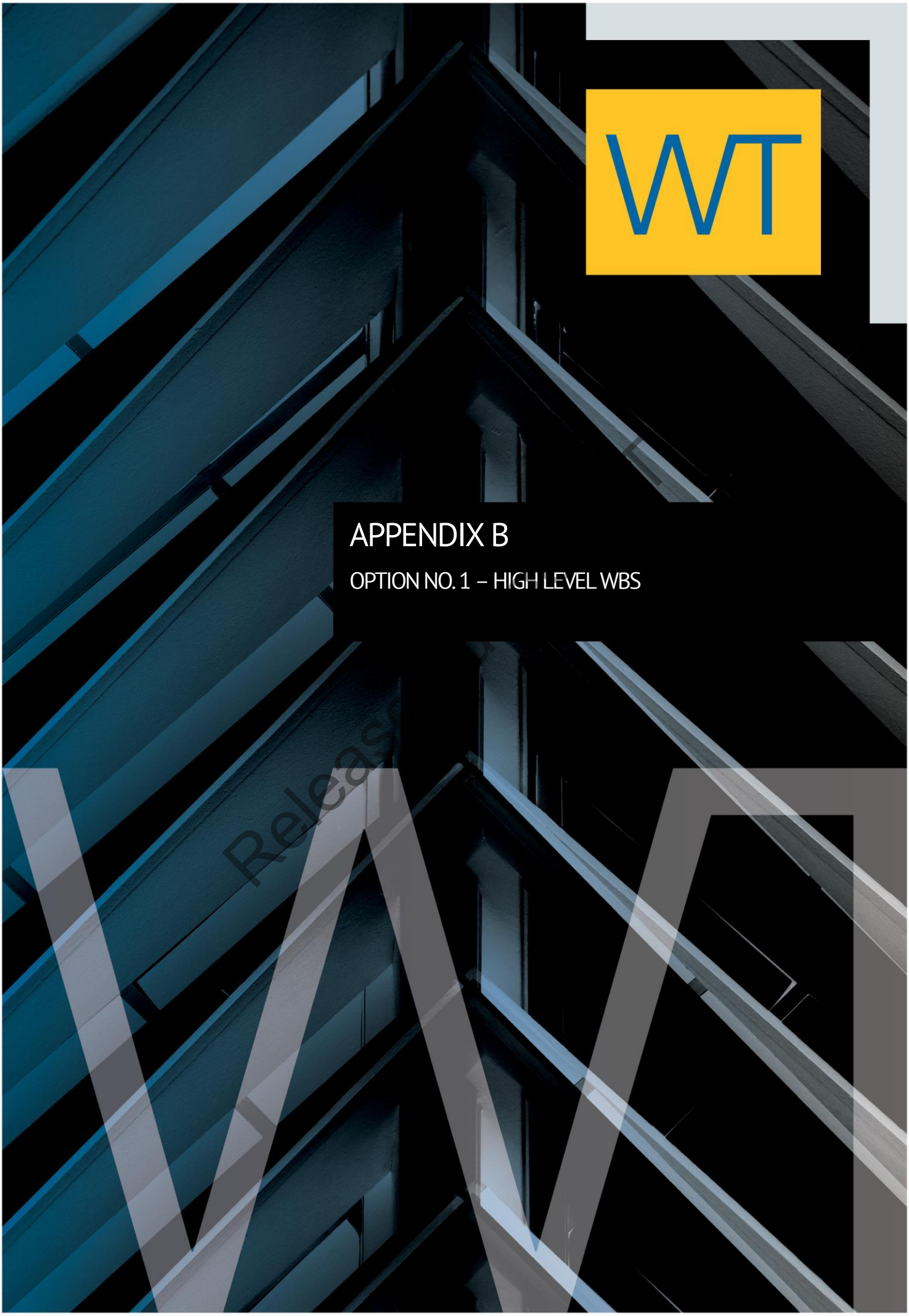
Task	External Tasks	Manual Task	Finish-only	Manual Progress	
Split	External Milestone	Duration-only	Deadline		
Milestone	Inactive Task	Manual Summary Rollup	Critical		
Summary	Inactive Milestone	Manual Summary	Critical Split		
Project Summary	Inactive Summary	Start-only	Progress		

ID	Task Name
101	**Stage 3 (Median - Southbound)**
102	Remove existing seal
103	New seal
104	Removing temporary barriers to so
105	Completion of median works, asph
106	Road Authority Inspection
107	Completion of Ch. 11500 - Ch. 11770
138	Practical Completion
139	Defect Period
140	Contingency - P90
141	Inclement weather allowance
142	Handover



Project: SoT Transit Lane Stage-2
Date: Thu 15/06/23

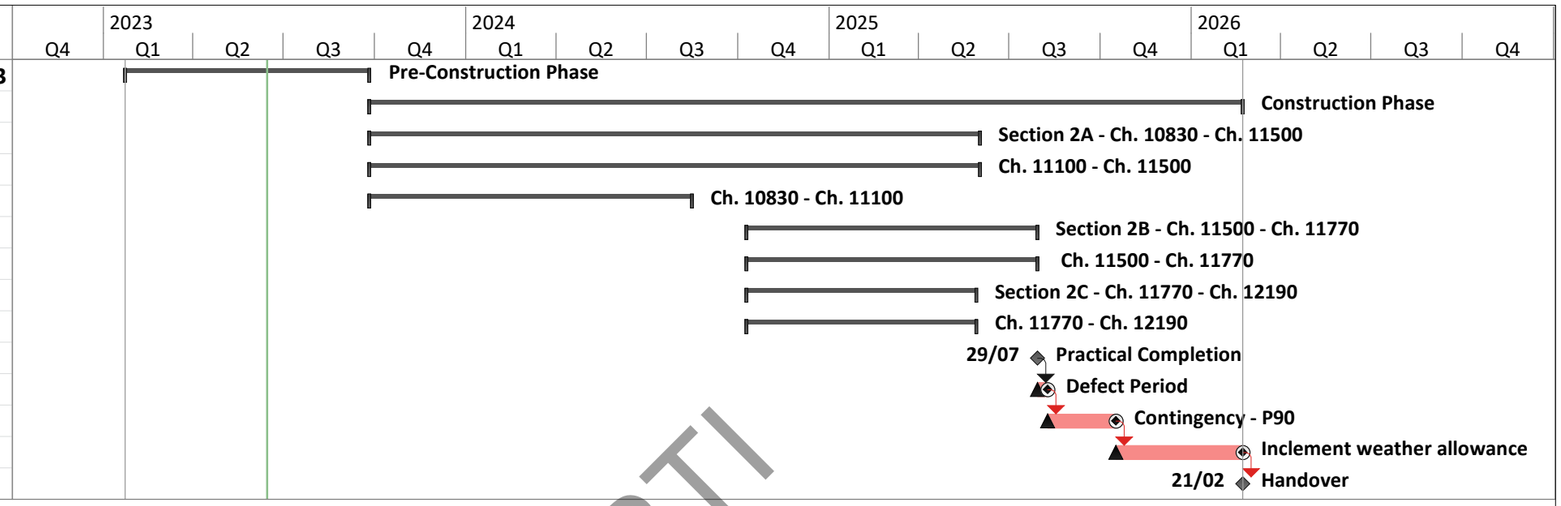
Task	External Tasks	Manual Task	Finish-only	Manual Progress
Split	External Milestone	Duration-only	Deadline	
Milestone	Inactive Task	Manual Summary Rollup	Critical	
Summary	Inactive Milestone	Manual Summary	Critical Split	
Project Summary	Inactive Summary	Start-only	Progress	



APPENDIX B

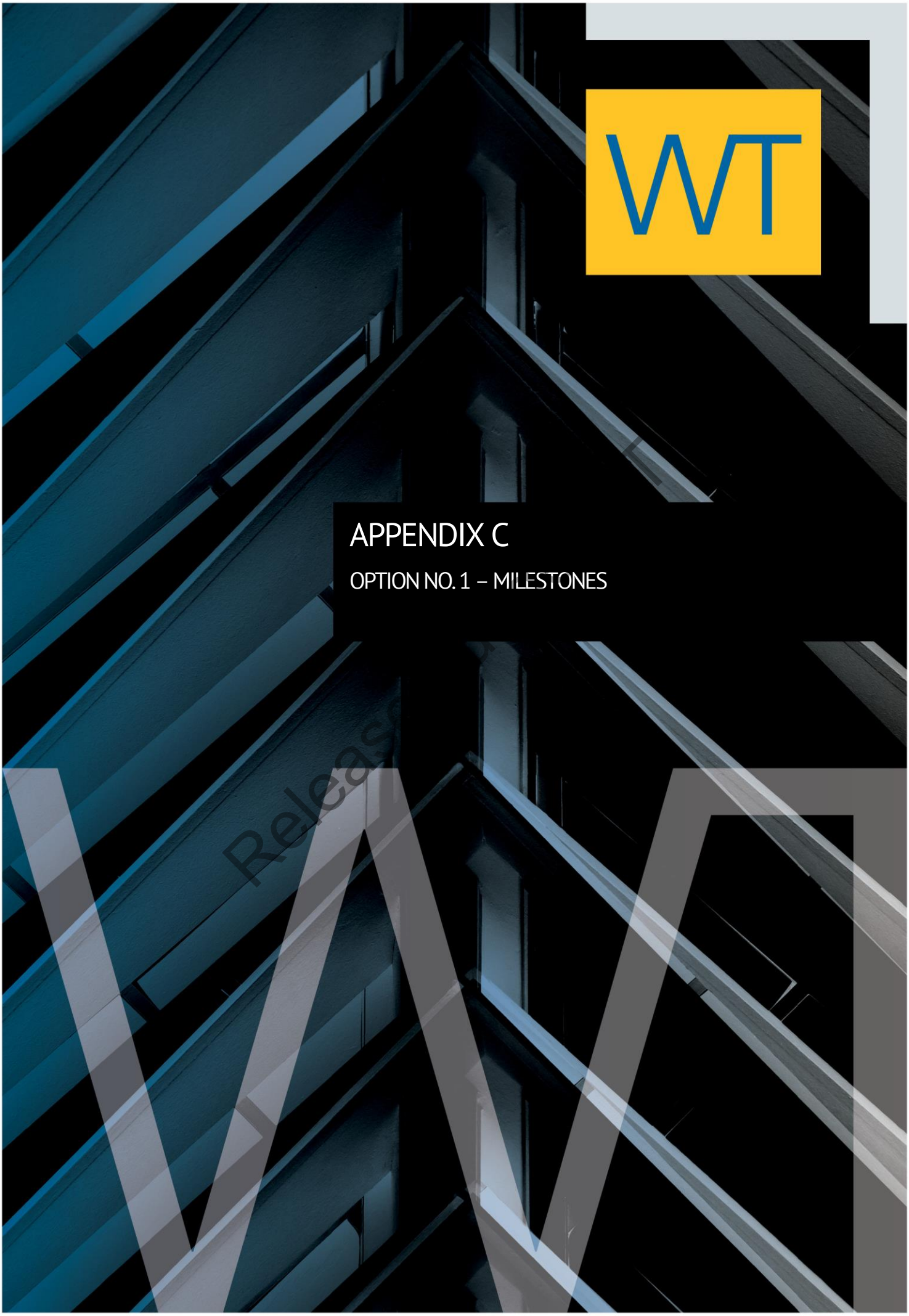
OPTION NO. 1 – HIGH LEVEL WBS

ID	WBS	Task Name	Duration	Start	Finish
1	**1**	**Pre-Construction Phase**	**170 days**	**Mon 23/01/23**	**Mon 25/09/23**
23	**2**	**Construction Phase**	**1044 days**	**Mon 25/09/23**	**Sat 21/02/26**
24	**2.1**	**Section 2A - Ch. 10830 - Ch. 11**	**725 days**	**Mon 25/09/23**	**Mon 2/06/25**
25	**2.1.1**	**Ch. 11100 - Ch. 11500**	**725 days**	**Mon 25/09/23**	**Mon 2/06/25**
56	**2.1.2**	**Ch. 10830 - Ch. 11100**	**381 days**	**Mon 25/09/23**	**Thu 15/08/24**
86	**2.2**	**Section 2B - Ch. 11500 - Ch. 11**	**345 days**	**Wed 9/10/24**	**Tue 29/07/25**
87	**2.2.1**	**Ch. 11500 - Ch. 11770**	**345 days**	**Wed 9/10/24**	**Tue 29/07/25**
108	**2.3**	**Section 2C - Ch. 11770 - Ch. 12**	**271 days**	**Wed 9/10/24**	**Thu 29/05/25**
109	**2.3.1**	**Ch. 11770 - Ch. 12190**	**271 days**	**Wed 9/10/24**	**Thu 29/05/25**
138	2.4	Practical Completion	0 days	Tue 29/07/25	Tue 29/07/25
139	2.5	Defect Period	14 days	Tue 29/07/25	Sat 9/08/25
140	2.6	Contingency - P90	82 days	Sat 9/08/25	Thu 16/10/25
141	2.7	Inclement weather allowance	153 days	Thu 16/10/25	Sat 21/02/26
142	2.8	Handover	0 days	Sat 21/02/26	Sat 21/02/26



Project: SoT Transit Lane Stage-2
Option 1
Date: Thu 15/06/23

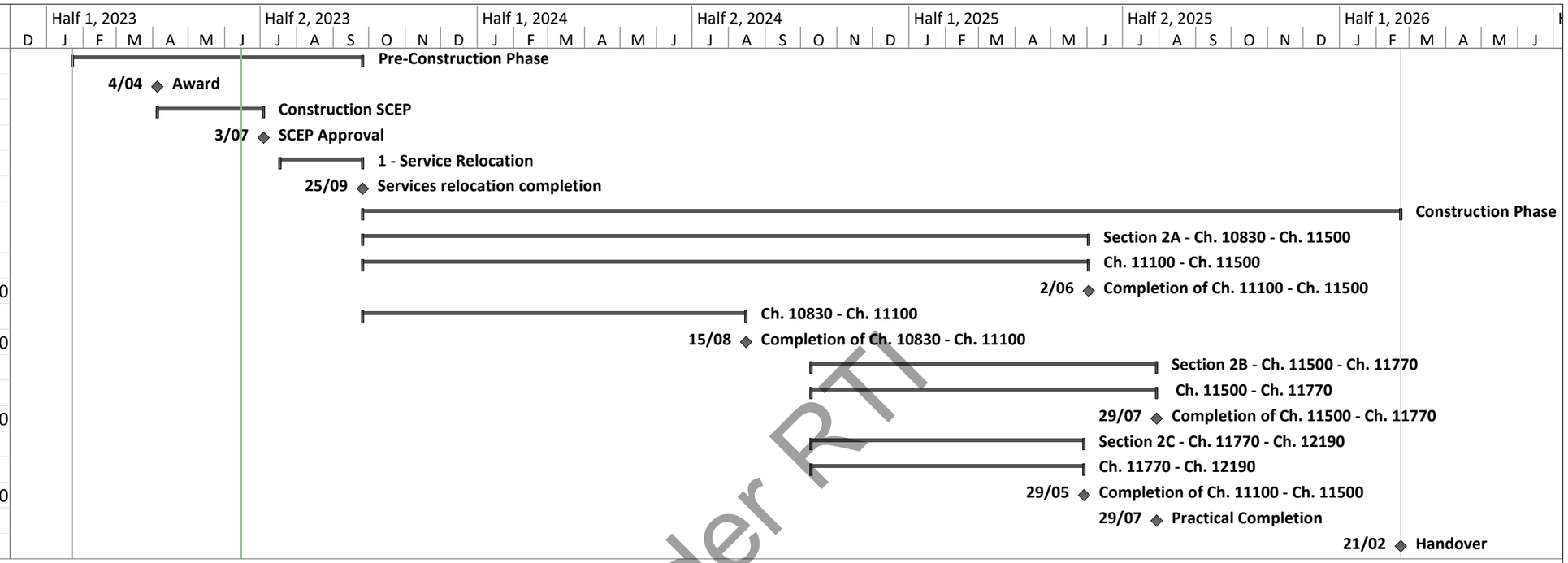
Task	External Tasks	Manual Task	Finish-only	Manual Progress
Split	External Milestone	Duration-only	Deadline	
Milestone	Inactive Task	Manual Summary Rollup	Critical	
Summary	Inactive Milestone	Manual Summary	Critical Split	
Project Summary	Inactive Summary	Start-only	Progress	



APPENDIX C

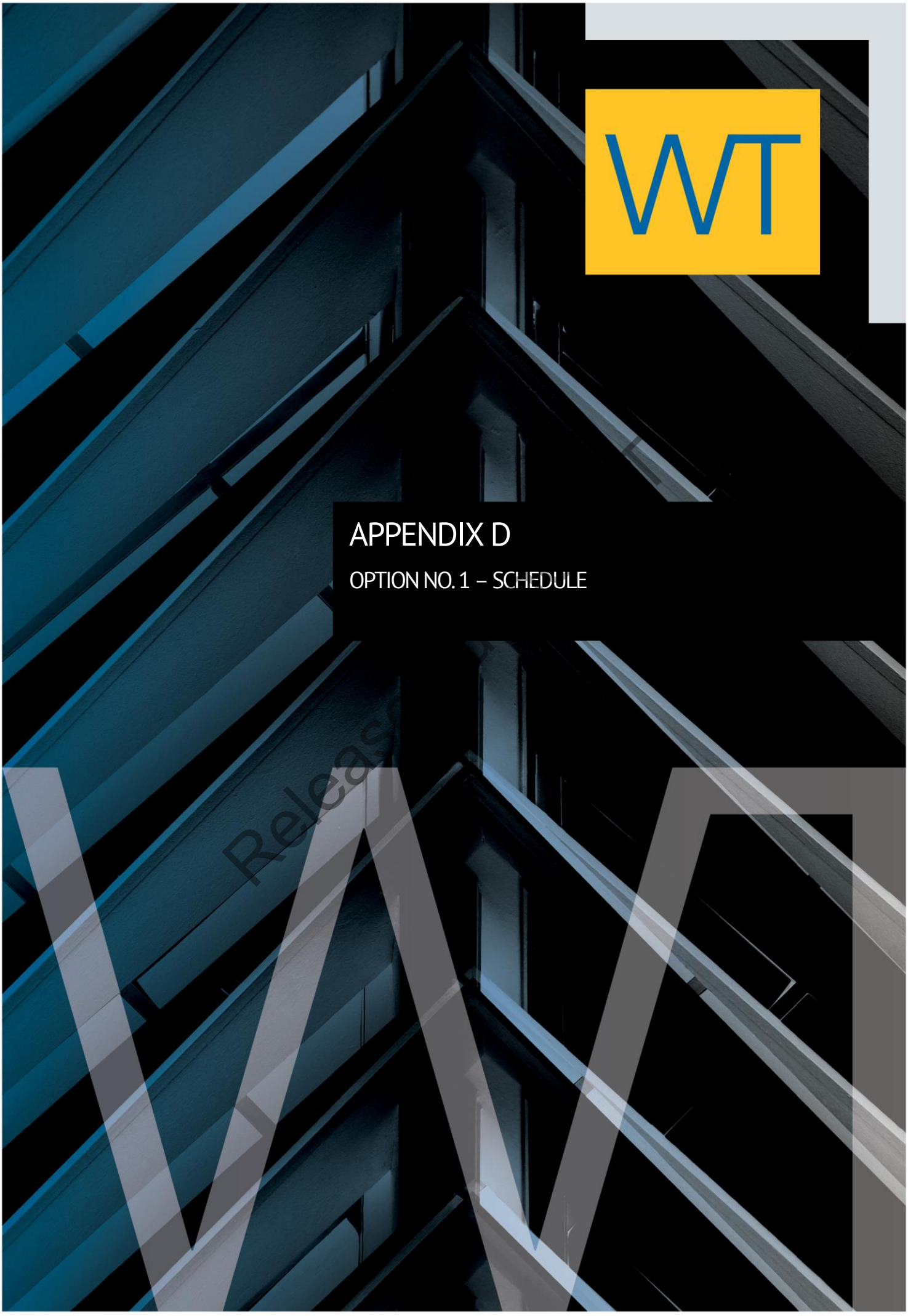
OPTION NO. 1 – MILESTONES

ID	Task Name
1	**Pre-Construction Phase**
3	Award
4	**Construction SCEP**
10	SCEP Approval
16	**1 - Service Relocation**
22	Services relocation completion
23	**Construction Phase**
24	**Section 2A - Ch. 10830 - Ch. 11500**
25	**Ch. 11100 - Ch. 11500**
55	Completion of Ch. 11100 - Ch. 11500
56	**Ch. 10830 - Ch. 11100**
85	Completion of Ch. 10830 - Ch. 11100
86	**Section 2B - Ch. 11500 - Ch. 11770**
87	**Ch. 11500 - Ch. 11770**
107	Completion of Ch. 11500 - Ch. 11770
108	**Section 2C - Ch. 11770 - Ch. 12190**
109	**Ch. 11770 - Ch. 12190**
137	Completion of Ch. 11100 - Ch. 11500
138	Practical Completion
142	Handover



Project: SoT Transit Lane Stage-2
Date: Thu 15/06/23

Task	External Tasks	Manual Task	Finish-only	Manual Progress	
Split	External Milestone	Duration-only	Deadline		
Milestone	Inactive Task	Manual Summary Rollup	Critical		
Summary	Inactive Milestone	Manual Summary	Critical Split		
Project Summary	Inactive Summary	Start-only	Progress		



APPENDIX D

OPTION NO. 1 – SCHEDULE

ID	WBS	Task Name	Duration	Start
1	**1**	**Pre-Construction Phase**	**170 days**	**Mon 23/01/23**
2	1.1	Tender Period and Evaluation	10 wks	Mon 23/01/23
3	1.2	Award	0 days	Tue 4/04/23
4	**1.3**	**Construction SCEP**	**60 days**	**Wed 5/04/23**
5	1.3.1	Draft SCEP	4 wks	Wed 5/04/23
6	1.3.2	Draft review	3 wks	Mon 8/05/23
7	1.3.3	Update SCEP	2 wks	Mon 29/05/23
8	1.3.4	Final Review	2 wks	Tue 13/06/23
9	1.3.5	Final Update	1 wk	Tue 27/06/23
10	1.3.6	SCEP Approval	0 days	Mon 3/07/23
11	**1.4**	**Pre construction stakeholder activities**	**20 days**	**Tue 4/07/23**
12	1.4.1	VMBs	2 wks	Tue 4/07/23
13	1.4.2	Start of Works Notification to adjacent reside	2 wks	Tue 4/07/23
14	1.4.3	Traffic Management Strategy implementation (TBC)	2 wks	Tue 4/07/23
15	1.4.4	Building Inspections	4 wks	Tue 4/07/23
16	**1.5**	**1 - Service Relocation**	**50 days**	**Tue 18/07/23**
17	1.5.1	Water Outage Notification	2 wks	Tue 18/07/23
18	1.5.2	Water relocation	4 wks	Tue 1/08/23
19	1.5.3	TasNetworks Pole relocation	4 wks	Tue 1/08/23
20	1.5.4	TasNetworks u/g relocation	4 wks	Tue 29/08/23
21	1.5.5	Rock outcrop removal	4 wks	Tue 1/08/23
22	1.5.6	Services relocation completion	0 days	Mon 25/09/23
23	**2**	**Construction Phase**	**1044 days**	**Mon 25/09/23**
24	**2.1**	**Section 2A - Ch. 10830 - Ch. 11500**	**725 days**	**Mon 25/09/23**
25	**2.1.1**	**Ch. 11100 - Ch. 11500**	**725 days**	**Mon 25/09/23**
26	**2.1.1.1**	**Stage 0**	**9 days**	**Mon 25/09/23**
27	2.1.1.1.1	Setting up the site camp and laydown are	1 day	Mon 25/09/23
28	2.1.1.1.2	Installing project signs, VMS signs, or other infrastructure that will be	1 day	Mon 25/09/23
29	2.1.1.1.3	Works around the site that do not need permanent barriers, such as clearing and grubbing and minor earthworks to allow for service relocations.	5 days	Tue 26/09/23
30	2.1.1.1.4	Removing existing islands and paving them where required for future traffic	3 days	Sat 30/09/23
31	2.1.1.1.5	Demolish the existing dwellings and use the site for a temporary camp/ laydown	2 days	Sat 30/09/23
32	**2.1.1.2**	**Stage 1 (Northbound)**	**458 days**	**Tue 3/10/23**
33	2.1.1.2.1	Placing temporary barriers and re-line mark the pavements	3 days	Tue 3/10/23
34	2.1.1.2.2	Excavating embankment	425 days	Thu 5/10/23
35	2.1.1.2.3	Construct new retaining wall	10 days	Mon 30/09/24

Project: SoT Transit Lane Stage-2 Option 1
Date: Thu 15/06/23

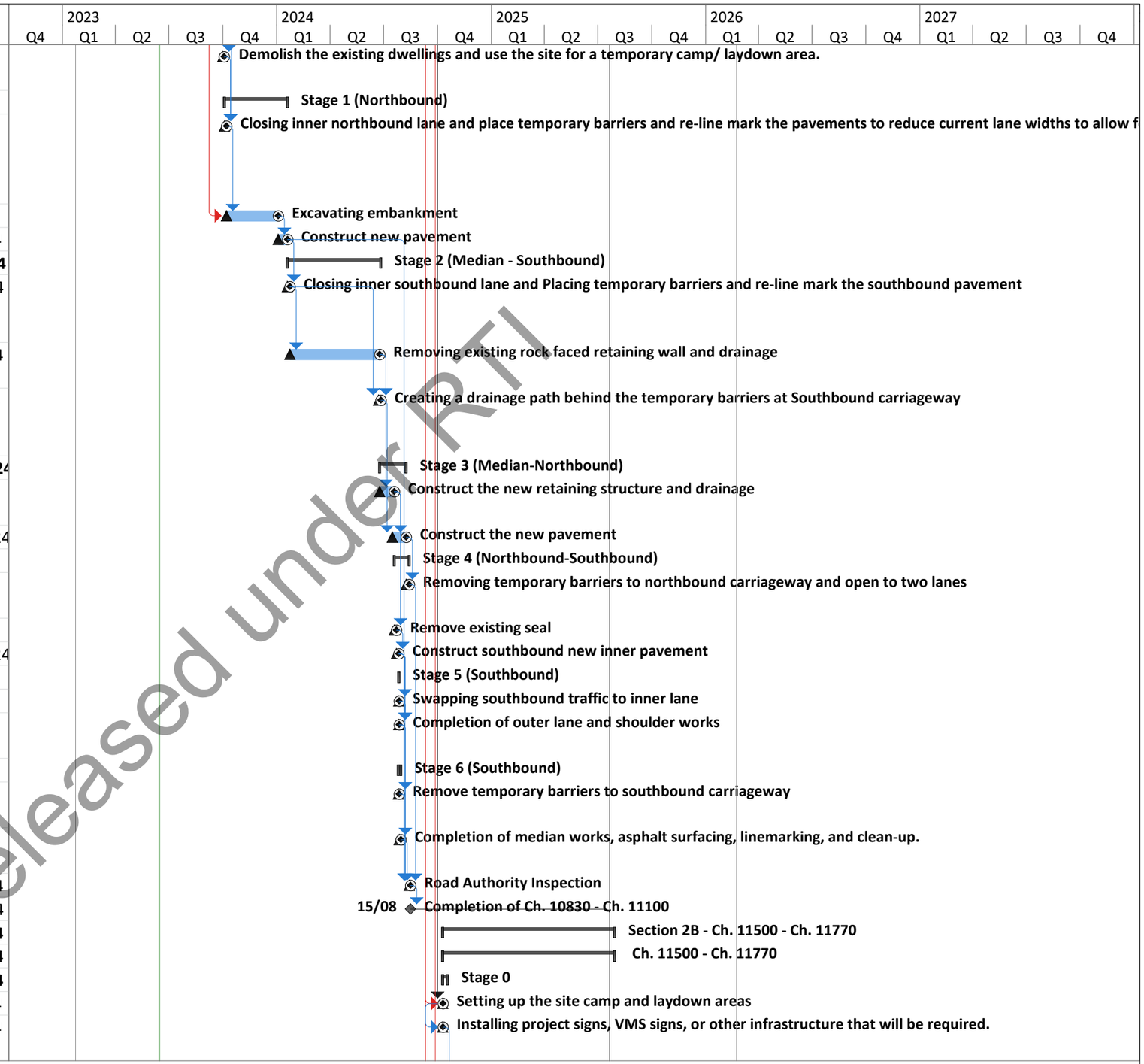
Task	External Tasks	Manual Task	Finish-only	Manual Progress
Split	External Milestone	Duration-only	Deadline	
Milestone	Inactive Task	Manual Summary Rollup	Critical	
Summary	Inactive Milestone	Manual Summary	Critical Split	
Project Summary	Inactive Summary	Start-only	Progress	

ID	WBS	Task Name	Duration	Start
36	2.1.1.2.4	Constructing pavement widening	22 days	Sat 5/10/24
37	**2.1.1.3**	**Stage 2 (Median)**	**255 days**	**Thu 24/10/24**
38	2.1.1.3.1	Shifting northbound traffic on to new pavement	1 day	Thu 24/10/24
39	2.1.1.3.2	Placing temporary barriers and re-line mark the southbound pavement	3 days	Thu 24/10/24
40	2.1.1.3.3	Removing existing rock faced retaining wall and drainage	189 days	Sat 26/10/24
41	2.1.1.3.4	Creating a drainage path behind the temporary barriers at Southbound carriageway	10 days	Tue 1/04/25
42	2.1.1.3.5	Constructing the new retaining structure and drainage	31 days	Sat 5/04/25
43	2.1.1.3.6	Removal of existing pavement	6 days	Sat 3/05/25
44	2.1.1.3.7	Constructing new pavement to southbound carriageway	18 days	Tue 6/05/25
45	2.1.1.3.8	Constructing new pavement to Northbound carriageway	32 days	Sat 3/05/25
46	**2.1.1.4**	**Stage 3 (Northbound - Southbound)**	**6 days**	**Wed 21/05/25**
47	2.1.1.4.1	Moving traffic laterally to the inner side of the pavement	1 day	Wed 21/05/25
48	2.1.1.4.2	Move southbound lanes to the west and reopen the second lane	1 day	Wed 21/05/25
49	2.1.1.4.3	Place temporary barriers	3 days	Wed 21/05/25
50	2.1.1.4.4	Construct pavement widening and barrie	3 days	Fri 23/05/25
51	**2.1.1.5**	**Stage 4 (Southbound)**	**3 days**	**Mon 26/05/25**
52	2.1.1.5.1	Removing temporary barriers to southbound carriageway	1 day	Mon 26/05/25
53	2.1.1.5.2	Completion of median works, asphalt surfacing, linemarking, and clean-up.	2 days	Tue 27/05/25
54	2.1.1.6	Road Authority Inspection	3 days	Fri 30/05/25
55	2.1.1.7	Completion of Ch. 11100 - Ch. 11500	0 days	Mon 2/06/25
56	**2.1.2**	**Ch. 10830 - Ch. 11100**	**381 days**	**Mon 25/09/23**
57	**2.1.2.1**	**Stage 0**	**9 days**	**Mon 25/09/23**
58	2.1.2.1.1	Setting up the site camp and laydown are	1 day	Mon 25/09/23
59	2.1.2.1.2	Installing project signs, VMS signs, or other infrastructure that will be	1 day	Mon 25/09/23
60	2.1.2.1.3	Works around the site that do not need permanent barriers, such as clearing and grubbing and minor earthworks to allow for service relocations.	5 days	Tue 26/09/23
61	2.1.2.1.4	Removing existing islands and paving them where required for future traffic	3 days	Sat 30/09/23

Project: SoT Transit Lane Stage-2
Option 1
Date: Thu 15/06/23

Task	External Tasks	Manual Task	Finish-only	Manual Progress
Split	External Milestone	Duration-only	Deadline	
Milestone	Inactive Task	Manual Summary Rollup	Critical	
Summary	Inactive Milestone	Manual Summary	Critical Split	
Project Summary	Inactive Summary	Start-only	Progress	

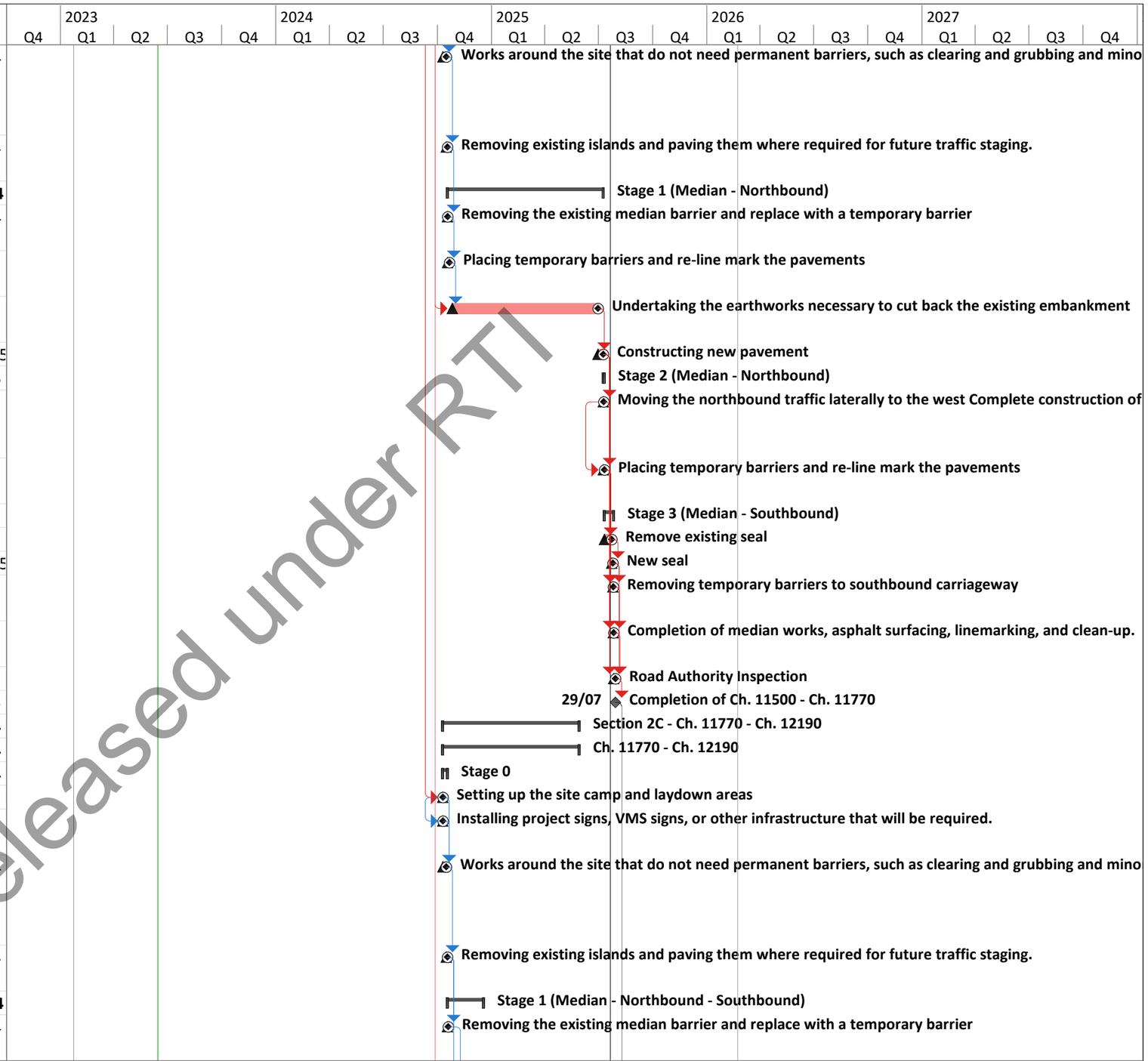
ID	WBS	Task Name	Duration	Start
62	2.1.2.1.5	Demolish the existing dwellings and use the site for a temporary camp/ laydown	2 days	Sat 30/09/23
63	**2.1.2.2**	**Stage 1 (Northbound)**	**121 days**	**Tue 3/10/23**
64	2.1.2.2.1	Closing inner northbound lane and place temporary barriers and re-line mark the pavements to reduce current lane widths to allow for new works to be	5 days	Tue 3/10/23
65	2.1.2.2.2	Excavating embankment	96 days	Sat 7/10/23
66	2.1.2.2.3	Construct new pavement	20 days	Wed 3/01/24
67	**2.1.2.3**	**Stage 2 (Median - Southbound)**	**190 days**	**Thu 18/01/24**
68	2.1.2.3.1	Closing inner southbound lane and Placing temporary barriers and re-line mark the southbound pavement	5 days	Thu 18/01/24
69	2.1.2.3.2	Removing existing rock faced retaining wall and drainage	182 days	Tue 23/01/24
70	2.1.2.3.3	Creating a drainage path behind the temporary barriers at Southbound carriageway	5 days	Sat 22/06/24
71	**2.1.2.4**	**Stage 3 (Median-Northbound)**	**57 days**	**Mon 24/06/24**
72	2.1.2.4.1	Construct the new retaining structure and drainage	31 days	Mon 24/06/24
73	2.1.2.4.2	Construct the new pavement	31 days	Mon 15/07/24
74	**2.1.2.5**	**Stage 4 (Northbound-Southbound)**	**31 days**	**Fri 19/07/24**
75	2.1.2.5.1	Removing temporary barriers to northbound carriageway and open to	5 days	Thu 8/08/24
76	2.1.2.5.2	Remove existing seal	4 days	Fri 19/07/24
77	2.1.2.5.3	Construct southbound new inner paveme	6 days	Mon 22/07/24
78	**2.1.2.6**	**Stage 5 (Southbound)**	**1 day**	**Fri 26/07/24**
79	2.1.2.6.1	Swapping southbound traffic to inner lan	1 day	Fri 26/07/24
80	2.1.2.6.2	Completion of outer lane and shoulder works	1 day	Fri 26/07/24
81	**2.1.2.7**	**Stage 6 (Southbound)**	**5 days**	**Fri 26/07/24**
82	2.1.2.7.1	Remove temporary barriers to southbound carriageway	2 days	Fri 26/07/24
83	2.1.2.7.2	Completion of median works, asphalt surfacing, linemarking, and clean-up.	3 days	Sat 27/07/24
84	2.1.2.8	Road Authority Inspection	3 days	Tue 13/08/24
85	2.1.2.9	Completion of Ch. 10830 - Ch. 11100	0 days	Thu 15/08/24
86	**2.2**	**Section 2B - Ch. 11500 - Ch. 11770**	**345 days**	**Wed 9/10/24**
87	**2.2.1**	**Ch. 11500 - Ch. 11770**	**345 days**	**Wed 9/10/24**
88	**2.2.1.1**	**Stage 0**	**9 days**	**Wed 9/10/24**
89	2.2.1.1.1	Setting up the site camp and laydown are	1 day	Wed 9/10/24
90	2.2.1.1.2	Installing project signs, VMS signs, or other infrastructure that will be	1 day	Wed 9/10/24



Project: SoT Transit Lane Stage-2
Option 1
Date: Thu 15/06/23

Task	External Tasks	Manual Task	Finish-only	Manual Progress
Split	External Milestone	Duration-only	Deadline	
Milestone	Inactive Task	Manual Summary Rollup	Critical	
Summary	Inactive Milestone	Manual Summary	Critical Split	
Project Summary	Inactive Summary	Start-only	Progress	

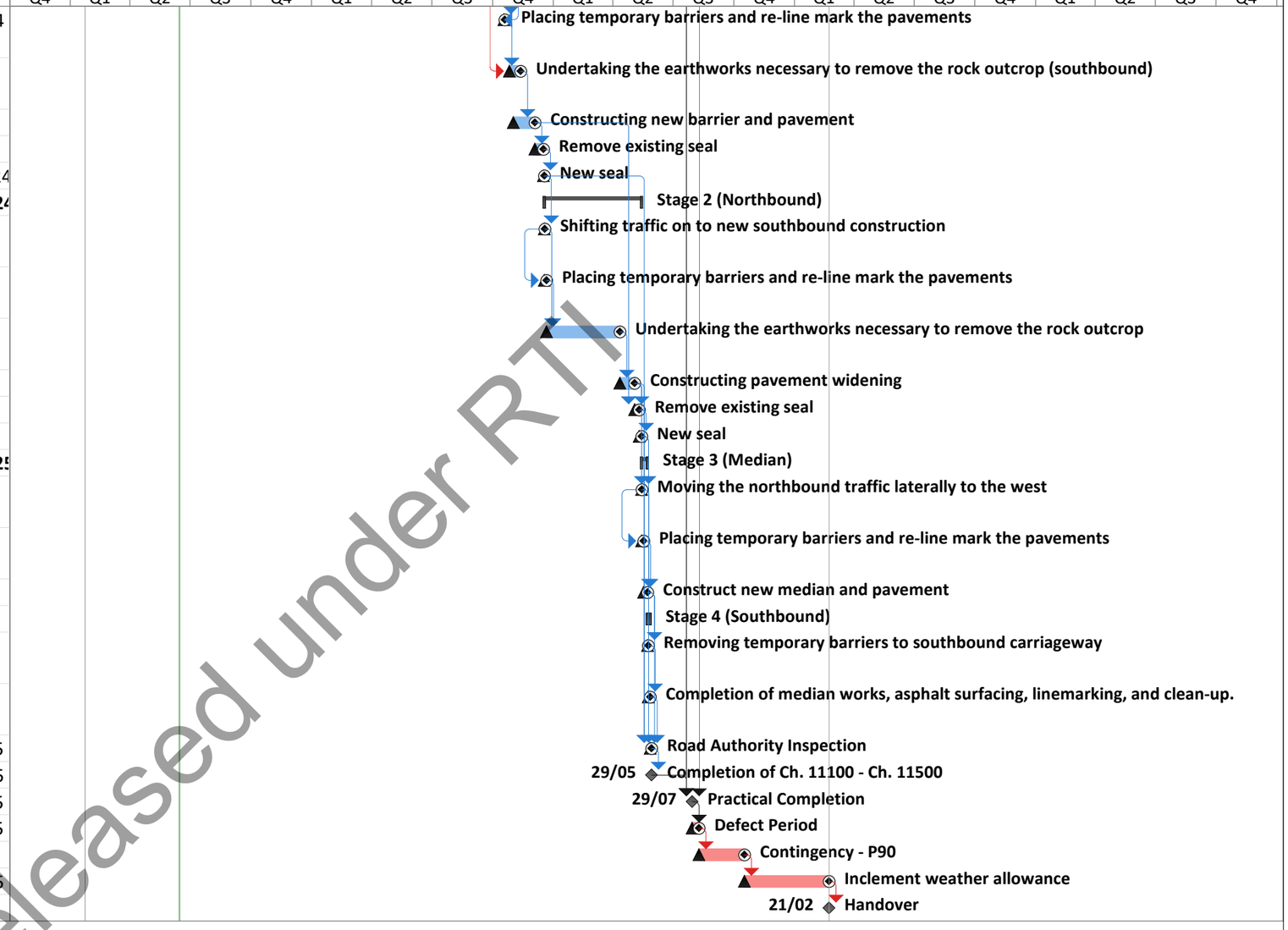
ID	WBS	Task Name	Duration	Start
91	2.2.1.1.3	Works around the site that do not need permanent barriers, such as clearing and grubbing and minor earthworks to allow for service relocations.	5 days	Thu 10/10/24
92	2.2.1.1.4	Removing existing islands and paving them where required for future traffic	3 days	Tue 15/10/24
93	**2.2.1.2**	**Stage 1 (Median - Northbound)**	**311 days**	**Thu 17/10/24**
94	2.2.1.2.1	Removing the existing median barrier and replace with a temporary barrier	1 day	Thu 17/10/24
95	2.2.1.2.2	Placing temporary barriers and re-line mark the pavements	3 days	Fri 18/10/24
96	2.2.1.2.3	Undertaking the earthworks necessary to cut back the existing embankment	288 days	Sat 26/10/24
97	2.2.1.2.4	Constructing new pavement	12 days	Mon 30/06/25
98	**2.2.1.3**	**Stage 2 (Median - Northbound)**	**3 days**	**Wed 9/07/25**
99	2.2.1.3.1	Moving the northbound traffic laterally to the west Complete construction of third lane northbound	1 day	Wed 9/07/25
100	2.2.1.3.2	Placing temporary barriers and re-line mark the pavements	3 days	Wed 9/07/25
101	**2.2.1.4**	**Stage 3 (Median - Southbound)**	**19 days**	**Fri 11/07/25**
102	2.2.1.4.1	Remove existing seal	14 days	Fri 11/07/25
103	2.2.1.4.2	New seal	3 days	Wed 23/07/25
104	2.2.1.4.3	Removing temporary barriers to southbound carriageway	1 day	Fri 25/07/25
105	2.2.1.4.4	Completion of median works, asphalt surfacing, linemarking, and clean-up.	1 day	Sat 26/07/25
106	2.2.1.5	Road Authority Inspection	3 days	Sat 26/07/25
107	2.2.1.6	Completion of Ch. 11500 - Ch. 11770	0 days	Tue 29/07/25
108	**2.3**	**Section 2C - Ch. 11770 - Ch. 12190**	**271 days**	**Wed 9/10/24**
109	**2.3.1**	**Ch. 11770 - Ch. 12190**	**271 days**	**Wed 9/10/24**
110	**2.3.1.1**	**Stage 0**	**9 days**	**Wed 9/10/24**
111	2.3.1.1.1	Setting up the site camp and laydown are	1 day	Wed 9/10/24
112	2.3.1.1.2	Installing project signs, VMS signs, or other infrastructure that will be	1 day	Wed 9/10/24
113	2.3.1.1.3	Works around the site that do not need permanent barriers, such as clearing and grubbing and minor earthworks to allow for service relocations.	5 days	Thu 10/10/24
114	2.3.1.1.4	Removing existing islands and paving them where required for future traffic	3 days	Tue 15/10/24
115	**2.3.1.2**	**Stage 1 (Median - Northbound - Southbour**	**74 days**	**Thu 17/10/24**
116	2.3.1.2.1	Removing the existing median barrier and replace with a temporary barrier	2 days	Thu 17/10/24



Project: SoT Transit Lane Stage-2
Option 1
Date: Thu 15/06/23

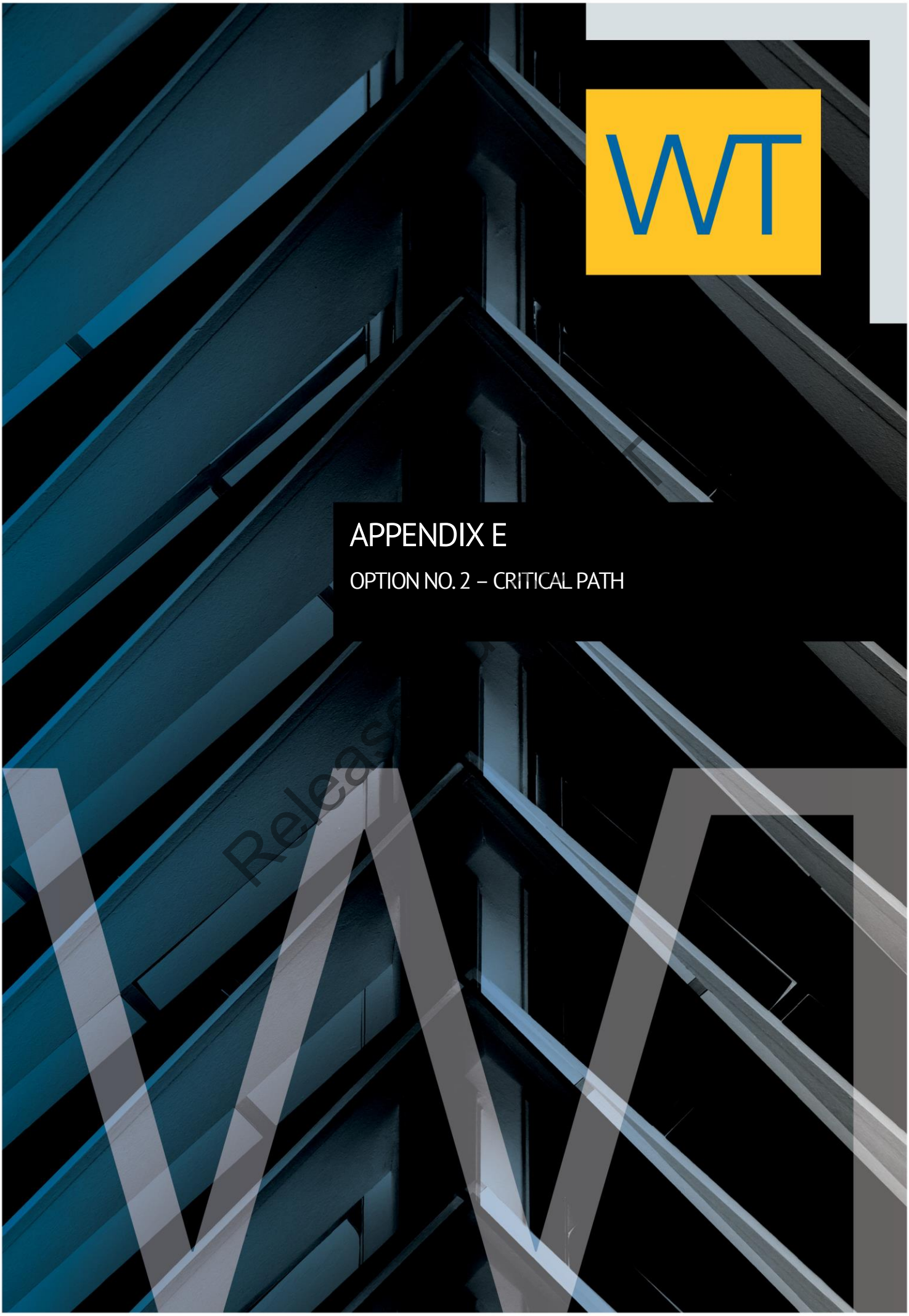
Task	External Tasks	Manual Task	Finish-only	Manual Progress
Split	External Milestone	Duration-only	Deadline	
Milestone	Inactive Task	Manual Summary Rollup	Critical	
Summary	Inactive Milestone	Manual Summary	Critical Split	
Project Summary	Inactive Summary	Start-only	Progress	

ID	WBS	Task Name	Duration	Start
117	2.3.1.2.2	Placing temporary barriers and re-line mark the pavements	2 days	Thu 17/10/24
118	2.3.1.2.3	Undertaking the earthworks necessary to remove the rock outcrop	18 days	Sat 26/10/24
119	2.3.1.2.4	Constructing new barrier and pavement	38 days	Fri 1/11/24
120	2.3.1.2.5	Remove existing seal	15 days	Tue 3/12/24
121	2.3.1.2.6	New seal	2 days	Mon 16/12/24
122	**2.3.1.3**	**Stage 2 (Northbound)**	**168 days**	**Wed 18/12/24**
123	2.3.1.3.1	Shifting traffic on to new southbound construction	1 day	Wed 18/12/24
124	2.3.1.3.2	Placing temporary barriers and re-line mark the pavements	5 days	Wed 18/12/24
125	2.3.1.3.3	Undertaking the earthworks necessary to remove the rock outcrop	126 days	Sat 21/12/24
126	2.3.1.3.4	Constructing pavement widening	26 days	Fri 11/04/25
127	2.3.1.3.5	Remove existing seal	9 days	Sat 3/05/25
128	2.3.1.3.6	New seal	2 days	Sat 10/05/25
129	**2.3.1.4**	**Stage 3 (Median)**	**12 days**	**Wed 14/05/25**
130	2.3.1.4.1	Moving the northbound traffic laterally to the west	1 day	Wed 14/05/25
131	2.3.1.4.2	Placing temporary barriers and re-line mark the pavements	5 days	Wed 14/05/25
132	2.3.1.4.3	Construct new median and pavement	7 days	Sat 17/05/25
133	**2.3.1.5**	**Stage 4 (Southbound)**	**5 days**	**Fri 23/05/25**
134	2.3.1.5.1	Removing temporary barriers to southbound carriageway	2 days	Fri 23/05/25
135	2.3.1.5.2	Completion of median works, asphalt surfacing, linemarking, and clean-up.	3 days	Sat 24/05/25
136	2.3.1.6	Road Authority Inspection	3 days	Tue 27/05/25
137	2.3.1.7	Completion of Ch. 11100 - Ch. 11500	0 days	Thu 29/05/25
138	2.4	Practical Completion	0 days	Tue 29/07/25
139	2.5	Defect Period	14 days	Tue 29/07/25
140	2.6	Contingency - P90	82 days	Sat 9/08/25
141	2.7	Inclement weather allowance	153 days	Thu 16/10/25
142	2.8	Handover	0 days	Sat 21/02/26



Project: SoT Transit Lane Stage-2
Option 1
Date: Thu 15/06/23

Task	External Tasks	Manual Task	Finish-only	Manual Progress
Split	External Milestone	Duration-only	Deadline	
Milestone	Inactive Task	Manual Summary Rollup	Critical	
Summary	Inactive Milestone	Manual Summary	Critical Split	
Project Summary	Inactive Summary	Start-only	Progress	



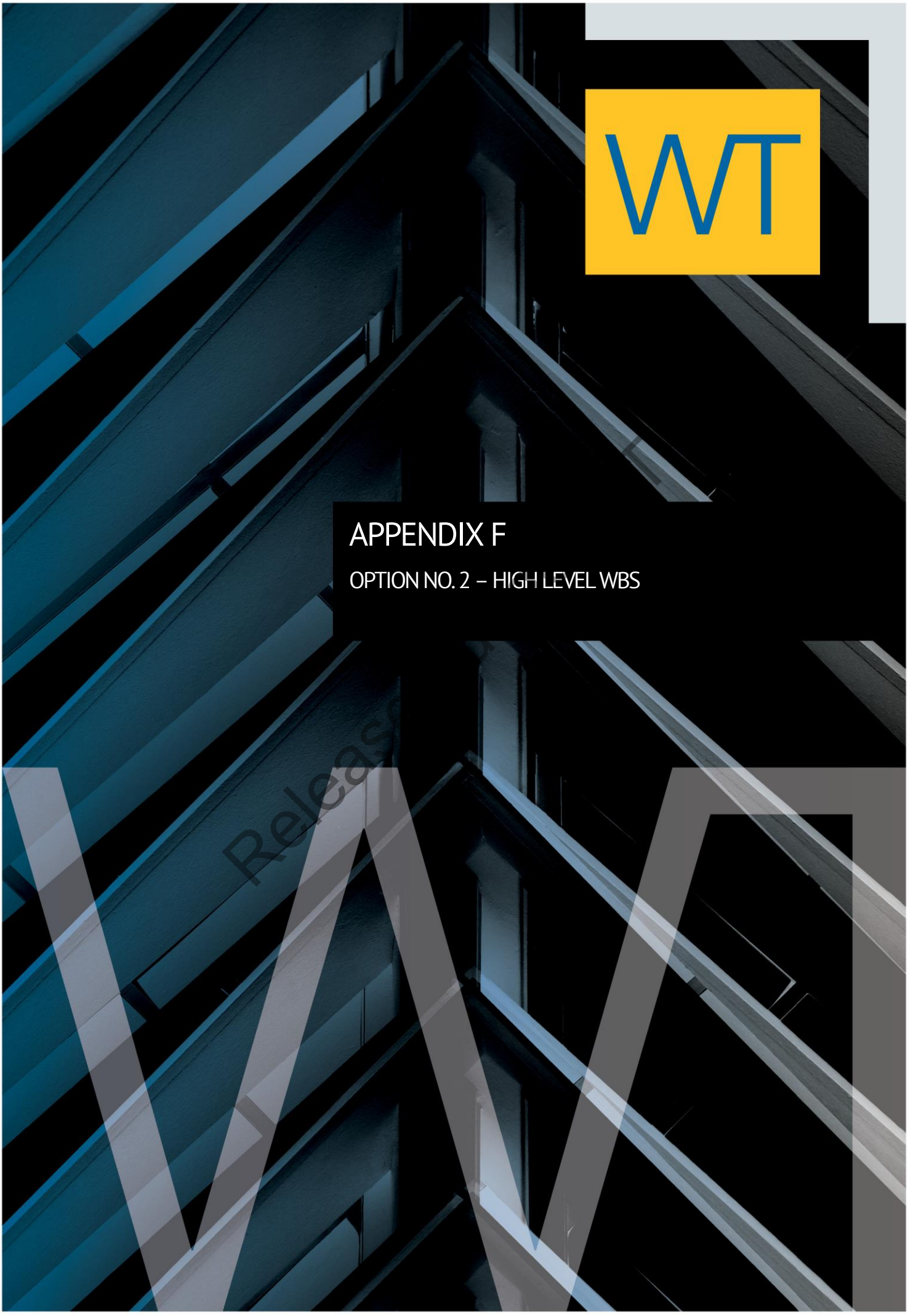
APPENDIX E

OPTION NO. 2 – CRITICAL PATH

ID	WBS	Task Name
1	**1**	**Pre-Construction Phase**
2	1.1	**Tender Period and Evaluation**
3	1.2	**4/04 Award**
4	**1.3**	**Construction SCEP**
5	1.3.1	**Draft SCEP**
6	1.3.2	**Draft review**
7	1.3.3	**Update SCEP**
8	1.3.4	**Final Review**
9	1.3.5	**Final Update**
10	1.3.6	**3/07 SCEP Approval**
11	**1.4**	**Pre construction stakeholder activities**
15	1.4.4	**Building Inspections**
16	**1.5**	**1 - Service Relocation**
19	1.5.3	**TasNetworks Pole relocation**
20	1.5.4	**TasNetworks u/g relocation**
22	1.5.6	**25/09 Services relocation completion**
23	**2**	**Construction Phase**
24	**2.1**	**Section 2A - Ch. 10830 - Ch. 11500**
25	**2.1.1**	**Ch. 11100 - Ch. 11500**
86	**2.2**	**Section 2B - Ch. 11500 - Ch. 11770**
87	**2.2.1**	**Ch. 11500 - Ch. 11770**
138	2.4	**23/04 Practical Completion**
139	2.5	**Defect Period**
140	2.6	**Contingency - P90**
141	2.7	**Inclement weather allowance**
142	2.8	**1/02 Handover**

Project: SoT Transit Lane Stage-2
Date: Thu 15/06/23

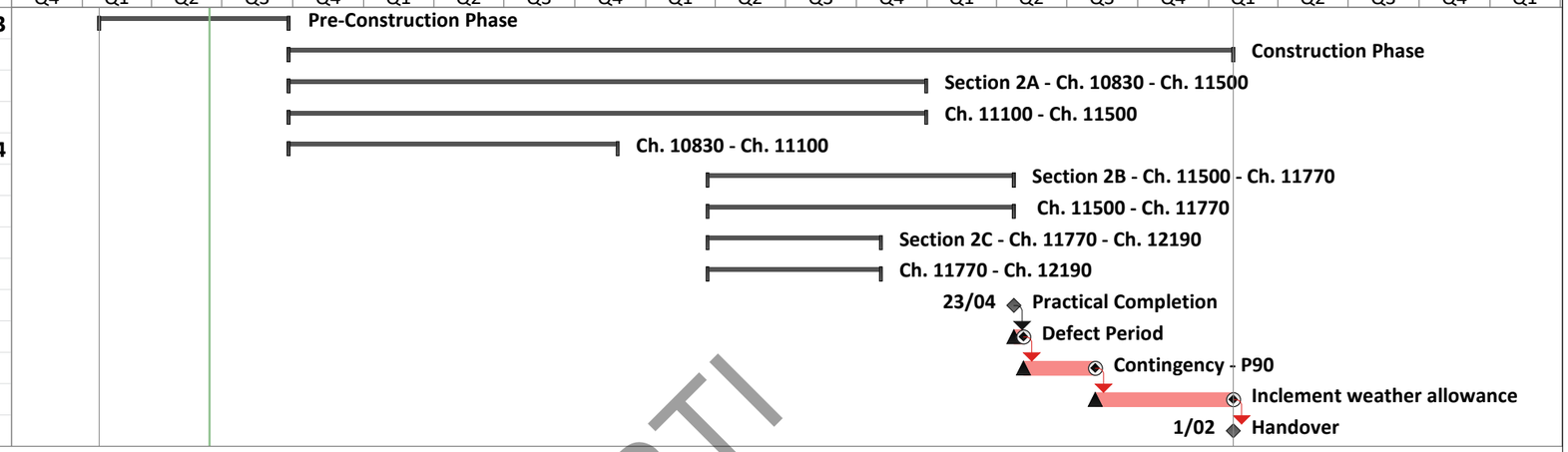
Task	External Tasks	Manual Task	Finish-only	Manual Progress
Split	External Milestone	Duration-only	Deadline	
Milestone	Inactive Task	Manual Summary Rollup	Critical	
Summary	Inactive Milestone	Manual Summary	Critical Split	
Project Summary	Inactive Summary	Start-only	Progress	



APPENDIX F

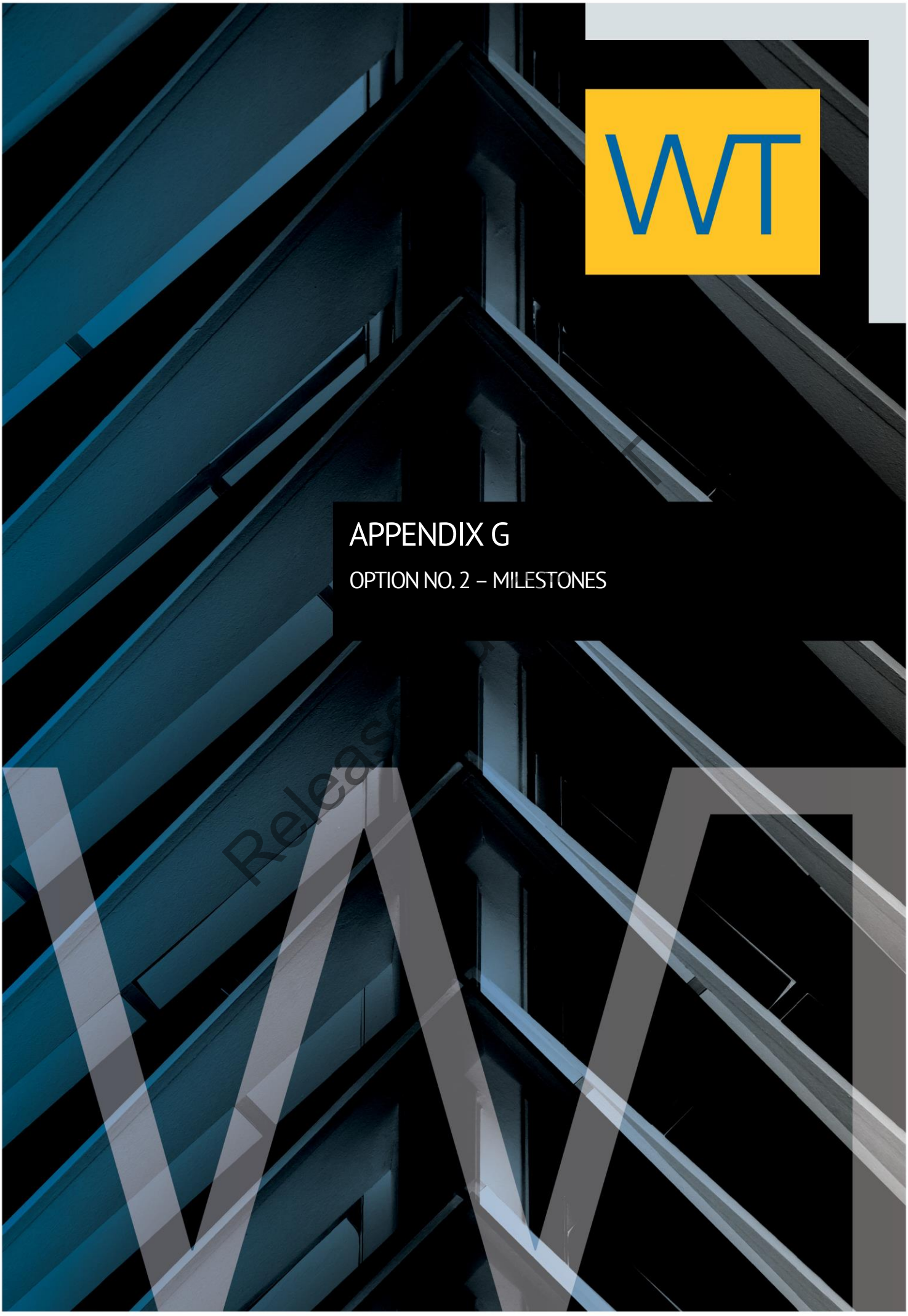
OPTION NO. 2 – HIGH LEVEL WBS

ID	WBS	Task Name	Duration	Start	Finish
1	**1**	**Pre-Construction Phase**	**170 days**	**Mon 23/01/23**	**Mon 25/09/23**
23	**2**	**Construction Phase**	**1455 days**	**Mon 25/09/23**	**Mon 1/02/27**
24	**2.1**	**Section 2A - Ch. 10830 - Ch. 11**	**981 days**	**Mon 25/09/23**	**Tue 30/12/25**
25	**2.1.1**	**Ch. 11100 - Ch. 11500**	**981 days**	**Mon 25/09/23**	**Tue 30/12/25**
56	**2.1.2**	**Ch. 10830 - Ch. 11100**	**505 days**	**Mon 25/09/23**	**Mon 25/11/24**
86	**2.2**	**Section 2B - Ch. 11500 - Ch. 11**	**473 days**	**Sat 22/03/25**	**Thu 23/04/26**
87	**2.2.1**	**Ch. 11500 - Ch. 11770**	**473 days**	**Sat 22/03/25**	**Thu 23/04/26**
108	**2.3**	**Section 2C - Ch. 11770 - Ch. 12**	**271 days**	**Sat 22/03/25**	**Sat 1/11/25**
109	**2.3.1**	**Ch. 11770 - Ch. 12190**	**271 days**	**Sat 22/03/25**	**Sat 1/11/25**
138	2.4	Practical Completion	0 days	Thu 23/04/26	Thu 23/04/26
139	2.5	Defect Period	14 days	Thu 23/04/26	Tue 5/05/26
140	2.6	Contingency - P90	114 days	Tue 5/05/26	Thu 6/08/26
141	2.7	Inclement weather allowance	213 days	Thu 6/08/26	Mon 1/02/27
142	2.8	Handover	0 days	Mon 1/02/27	Mon 1/02/27



Project: SoT Transit Lane Stage-2
Option 2
Date: Thu 15/06/23

Task	External Tasks	Manual Task	Finish-only	Manual Progress
Split	External Milestone	Duration-only	Deadline	
Milestone	Inactive Task	Manual Summary Rollup	Critical	
Summary	Inactive Milestone	Manual Summary	Critical Split	
Project Summary	Inactive Summary	Start-only	Progress	



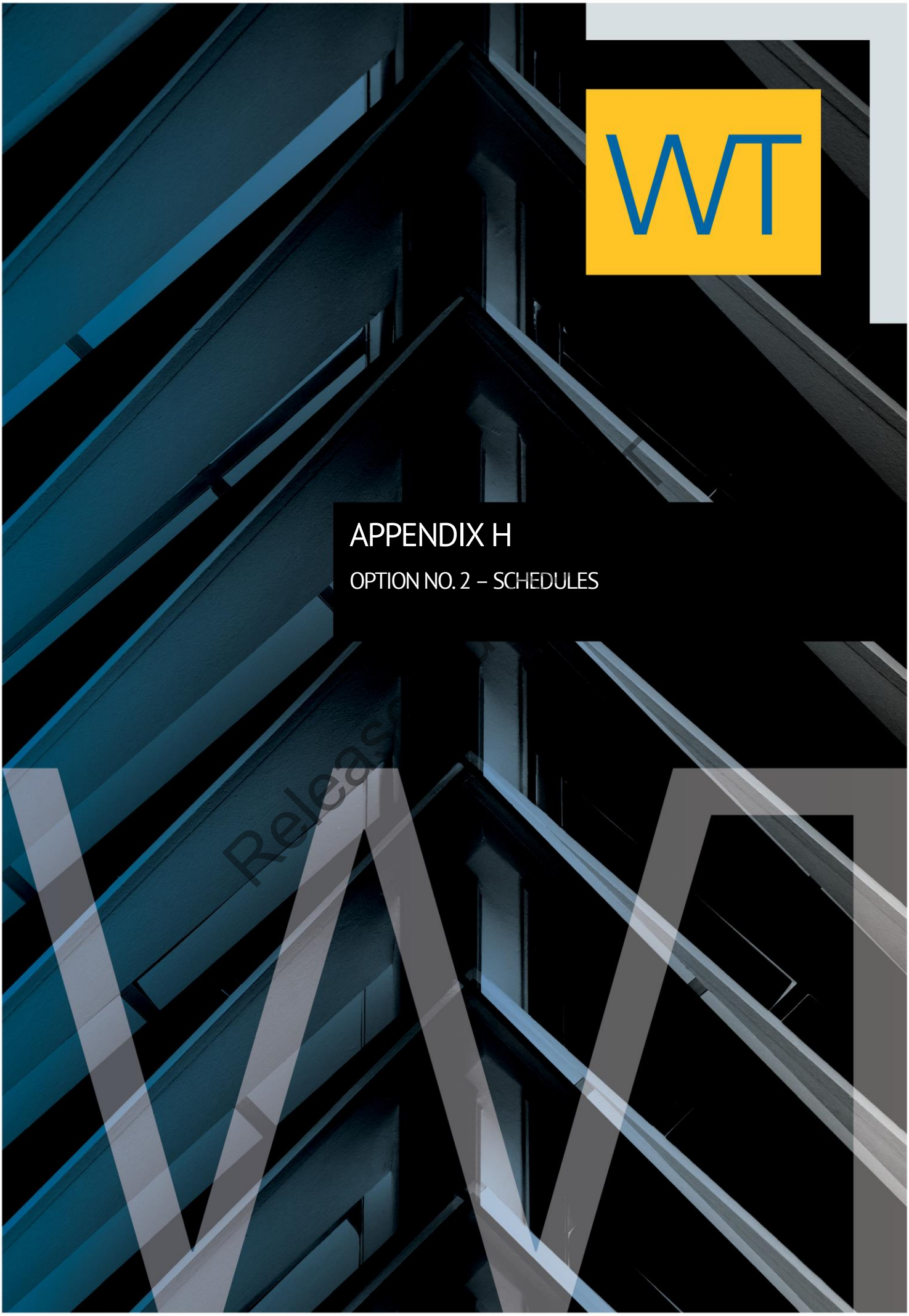
APPENDIX G

OPTION NO. 2 – MILESTONES

ID	WBS	Half 1, 2023	Half 2, 2023	Half 1, 2024	Half 2, 2024	Half 1, 2025	Half 2, 2025	Half 1, 2026	Half 2, 2026	Half 1, 2027	Half
		D J F M A M J	J A S O N D	J F M A M J	J A S O N D	J F M A M J	J A S O N D	J F M A M J	J A S O N D	J F M A M J	J
1	**1**	**Pre-Construction Phase**									
3	1.2	**4/04 Award**									
4	**1.3**		**Construction SCEP**								
10	1.3.6		**3/07 SCEP Approval**								
16	**1.5**		**1 - Service Relocation**								
22	1.5.6		**25/09 Services relocation completion**								
23	**2**									**Construction Phase**	
24	**2.1**							**Section 2A - Ch. 10830 - Ch. 11500**			
25	**2.1.1**							**Ch. 11100 - Ch. 11500**			
55	2.1.1.7							**30/12 Completion of Ch. 11100 - Ch. 11500**			
56	**2.1.2**					**Ch. 10830 - Ch. 11100**					
85	2.1.2.9					**25/11 Completion of Ch. 10830 - Ch. 11100**					
86	**2.2**						**Section 2B - Ch. 11500 - Ch. 11770**				
87	**2.2.1**						**Ch. 11500 - Ch. 11770**				
107	2.2.1.6							**23/04 Completion of Ch. 11500 - Ch. 11770**			
108	**2.3**						**Section 2C - Ch. 11770 - Ch. 12190**				
109	**2.3.1**						**Ch. 11770 - Ch. 12190**				
137	2.3.1.7						**1/11 Completion of Ch. 11100 - Ch. 11500**				
138	2.4							**23/04 Practical Completion**			
142	2.8									**1/02 Handover**	

Project: SoT Transit Lane Stage-2
Date: Thu 15/06/23

Task	External Tasks	Manual Task	Finish-only	Manual Progress
Split	External Milestone	Duration-only	Deadline	
Milestone	Inactive Task	Manual Summary Rollup	Critical	
Summary	Inactive Milestone	Manual Summary	Critical Split	
Project Summary	Inactive Summary	Start-only	Progress	



APPENDIX H

OPTION NO. 2 – SCHEDULES

ID	WBS	Task Name	Duration	Start	Finish
1	**1**	**Pre-Construction Phase**	**170 days**	**Mon 23/01/23**	**Mon 25/09/23**
2	1.1	Tender Period and Evaluation	10 wks	Mon 23/01/23	Tue 4/04/23
3	1.2	Award	0 days	Tue 4/04/23	Tue 4/04/23
4	**1.3**	**Construction SCEP**	**60 days**	**Wed 5/04/23**	**Mon 3/07/23**
5	1.3.1	Draft SCEP	4 wks	Wed 5/04/23	Fri 5/05/23
6	1.3.2	Draft review	3 wks	Mon 8/05/23	Fri 26/05/23
7	1.3.3	Update SCEP	2 wks	Mon 29/05/23	Fri 9/06/23
8	1.3.4	Final Review	2 wks	Tue 13/06/23	Mon 26/06/23
9	1.3.5	Final Update	1 wk	Tue 27/06/23	Mon 3/07/23
10	1.3.6	SCEP Approval	0 days	Mon 3/07/23	Mon 3/07/23
11	**1.4**	**Pre construction stakeholder activities**	**20 days**	**Tue 4/07/23**	**Mon 31/07/23**
12	1.4.1	VMBs	2 wks	Tue 4/07/23	Mon 17/07/23
13	1.4.2	Start of Works Notification to adjacent residents	2 wks	Tue 4/07/23	Mon 17/07/23
14	1.4.3	Traffic Management Strategy implementation (T	2 wks	Tue 4/07/23	Mon 17/07/23
15	1.4.4	Building Inspections	4 wks	Tue 4/07/23	Mon 31/07/23
16	**1.5**	**1 - Service Relocation**	**50 days**	**Tue 18/07/23**	**Mon 25/09/23**
17	1.5.1	Water Outage Notification	2 wks	Tue 18/07/23	Mon 31/07/23
18	1.5.2	Water relocation	4 wks	Tue 1/08/23	Mon 28/08/23
19	1.5.3	TasNetworks Pole relocation	4 wks	Tue 1/08/23	Mon 28/08/23
20	1.5.4	TasNetworks u/g relocation	4 wks	Tue 29/08/23	Mon 25/09/23
21	1.5.5	Rock outcrop removal	4 wks	Tue 1/08/23	Mon 28/08/23
22	1.5.6	Services relocation completion	0 days	Mon 25/09/23	Mon 25/09/23
23	**2**	**Construction Phase**	**1455 days**	**Mon 25/09/23**	**Mon 1/02/27**
24	**2.1**	**Section 2A - Ch. 10830 - Ch. 11500**	**981 days**	**Mon 25/09/23**	**Tue 30/12/25**
25	**2.1.1**	**Ch. 11100 - Ch. 11500**	**981 days**	**Mon 25/09/23**	**Tue 30/12/25**
26	**2.1.1.1**	**Stage 0**	**9 days**	**Mon 25/09/23**	**Tue 3/10/23**
27	2.1.1.1.	Setting up the site camp and laydown areas	1 day	Mon 25/09/23	Tue 26/09/23
28	2.1.1.1.	Installing project signs, VMS signs, or other infrastructure that will be required.	1 day	Mon 25/09/23	Tue 26/09/23
29	2.1.1.1.	Works around the site that do not need permanent barriers, such as clearing and grubbing and minor earthworks to allow for service relocations.	5 days	Tue 26/09/23	Sat 30/09/23
30	2.1.1.1.	Removing existing islands and paving them where required for future traffic staging.	3 days	Sat 30/09/23	Tue 3/10/23
31	2.1.1.1.	Demolish the existing dwellings and use the site for a temporary camp/ laydown	2 days	Sat 30/09/23	Tue 3/10/23
32	**2.1.1.2**	**Stage 1 (Northbound)**	**649 days**	**Tue 3/10/23**	**Fri 4/04/25**
33	2.1.1.2.	Placing temporary barriers and re-line mark the pavements	3 days	Tue 3/10/23	Thu 5/10/23
34	2.1.1.2.	Excavating embankment	587 days	Thu 5/10/23	Sat 15/02/25
35	2.1.1.2.	Construct new retaining wall	32 days	Sat 15/02/25	Fri 14/03/25
36	2.1.1.2.	Constructing pavement widening	29 days	Wed 12/03/25	Fri 4/04/25

Project: SoT Transit Lane Stage-2
Date: Thu 15/06/23

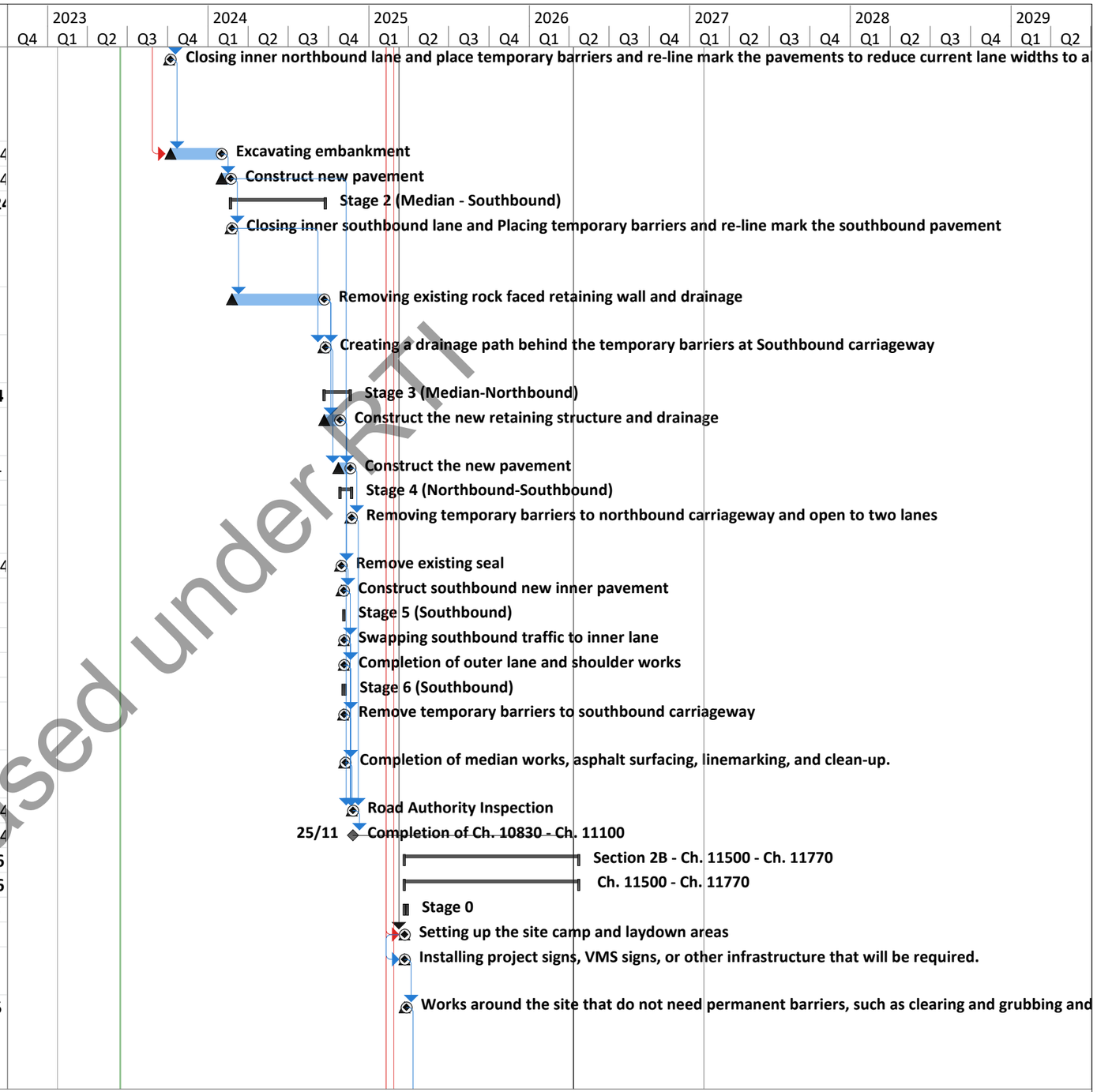
Task	External Tasks	Manual Task	Finish-only		Manual Progress
Split	External Milestone	Duration-only	Deadline		
Milestone	Inactive Task	Manual Summary Rollup	Critical		
Summary	Inactive Milestone	Manual Summary	Critical Split		
Project Summary	Inactive Summary	Start-only	Progress		

ID	WBS	Task Name	Duration	Start	Finish
37	**2.1.1.3**	**Stage 2 (Median)**	**320 days**	**Fri 4/04/25**	**Sat 27/12/25**
38	2.1.1.3.	Shifting northbound traffic on to new pavement	1 day	Fri 4/04/25	Sat 5/04/25
39	2.1.1.3.	Placing temporary barriers and re-line mark the southbound pavement	3 days	Fri 4/04/25	Tue 8/04/25
40	2.1.1.3.	Removing existing rock faced retaining wall and drainage	242 days	Tue 8/04/25	Sat 25/10/25
41	2.1.1.3.	Creating a drainage path behind the temporary barriers at Southbound	13 days	Wed 22/10/25	Sat 1/11/25
42	2.1.1.3.	Constructing the new retaining structure and drainage	43 days	Sat 25/10/25	Tue 2/12/25
43	2.1.1.3.	Removal of existing pavement	6 days	Tue 2/12/25	Sat 6/12/25
44	2.1.1.3.	Constructing new pavement to southbound carriageway	18 days	Thu 4/12/25	Fri 19/12/25
45	2.1.1.3.	Constructing new pavement to Northbound carriageway	32 days	Tue 2/12/25	Sat 27/12/25
46	**2.1.1.4**	**Stage 3 (Northbound - Southbound)**	**6 days**	**Fri 19/12/25**	**Wed 24/12/25**
47	2.1.1.4.	Moving traffic laterally to the inner side of the pavement	1 day	Fri 19/12/25	Sat 20/12/25
48	2.1.1.4.	Move southbound lanes to the west and reopen the second lane	1 day	Fri 19/12/25	Sat 20/12/25
49	2.1.1.4.	Place temporary barriers	3 days	Fri 19/12/25	Mon 22/12/25
50	2.1.1.4.	Construct pavement widening and barriers	3 days	Mon 22/12/25	Wed 24/12/25
51	**2.1.1.5**	**Stage 4 (Southbound)**	**3 days**	**Wed 24/12/25**	**Fri 26/12/25**
52	2.1.1.5.	Removing temporary barriers to southbound carriageway	1 day	Wed 24/12/25	Thu 25/12/25
53	2.1.1.5.	Completion of median works, asphalt surfacing, linemarking, and clean-up.	2 days	Thu 25/12/25	Fri 26/12/25
54	2.1.1.6	Road Authority Inspection	3 days	Sat 27/12/25	Tue 30/12/25
55	2.1.1.7	Completion of Ch. 11100 - Ch. 11500	0 days	Tue 30/12/25	Tue 30/12/25
56	**2.1.2**	**Ch. 10830 - Ch. 11100**	**505 days**	**Mon 25/09/23**	**Mon 25/11/24**
57	**2.1.2.1**	**Stage 0**	**9 days**	**Mon 25/09/23**	**Tue 3/10/23**
58	2.1.2.1.	Setting up the site camp and laydown areas	1 day	Mon 25/09/23	Tue 26/09/23
59	2.1.2.1.	Installing project signs, VMS signs, or other infrastructure that will be required.	1 day	Mon 25/09/23	Tue 26/09/23
60	2.1.2.1.	Works around the site that do not need permanent barriers, such as clearing and grubbing and minor earthworks to allow for service relocations.	5 days	Tue 26/09/23	Sat 30/09/23
61	2.1.2.1.	Removing existing islands and paving them where required for future traffic staging.	3 days	Sat 30/09/23	Tue 3/10/23
62	2.1.2.1.	Demolish the existing dwellings and use the site for a temporary camp/ laydown	2 days	Sat 30/09/23	Tue 3/10/23
63	**2.1.2.2**	**Stage 1 (Northbound)**	**160 days**	**Tue 3/10/23**	**Wed 21/02/24**

Project: SoT Transit Lane Stage-2
Date: Thu 15/06/23

Task	External Tasks	Manual Task	Finish-only	Manual Progress
Split	External Milestone	Duration-only	Deadline	
Milestone	Inactive Task	Manual Summary Rollup	Critical	
Summary	Inactive Milestone	Manual Summary	Critical Split	
Project Summary	Inactive Summary	Start-only	Progress	

ID	WBS	Task Name	Duration	Start	Finish
64	2.1.2.2.	Closing inner northbound lane and place temporary barriers and re-line mark the pavements to reduce current lane widths to allow for new works to be constructed	5 days	Tue 3/10/23	Sat 7/10/23
65	2.1.2.2.	Excavating embankment	129 days	Sat 7/10/23	Wed 31/01/24
66	2.1.2.2.	Construct new pavement	26 days	Wed 31/01/24	Wed 21/02/24
67	**2.1.2.3**	**Stage 2 (Median - Southbound)**	**261 days**	**Tue 20/02/24**	**Mon 23/09/24**
68	2.1.2.3.	Closing inner southbound lane and Placing temporary barriers and re-line mark the southbound pavement	5 days	Tue 20/02/24	Sat 24/02/24
69	2.1.2.3.	Removing existing rock faced retaining wall and drainage	253 days	Sat 24/02/24	Fri 20/09/24
70	2.1.2.3.	Creating a drainage path behind the temporary barriers at Southbound	5 days	Thu 19/09/24	Mon 23/09/24
71	**2.1.2.4**	**Stage 3 (Median-Northbound)**	**71 days**	**Fri 20/09/24**	**Tue 19/11/24**
72	2.1.2.4.	Construct the new retaining structure and drainage	45 days	Fri 20/09/24	Sat 26/10/24
73	2.1.2.4.	Construct the new pavement	31 days	Wed 23/10/24	Tue 19/11/24
74	**2.1.2.5**	**Stage 4 (Northbound-Southbound)**	**31 days**	**Sat 26/10/24**	**Fri 22/11/24**
75	2.1.2.5.	Removing temporary barriers to northbound carriageway and open to two	5 days	Tue 19/11/24	Fri 22/11/24
76	2.1.2.5.	Remove existing seal	4 days	Sat 26/10/24	Wed 30/10/24
77	2.1.2.5.	Construct southbound new inner pavemen	6 days	Wed 30/10/24	Mon 4/11/24
78	**2.1.2.6**	**Stage 5 (Southbound)**	**1 day**	**Mon 4/11/24**	**Tue 5/11/24**
79	2.1.2.6.	Swapping southbound traffic to inner lane	1 day	Mon 4/11/24	Tue 5/11/24
80	2.1.2.6.	Completion of outer lane and shoulder wor	1 day	Mon 4/11/24	Tue 5/11/24
81	**2.1.2.7**	**Stage 6 (Southbound)**	**5 days**	**Sat 2/11/24**	**Fri 8/11/24**
82	2.1.2.7.	Remove temporary barriers to southbound carriageway	2 days	Sat 2/11/24	Tue 5/11/24
83	2.1.2.7.	Completion of median works, asphalt surfacing, linemarking, and clean-up.	3 days	Tue 5/11/24	Fri 8/11/24
84	2.1.2.8	Road Authority Inspection	3 days	Fri 22/11/24	Mon 25/11/24
85	2.1.2.9	Completion of Ch. 10830 - Ch. 11100	0 days	Mon 25/11/24	Mon 25/11/24
86	**2.2**	**Section 2B - Ch. 11500 - Ch. 11770**	**473 days**	**Sat 22/03/25**	**Thu 23/04/26**
87	**2.2.1**	**Ch. 11500 - Ch. 11770**	**473 days**	**Sat 22/03/25**	**Thu 23/04/26**
88	**2.2.1.1**	**Stage 0**	**9 days**	**Sat 22/03/25**	**Sat 29/03/25**
89	2.2.1.1.	Setting up the site camp and laydown areas	1 day	Sat 22/03/25	Sat 22/03/25
90	2.2.1.1.	Installing project signs, VMS signs, or other infrastructure that will be required.	1 day	Sat 22/03/25	Sat 22/03/25
91	2.2.1.1.	Works around the site that do not need permanent barriers, such as clearing and grubbing and minor earthworks to allow for service relocations.	5 days	Sat 22/03/25	Thu 27/03/25



Project: SoT Transit Lane Stage-2
Date: Thu 15/06/23

Task	External Tasks	Manual Task	Finish-only	Manual Progress
Split	External Milestone	Duration-only	Deadline	
Milestone	Inactive Task	Manual Summary Rollup	Critical	
Summary	Inactive Milestone	Manual Summary	Critical Split	
Project Summary	Inactive Summary	Start-only	Progress	

ID	WBS	Task Name	Duration	Start	Finish
92	2.2.1.1.4	Removing existing islands and paving them where required for future traffic staging.	3 days	Thu 27/03/25	Sat 29/03/25
93	**2.2.1.2**	**Stage 1 (Median - Northbound)**	**439 days**	**Sat 29/03/25**	**Tue 31/03/26**
94	2.2.1.2.1	Removing the existing median barrier and replace with a temporary barrier	1 day	Sat 29/03/25	Sat 29/03/25
95	2.2.1.2.2	Placing temporary barriers and re-line mark the pavements	3 days	Sat 29/03/25	Tue 1/04/25
96	2.2.1.2.3	Undertaking the earthworks necessary to cut back the existing embankment	412 days	Tue 8/04/25	Thu 19/03/26
97	2.2.1.2.4	Constructing new pavement	16 days	Thu 19/03/26	Tue 31/03/26
98	**2.2.1.3**	**Stage 2 (Median - Northbound)**	**3 days**	**Tue 31/03/26**	**Thu 2/04/26**
99	2.2.1.3.1	Moving the northbound traffic laterally to the west Complete construction of third lane northbound	1 day	Tue 31/03/26	Wed 1/04/26
100	2.2.1.3.2	Placing temporary barriers and re-line mark the pavements	3 days	Tue 31/03/26	Thu 2/04/26
101	**2.2.1.4**	**Stage 3 (Median - Southbound)**	**19 days**	**Thu 2/04/26**	**Tue 21/04/26**
102	2.2.1.4.1	Remove existing seal	14 days	Thu 2/04/26	Fri 17/04/26
103	2.2.1.4.2	New seal	3 days	Fri 17/04/26	Mon 20/04/26
104	2.2.1.4.3	Removing temporary barriers to southbound carriageway	1 day	Mon 20/04/26	Mon 20/04/26
105	2.2.1.4.4	Completion of median works, asphalt surfacing, linemarking, and clean-up.	1 day	Mon 20/04/26	Tue 21/04/26
106	2.2.1.5	Road Authority Inspection	3 days	Tue 21/04/26	Thu 23/04/26
107	2.2.1.6	Completion of Ch. 11500 - Ch. 11770	0 days	Thu 23/04/26	Thu 23/04/26
108	**2.3**	**Section 2C - Ch. 11770 - Ch. 12190**	**271 days**	**Sat 22/03/25**	**Sat 1/11/25**
109	**2.3.1**	**Ch. 11770 - Ch. 12190**	**271 days**	**Sat 22/03/25**	**Sat 1/11/25**
110	**2.3.1.1**	**Stage 0**	**9 days**	**Sat 22/03/25**	**Sat 29/03/25**
111	2.3.1.1.1	Setting up the site camp and laydown areas	1 day	Sat 22/03/25	Sat 22/03/25
112	2.3.1.1.2	Installing project signs, VMS signs, or other infrastructure that will be required.	1 day	Sat 22/03/25	Sat 22/03/25
113	2.3.1.1.3	Works around the site that do not need permanent barriers, such as clearing and grubbing and minor earthworks to allow for service relocations.	5 days	Sat 22/03/25	Thu 27/03/25
114	2.3.1.1.4	Removing existing islands and paving them where required for future traffic staging.	3 days	Thu 27/03/25	Sat 29/03/25
115	**2.3.1.2**	**Stage 1 (Median - Northbound - Southbound)**	**74 days**	**Sat 29/03/25**	**Sat 31/05/25**
116	2.3.1.2.1	Removing the existing median barrier and replace with a temporary barrier	2 days	Sat 29/03/25	Mon 31/03/25
117	2.3.1.2.2	Placing temporary barriers and re-line mark the pavements	2 days	Sat 29/03/25	Mon 31/03/25
118	2.3.1.2.3	Undertaking the earthworks necessary to remove the rock outcrop (southbound)	18 days	Tue 8/04/25	Thu 24/04/25

Project: SoT Transit Lane Stage-2
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Task	External Tasks	Manual Task	Finish-only	Manual Progress
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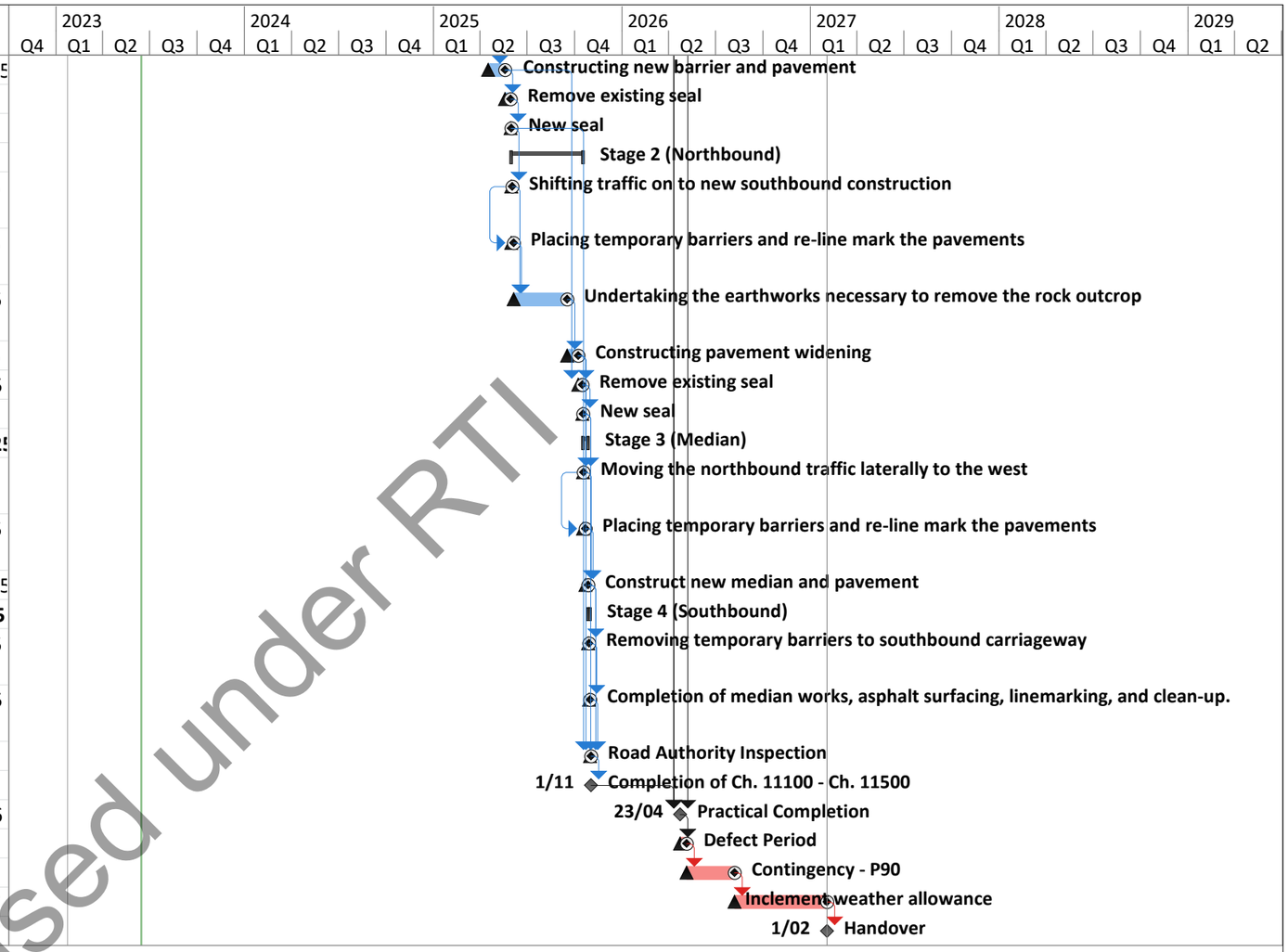
Summary	Inactive Milestone	Manual Summary	Critical Split	
Project Summary	Inactive Summary	Start-only	Progress	

ID	WBS	Task Name	Duration	Start	Finish
119	2.3.1.2.4	Constructing new barrier and pavement	38 days	Wed 16/04/25	Mon 19/05/25
120	2.3.1.2.5	Remove existing seal	15 days	Mon 19/05/25	Fri 30/05/25
121	2.3.1.2.6	New seal	2 days	Fri 30/05/25	Sat 31/05/25
122	**2.3.1.3**	**Stage 2 (Northbound)**	**168 days**	**Sat 31/05/25**	**Fri 17/10/25**
123	2.3.1.3.1	Shifting traffic on to new southbound construction	1 day	Sat 31/05/25	Mon 2/06/25
124	2.3.1.3.2	Placing temporary barriers and re-line mark the pavements	5 days	Sat 31/05/25	Wed 4/06/25
125	2.3.1.3.3	Undertaking the earthworks necessary to remove the rock outcrop	126 days	Wed 4/06/25	Tue 16/09/25
126	2.3.1.3.4	Constructing pavement widening	26 days	Tue 16/09/25	Wed 8/10/25
127	2.3.1.3.5	Remove existing seal	9 days	Wed 8/10/25	Thu 16/10/25
128	2.3.1.3.6	New seal	2 days	Thu 16/10/25	Fri 17/10/25
129	**2.3.1.4**	**Stage 3 (Median)**	**12 days**	**Fri 17/10/25**	**Mon 27/10/25**
130	2.3.1.4.1	Moving the northbound traffic laterally to the west	1 day	Fri 17/10/25	Sat 18/10/25
131	2.3.1.4.2	Placing temporary barriers and re-line mark the pavements	5 days	Fri 17/10/25	Tue 21/10/25
132	2.3.1.4.3	Construct new median and pavement	7 days	Tue 21/10/25	Mon 27/10/25
133	**2.3.1.5**	**Stage 4 (Southbound)**	**5 days**	**Mon 27/10/25**	**Thu 30/10/25**
134	2.3.1.5.1	Removing temporary barriers to southbound carriageway	2 days	Mon 27/10/25	Tue 28/10/25
135	2.3.1.5.2	Completion of median works, asphalt surfacing, linemarking, and clean-up.	3 days	Tue 28/10/25	Thu 30/10/25
136	2.3.1.6	Road Authority Inspection	3 days	Thu 30/10/25	Sat 1/11/25
137	2.3.1.7	Completion of Ch. 11100 - Ch. 11500	0 days	Sat 1/11/25	Sat 1/11/25
138	2.4	Practical Completion	0 days	Thu 23/04/26	Thu 23/04/26
139	2.5	Defect Period	14 days	Thu 23/04/26	Tue 5/05/26
140	2.6	Contingency - P90	114 days	Tue 5/05/26	Thu 6/08/26
141	2.7	Inclement weather allowance	213 days	Thu 6/08/26	Mon 1/02/27
142	2.8	Handover	0 days	Mon 1/02/27	Mon 1/02/27



Project: SoT Transit Lane Stage-2
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2 February 2023

The Crown in Right of Tasmania
C/- Department of State Growth
4 Salamanca Place
HOBART TAS 7000
@stategrowth.tas.gov.au

Dear

NR1445 - SOUTHERN OUTLET TRANSIT LANE

OPTIONS STUDY FOR CONSTRUCTION METHODOLOGY & SCHEDULING

Please find attached our draft Construction Methodology and Scheduling options study for the above project.

The Services to be supplied:

The services (the Services) to be supplied by the WTP Australia Pty Ltd (WT) to the Principal in accordance with the agreed fee proposal are as follows:

1. The development and delivery of the report that considers options/construction methodology associated with the Southern Outlet Transit Lane, which are based on the more recent design concepts, and which primarily avoid lane closures on the Southern Outlet during peak hours (6:30 a.m. – 9:30 a.m. and 3:30 p.m. – 6:30 p.m.).

A more detailed description of the Services as below:

Specification applicable to Services:

Stage 1 – Options Study

1. WT is to undertake an options study associated with the Southern Outlet Transit Lane, based on the more recent design concepts, with the primary output to consider options which avoid lane closures on the Southern Outlet during peak hours (6:30 a.m. – 9:30 a.m. and 3:30 p.m. – 6:30 p.m.).
2. WT arranged for an online meeting on Tuesday 20 December 2022 and discussed the identified options.

Stage 2 – Planning Methodology

1. WT has prepared detailed method statements on the preferred option/s (as nominated by the Principal). The method statements are to include a high-level Gantt chart with draft schedule, timeline, critical path(s). This report dated 01 February 2023 concluded stage 2 planning methodology.

Stage 3 – Report and Basis of Schedule

1. WT to prepare a report that summaries the findings of the Options Study and Planning Methodology stages, and includes the Basis of Schedule that outlines all assumptions and information deficiencies. WT expected to issue stage 3 in draft format before end January 2023.

Should you have any queries regarding our report or require any further information, please do not hesitate to contact Serkan Karaca or the undersigned.

Yours sincerely

State Director - Portfolio and Program Advisory
WT

WT REF: PR-018142-01

NR1445 - SOUTHERN OUTLET TRANSIT LANE

OPTIONS STUDY FOR CONSTRUCTION METHODOLOGY & SCHEDULING

2 February 2023

CONTENTS

APPENDICES

1 SUMMARY

The project site is located at Davey Street to Olinda Grove Intersection, Hobart, Tasmania. The project has 2 stages; namely:

Stage 1: Intersection works (not part of WT's scope)

Stage 2: Transit Lane Construction works which include; (WT's scope)

- Removal of the existing retaining wall at the median and construction of a new retaining wall
- Construction of a new retaining wall at northbound of Southern Outlet Highway
- Widening of the northbound of Southern Outlet Highway to construct a transit lane

WT is asked to prepare a constructability methodology avoiding any lane closures during the peak hours (6.30am-9.30am and 3.30pm – 6.30pm).

Figure 1: Plan view – Southern Outlet Highway

Information received:

1. Southern Outlet - DRAFT construction program (draft construction programme, based on the previous design iteration. For information only)
2. Southern Outlet Transit Lane - Preliminary Design Cost Estimate - Nov2022 (for information only)
3. Southern Outlet Transit Lane - DRAFT design plans Stage 1 C0000-C0511 - Aug2022
4. Southern Outlet Transit Lane - DRAFT design plans Stage 2 C1000-C1541 - Aug2022
5. Southern Outlet Transit Lane - Stage 1 Display Plan - Intersection Closeup
6. Southern Outlet Transit Lane - Stage 2 (from Olinda Grove) Display Plan
7. Southern Outlet Transit Lane - Constructability Assessment (Email on 12.12.2022)
8. RE: Southern Outlet Transit Lane - Constructability Assessment (Email on 14.12.2022)

There are 6 typical sections from Ch. 840 to Ch. 2181.42. Construction method, sequence and structures are tailored specific to each typical section to avoid lane closures (at least 2 lanes are open at any one time) during the peak hours in order to keep the existing Level-of-Service of the highway.

Traffic diversion may not be a feasible solution due to insufficiency, location and suitability of the side roads.

Additional options to be proposed depending on resourcing. Duration could be reduced/increased depending on resourcing and budget.

Duration wise the optimum solution would be starting from Ch. 1440 and concurrently moving outwards with two separate teams as shown in Figure 2.

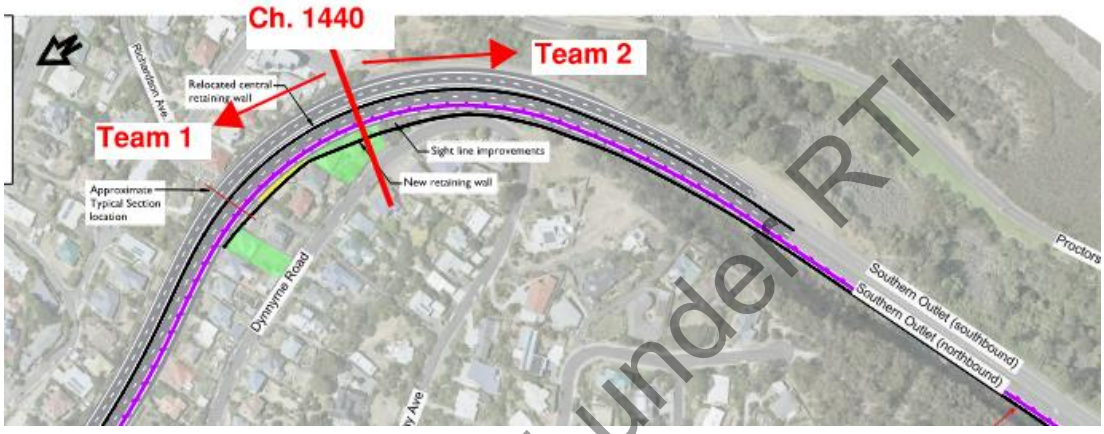


Figure 2: Southern Outlet Highway commencement location of construction works

2 OPTION 1

2.1 PROPOSED METHODOLOGY

When generating Option 1, maximum gang numbers and 24h shifts are employed.

2.1.1 CH. 840 TO CH. 940

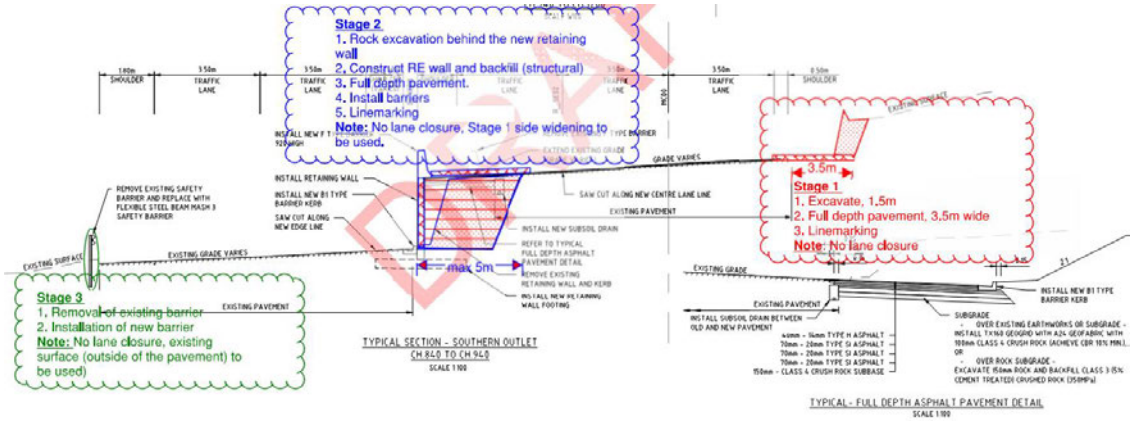


Figure 3: Typical section – Southern Outlet Ch. 840 to Ch. 940

STAGE 1 - NORTHBOUND

1. New Jersey barriers to be placed (24h shift)
2. Existing surface of northside of the northbound road to be excavated 1.5m wide to allow construction of a new 3.5m wide lane. This lane will be used to avoid any lane closures during the RE wall construction at the median (Day shift)
3. 3.5m wide, full depth pavement to be constructed
4. Linemarking to be conducted (24h shift)
5. New Jersey barriers to be removed (24h shift)

Note: No lane closures

STAGE 2 – MEDIAN

1. New Jersey barriers to be placed (24h shift)
2. Existing retaining wall to be removed and approximately 5m wide rock excavation to be conducted to allow construction a new retaining wall (Day shift)
3. A new reinforced earth wall to be constructed and structural backfill to be placed (24h shift)
4. Full depth pavement to be constructed (24h shift)
5. Linemarking to be conducted (24h shift)
6. Removal of New Jersey barriers (24h shift)

Note: No lane closures, Stage 1 new lane to be used

STAGE 3 – SOUTHBOUND (DAY SHIFT)

1. New Jersey barriers to be placed
2. Removal of existing safety barrier
3. Installation of flexible steel beam mesh 3 safety barrier
4. Removal of New Jersey barriers

Note: No lane closures, works to be conducted from the outside of the existing pavement, on existing surface.

2.1.2 CH. 940 TO CH. 1200

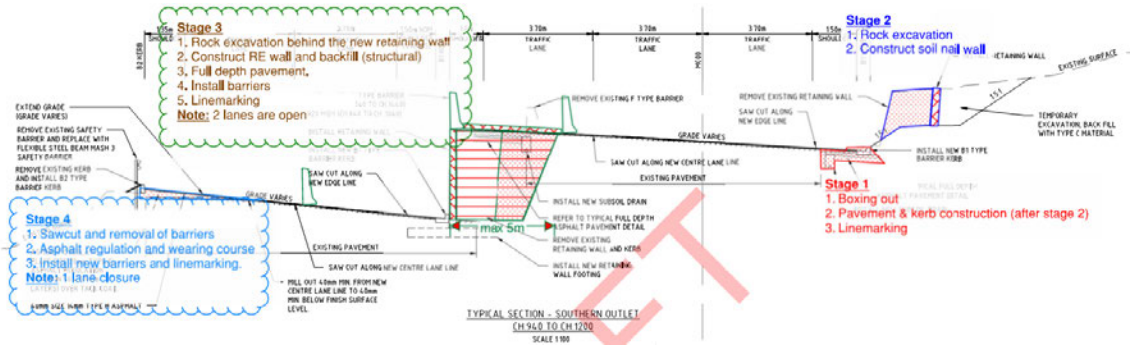


Figure 4: Typical section – Southern Outlet Ch. 940 to Ch. 1200

STAGE 1 - NORTHBOUND (24H SHIFT)

1. New Jersey barriers to be placed
2. Boxing out to allow the construction of new pavement & kerb (after Stage 2 works). This lane will be used to avoid any lane closures during the RE wall construction at the median
3. Linemarking to be conducted
4. New Jersey barriers to be removed

Note: No lane closures

STAGE 2 – NORTHBOUND

1. Rock excavation to be conducted to allow construction a new retaining structure (Day Shift)
2. A new soil nail wall to be constructed and backfill to be placed (24h Shift)

Note: No lane closures

STAGE 3 – MEDIAN (24H SHIFT)

1. New Jersey barriers to be placed
2. Soil excavation to be conducted to allow construction of a new retaining structure
3. Existing retaining wall to be removed and approximately 5m wide rock excavation to be conducted to allow construction a new retaining wall
4. A new reinforced earth wall to be constructed and structural backfill to be placed
5. Full depth pavement to be constructed
6. Linemarking to be conducted
7. Removal of New Jersey barriers

Note: 2 lanes are open at both sides

STAGE 4 – SOUTHBOUND (24H SHIFT)

1. New Jersey barriers to be placed
2. Saw cut and removal of existing safety barrier and existing kerb
3. Asphalt regulation and full wearing course
4. Installation of existing kerb and flexible steel beam mash 3 safety barrier
5. Linemarking to be conducted
6. Removal of New Jersey barriers

Note: No lane closures

2.1.3 CH. 1220 TO CH. 1440

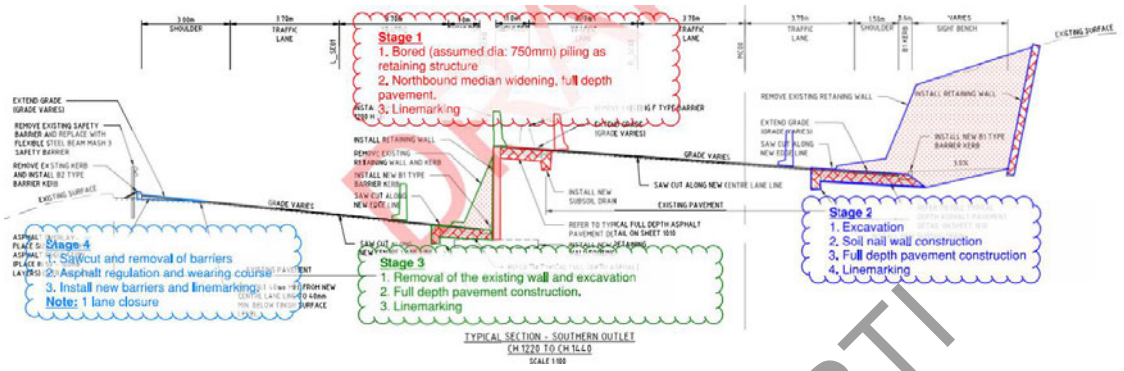


Figure 5: Typical section – Southern Outlet Ch. 1220 to Ch. 1440

STAGE 1 - MEDIAN (24H SHIFT)

1. New Jersey barriers to be placed
2. Bored piling (assumed dia: 750mm) as retaining structure
3. Northbound median widening, construction of full depth pavement
4. Linemarking to be conducted
5. New Jersey barriers to be removed

Note: No lane closures

STAGE 2 – NORTHBOUND (DAY SHIFT)

1. New Jersey barriers to be placed
2. Rock excavation to be conducted to allow construction of a new retaining structure and a new pavement
3. A new soil nail wall to be constructed and backfill to be placed
4. Construction of full depth pavement
5. Linemarking to be conducted
6. New Jersey barriers to be removed

Note: No lane closures, widened median is open

STAGE 3 – MEDIAN (24H SHIFT)

1. New Jersey barriers to be placed
2. Existing retaining wall to be removed and excavation to be conducted
3. Full depth pavement to be constructed
4. Linemarking to be conducted
5. Removal of New Jersey barriers

Note: 2 lanes are open

STAGE 4 – SOUTHBOUND (24H SHIFT)

1. New Jersey barriers to be placed
2. Saw cut and removal of existing safety barrier and existing kerb
3. Asphalt regulation and full wearing course
4. Installation of existing kerb and flexible steel beam mash 3 safety barrier
5. Linemarking to be conducted
6. Removal of New Jersey barriers

Note: No lane closures

2.1.4 CH. 1440 TO CH. 1770

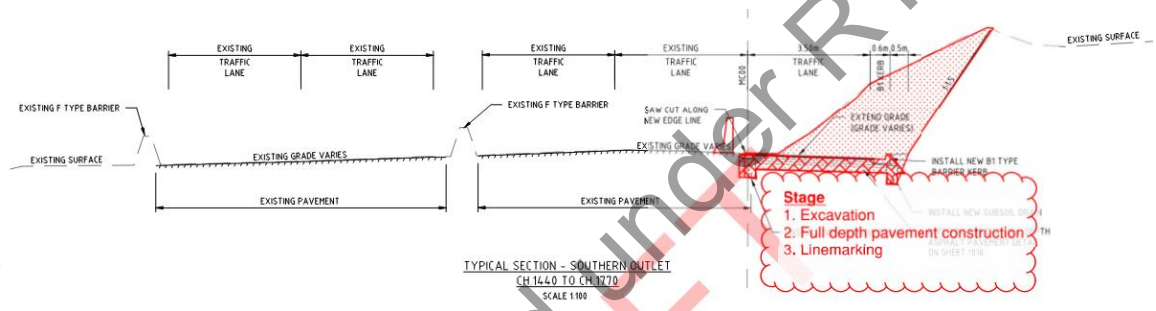


Figure 6: Typical section – Southern Outlet Ch. 1440 to Ch. 1770

NORTHBOUND

1. New Jersey barriers to be placed (24h Shift)
2. Rock excavation to be conducted to allow construction of a new pavement (Day Shift)
3. Construction of full depth pavement (24h Shift)
4. Installation of new B1 type barrier kerb (24h Shift)
5. Linemarking to be conducted (24h Shift)
6. New Jersey barriers to be removed (24h Shift)

Note: No lane closures

2.1.5 CH. 1770 TO CH. 2040

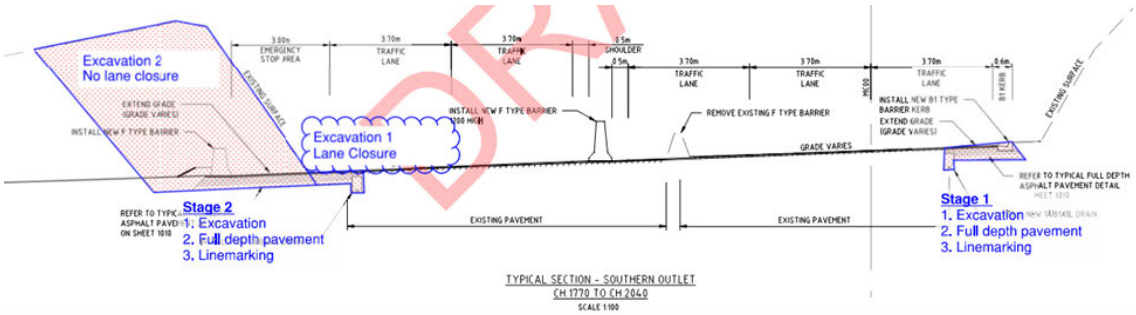


Figure 7: Typical section – Southern Outlet Ch. 1770 to Ch. 2040

STAGE 1 - NORTHBOUND

1. New Jersey barriers to be placed (24h Shift)
2. Rock excavation to be conducted to allow construction of a new pavement (Day Shift)
3. Construction of full depth pavement (24h Shift)
4. Installation of new B1 barrier kerb (24h Shift)
5. Linemarking to be conducted (24h Shift)
6. New Jersey barriers to be removed (24h Shift)

Note: No lane closures

STAGE 2 – SOUTHBOUND (24H SHIFT)

1. New Jersey barriers to be placed
2. Primary excavation to be conducted to allow secondary excavation (1 lane is closed)
3. Secondary excavation to be conducted to allow construction of a new pavement (no lane closures)
4. Full depth pavement to be constructed
5. Removal of existing F type barrier and installation of new F type barrier
6. Linemarking to be conducted
7. Removal of New Jersey barriers

Note: 2 lanes are open

2.1.6 CH. 2040 TO CH. 2181.42

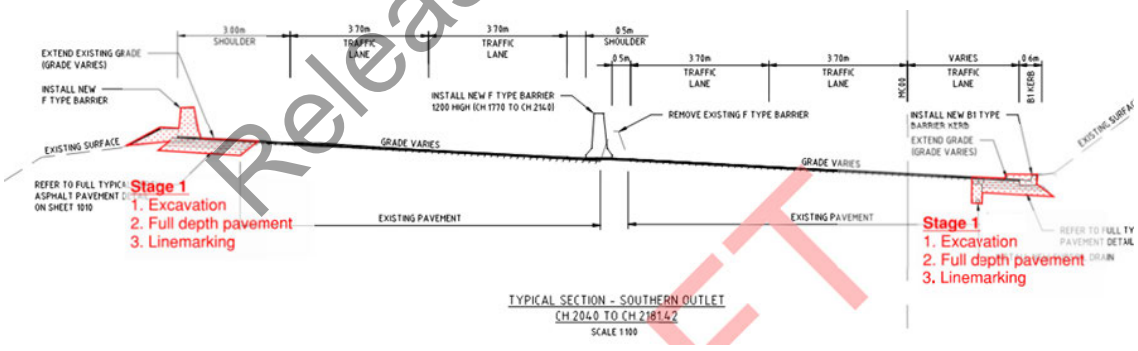


Figure 8: Typical section – Southern Outlet Ch. 2040 to Ch. 2181.42

STAGE 1 - NORTHBOUND

1. New Jersey barriers to be placed (24h Shift)
2. Rock excavation to be conducted to allow construction of a new pavement (Day Shift)
3. Construction of full depth pavement (24h Shift)
4. Installation of new B1 barrier kerb (24h Shift)
5. Linemarking to be conducted (24h Shift)
6. New Jersey barriers to be removed (24h Shift)

Note: No lane closures

STAGE 2 – SOUTHBOUND

1. New Jersey barriers to be placed (24h Shift)
2. Rock excavation to be conducted to allow construction of a new pavement (Day Shift)
3. Construction of full depth pavement (24h Shift)
4. Installation of new B1 barrier kerb (24h Shift)
5. Linemarking to be conducted (24h Shift)
6. New Jersey barriers to be removed (24h Shift)

Note: No lane closures

2.2 BASIS OF SCHEDULE

2.2.1 DURATIONS & IMPORTANT DATES

ACTIVITY	DURATION (W/DAYS)	START	FINISH
Pre-Construction	170	23.01.2023	25.09.2023
Construction	187	25.09.2023	06.07.2024
Ch. 840 - 2182 defect period	15	27.05.2024	17.06.2024
Contingency - P100	45	17.06.2024	06.07.2024

2.2.2 CALENDARS

3 different calendars are employed in the schedule having consideration in respect to noise.

CALENDAR	ACTIVITIES
Standard	Authorities, Approvals, Design, Engineering, services relocation (5 days, 8 hours/day + public holidays)
SOT Day Shift	Earthworks, Retaining structures, Pavement Construction, Barrier Installation (6 days, 12 hours/day + public holidays + RDOs)
SOT 24h Shift	Earthworks (except rock cut due to noise), Retaining structures, Pavement Construction, Barrier Installation (6 days, 22 hours/day + public holidays + RDOs)

2.2.3 EARTHWORKS

ACTIVITY	VOLUME* (M3)	DURATION (HOURS)	PRODUCTIVITY** (M3/H)
Rock Cut	9030	2360	4
Soil Cut	7104	791	9

*Volumes are approximate, gang No's vary

**All productivities are assumed based on past similar projects

Earthworks include breaking, excavating, loading, transporting the excavated material and traffic management. WT has considered that transport cycle / tipping will be an average of approx. 15km radius.

Note: Between Ch. 1220 – 1440; retaining wall was shown at northbound, even though the profile appears as rock on the sections. WT proposed soil nail assuming the rock profile is incorrect.

2.2.4 RETAINING STRUCTURES

ACTIVITY	QUANTITY*	DURATION (HOURS)	PRODUCTIVITY **
Reinforced Earth Wall	960 m2	400	2.4 m2/h
Soil Nail Wall	1538 m2	513	3 m2/h
Bored Pile Wall	114 No's	570	0.2 No's/h

*Quantities are approximate, gang No's variate

**All productivities are assumed based on past similar projects

Reinforced Earth Wall works include backfill, compaction, RE Wall Construction, testing. Assumed 1 panel would be 2.4m wide, 1m high

Soil Nail Wall works include mobilization, drilling, grouting, plating and post tensioning, testing. Assumed 4m drills with 2m horizontal and 1m vertical spacing.

Bored Pile Wall works include mobilization, drilling, placement of precast piles (assumed dia: 750mm), trimming, testing and shotcrete application

2.2.5 PAVEMENT CONSTRUCTION

ACTIVITY	AREA* (M2)	DURATION (HOURS)	PRODUCTIVITY** (M2/H)
Pavement Construction	13,117	2190	6

*Areas are approximate, gang No's variate

**All productivities are assumed based on past similar projects

Pavement construction includes subgrades, drains, kerbs, removal of old barriers & installation of new barriers and linemarking. Pavement construction will be conducted only during the day shift to keep the works cost effective.

2.2.6 OTHER CONSIDERATIONS

- General wet weather allowances have been included within the productivity assumptions.
- Exceptional wet weather allowances have not been considered at this time and will be incorporated in future detailed studies.
- Inherent risk (Uncertainty) associated with the level of documentation, unknowns, difficulty and other factors have been considered in the contingency allowance (P100)
- Soil contamination and other specifics may be considered at later iterations.
- WT has employed the standard VIC construction day calendar and RDO's (provisional)

3 OPTION 2

3.1 PROPOSED METHODOLOGY

When generating Option 2, maximum gang numbers and only day shifts are employed.

3.1.1 CH. 840 TO CH. 940

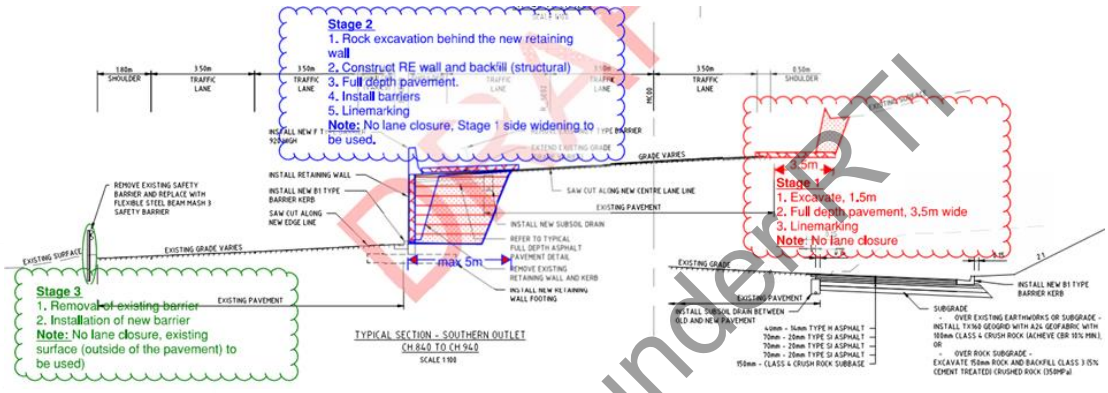


Figure 9: Typical section – Southern Outlet Ch. 840 to Ch. 940

STAGE 1 - NORTHBOUND

1. New Jersey barriers to be placed
2. Existing surface of northside of the northbound road to be excavated 1.5m wide to allow construction of a new 3.5m wide lane. This lane will be used to avoid any lane closures during the RE wall construction at the median
3. 3.5m wide, full depth pavement to be constructed
4. Linemarking to be conducted
5. New Jersey barriers to be removed

Note: No lane closures

STAGE 2 – MEDIAN

1. New Jersey barriers to be placed
2. Existing retaining wall to be removed and approximately 5m wide rock excavation to be conducted to allow construction a new retaining wall
3. A new RE wall to be constructed and structural backfill to be placed
4. Full depth pavement to be constructed
5. Linemarking to be conducted
6. Removal of New Jersey barriers

Note: No lane closures, Stage 1 new lane to be used

STAGE 3 – SOUTHBOUND

1. New Jersey barriers to be placed
2. Removal of existing safety barrier
3. Installation of flexible steel beam mash 3 safety barrier
4. Removal of New Jersey barriers

Note: No lane closures, works to be conducted from the outside of the existing pavement, on existing surface.

3.1.2 CH. 940 TO CH. 1200

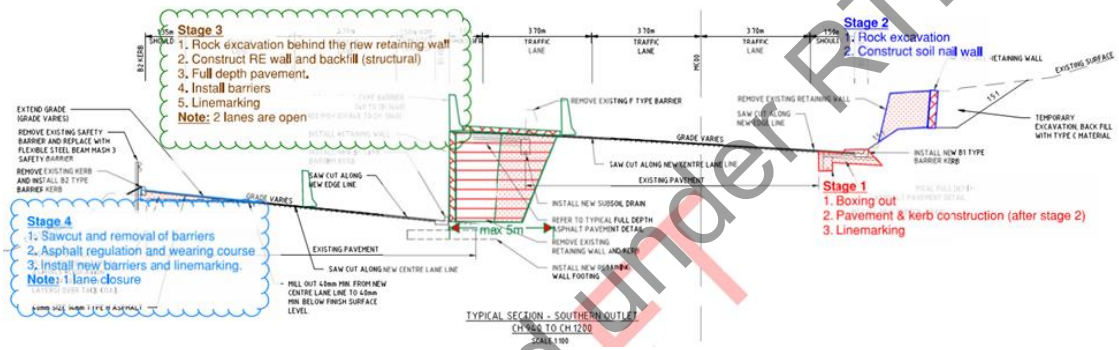


Figure 10: Typical section – Southern Outlet Ch. 940 to Ch. 1200

STAGE 1 - NORTHBOUND

1. New Jersey barriers to be placed
2. Boxing out to allow the construction of new pavement & kerb (after Stage 2 works). This lane will be used to avoid any lane closures during the RE wall construction at the median
3. Linemarking to be conducted
4. New Jersey barriers to be removed

Note: No lane closures

STAGE 2 – NORTHBOUND

1. Rock excavation to be conducted to allow construction a new retaining structure
2. A new soil nail wall to be constructed and backfill to be placed

Note: No lane closures

STAGE 3 – SOUTHBOUND

1. New Jersey barriers to be placed
2. Rock excavation to be conducted to allow construction of a new retaining structure
3. Existing retaining wall to be removed and approximately 5m wide rock excavation to be conducted to allow construction a new retaining wall

4. A new RE wall to be constructed and structural backfill to be placed
5. Full depth pavement to be constructed
6. Linemarking to be conducted
7. Removal of New Jersey barriers

Note: 2 lanes are open at both sides

STAGE 4 – SOUTHBOUND

1. New Jersey barriers to be placed
2. Saw cut and removal of existing safety barrier and existing kerb
3. Asphalt regulation and full wearing course
4. Installation of existing kerb and flexible steel beam mash 3 safety barrier
5. Linemarking to be conducted
6. Removal of New Jersey barriers

Note: No lane closures

3.1.3 CH. 1220 TO CH. 1440

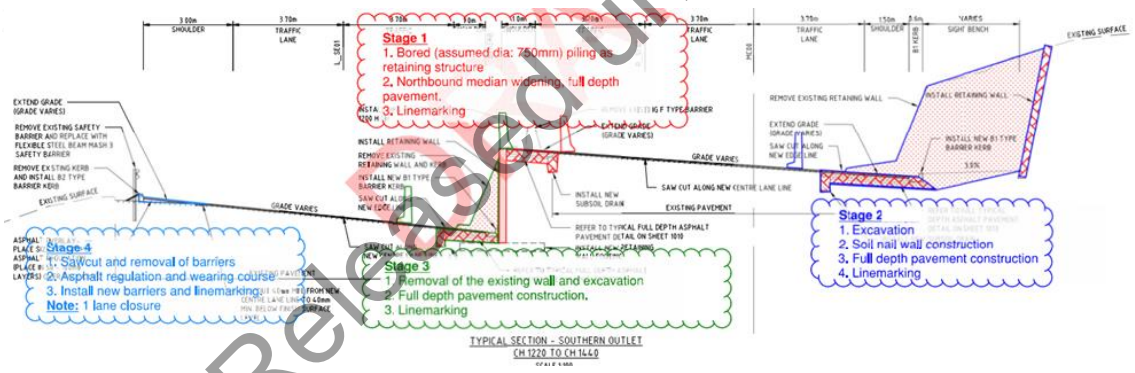


Figure 11: Typical section – Southern Outlet Ch. 1220 to Ch. 1440

STAGE 1 - MEDIAN

1. New Jersey barriers to be placed
2. Bored piling (assumed dia: 750mm) as retaining structure
3. Northbound median widening, construction of full depth pavement
4. Linemarking to be conducted
5. New Jersey barriers to be removed

Note: No lane closures

STAGE 2 – NORTHBOUND

1. New Jersey barriers to be placed
2. Rock excavation to be conducted to allow construction of a new retaining structure and a new pavement
3. A new soil nail wall to be constructed and backfill to be placed
4. Construction of full depth pavement
5. Linemarking to be conducted
6. New Jersey barriers to be removed

Note: No lane closures, widened median is open

STAGE 3 – MEDIAN

1. New Jersey barriers to be placed
2. Existing retaining wall to be removed and excavation to be conducted
3. Full depth pavement to be constructed
4. Linemarking to be conducted
5. Removal of New Jersey barriers

Note: 2 lanes are open

STAGE 4 – SOUTHBOUND

1. New Jersey barriers to be placed
2. Saw cut and removal of existing safety barrier and existing kerb
3. Asphalt regulation and full wearing course
4. Installation of existing kerb and flexible steel beam mash 3 safety barrier
5. Linemarking to be conducted
6. Removal of New Jersey barriers

Note: No lane closures

3.1.4 CH. 1440 TO CH. 1770

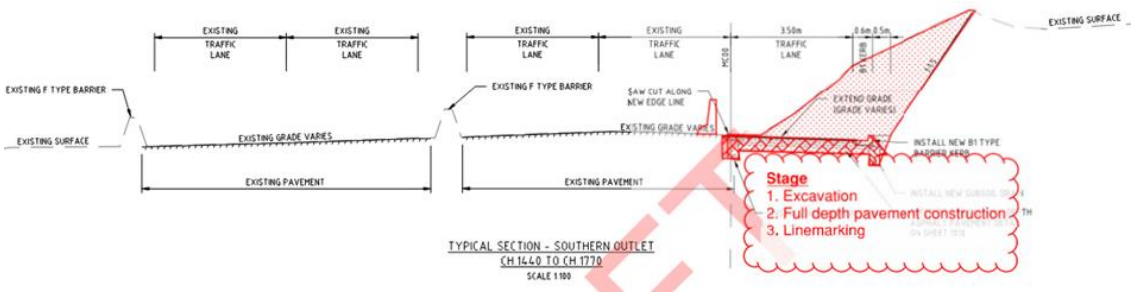


Figure 12: Typical section – Southern Outlet Ch. 1440 to Ch. 1770

NORTHBOUND

1. New Jersey barriers to be placed
2. Rock excavation to be conducted to allow construction of a new pavement
3. Construction of full depth pavement
4. Installation of new B1 type barrier kerb
5. Linemarking to be conducted
6. New Jersey barriers to be removed

Note: No lane closures

3.1.5 CH. 1770 TO CH. 2040

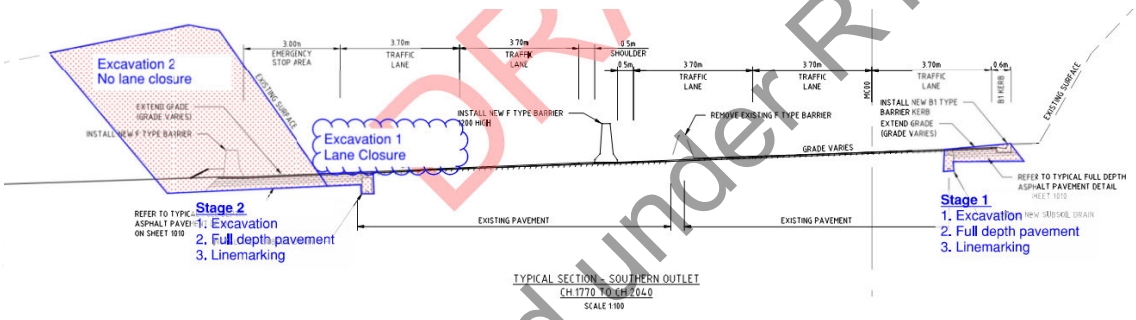


Figure 13: Typical section – Southern Outlet Ch. 1770 to Ch. 2040

STAGE 1 - NORTHBOUND

1. New Jersey barriers to be placed
2. Rock excavation to be conducted to allow construction of a new pavement
3. Construction of full depth pavement
4. Installation of new B1 barrier kerb
5. Linemarking to be conducted
6. New Jersey barriers to be removed

Note: No lane closures

STAGE 2 – SOUTHBOUND

1. New Jersey barriers to be placed
2. Primary excavation to be conducted during the night shift to allow secondary excavation (1 lane is closed during the night shift)
3. Secondary excavation to be conducted during the day shift to allow construction of a new pavement (no lane closures)
4. Full depth pavement to be constructed
5. Removal of existing F type barrier and installation of new F type barrier
6. Linemarking to be conducted only during the nightshift
7. Removal of New Jersey barriers

Note: 2 lanes are open

3.1.6 CH. 2040 TO CH. 2181.42

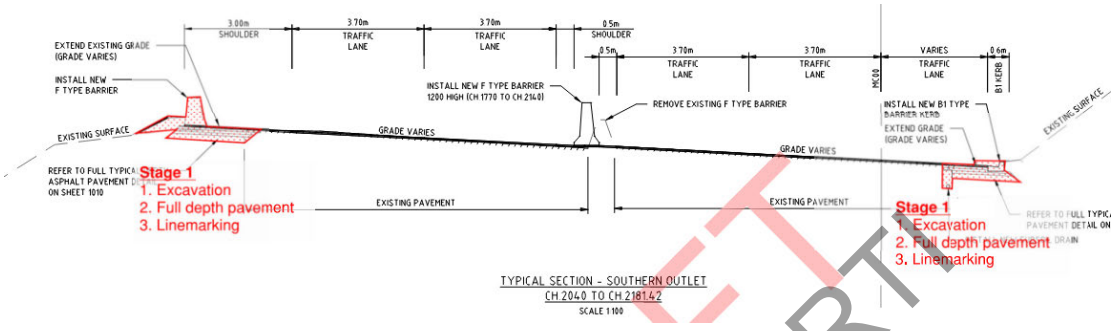


Figure 14: Typical section – Southern Outlet Ch. 2040 to Ch. 2181.42

STAGE 1 - NORTHBOUND

1. New Jersey barriers to be placed
2. Rock excavation to be conducted to allow construction of a new pavement
3. Construction of full depth pavement
4. Installation of new B1 barrier kerb
5. Linemarking to be conducted
6. New Jersey barriers to be removed

Note: No lane closures

STAGE 2 – SOUTHBOUND

1. New Jersey barriers to be placed
2. Rock excavation to be conducted to allow construction of a new pavement
3. Construction of full depth pavement
4. Installation of new B1 barrier kerb
5. Linemarking to be conducted
6. New Jersey barriers to be removed

Note: No lane closures

3.2 BASIS OF SCHEDULE

3.2.1 DURATIONS & IMPORTANT DATES

Generally, no lags or leads defined for the activity durations. SS and FS relations used to link activities.

ACTIVITY	DURATION (W/DAYS)	START	FINISH
Pre-Construction	170	23.01.2023	25.09.2023
Construction	269	25.09.2023	30.10.2024
Ch. 840 - 2182 defect period	15	03.09.2024	24.09.2024
Contingency - P100	45	24.09.2024	30.10.2024

3.2.2 CALENDARS

2 different calendars are employed in the schedule having consideration in respect to type of activities.

CALENDAR	ACTIVITIES
Standard	Authorities, Approvals, Design, Engineering, services relocation (5 days, 8 hours/day + public holidays)
SOT Day Shift	Construction works (6 days, 12 hours/day + public holidays + RDOs)

3.2.3 EARTHWORKS

ACTIVITY	VOLUME* (M3)	DURATION (HOURS)	PRODUCTIVITY** (M3/H)
Rock Cut	9030	2360	4
Soil Cut	7104	791	9

*Volumes are approximate, gang No's variate

**All productivities are assumed based on past similar projects

Earthworks include breaking, excavating, loading, transporting the excavated material and traffic management. WT has considered that transport cycle / tipping will be an average of approx. 15km radius.

Note: Between Ch. 1220 – 1440; retaining wall was shown at northbound, even though the profile appears as rock on the sections. WT proposed soil nail assuming the rock profile is incorrect.

3.2.4 RETAINING STRUCTURES

ACTIVITY	QUANTITY*	DURATION (HOURS)	PRODUCTIVITY **
RE Wall	960 m^2	400	2.4 m^2/h
Soil Nail Wall	1538 m^2	513	3 m^2/h
Bored Pile Wall	114 No's	570	0.2 No's/h

*Quantities are approximate, gang No's variate
**All productivities are assumed based on past similar projects

Reinforced Earth Wall works include backfill, compaction, RE Wall Construction, testing. Assumed 1 panel would be 2.4m wide, 1m high

Soil Nail Wall works include mobilization, drilling, grouting, plating and post tensioning, testing. Assumed 4m drills with 2m horizontal and 1m vertical spacing.

Bored Pile Wall works include mobilization, drilling, placement of precast piles (assumed dia: 750mm), trimming, testing and shotcrete application

3.2.5 PAVEMENT CONSTRUCTION

ACTIVITY	AREA* (M2)	DURATION (HOURS)	PRODUCTIVITY** (M2/H)
Pavement Construction	13117	2190	6

*Areas are approximate, gang No's variate
**All productivities are assumed based on past similar projects

Pavement construction includes subgrades, drains, kerbs, removal of old barriers & installation of new barriers and linemarking.

3.2.6 OTHER CONSIDERATIONS

- General wet weather allowances have been included within the productivity assumptions.
- Exceptional wet weather allowances have not been considered at this time and will be incorporated in future detailed studies.
- Inherent risk (Uncertainty) associated with the level of documentation, unknowns, difficulty and other factors have been considered in the contingency allowance (P100)
- Soil contamination and other specifics may be considered at later iterations.
- WT has employed the standard VIC construction day calendar and RDO's (provisional)

4 CONCLUSION

For both options, exceptionally wet weather and soil contamination are general risks which have not been considered at this stage.

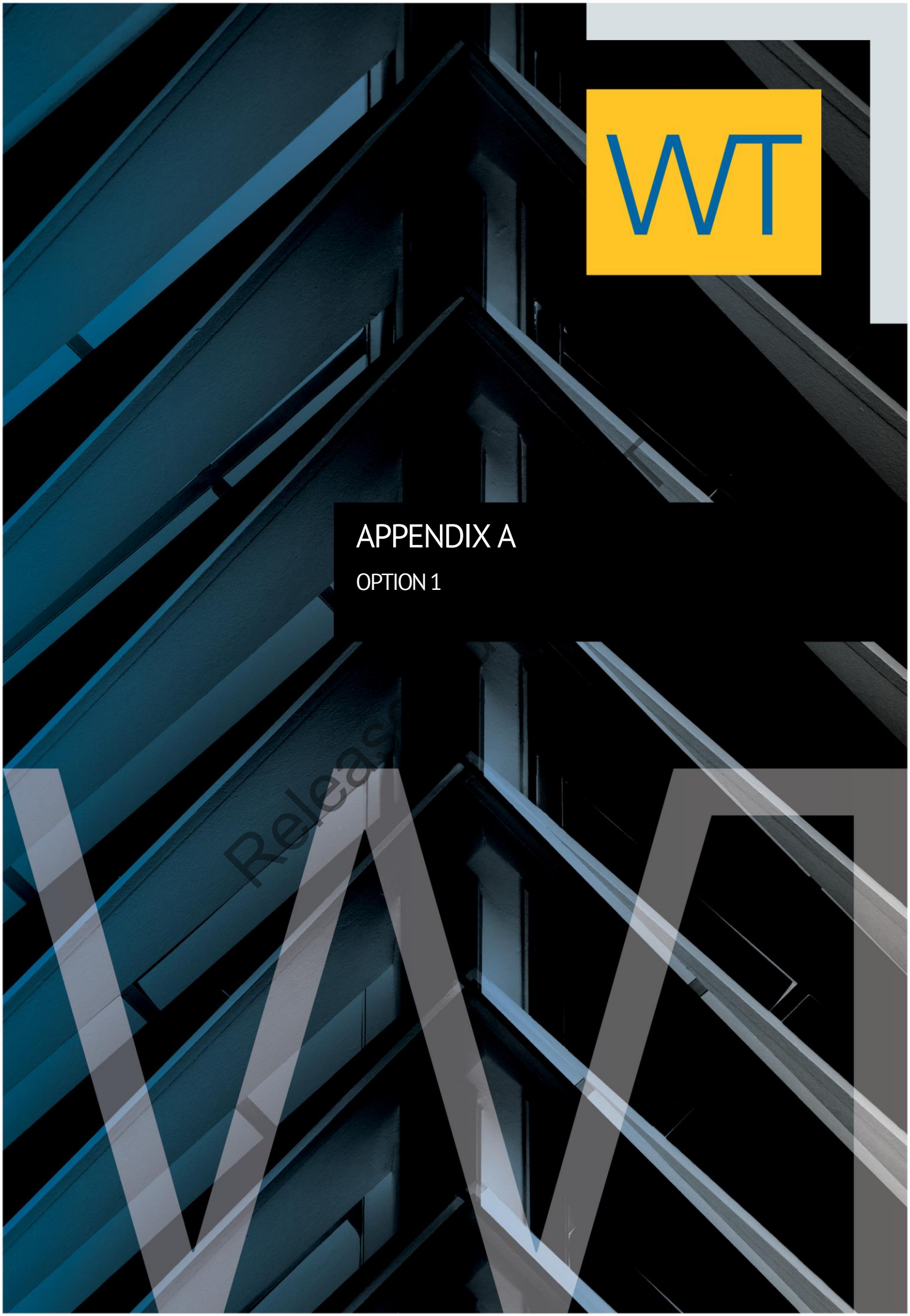
Based on the provided cross sections, it appears as there are significant amounts of rock in certain areas which should be considered as a potential risk. A thorough geotechnical survey would be useful to identify the rock & soil type which will inform a better selection in respect to equipment and gang make up. This will in turn be valuable in determining the optimum construction method and to reconsider the productivity rates currently employed.

The construction duration is identified as and additional risk for both options. Longer duration indicates higher uncertainty, which in turn will be an increased risk on the earthworks trade. Furthermore, longer duration increases the health and safety risk as the highway will be fully functional during the construction period.

Generally, WT recommends commencing the construction concurrently from Ch. 1440 due to the significant amounts of rock. This action would greatly benefit to reduce the construction duration especially considering volume and density of Southern Outlet Highway.

Option 1 has a shorter duration; however, it requires increased resources to complete the construction. Option 1 consists of night works which may cause noise issues for the residents and may require additional resources to reduce the noise levels. Moreover, night works generally carry a higher risk when compared to day works in terms of health and safety.

Even though Option 2 has a longer duration, all works are conducted during the day, therefore, it is considered as lower risk and more cost effective than Option 1.



APPENDIX A

OPTION 1

Southern Outlet Transit Stage 2 Construction Staging

2023 | 2024

Q3 | Q4 | Q1 | Q2 | Q3

Construction
1 - Ch. 1220 - 1440 works
Stage - 1 Median
Stage - 2 Northbound
Stage - 3 Median
Stage - 4 Southbound
Road Authority Inspection
Completion of Ch. 1220 - 1440 works (4/04/2024)
2 - Ch. 1440 - 1770 works
Northbound
Road Authority Inspection
Completion of Ch. 1440 - 1770 works (30/01/2024)
3 - Ch. 1770 - 2040 works
Stage - 1 Northbound
Stage - 2 Southbound
Road Authority Inspection
Completion of Ch. 1770 - 2040 works (9/02/2024)
4 - Ch. 2070 - 2182 works
Stage -1 Northbound
Stage - 2 Southbound
Road Authority Inspection
Completion of Ch. 2070 - 2182 works (2/02/2024)
5 - Ch. 940 - 1200 works
Stage - 1 Northbound
Stage - 2 Northbound
Stage - 3 Median
Stage - 4 Southbound
Road Authority Inspection
Completion of Ch. 940 - 1200 works(24/05/2024)
6 - Ch. 840 - 940 works
Stage - 1 Northbound
Stage - 2 Median
Stage - 3 Southbound
Road Authority Inspection
Completion of Ch. 840 - 940 works (3/05/2024)
Ch. 840 - 2182 defect period
Contingency - P100

Phase

- 1 - Ch. 1220 - 1440 work
- 2 - Ch. 1440 - 1770 work
- 3 - Ch. 1770 - 2040 work
- 4 - Ch. 2070 - 2182 work
- 5 - Ch. 940 - 1200 works
- 6 - Ch. 840 - 940 works
- Post Construction
- Summary

Southern Outlet Transit Stage 2 Critical Path

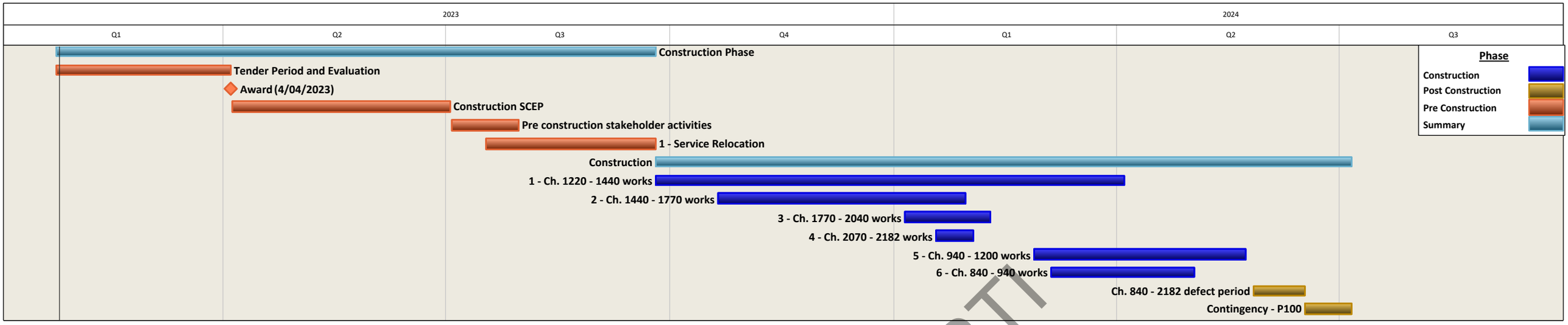
2023 | 2024

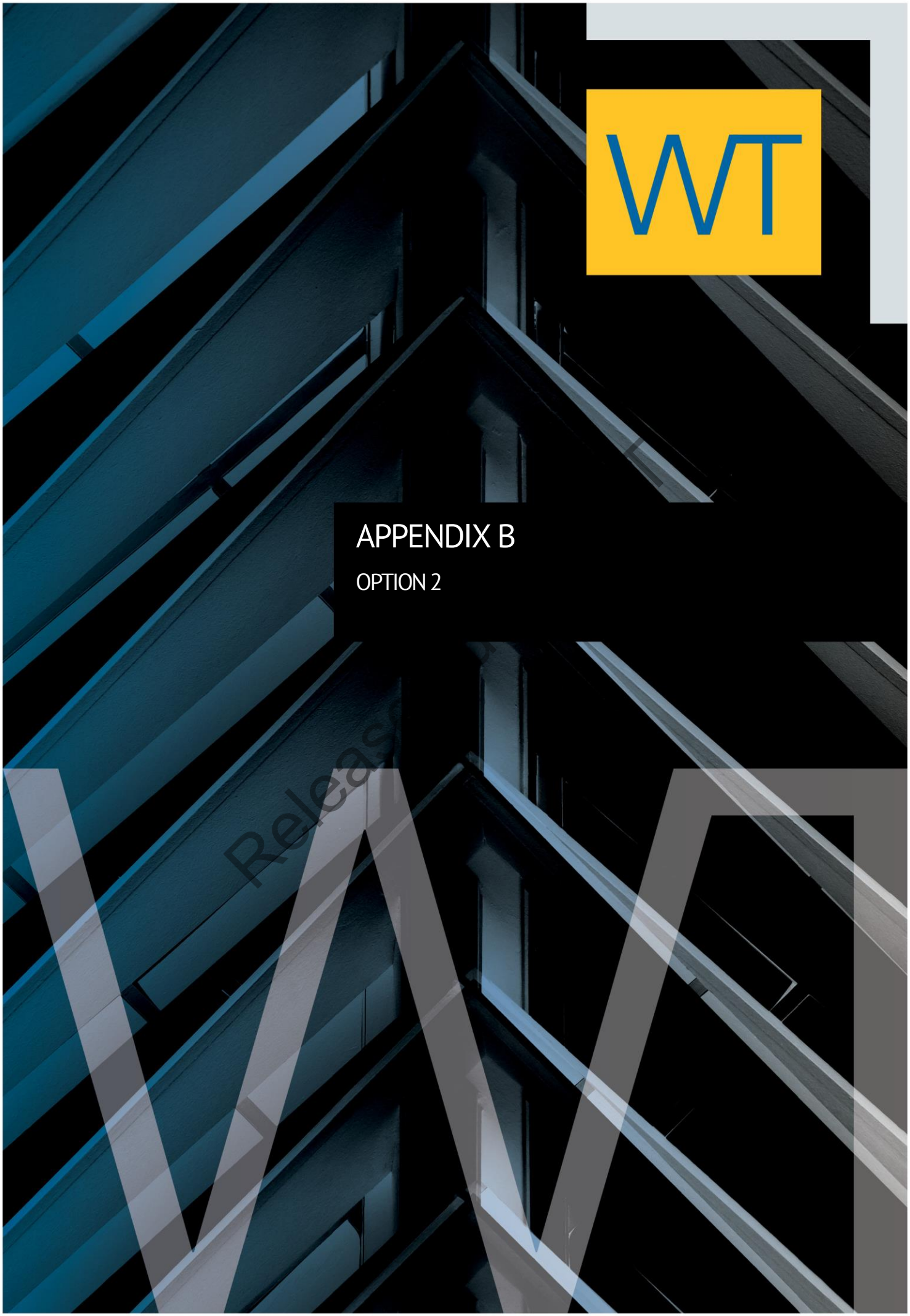
Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3

Construction Phase
Tender Period and Evaluation
Award (4/04/2023)
Construction SCEP
Draft SCEP
Draft review
Update SCEP
Final Review
Final Update
SCEP Approval(3/07/2023)
Pre construction stakeholder activities
Building Inspections
1 - Service Relocation
TasNetworks Pole relocation
TasNetworks u/g relocation
Services relocation completion(25/09/2023)
Construction
1 - Ch. 1220 - 1440 works
Stage - 1 Median
Bored pile wall construction
Pavement Construction (Northbound median widening)
Stage - 2 Northbound
Rock cut
5 - Ch. 940 - 1200 works
Stage - 1 Northbound
Boxing out(28/02/2024)
Pavement Construction
Stage - 2 Northbound
Rock Cut
Soil Nail Wall Construction
Stage - 3 Median
Soil Cut
RE wall construction
Pavement Construction
Stage - 4 Southbound
Pavement Construction
Road Authority Inspection
Completion of Ch. 940 - 1200 works(24/05/2024)
Ch. 840 - 2182 defect period
Contingency - P100

Phase
- Construction
- Post Construction
- Pre Construction
- Summary

Southern Outlet Transit Stage 2 WBS Level 2





APPENDIX B

OPTION 2

Southern Outlet Transit Stage 2 Construction Staging

2023 | 2024

Q3 | Q4 | Q1 | Q2 | Q3 | Q4

Construction
1 - Ch. 1220 - 1440 works
Stage - 1 Median
Stage - 2 Northbound
Stage - 3 Median
Stage - 4 Southbound
Road Authority Inspection
Completion of Ch. 1220 - 1440 works(19/06/2024)
2 - Ch. 1440 - 1770 works
Northbound
Road Authority Inspection
Completion of Ch. 1440 - 1770 works (1/04/2024)
3 - Ch. 1770 - 2040 works
Stage - 1 Northbound
Stage - 2 Southbound
Road Authority Inspection
Completion of Ch. 1770 - 2040 works(23/04/2024)
4 - Ch. 2070 - 2182 works
Northbound
Southbound
Road Authority Inspection
Completion of Ch. 2070 - 2182 works (5/04/2024)
5 - Ch. 940 - 1200 works
Stage - 1 Northbound
Stage - 2 Northbound
Stage - 3 Median
Stage - 3 Southbound
Road Authority Inspection
Completion of Ch. 940 - 1200 works (3/09/2024)
6 - Ch. 840 - 940 works
Stage - 1 Northbound
Stage - 2 Median
Stage - 3 Southbound(24/06/2024)
Road Authority Inspection
Completion of Ch. 840 - 940 works (1/07/2024)
Ch. 840 - 2182 defect period
Contingency - P100

Phase
- 1 - Ch. 1220 - 1440 works
- 2 - Ch. 1440 - 1770 works
- 3 - Ch. 1770 - 2040 works
- 4 - Ch. 2070 - 2182 works
- 5 - Ch. 940 - 1200 works
- 6 - Ch. 840 - 940 works
- Post Construction
- Summary

Southern Outlet Transit Stage 2 Critical Path

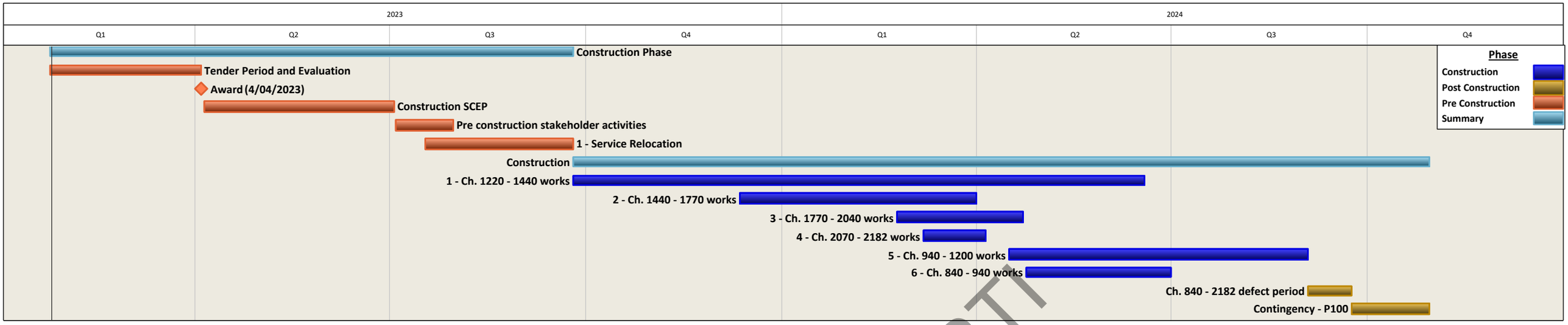
2023 | 2024

Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4

Construction Phase
Tender Period and Evaluation
Award (4/04/2023)
Construction SCEP
Draft SCEP
Draft review
Update SCEP
Final Review
Final Update
SCEP Approval(3/07/2023)
Pre construction stakeholder activities
Building Inspections
1 - Service Relocation
TasNetworks Pole relocation
TasNetworks u/g relocation
Services relocation completion(25/09/2023)
Construction
1 - Ch. 1220 - 1440 works
Stage - 1 Median
Bored pile wall construction
Pavement Construction (Northbound median widening)
Stage - 2 Northbound
Rock cut
5 - Ch. 940 - 1200 works
Stage - 1 Northbound
Boxing out
Pavement Construction
Stage - 2 Northbound
Soil Cut
Soil Nail Wall Construction
Stage - 3 Median
Soil Cut
RE wall construction
Pavement Construction
Stage - 3 Southbound
Pavement Construction
Road Authority Inspection
Completion of Ch. 940 - 1200 works (3/09/2024)
Ch. 840 - 2182 defect period
Contingency - P100

Phase
- Construction
- Post Construction
- Pre Construction
- Summary

Southern Outlet Transit Stage 2 WBS Level 2



Technical Memorandum

March 7, 2023

To		**Project No.**	12556430
From	Out of scope		
Project Name	Southern Outlet Transit Lane		
Subject	Southern Outlet Transit Lane – GHD Response to WT Partnership Report		

1. Introduction

The Department of State Growth engaged WT Partnership to undertake a review of the Southern Outlet Transit Lane Project preliminary design drawings to determine if a construction methodology of keeping two lanes open in both directions at all times was feasible. The report *NR1445 – Southern Outlet Transit Lane – Options study for construction methodology & scheduling* (2 February 2023), from WT partnership advised two lanes (both directions) could be kept open at all times.

GHD has reviewed the report prepared by WT Partnership and have produced this memorandum as a response. WT Partnership's review was based on preliminary design information as detailed in the report, whereas this review is based on the detailed design drawings.

1.1 Scope and limitations

This technical memorandum has been prepared by GHD for the Department of State Growth. It is not prepared as, and is not represented to be, a deliverable suitable for reliance by any person for any purpose. It is not intended for circulation or incorporation into other documents. The matters discussed in this memorandum are limited to those specifically detailed in the memorandum and are subject to any limitations or assumptions specially set out.

GHD has prepared this memorandum on the basis of information provided by the Client and others who provided information to GHD (which may also include Government authorities), which GHD has not independently verified or checked for the purpose of this memorandum. GHD does not accept liability in connection with such unverified information, including errors and omissions in the memorandum which were caused by errors or omissions in that information.

2. Basis of WT Partnership report

WT produced two options in the report.

– Option 1 – Maximum gang numbers and 24 hour shifts
– Option 2 – Maximum gang numbers and day shifts only

There appeared to be no difference in the methodology, just in the scheduling to complete. As such, only Option 1 has been reviewed in detail.

3. Option 1

3.1 Section 1 – Ch 840 to 940 (Ch 10840 to 10940)

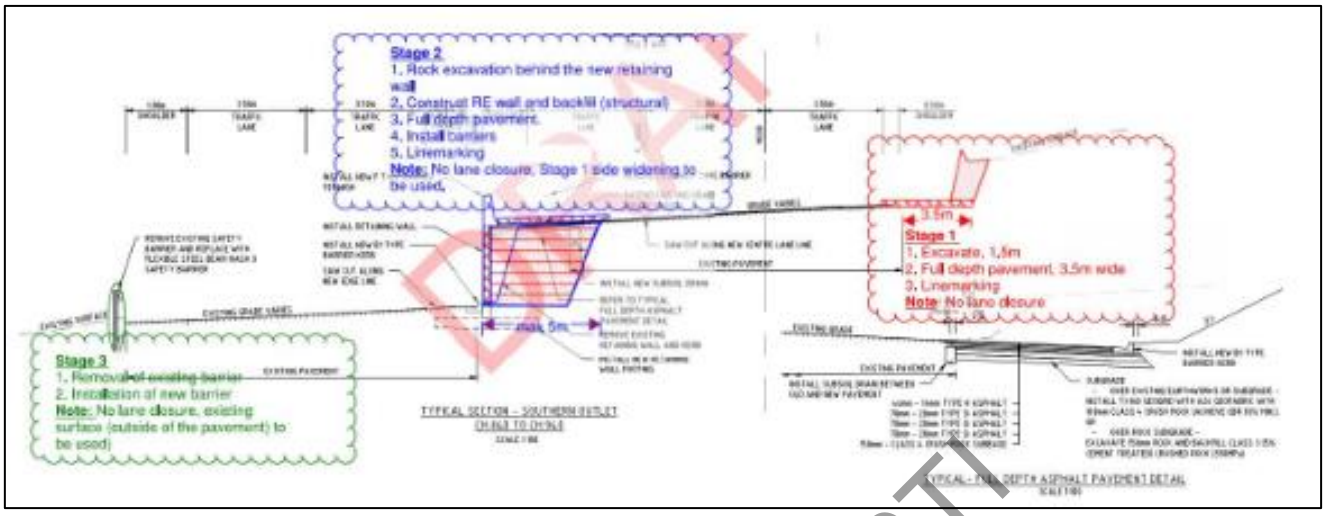


Figure 1 Section 1 - Ch 10840 to 10940

3.1.1 WT Partnership proposed methodology

STAGE 1 – NORTHBOUND

1. New Jersey barriers to be placed (24h shift)
2. Existing surface of northside of the northbound road to be excavated 1.5m wide to allow construction of a new 3.5m wide lane. This lane will be used to avoid any lane closures during the RE wall construction at the median (day shift)
3. 3.5m wide, full depth pavement to be constructed
4. Linemarking to be conducted (24h shift)
5. New Jersey barriers to be removed (24h shift)

Note: No lane closures

STAGE 2 – MEDIAN

1. New Jersey barriers to be placed (24h shift)

2. Existing retaining wall to be removed and approximately 5m wide rock excavation to be conducted to allow construction a new retaining wall (day shift)

3. A new reinforced earth wall to be constructed and structural backfill to be placed (24h shift)

4. Full depth pavement to be constructed (24h shift)

5. Linemarking to be conducted (24h shift)

6. Removal of New Jersey barriers (24h shift)

Note: No lane closures, Stage 1 new lane to be used

STAGE 3 – SOUTHBOUND (DAY SHIFT)

1. New Jersey barriers to be placed
2. Removal of existing safety barrier
3. Installation of flexible steel beam mesh 3 safety barrier
4. Removal of New Jersey barriers

Note: No lane closures – works to be conducted from the outside of the existing pavement on existing surface.

3.1.2 Stage 1 comments

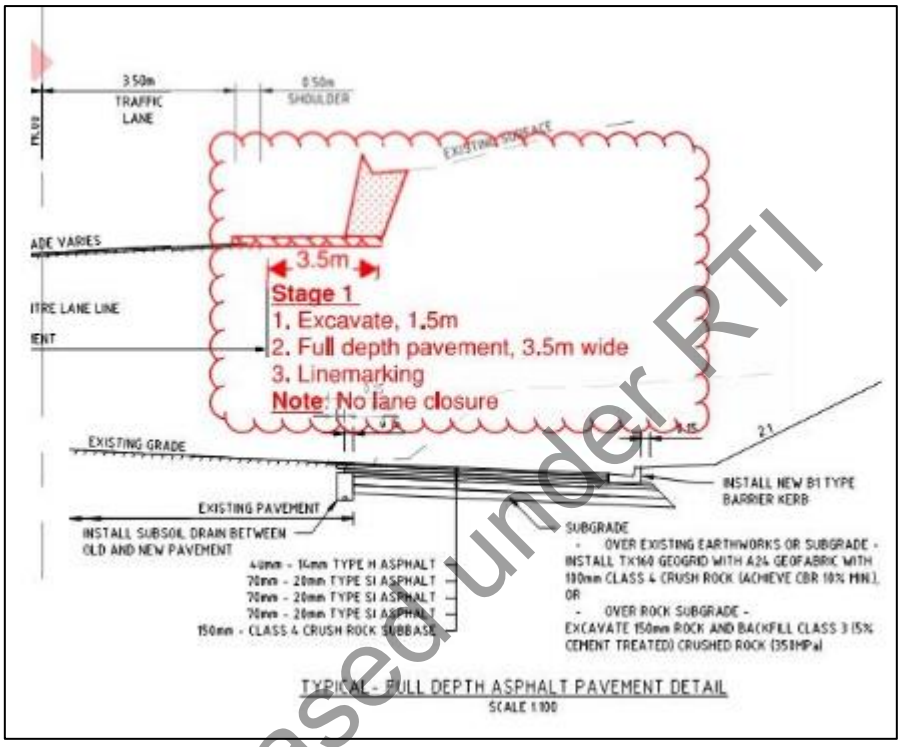


Figure 2 Section 1 Stage 1

– No mention of lane widths or barrier offset to confirm width for construction. Assumption that 0.5m shoulders, 3.5m lane, and 1m for barrier and deflection (as long as barrier is bolted down) or 9m temp traffic width leaves about 3.5m to work in. Appears to be tight but workable.
– No mention of how material is spoiled from site.
– Based on this detail extra width will be required for machinery and material access.

3.1.3 Stage 2 comments

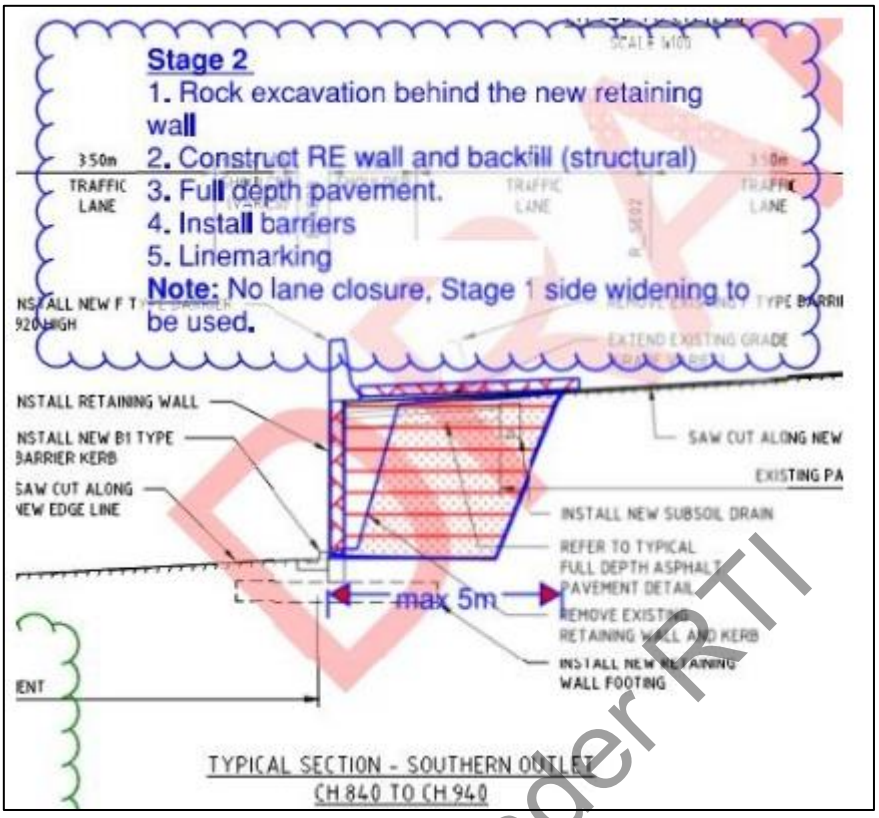


Figure 3 Section 1 – Stage 2

- No mention of lane widths or barrier offset to confirm width for construction. Assumption that 0.5m shoulders, 3.5m lane, and 1m for barrier and deflection (as long as barrier is bolted down) or 9m temp traffic width leaves about 3.5m to work in.
- Retaining wall is about 3.5m high. It is expected that an RE Block of about 4m at the base would be required. This would need to be battered back to avoid collapse of the existing roadway. **As the space available for construction is only 3.5 m, this solution does not appear to work.**
- No mention of how material is spoiled from site.
- Based on this detail extra width will be required for machinery and material access, which would require lane closures.

3.1.4 Stage 3 comments

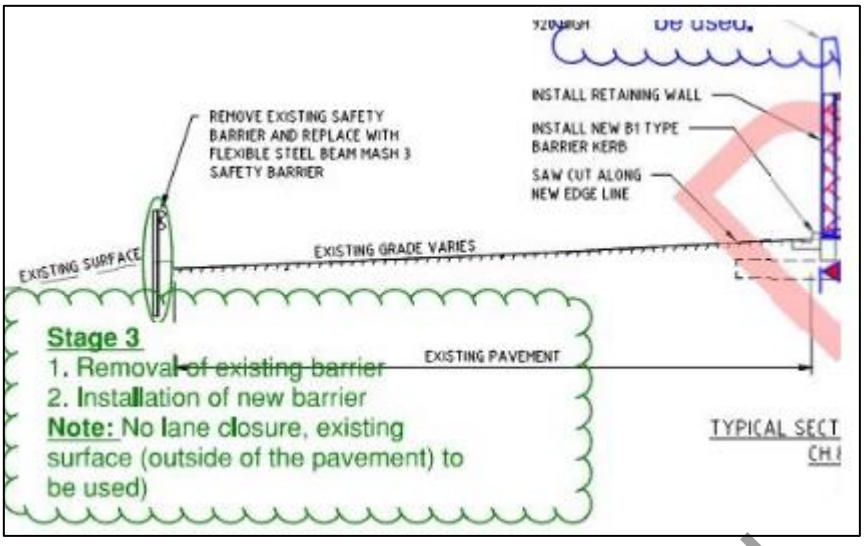


Figure 4 Section 1 Stage 3

– No mention of lane widths or barrier offset to confirm width for construction.
– However there appears to be sufficient width to undertake this work.

3.2 Section 2 – Ch 940 to 1200 (Ch 10 940 to 11 200)

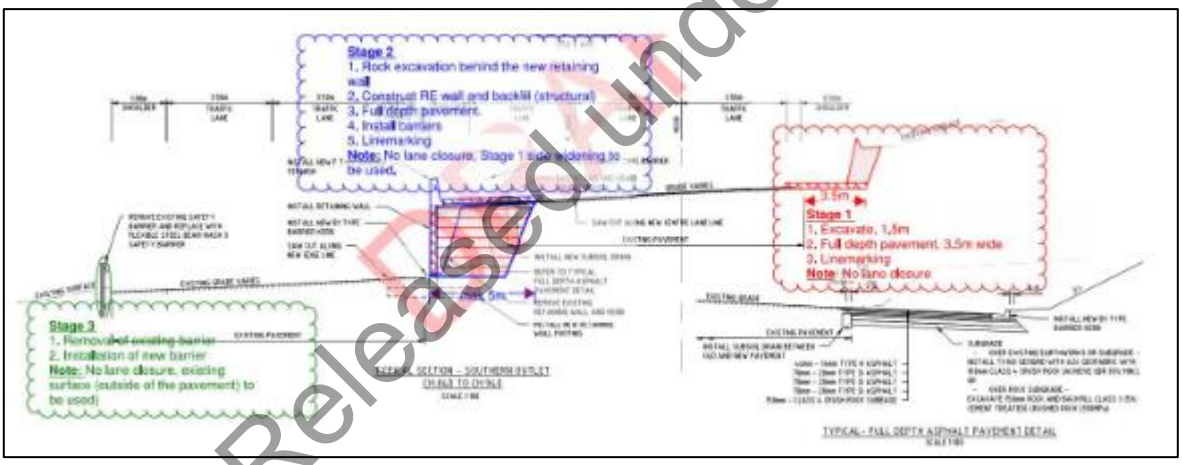


Figure 5 Section 2 - Ch 10 940 to 11 200

3.2.1 WT Partnership methodology

STAGE 1 - NORTHBOUND (24H SHIFT)

1. New Jersey barriers to be placed
2. Boxing out to allow the construction of new pavement & kerb (after Stage 2 works). This lane will be used to avoid any lane closures during the RE wall construction at the median
3. Linemarking to be conducted
4. New Jersey barriers to be removed

Note: No lane closures

STAGE 2 – NORTHBOUND

5. Rock excavation to be conducted to allow construction a new retaining structure (Day Shift)
6. A new soil nail wall to be constructed and backfill to be placed (24h Shift)

Note: No lane closures

STAGE 3 – MEDIAN (24H SHIFT)

1. New Jersey barriers to be placed
2. Soil excavation to be conducted to allow construction of a new retaining structure
3. Existing retaining wall to be removed and approximately 5m wide rock excavation to be conducted to allow construction a new retaining wall
4. A new reinforced earth wall to be constructed and structural backfill to be placed
5. Full depth pavement to be constructed
6. Linemarking to be conducted
7. Removal of New Jersey barriers

Note: Two lanes are open at both sides

STAGE 4 – SOUTHBOUND (24H SHIFT)

1. New Jersey barriers to be placed
2. Saw cut and removal of existing safety barrier and existing kerb
3. Asphalt regulation and full wearing course
4. Installation of existing kerb and flexible steel beam mash 3 safety barrier
5. Linemarking to be conducted
6. Removal of New Jersey barriers

Note: No lane closures

3.2.2 Stage 1 comments

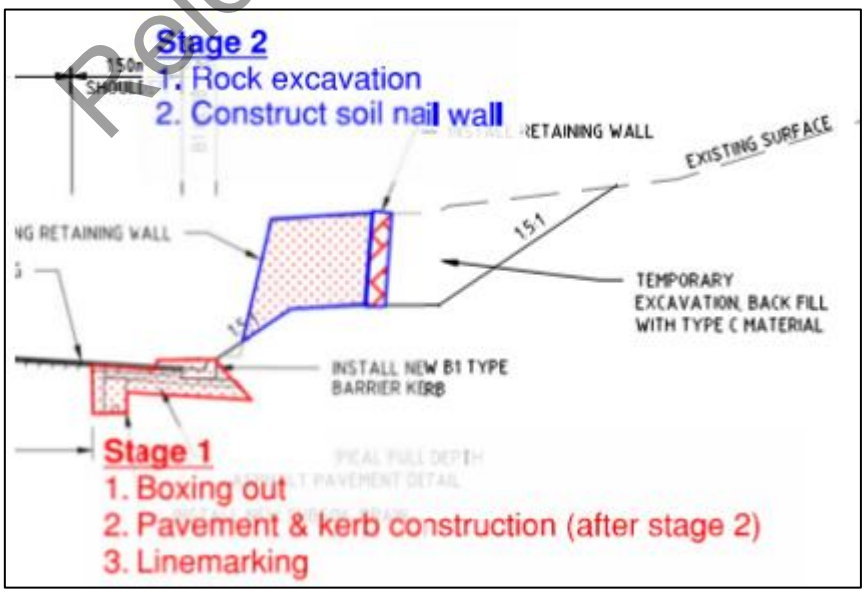


Figure 6 Section 2 – Stage 1

– No mention of lane widths or barrier offset to confirm width for construction. Assumption that 0.5m shoulders, 3.5m lane, and 1m for barrier and deflection (as long as barrier is bolted down) or 9m temp traffic width leaves about 3.5 m to construct the wall. This leaves room for a small machine to operate behind the barriers. However, to load out the spoil will require extra width.
– Based on this detail extra width will be required for machinery and material access, which would require lane closures.

3.2.3 Stage 2 comments

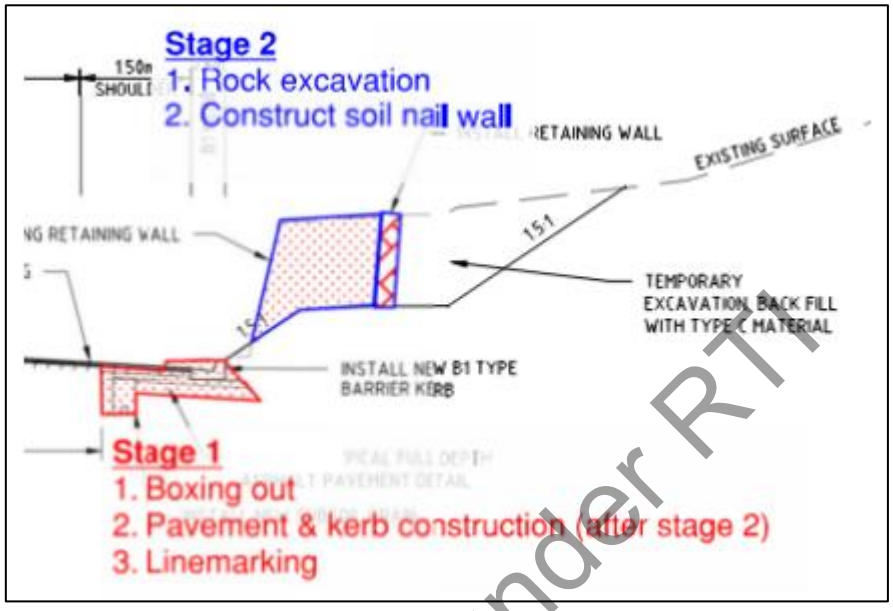


Figure 7 Section 2 – Stage 2

– No mention of lane widths or barrier offset to confirm width for construction. Assumption that 0.5m shoulders, 3.5m lane, and 1m for barrier and deflection (as long as barrier is bolted down) or 9m temp traffic width leaves about 3.5m to construct the wall. This leaves room for a small machine to operate behind the barriers. However, to load out the spoil will require extra width.

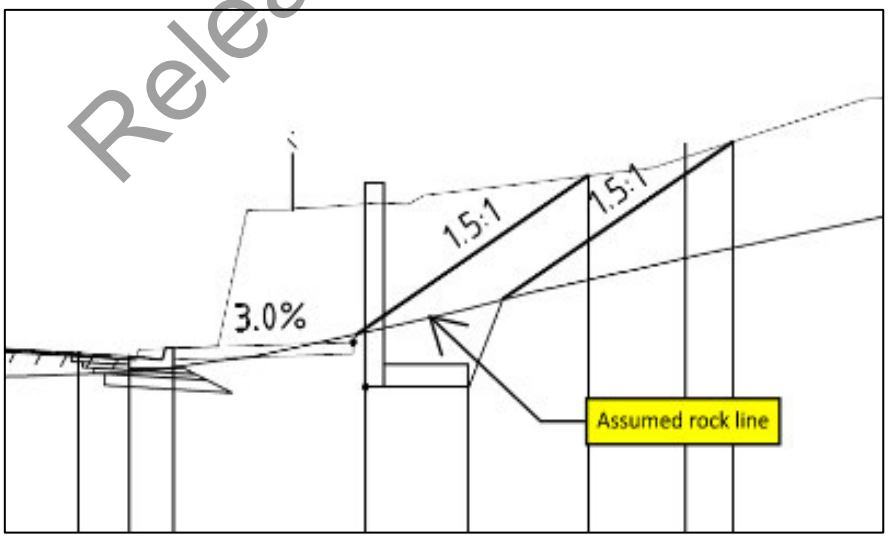


Figure 8 Section 2 – Assumed rock line

– The assumed rock line based on best geotechnical information to date shows there is no rock behind the retaining wall to soil nail into.

– If soil nailing was to be undertaken there is insufficient room to place and operate the rig to install the nails. Additional width would be required for the concrete trucks and grout pump for the nail installation.
– **This makes this stage impracticable.**
– Based on this detail extra width will be required for machinery and material access, which would require lane closures.

3.2.4 Stage 3 comments

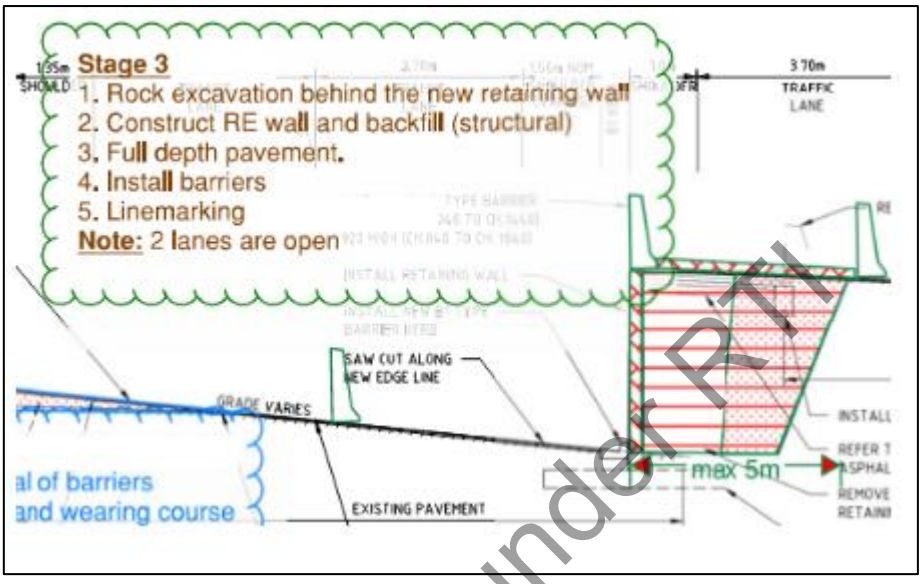


Figure 9 *Section 2 – Stage 3*

– No mention of lane widths or barrier offset to confirm width for construction.
– No mention of how material is spoiled from site.
– Width to be confirmed that an excavator and truck can work next to each other in the median.
– This stage does not allow for the RE panels to be brought to site or the backfill for the wall.
– Based on this detail extra width will be required for machinery and material access, which would require lane closures.

3.3 Stage 4 comments

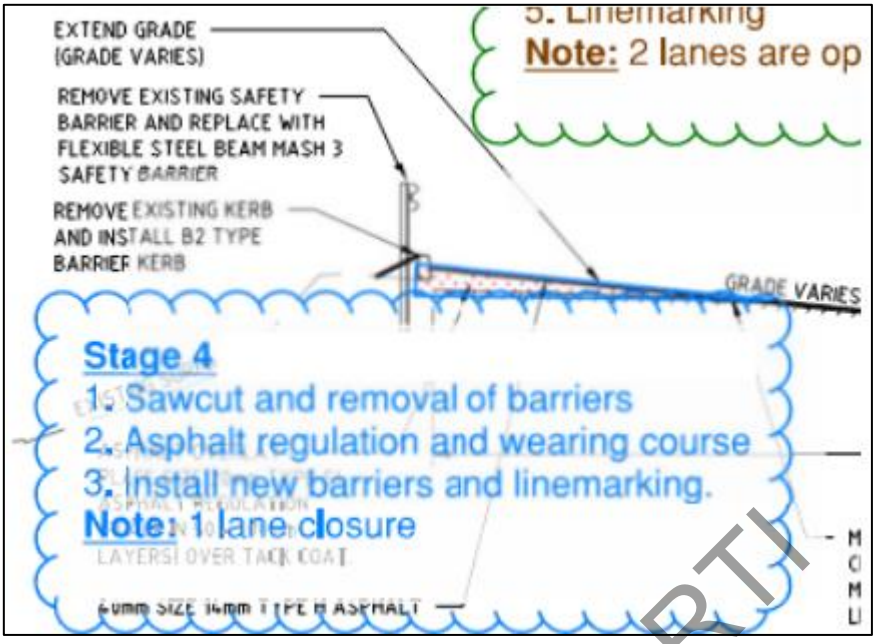


Figure 10 Section 2 – Stage 4

– No mention of lane widths or barrier offset to confirm width for construction.
– No mention of how material is spoiled from site.
– Appears to be a reasonable approach.

3.4 Section 3 – Ch 1220 to 1440 (Ch 11 200 to 11 440)

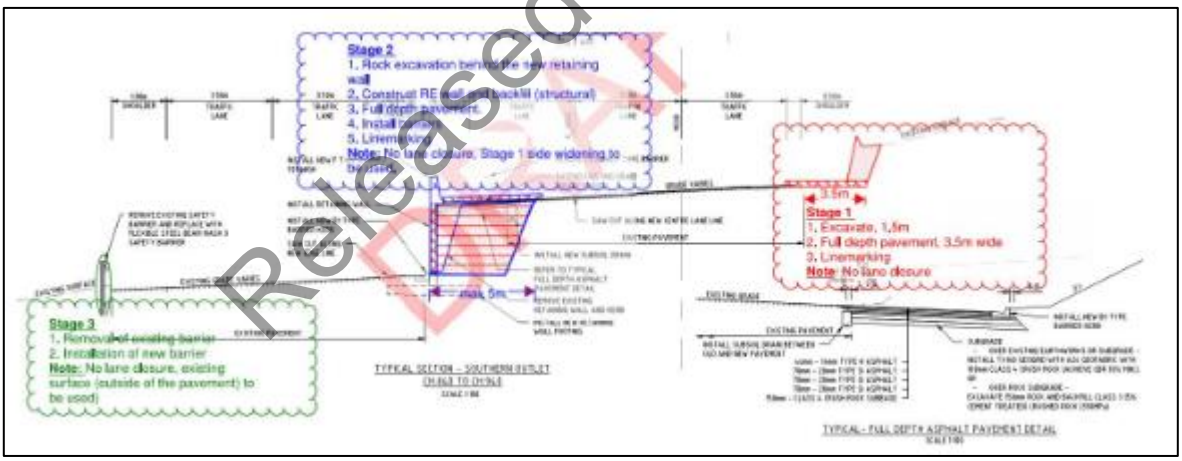


Figure 11 Section 3 - Ch 11 200 to 11 440

3.4.1 WT Partnership methodology

STAGE 1 – MEDIAN (24H SHIFT)

1. New Jersey barriers to be placed
2. Bored piling (assumed dia: 750mm) as retaining structure
3. Northbound median widening, construction of full depth pavement
4. Linemarking to be conducted

5. New Jersey barriers to be removed

Note: No lane closures

STAGE 2 – NORTHBOUND (DAY SHIFT)

1. New Jersey barriers to be placed
2. Rock excavation to be conducted to allow construction of a new retaining structure and a new pavement
3. A new soil nail wall to be constructed and backfill to be placed
4. Construction of full depth pavement
5. Linemarking to be conducted
6. New Jersey barriers to be removed

Note: No lane closures, widened median is open

STAGE 3 – MEDIAN (24H SHIFT)

1. New Jersey barriers to be placed
2. Existing retaining wall to be removed and excavation to be conducted
3. Full depth pavement to be constructed
4. Linemarking to be conducted
5. Removal of New Jersey barriers

Note: Two lanes are open

STAGE 4 – SOUTHBOUND (24H SHIFT)

1. New Jersey barriers to be placed
2. Saw cut and removal of existing safety barrier and existing kerb
3. Asphalt regulation and full wearing course
4. Installation of existing kerb and flexible steel beam mash 3 safety barrier
5. Linemarking to be conducted
6. Removal of New Jersey barriers

Note: No lane closures

3.4.2 Stage 1 comments

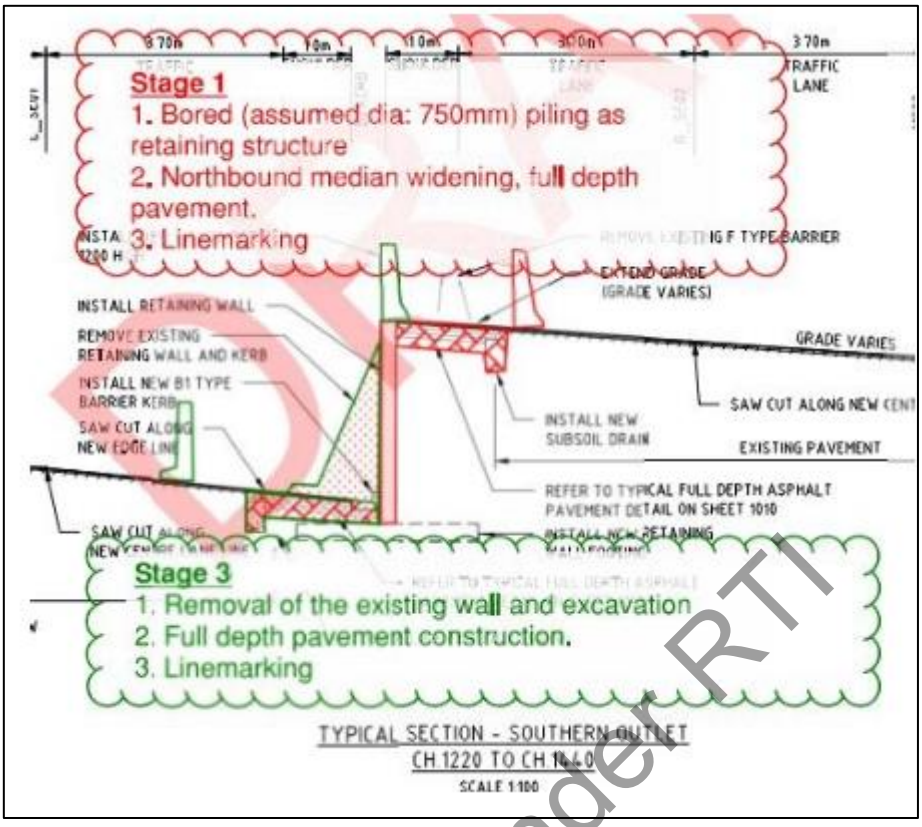


Figure 12 Section 3 – Stage 1

- No mention of lane widths or barrier offset to confirm width for construction.
- No mention of how material is spoiled from site.
- Bored pile of 750mm seems a very expensive temporary solution.
- Connection of concrete barrier to temporary wall is not discussed. This load is substantial and unlikely to be contained by the bored pile wall.
- **It is not possible to install a piling rig in the area behind the barriers, due to the available width**. This piling rig would also need to have steel liners, reinforcing cages, and concrete delivered to the area to construct the concrete piles. This will require more width than allowed for delivery trucks to stop and a crane to unload the materials.
- Based on this detail extra width will be required for machinery and material access.

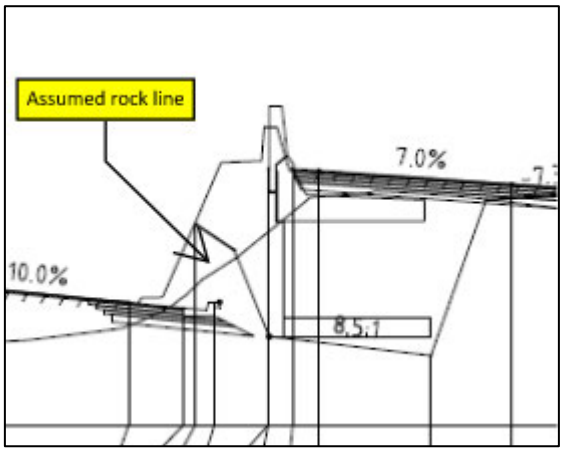


Figure 13 Section 3 assumed rock line

– Bored pile of 750mm will need to be socketed quite deeply into rock to allow for the barrier impact loads and the removal of the existing rock on the southbound lane.

3.4.3 Stage 2 comments

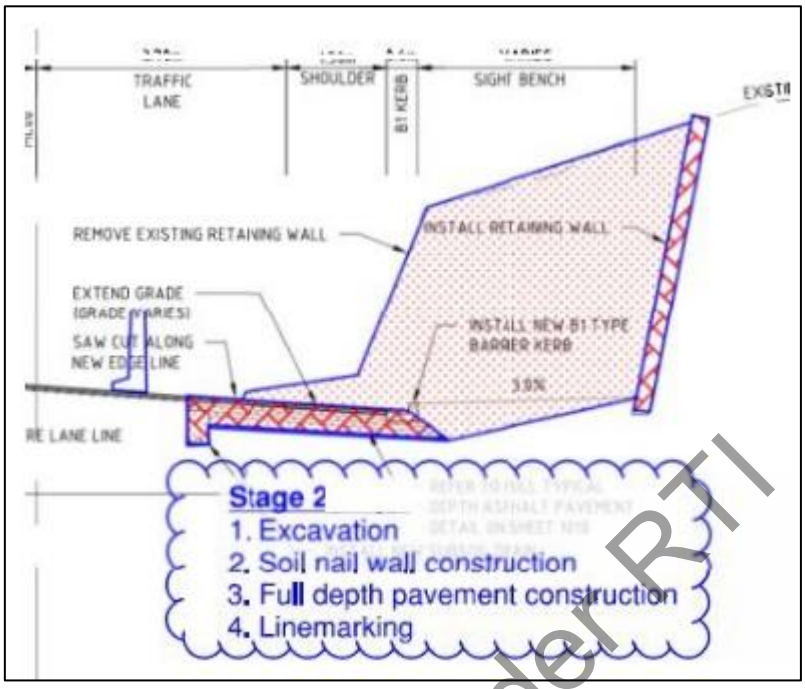


Figure 14 Section 3 – Stage 2

– No mention of lane widths or barrier offset to confirm width for construction.
– No mention of how material is spoiled from site.
– Installation of a soil nail wall is not necessary as the rock face is sufficiently stable.
– Based on this detail extra width will be required for machinery and material access, which would require lane closures.

3.4.4 Stage 3 comments

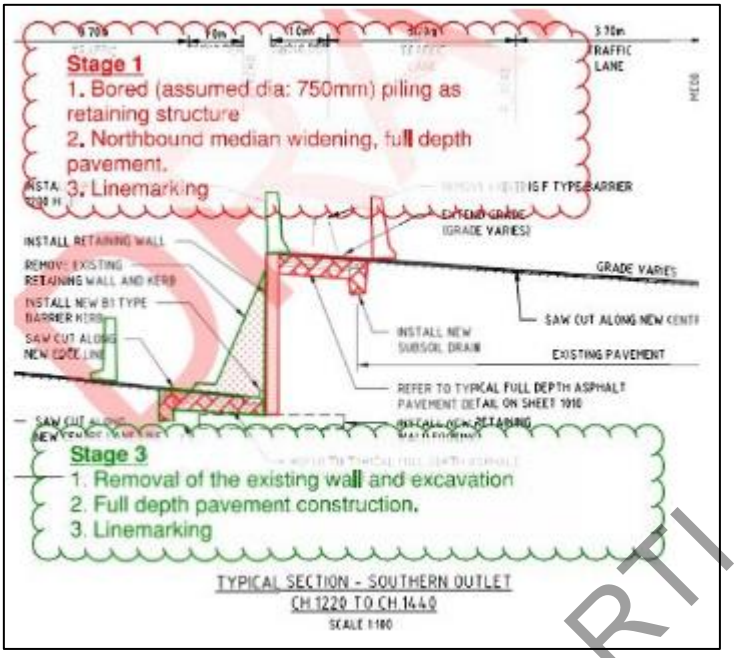


Figure 15 Section 3 – Stage 3

- No mention of lane widths or barrier offset to confirm width for construction.
- No mention of how material is spoiled from site.
- Width to be confirmed that an excavator and truck can work next to each other in the median.
- Based on this detail extra width will be required for machinery and material access, which would require lane closures.

3.4.5 Stage 4 comments

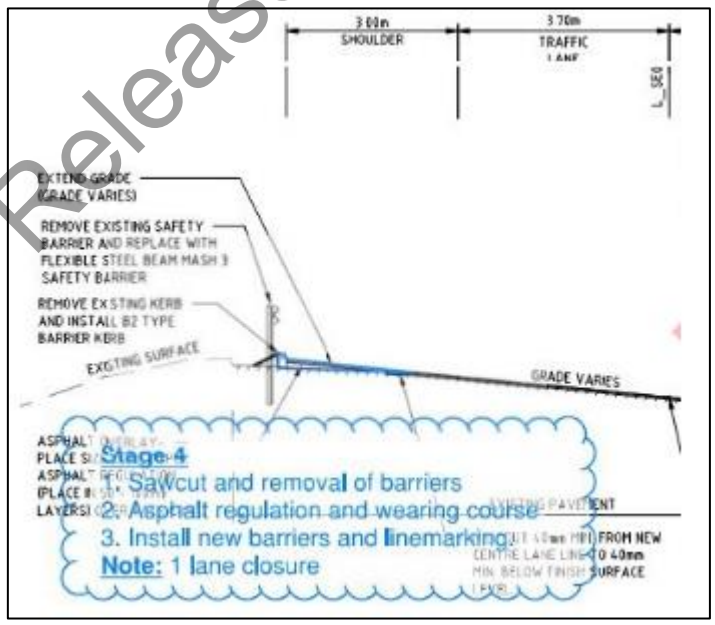


Figure 16 Section 3 – Stage 4

- No mention of lane widths or barrier offset to confirm width for construction.

– No mention of how material is spoiled from site.
– Appears to be a reasonable approach.

3.5 Section 4 – Ch 1440 to 1770 (Ch 11 440 to 11 770)

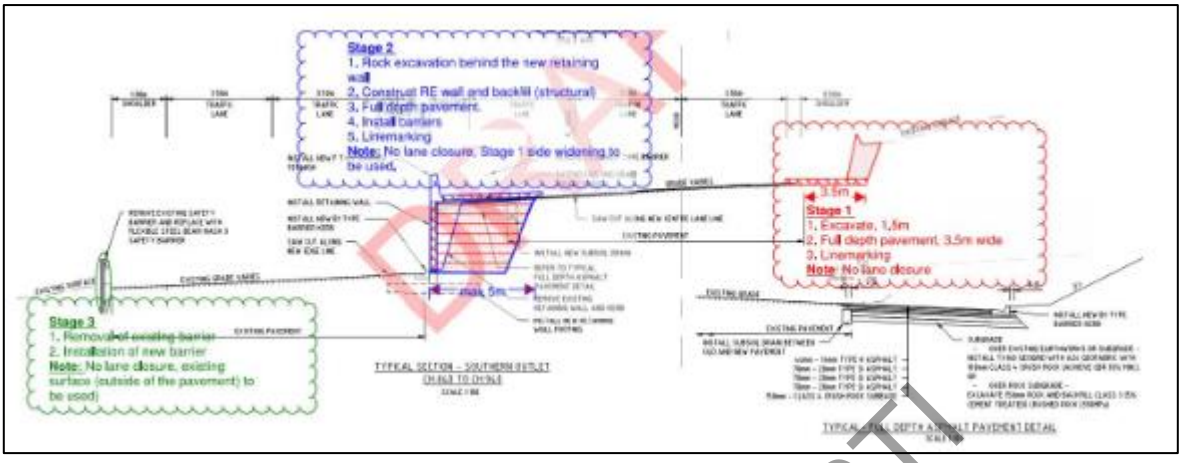


Figure 17 Section 4 - Ch 11 440 to 11 770

3.5.1 WT Partnership methodology

NORTHBOUND

1. New Jersey barriers to be placed (24h Shift)
2. Rock excavation to be conducted to allow construction of a new pavement (Day Shift)
3. Construction of full depth pavement (24h Shift)
4. Installation of new B1 type barrier kerb (24h Shift)
5. Linemarking to be conducted (24h Shift)
6. New Jersey barriers to be removed (24h Shift)

Note: No lane closures

3.5.2 Stage 1 comments

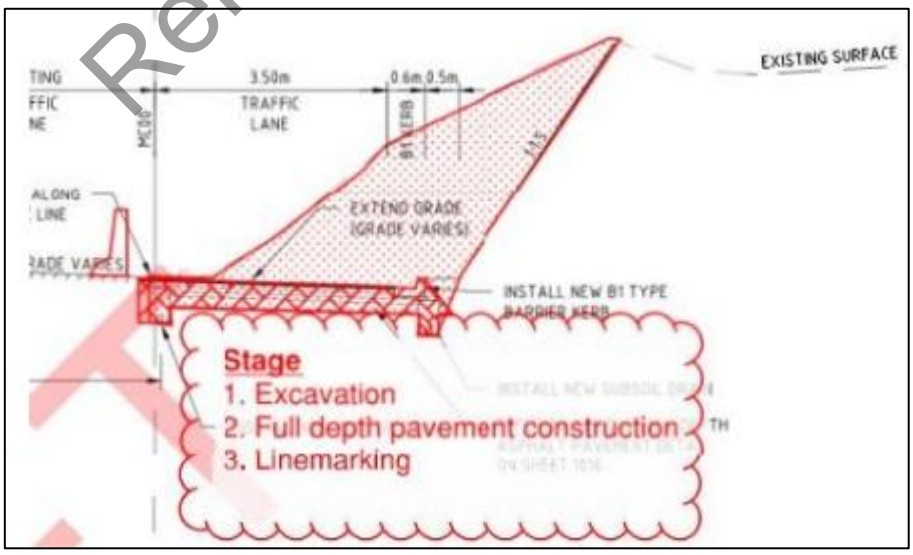


Figure 18 Section 4 – Stage 1

– No mention of lane widths or barrier offset to confirm width for construction.
– No mention of how material is spoiled from site.
– Based on this detail extra width will be required for machinery and material access, which would require lane closures.

3.6 Section 5 – Ch 1770 to 2040 (Ch 11 770 to 12 040)

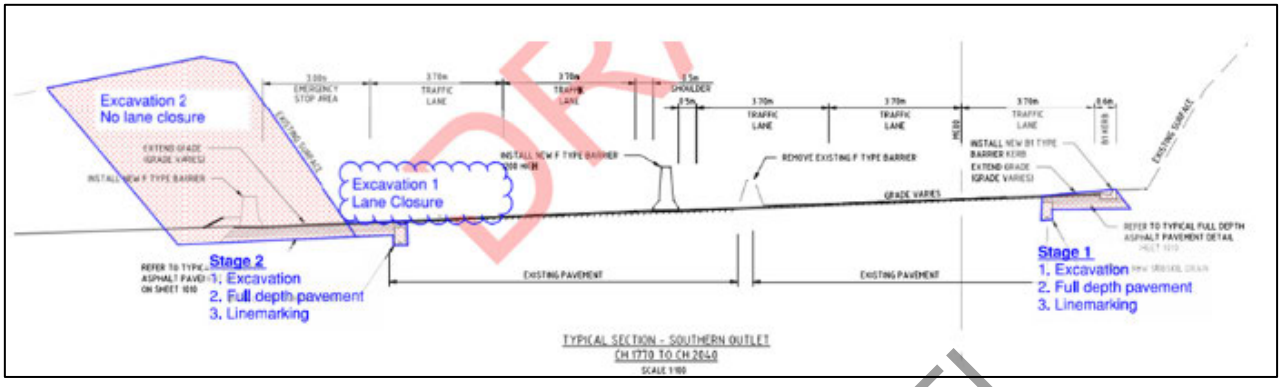


Figure 19 Section 5 - Ch 11 770 to 12 040

3.6.1 WT Partnership methodology

STAGE 1 - NORTHBOUND

1. New Jersey barriers to be placed (24h Shift)
2. Rock excavation to be conducted to allow construction of a new pavement (Day Shift)
3. Construction of full depth pavement (24h Shift)
4. Installation of new B1 barrier kerb (24h Shift)
5. Linemarking to be conducted (24h Shift)
6. New Jersey barriers to be removed (24h Shift)

Note: No lane closures

STAGE 2 – SOUTHBOUND (24H SHIFT)

1. New Jersey barriers to be placed
2. Primary excavation to be conducted to allow secondary excavation (1 lane is closed)
3. Secondary excavation to be conducted to allow construction of a new pavement (no lane closures)
4. Full depth pavement to be constructed
5. Removal of existing F type barrier and installation of new F type barrier
6. Linemarking to be conducted
7. Removal of New Jersey barriers

Note: Two lanes are open

3.6.2 Stage 1 comments

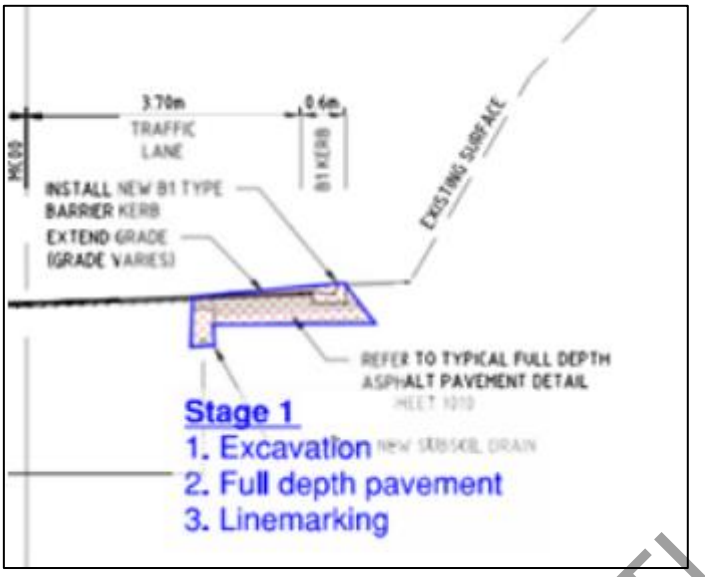


Figure 20 Section 5 – Stage 1

– No mention of lane widths or barrier offset to confirm width for construction. Assumption that 0.5m shoulders, 3.5m lane, and 1m for barrier and deflection (as long as barrier is bolted down) or 9m temp traffic width leaves about 3.5m to work in. Appears to be tight but workable.
– No mention of how material is spoiled from site.
– Based on this detail extra width will be required for machinery and material access, which would require lane closures.

3.6.3 Stage 2 comments

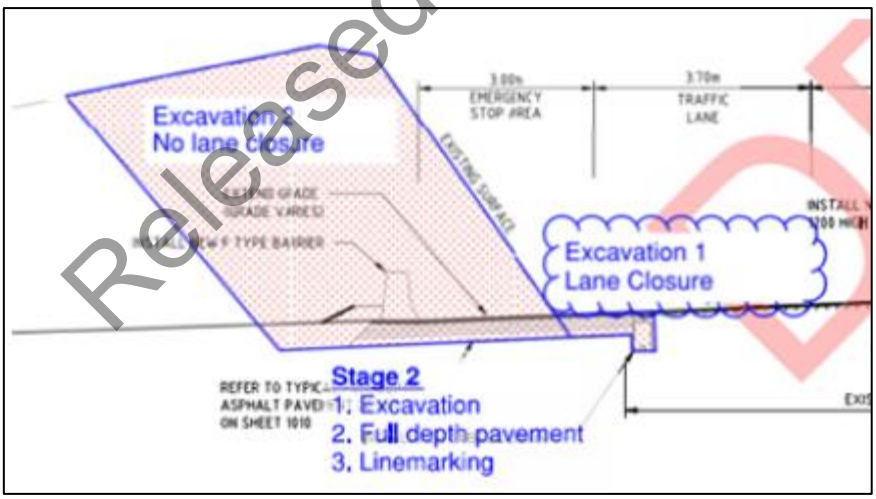


Figure 21 Section 5 – Stage 2

– No mention of lane widths or barrier offset to confirm width for construction. Assumption that 0.5m shoulders, 3.5m lane, and 1m for barrier and deflection (as long as barrier is bolted down) or 9m temp traffic width leaves about 3.5m to work in.
– Retaining wall is about 3.5m high. It is expected that an RE Block of about 4m at the base would be required. This would need to be battered back to avoid collapse of the existing roadway.
– Space available for construction is only 3.5m. This solution does not appear to work.
– No mention of how material is spoiled from site.

– Based on this detail extra width will be required for machinery and material access, which would require lane closures.

3.7 Section 6 – Ch 2040 to 2181.42 (Ch 12 040 to 12 180)

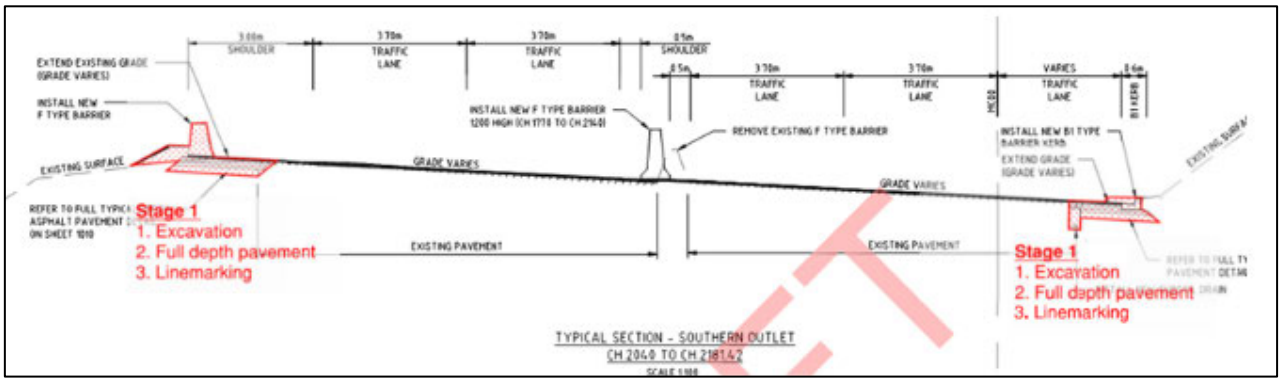


Figure 22 Section 6 -Ch 12 040 to 12 180

3.7.1 WT Partnership methodology

STAGE 1 - NORTHBOUND

1. New Jersey barriers to be placed (24h Shift)
2. Rock excavation to be conducted to allow construction of a new pavement (Day Shift)
3. Construction of full depth pavement (24h Shift)
4. Installation of new B1 barrier kerb (24h Shift)
5. Linemarking to be conducted (24h Shift)
6. New Jersey barriers to be removed (24h Shift)

Note: No lane closures

STAGE 2 – SOUTHBOUND

1. New Jersey barriers to be placed (24h Shift)
2. Rock excavation to be conducted to allow construction of a new pavement (Day Shift)
3. Construction of full depth pavement (24h Shift)
4. Installation of new B1 barrier kerb (24h Shift)
5. Linemarking to be conducted (24h Shift)
6. New Jersey barriers to be removed (24h Shift)

Note: No lane closures

3.7.2 Stage 1 comments

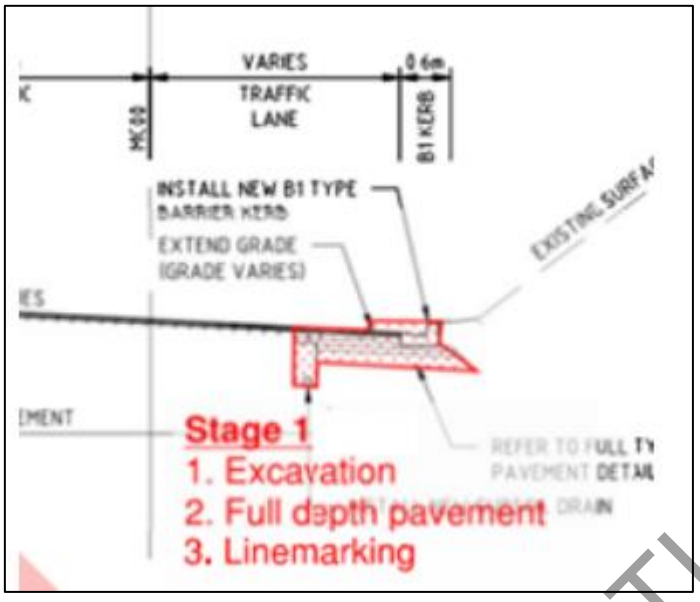


Figure 23 Section 6 – Stage 1

– No mention of lane widths or barrier offset to confirm width for construction. Assumption that 0.5m shoulders, 3.5m lane, and 1m for barrier and deflection (as long as barrier is bolted down) or 9m temp traffic width leaves about 3.5m to work in. Appears to be tight but workable.

3.7.3 Stage 2 comments

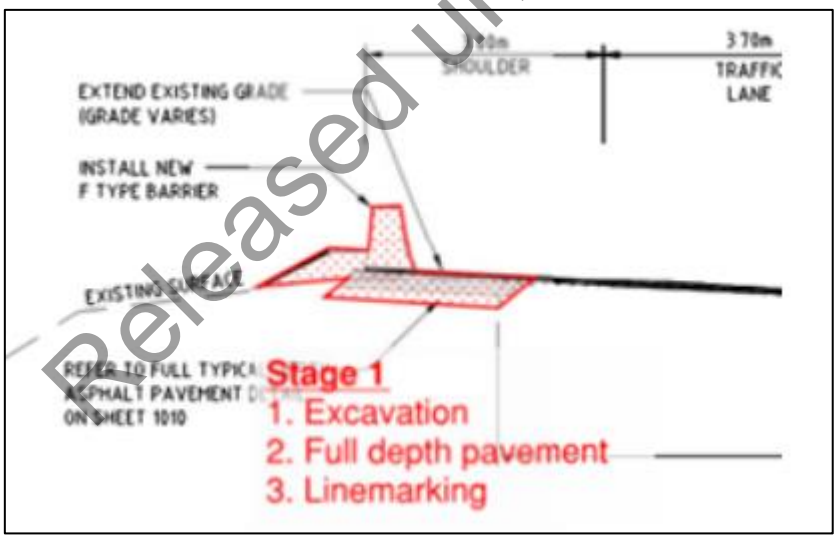


Figure 24 Section 6 - Stage2

– No mention of lane widths or barrier offset to confirm width for construction. Assumption that 0.5m shoulders, 3.5m lane, and 1m for barrier and deflection (as long as barrier is bolted down) or 9m temp traffic width leaves about 3.5m to work in.
– Based on this detail extra width will be required for machinery and material access, which would require lane closures.

4. Summary

In general the methodology proposed does not allow for materials to be delivered or taken from site. For example, the excavation of the existing retaining wall in section 3 will require a 30t excavator to provide sufficient power to remove the existing wall and excavate the rock behind. This spoil material will need to be removed from site during the operation as there is no room to stockpile in the median. The cross section would look like Figure 25.

Based on the review, it is unlikely that two lanes will be open at all times as WT Partnership has suggested. There may be times where two lanes could be open to the public (e.g. during peak hours).

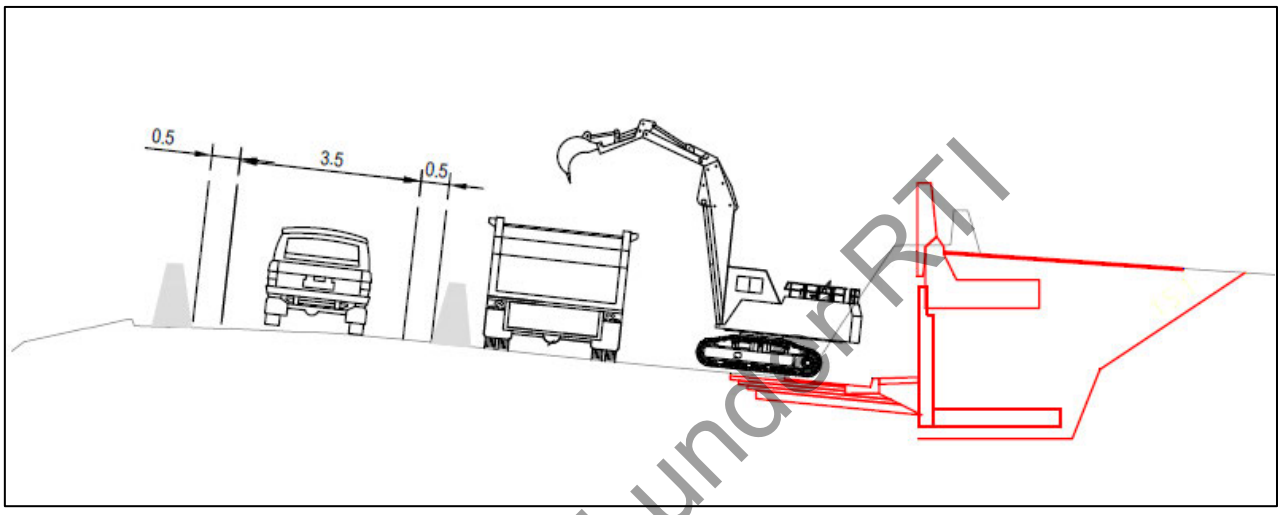


Figure 25 Width for Excavator and Truck

The methodology provided by WT Partnership

- Does not fully allow for construction widths to construct the works.
- Proposes an alternative option for the retaining wall as a bored piled wall that is not constructable as it does not show how a piling rig could operate near the traffic lanes.
- Proposes a soil nail wall without demonstrating that a rig could operate next to live traffic safely.
- Does not address how materials are moved onto site or taken away. The widths described by the staging are very narrow and would not create a safe work space.

Regards

Senior Technical Director

07 March 2023

To		**Email**	**@stategrowth.tas.gov.au**
From		**Project No.**	12556430
Project Name	Southern Outlet - Transit Lane		
Subject	Constructability review		

1. Introduction

The Department of State Growth (State Growth) has engaged GHD Pty Ltd (GHD) to undertake the design of the Southern Outlet Transit Lane project (referred to herein as SOTL). The SOTL is a part (Sub-Project 1) of the greater Hobart City Deal Southern Projects which aims to address congestion and accessibility along the Southern Corridor, comprising Kingston, the Southern Outlet, and the Macquarie-Davey Street couplet between Kingston and Hobart.

1.1 Purpose of this Memorandum

This memorandum presents the results of a preliminary constructability review of the proposed design of the Southern Outlet Transit Lane project based on the drawings listed in Table 1.

Table 1 List of drawings reviewed

Drawing Number	Rev	Title	Status
12556430-C0100	C	GENERAL ARRAGEMENT - STAGE 1 - SHEET 1 OF 4	S3
12556430-C0101	C	GENERAL ARRAGEMENT - STAGE 1 - SHEET 2 OF 4	S3
12556430-C0102	C	GENERAL ARRAGEMENT - STAGE 1 - SHEET 3 OF 4	S3
12556430-C0103	C	GENERAL ARRAGEMENT - STAGE 1 - SHEET 4 OF 4	S3
12556430-C0400	B	STAGE 1 - SIGNS AND PAVEMENT MARKINGS - SHEET 1 OF 5	S3
12556430-C0401	B	STAGE 1 - SIGNS AND PAVEMENT MARKINGS - SHEET 2 OF 5	S3
12556430-C0402	B	STAGE 1 - SIGNS AND PAVEMENT MARKINGS - SHEET 3 OF 5	S3
12556430-C0403	B	STAGE 1 - SIGNS AND PAVEMENT MARKINGS - SHEET 4 OF 5	S3
12556430-C0404	B	STAGE 1 - SIGNS AND PAVEMENT MARKINGS - SHEET 5 OF 5	S3
12556430-C1400	B	STAGE 2 - SIGNS AND PAVEMENT MARKINGS - SHEET 1 OF 8	S3
12556430-C1401	B	STAGE 2 - SIGNS AND PAVEMENT MARKINGS - SHEET 2 OF 8	S3
12556430-C1402	B	STAGE 2 - SIGNS AND PAVEMENT MARKINGS - SHEET 3 OF 8	S3
12556430-C1403	B	STAGE 2 - SIGNS AND PAVEMENT MARKINGS - SHEET 4 OF 8	S3
12556430-C1404	B	STAGE 2 - SIGNS AND PAVEMENT MARKINGS - SHEET 5 OF 8	S3
12556430-C1405	B	STAGE 2 - SIGNS AND PAVEMENT MARKINGS - SHEET 6 OF 8	S3
12556430-C1406	B	STAGE 2 - SIGNS AND PAVEMENT MARKINGS - SHEET 7 OF 8	S3
12556430-C1407	B	STAGE 2 - SIGNS AND PAVEMENT MARKINGS - SHEET 8 OF 8	S3
12556430-C1500	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 1	S3
12556430-C1501	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 2	S3
12556430-C1502	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 3	S3

Drawing Number	Rev	Title	Status
12556430-C1503	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 4	S3
12556430-C1504	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 5	S3
12556430-C1505	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 6	S3
12556430-C1506	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 7	S3
12556430-C1507	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 8	S3
12556430-C1508	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 9	S3
12556430-C1509	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 10	S3
12556430-C1510	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 11	S3
12556430-C1511	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 12	S3
12556430-C1512	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 13	S3
12556430-C1513	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 14	S3
12556430-C1514	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 15	S3
12556430-C1515	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 16	S3
12556430-C1516	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 17	S3
12556430-C1517	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 18	S3
12556430-C1518	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 19	S3
12556430-C1519	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 20	S3
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12556430-C1521	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 22	S3
12556430-C1522	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 23	S3
12556430-C1523	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 24	S3
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12556430-C1525	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 26	S3
12556430-C1526	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 27	S3
12556430-C1527	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 28	S3
12556430-C1528	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 29	S3
12556430-C1529	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 30	S3
12556430-C1530	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 31	S3
12556430-C1531	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 32	S3
12556430-C1532	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 33	S3
12556430-C1533	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 34	S3
12556430-C1534	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 35	S3
12556430-C1535	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 36	S3
12556430-C1536	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 37	S3
12556430-C1537	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 38	S3
12556430-C1538	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 39	S3
12556430-C1539	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 40	S3
12556430-C1540	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 41	S3
12556430-C1541	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 42	S3
12556430-C1542	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 43	S3

Drawing Number	Rev	Title	Status
12556430-C1543	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 44	S3
12556430-C1544	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 45	S3
12556430-C1545	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 46	S3
12556430-C1546	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 47	S3
12556430-C1547	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 48	S3
12556430-C1548	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 49	S3
12556430-C1549	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 50	S3
12556430-C1550	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 51	S3
12556430-C1551	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 52	S3
12556430-C1552	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 53	S3
12556430-C1553	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 54	S3
12556430-C1554	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 55	S3
12556430-C1555	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 56	S3
12556430-C1556	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 57	S3
12556430-C1557	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 58	S3
12556430-C1558	A	STAGE 2 - CROSS SECTIONS - (MC00) - SHEET 59	S3

This Technical Memorandum is provided as an interim communication under our agreement with Department of State Growth. It is provided to foster discussion in relation to technical matters associated with the project and should not be relied upon in any way or for any purpose.

1.2 Project Overview

The Southern Outlet Transit Lane (SOTL) is a part (Sub-Project 1) of the greater Hobart City Deal Southern Projects which aims to address congestion and accessibility along the Southern Corridor, comprising Kingston, the Southern Outlet, and the Macquarie/Davey Street couplet between Kingston and Hobart.

Specifically, the SOTL comprises a northbound T3 transit lane (for use by buses, private vehicles with three or more occupants, taxis, and emergency service vehicles) between Olinda Grove and Macquarie Street.

Along much of the alignment the existing carriageway and verges are not wide enough to accommodate an additional traffic lane, and so road widening is required. The key geological and geotechnical challenges involved in any widening works comprise the consideration and assessment of the various existing cuttings and filled areas along the alignment within the context of project boundary constraints such as private property and the topography of the area.

1.3 Current Site Overview

The concept design (CD) for the proposed SOTL traverses approximately 2.8km between the existing Olinda Road overpass bridge at the southern end (Chainage 00) and the Macquarie/Davey Street couplet at the northern end.

An aerial overview of the Southern Outlet area is shown in Figure 1. The aerial imagery was taken in 2013. The transit lane alignment is shown as the blue line

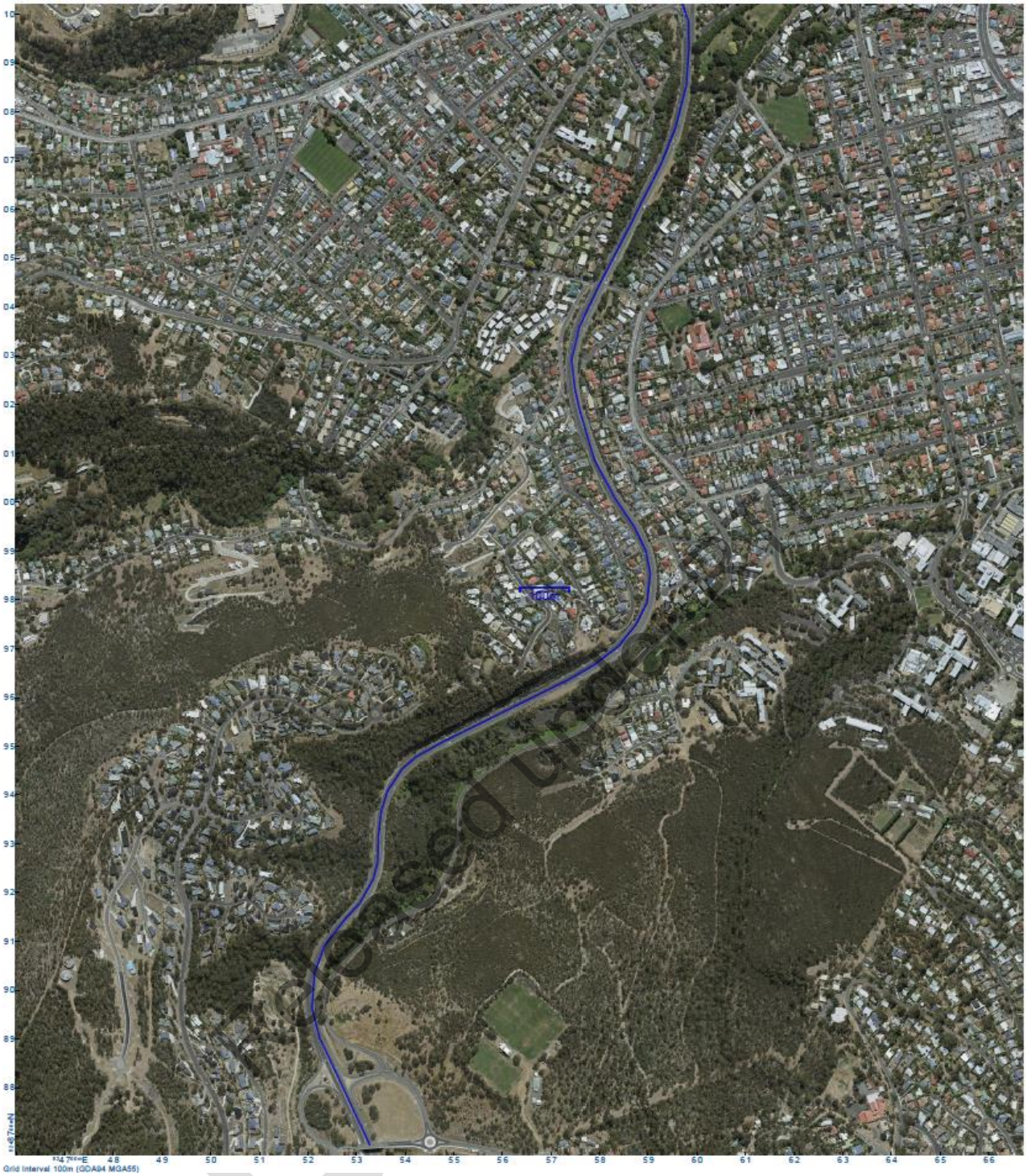


Figure 1 Aerial Overview (2013) of Southern Outlet Transit Lane Area

With reference to design chainages and the traffic flow direction of the proposed transit lane, the Southern Outlet at the project site is aligned approximately from south-southwest to north-northeast. The existing roadway comprises two vehicle lanes in each direction with an 80km/h speed limit. At southern sections of the alignment traffic is divided by concrete barriers. The concrete barrier system develops into a retaining wall at approximately Chainage 1300 due to the level difference associated with traversing the hill spur at 'Cats Eye Corner'. A steel cable system divides the northbound and southbound lanes for the remainder of the alignment north of approximate Chainage 2100.

The CD geotechnical report (completed by third parties) has divided the SOTL alignment into ten sections based on characteristic design challenges in each area. The division and basis are assessed to be generally

reasonable, and in the interests of continuity, these 'project section' designations are adopted herein. A summary of the project sections is provided in Table 2.

Table 2 Alignment Sections

Project Section	Chainage Extents	Key Existing Features and Design Challenges (As Per CD)	CD Recommendation Summary
1	00 to 350	Olinda Grove Bridge and Intersection. Commencement of transit lane.	Transit lane to commence after on-ramp merge.
2	350 to 660	Small cutting on west side. Filling and steep embankment on east side.	Widen on west side.
3	660 to 780	Large cutting on west side with rockfall protection works. Medium cutting on east side.	Widen on east side.
4	780 to 850	No significant constraints.	Widen on east side (continuity between Sections 3 and 5)
5	850 to 890	Very large cutting on northwest side with gabion block buttressing/retention. Filling and steep embankment on southeast side.	Critical alignment section. Widen on southeast side.
6	890 to 1200	As per Section 5 without gabion blocks.	As per Section 5.
7	1200 to 1370	No significant constraints.	Widen on southeast side; however, CD rationale is contradictory. Widening on northwest side may be preferable. The road is founded on large fill embankments associated with a filled historical quarry in this area.
8	1370 to 1635	'Cats Eye Corner'. Available space constrained by property boundaries and retaining walls. An existing underpass is present approximately at Chainage 1580.	Widen on northwest side. Revision of the underpass will be required.
9	1635 to 1810	Available space constrained by property boundaries. Land acquisition unavoidable.	Widen on west side (continuity from Section 8 and match-in to Section 10).
10	1810 to northern extent	No significant constraints or works required due to commencement of existing bus lane.	Existing bus lane to be used as new transit lane, with minimal other proposed changes.

The most critical sections from a geotechnical perspective are 2 to 9.

1.4 Project scope

This memorandum is to document the constructability review of the concept design. The review includes an analysis of:

– provision for traffic (including side tracking, if possible, detours and so on)
– provision for pedestrians and cyclists
– construction staging and sequencing,
– construction safety (road users and construction workers)
– the feasibility of the proposal (can it be constructed)

From these documents, the Reviewer was able to determine a possible construction staging methodology for the purpose of this review.

At the time of the review ITS design, stormwater, and water main reticulation design were not available. These designs may need to be reviewed and this memo updated once they are finalised and made available.

1.5 Limitations

This memorandum has been prepared by GHD for Department of State Development and may only be used and relied on by Department of State Development for the purpose agreed between GHD and Department of State Development as set out in this memorandum.

GHD otherwise disclaims responsibility to any person other than Department of State Development arising in connection with this memorandum. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this memorandum were limited to those specifically detailed in the memorandum and are subject to the scope limitations set out in the memorandum.

The opinions, conclusions and any recommendations in this memorandum are based on conditions encountered and information reviewed at the date of preparation of the memorandum. GHD has no responsibility or obligation to update this memorandum to account for events or changes occurring after the date that the memorandum was prepared.

The opinions, conclusions and any recommendations in this memorandum are based on assumptions made by GHD described in this memorandum (refer section 1.5 of this memorandum). GHD disclaims liability arising from any of the assumptions being incorrect.

The services undertaken by GHD in connection with preparing this memorandum:

- were limited to those specifically detailed in the scope of works
- were limited to the concept plans produced
- were limited by the lack of detail survey available
- were limited to structural advice based on a visual inspection of the structures
- were limited to high level concepts of the tunnel design
- were limited by the lack of geotechnical information to inform decisions about cut and fill ability
- were limited as there was no advice on the volumes of materials required
- were limited to a high-level overview based on the preliminary data available.

GHD has prepared this memorandum based on information provided by the Department of State Growth and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the memorandum which were caused by errors or omissions in that information.

2. Basis for the constructability review

The construction review is based on the design plans produced in Dec 2021, refer to Table 1.

Exclusions

Given that this is a high-level review, the review did not examine in detail the following information:

- Vertical and horizontal transitions of existing to new pavement surfaces during staging work.
- The source or type of material required for embankment construction, spoil or unsuitable material disposal, and any impact of the mass haul diagram has on staging
- Site access and egress to be determined by the contractor at the time of construction when the construction methodology is refined
- Temporary traffic staging details
- Cultural heritage impacts
- Environmental impacts.

2.1 Assumptions

The Constructability Review considered the following general assumptions and constraints:

For the purpose of this memorandum, it is assumed that construction of the road infrastructure and bridges will be provided in accordance with standard Department of State Growth approved construction methods.

The following reasonable assumptions have been made for this memorandum:

Contractor

- A single contract will cover the full scope of the project.
- Access to the full site will be available from the date of the letter of acceptance.
- The contractor is permitted to undertake concurrent works at multiple sites.
- The contractor is permitted to undertake works at night. These works shall comply with environmental legislation.
- The contractor awarded the project is competent and remains financially viable during the project.
- The contractor will be able to find and utilise a construction site for his requirements that allows for easy and efficient access to a site compound and lay down facilities so that operational inefficiencies are avoided.
- Noise and vibration issues will be dealt with by the design and prior consultation.
- Suitable traffic management will be employed, i.e. reduced speeds during work hours, the use of devices to separate workers from traffic, and following best practice procedures and controls.

Public Utility Services

- PUP can and will be relocated, where possible, prior to the commencement of the main construction works.
- No unknown PUP is encountered.

Community consultation and engagement

- A comprehensive stakeholder engagement program is undertaken, and no issues are raised.
- Access for emergency services will be always maintained.
- Local residents will be tolerant of the night works and that works do not need to be reprogramed or the construction methodology changed significantly due to complaints. Government will manage the impacted residents with the assistance of the Contractor if required.
- Pedestrians and cyclists (including mobility scooters, etc) will be disrupted during construction and as such, it is expected the Contractor will provide an approved Traffic Management Plan and subsequent Traffic Guidance Scheme's. The TMP and associated TGS's shall be reviewed and approved by the appropriate authority, prior to onsite implementation.

Environmental issues

- No cultural heritage issues are known or found.
- Best practice erosion and sediment control methods will be employed.
- It is assumed that the project will not be adversely affected by the acid sulphate soils.
- Stripping topsoil can only commence once environmental controls are in place.
- The Contractor is permitted by all relevant government agencies to undertake works.
- That there are no impacts of afflux on catchment and potential impacts to properties while construction activities are occurring.
- Dust management will be adequately managed by the contractor.

– Any Fauna or Flora issues will be dealt with by the design and any environmental management plans required.

Road users

– Long-term speed limit drop on the roads to 60km/hr are permissible for the duration of construction, and short-term speed limit drops down to 40km/hr can be accommodated, when necessary, for safety reasons
– Medium term closures of the dual lane to single lane will be acceptable.

Construction access to site

– Construction access into site will be required from major roads. These site accesses will need to meet the minimum requirements of the MUTCD and any State requirements. The access will require a tapered section to allow vehicles to decelerate to a safe speed before entering the site.
– Construction access from the site will also require tapers to allow site vehicles to accelerate to a safe merge speed or a controlled access point.
– No assessment of these requirements have been made.

2.2 Provision for traffic (e.g., side-tracks, detours)

The Southern Outlet is the major route south for Hobart. It should be a requirement of the contract that the highway will generally be maintained with two through lanes in each direction at all times during peak hour. However it will be necessary to be able to close a lane at off peak, or at night to allow for works, such as remove and replace pavement, cross lane works such as earthworks, drainage, and asphalt surfacing. There is little opportunity to detour traffic due to the very limited road network in the area, refer to Figure 2 for the local road network.

Figure 2 Surrounding road network from Metromaps 2022

Minimum pavement widths during construction

To construct the proposed design, it is essential that traffic is able to flow and maintain at least two lanes of traffic open, wherever possible, whilst ensuring minimum lane widths are provided in accordance with the Australian Guide to Temporary Traffic (AGTM) and the Manual of Uniform Traffic Control Devices (MUTCD).

It is assumed that the posted speeds in the project area will be reduced from 80 km/hr on the Southern Outlet Highway to 60 km/h and as such, a minimum lane width of 3.0 m could be provided, as per Table 2.5 of AGTTM Part 3, refer to Figure 3. The 3.0 m lane should have a 0.5m curve widening applied as per Table 2.5, refer to Figure 3AGTTM – Table 2.5 Minimum lane width to allow for a B-double (0.2m widening) therefore a lane of 3.5 m would be appropriate. Additionally, the traffic edge line shall be a minimum of 0.5 m from the traffic side edge of the approved safety barrier in accordance with the manufacturer's requirements. For the purpose of this review a single slope barrier with a 0.5m offset was assumed.

Table 2.5: Minimum lane width

Criteria	Lane width (m)*
General Lane widths	
≤ 60 km/h	3
> 60 km/h	3.5
Curve with radius 100 – 250 m	Curve widening 0.5 per lane
Curve with radius < 100 m	Consider swept path of long vehicles (e.g. buses, trams)
Approach lane is < 3 m wide	Equal to approach lane
Two-way residential street	5.5 (sum both ways)
Shuttle flow with active control	3.5
Shuttle flow operation	
Shuttle flow on residential streets (see Section 5.4.4)	Maximum 3.5

*Note: *This does not apply to curves of radius 250 m or less, or locations where there are fixed vertical obstructions such as fences or safety barriers within 30 cm of the edge of the lane on one or both sides. Where these conditions apply, consider widths wider than those listed above to accommodate large vehicles.*

Figure 3 AGTTM – Table 2.5 Minimum lane width

A minimum clear zone shall be provided behind the temporary barriers as an increased safety measure for construction workers which will be determined by the barrier systems adopted. Actual clearance will be based on the barriers chosen and their connectivity. Where there are no barriers, i.e., the existing road edge is retained then no barriers are proposed.

Actual clearance will be based on the barriers chosen and their connectivity. Where the lane is not beside a proposed work zone and next to an existing kerb, then no barriers are proposed, refer to Figure 4.

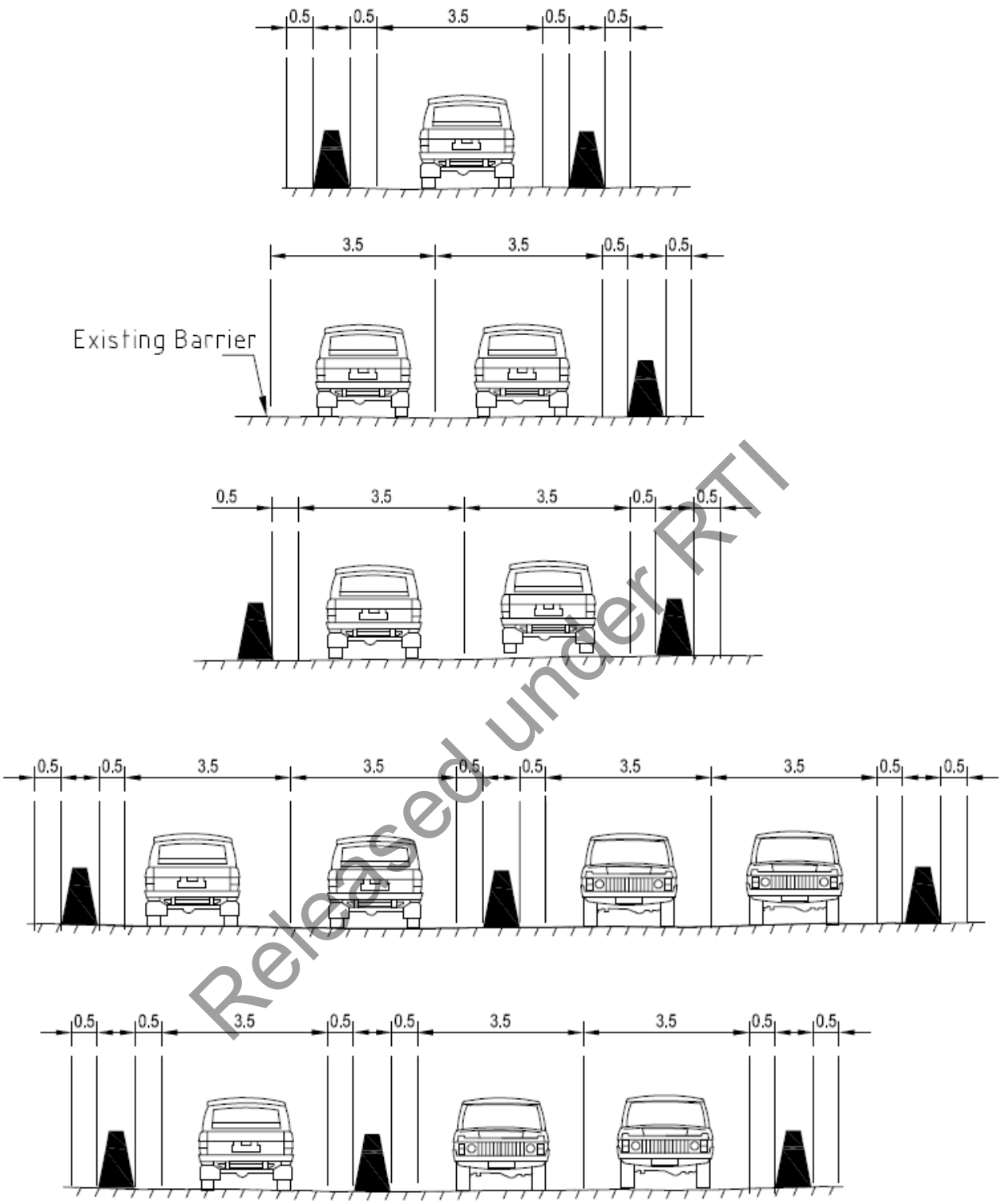


Figure 4 Minimum adopted lane widths

It will be a requirement of the contract to provide a minimum length of dual lanes approaching and departing the intersection. The Contractor will need to program their work activities around the available lane closures. This will lead to an extensive amount of remove and replace pavement under traffic. It is expected that off-peak or night works will constitute a majority of the paving works for the project. To achieve this the Contractor will need to use the full depth asphalt pavements. In some instances, there may be a rock layer

required if there is a poor subgrade. This will dramatically reduce production and allowances should be made by the Contractor to be able to open up to traffic at the end of the shift.

Emergency services access

Access for emergency services is to be maintained at all times. It is recommended that notification be given to Police, Ambulance, Fire and Emergency Services prior to works commencing. Any major traffic changes should be communicated to the emergency services prior to implementation.

Impact on traffic signals

Any signal relocations or upgrades are to be designed so that the intersection is maintained under control at all times. Works such as conduits, pedestals, and controller equipment is placed so that it can easily be done whilst keeping the intersection operational.

2.3 Provision for pedestrians and cyclists

Stage 1 has pedestrian and cyclist impacts from Davey Street north, while the rest of the project does not allow for pedestrians or cyclists.

The pedestrian movements around the existing intersections should be maintained where possible. Currently there is a narrow pedestrian path on both side of the Southern Outlet, refer to Figure 5.

Figure 5 Davey Street pedestrian facilities

There does not appear to be any cycle facilities on these roads.

3. Overall construction staging and sequencing

This project has been proposed in two stages

Stage 1

– CH 9760 to 10200

Stage 1 is the section from CH 9760 to 10200.

Two sections have been considered

– Section 1A at Ch 9 860
– Section 2B at Ch 10 080

Stage 2

– CH 10840 to 12180
– South of Stage 2 LOW to CH 12540 ITS conduits and VSLS

Stage 2 has been further divided into 3 sections

– Section 2A 10 830 to 11 500 - Contains the new central retaining wall
– Section 2B 11 500 to 11 770 – Contains minor pavement widening
– Section 2C 11 770 to 12 190 – Contains minor pavement widening and overlay.

For the purpose of this memorandum the stages have been assumed to be delivered as one project. However if the stages are delivered at different times the sequencing proposed for each stage is still valid.

For the purpose of this assessment, it is assumed that construction of the road infrastructure will be provided in accordance with standard approved construction methods evidenced by similar projects.

Construction of the works in stages is the logical sequence of works developed after consideration of the needs of immediate stakeholders. Staging considers the needs of

– Passenger Vehicles
– Trucks
– Buses
– Cyclists
– Pedestrians
– Service authorities
– Property owners
– Construction of the works.

The sequence and staging plans are based on producing a staging and construction sequencing that minimises the time of disruption and maximises the contractor's work area to provide the most economical solution.

The main criteria adopted for the staging methodology in this review are:

– Maintaining the existing number of lanes and capacity to cater for the current traffic volumes
– Reduction in speed limits
– Maintain full functionality of interchange at all times
– Any existing lighting will ideally be maintained during construction. Temporary lighting may be required until final lighting is operational
– New pavement opened to traffic in various stages will be to the layer below the final wearing course to allow for temporary marking and traffic control devices be installed without compromising the integrity and condition of the final AC layer
– Tie-in with existing pavements will need to be carried out under traffic, either off peak or at night by profiling and replacement with deep lift asphalt pavement
– Installation of traffic barriers and construction of temporary pavements in existing medians, islands and roundabouts should be carried out as night work

– Line-marking or flexible delineators (stick and stomps) should be used to separate opposing traffic movements. Construction sites will be delineated and protected as per the requirements of MRTS.02 and the MUTCD
– Barrier protection devices using temporary concrete barriers as a minimum to protect workers, work areas and other road users.

However, there will be instances where the above criteria cannot be met, and these will be highlighted as part of this memorandum.

A suggested construction staging sequence has been developed to determine if the project can be feasible constructed, and if so, what issues would be encountered. The staging plans in this memorandum are a high-level overview and do not purport to be comprehensive. The traffic staging plans will need to be developed further to comply with all requirements of the contract and will need to be approved by the Administrator prior to construction.

3.1 Section 1

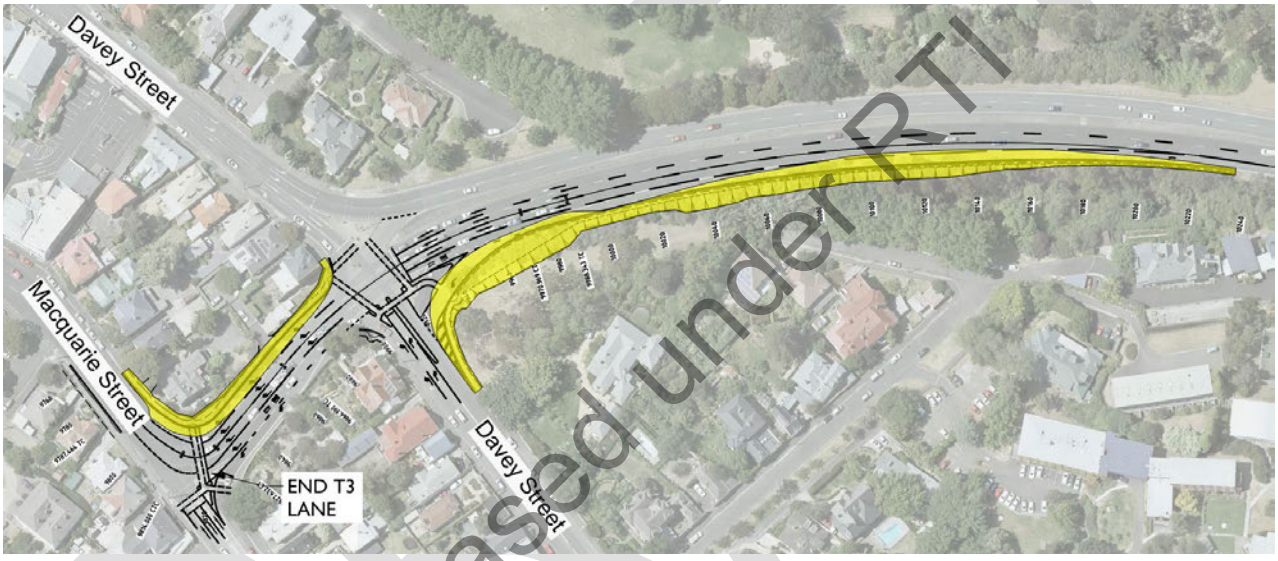


Figure 6 Stage 1 Ch 20 830 to 11 500

3.1.1 Stage 0

Stage 0 involves

– Setting up the site camp and laydown areas.
– Installing project signs, VMS signs, or other infrastructure that will be required.
– Works around the site that do not need permanent barriers, such as clearing and grubbing and minor earthworks to allow for service relocations.
– Service relocations and protection where required and able to be constructed.
– Removing existing islands and paving them where required for future traffic staging.

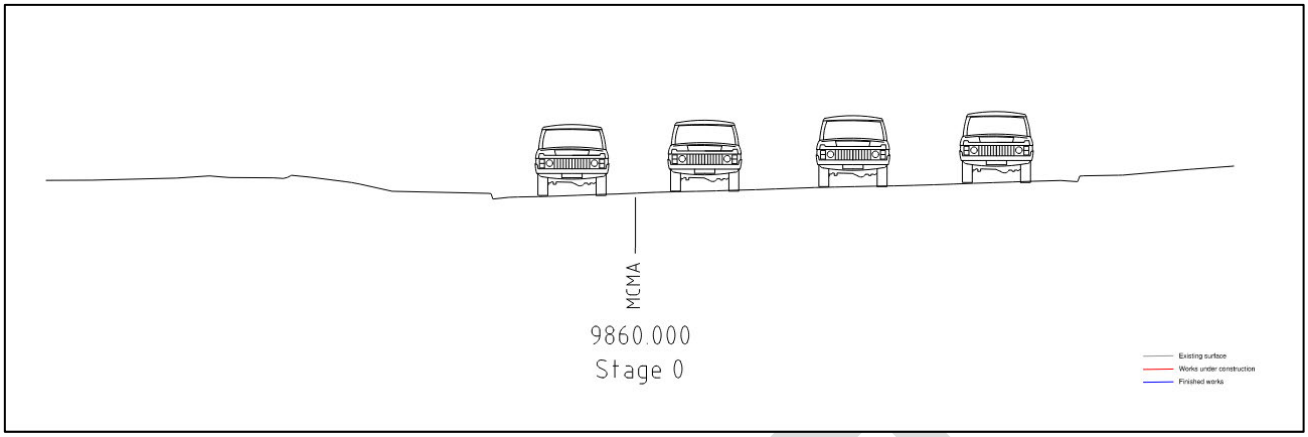


Figure 7 Section 1A – Stage 0

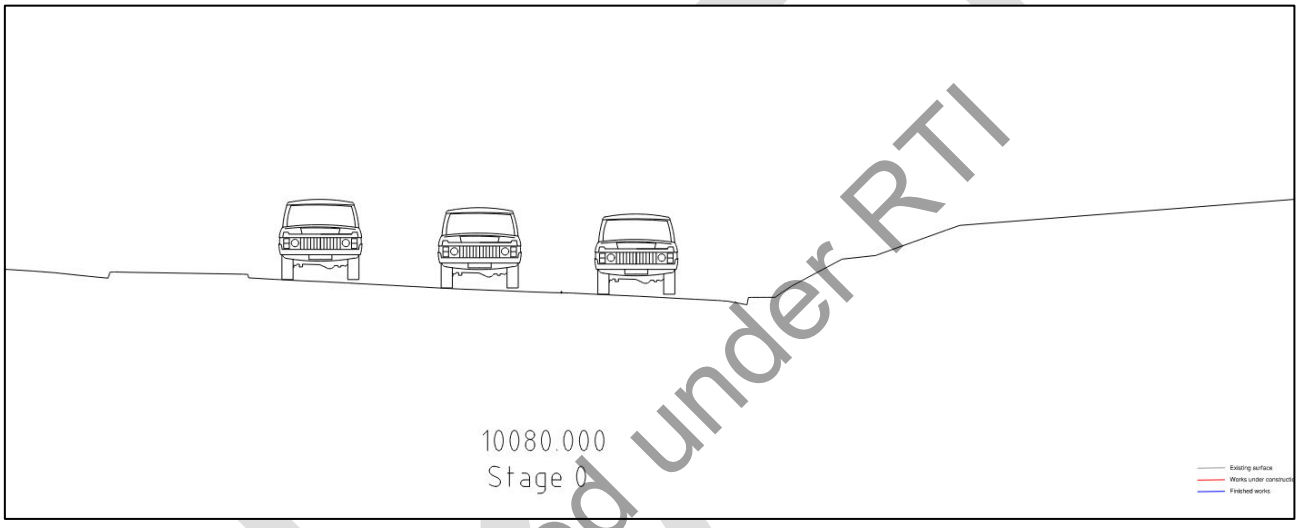


Figure 8 Section 1B – Stage 0

3.1.2 Stage 1

Stage 1 involves:

– Place temporary barriers and re-line mark the pavements to reduce current lane widths to allow for new works to be constructed.

– Construct earthworks and place drainage and kerb and channel.

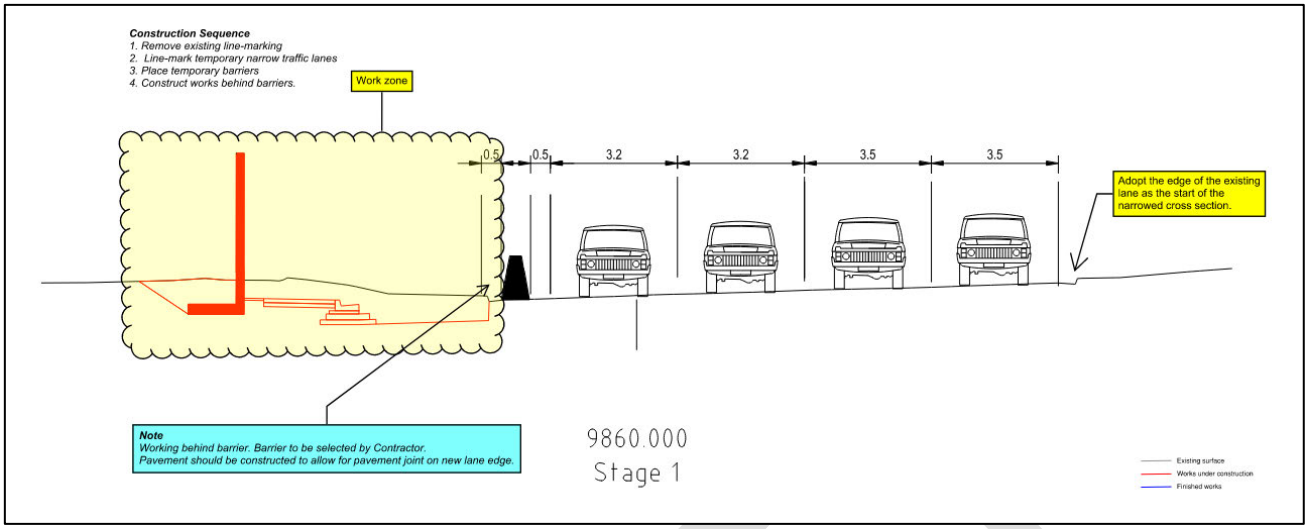


Figure 9 Section 1A – Stage 1

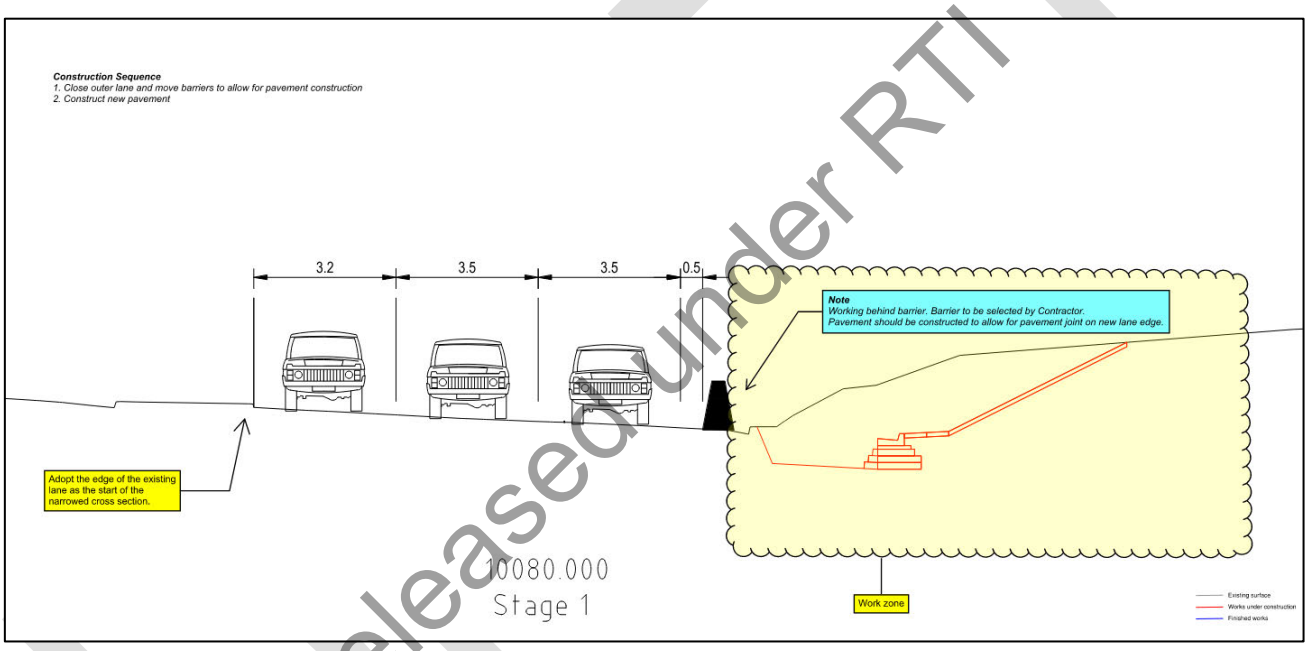


Figure 10 Section 1B – Stage 1

3.1.3 Stage 2

Stage 2 involves:

– Narrowing traffic to two lanes to allow for new pavement construction.

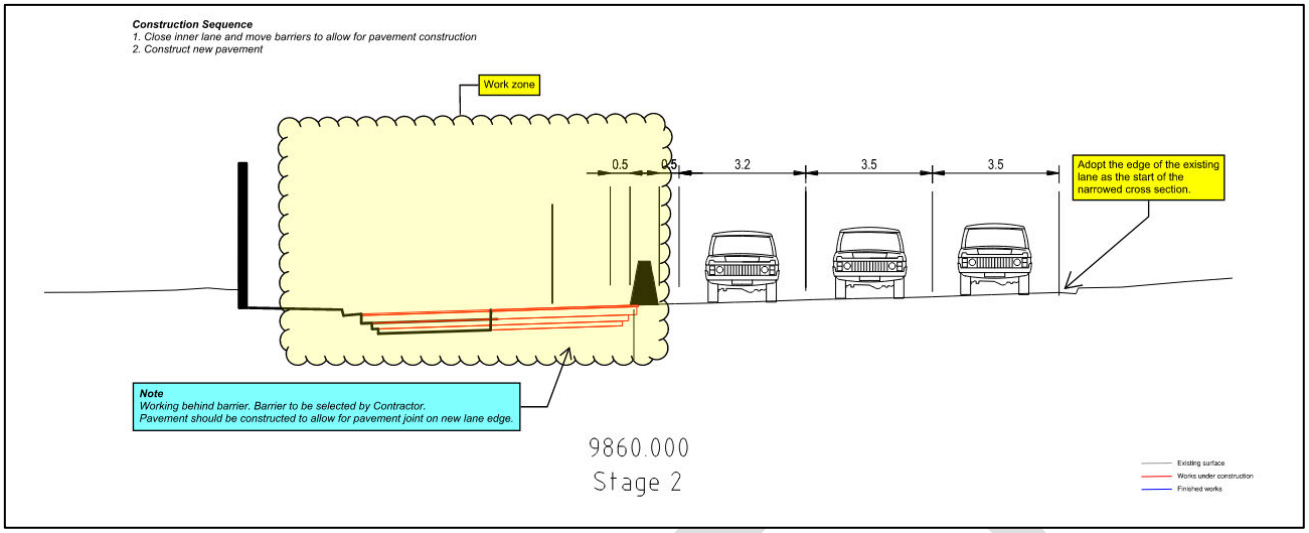


Figure 11 Section 1A – Stage 2

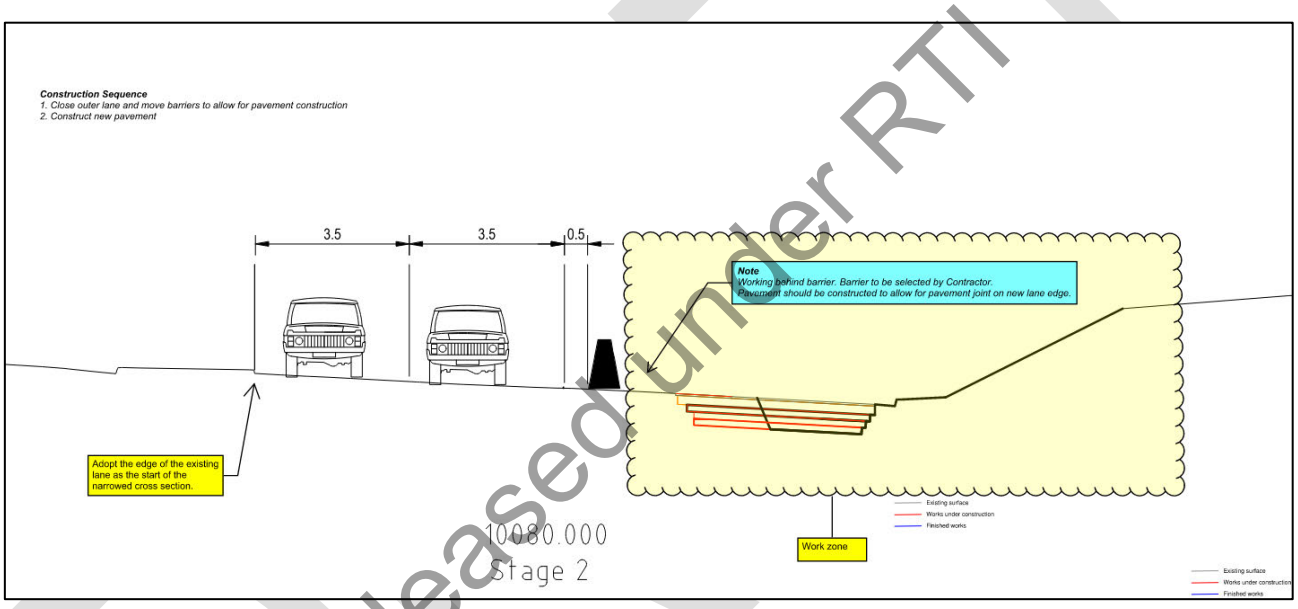


Figure 12 Section 1B – Stage 2

3.1.4 Stage 3

Stage 3 involves

- Remove temporary barriers
- Construct new signals and islands as required
- Completion of median works, asphalt surfacing, linemarking, and clean-up such as camp removals and laydown area reinstatement.

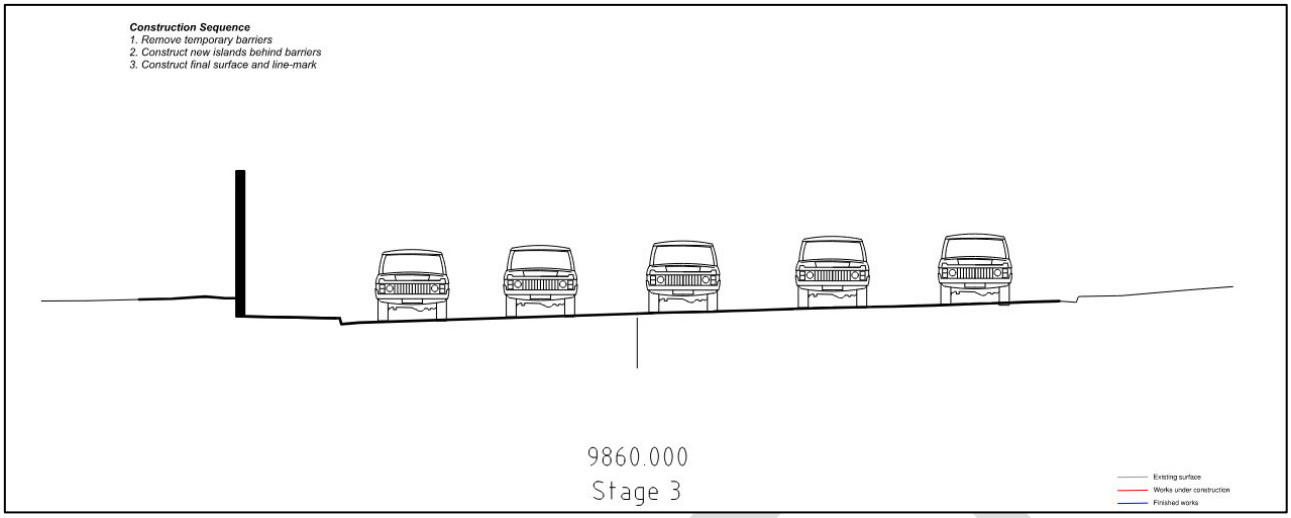


Figure 13 Section 1A – Stage 3

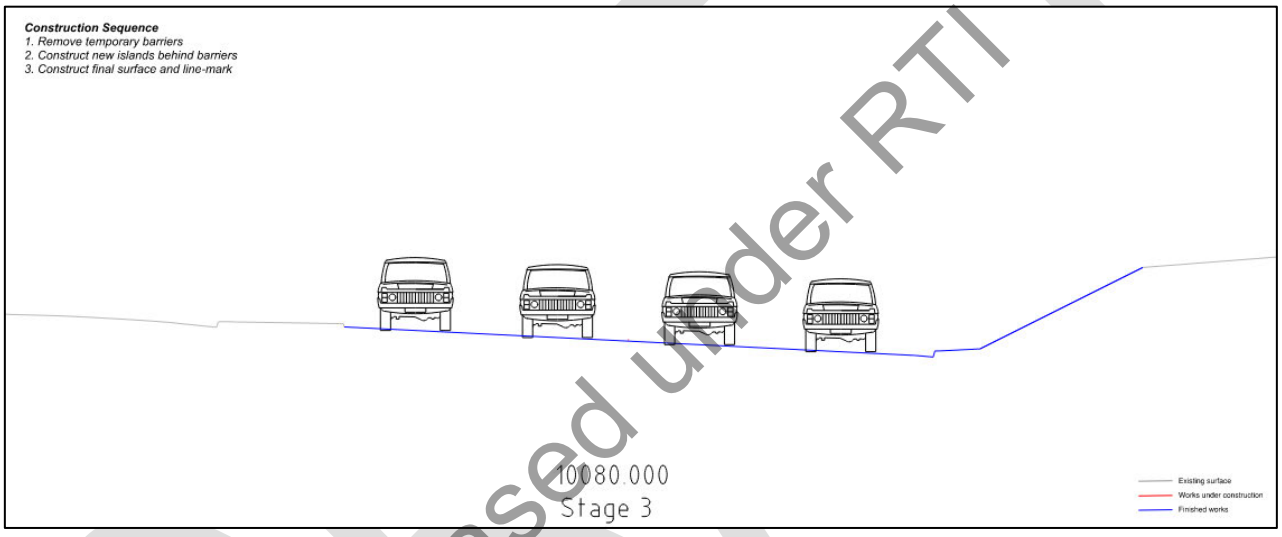


Figure 14 Section 1B – Stage 3

3.2 Section 2A – Ch 11 100

Stage 1 is the section from 10 830 to 11 500. It consists of a new central retaining wall, minor pavement widening, and pavement overlay.

Two sections were chosen for review

– Ch 11 100 – Narrow work area for southbound traffic
– Ch 11 300 – Large noise wall on northbound lanes.

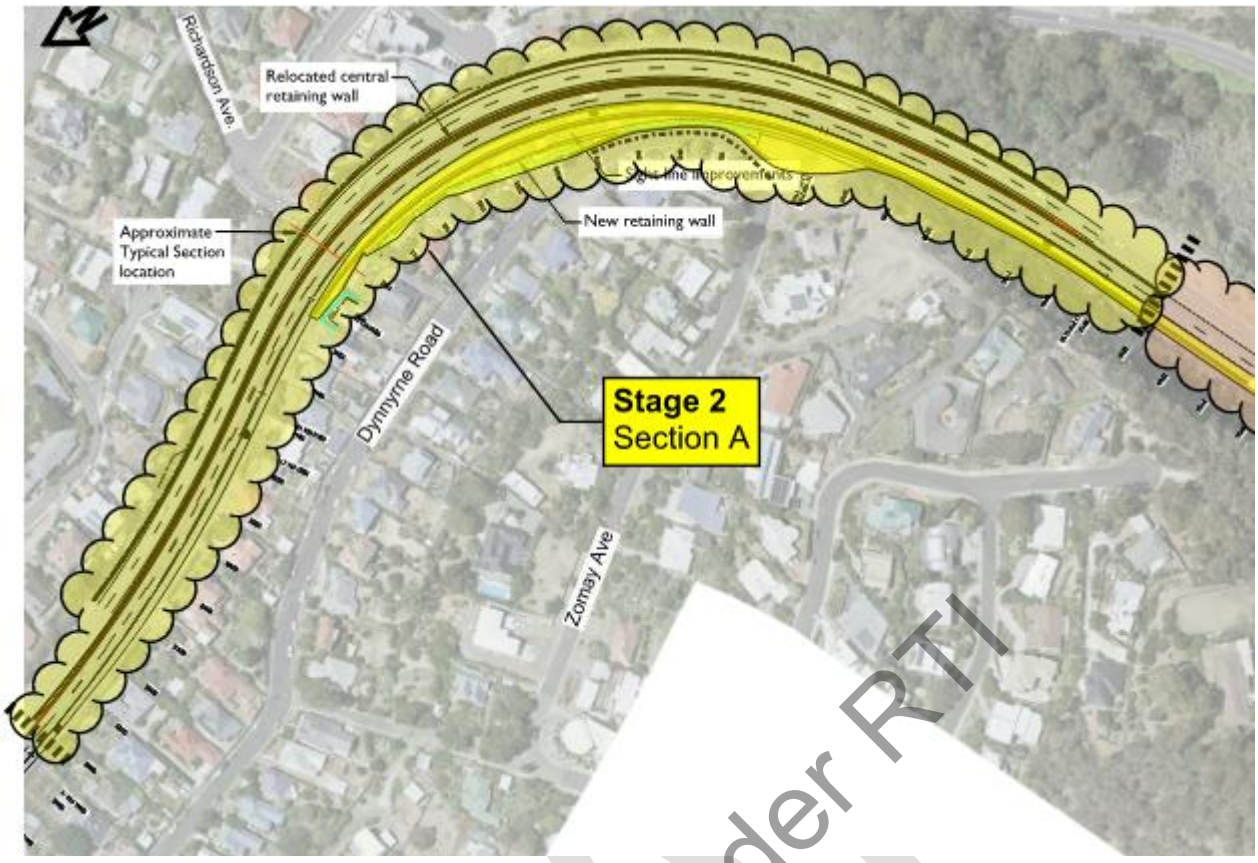


Figure 15 Stage 2 - Section 2A

3.2.1 Ch 11 100 - Stage 0

Stage 0 involves:

- Setting up the site camp and laydown areas.
- Installing project signs, VMS signs, or other infrastructure that will be required.
- Works around the site that do not need permanent barriers, such as clearing and grubbing and minor earthworks to allow for service relocations.
- Removing existing islands and paving them where required for future traffic staging.
- Demolish the existing dwellings and use the site for a temporary camp/ laydown area.

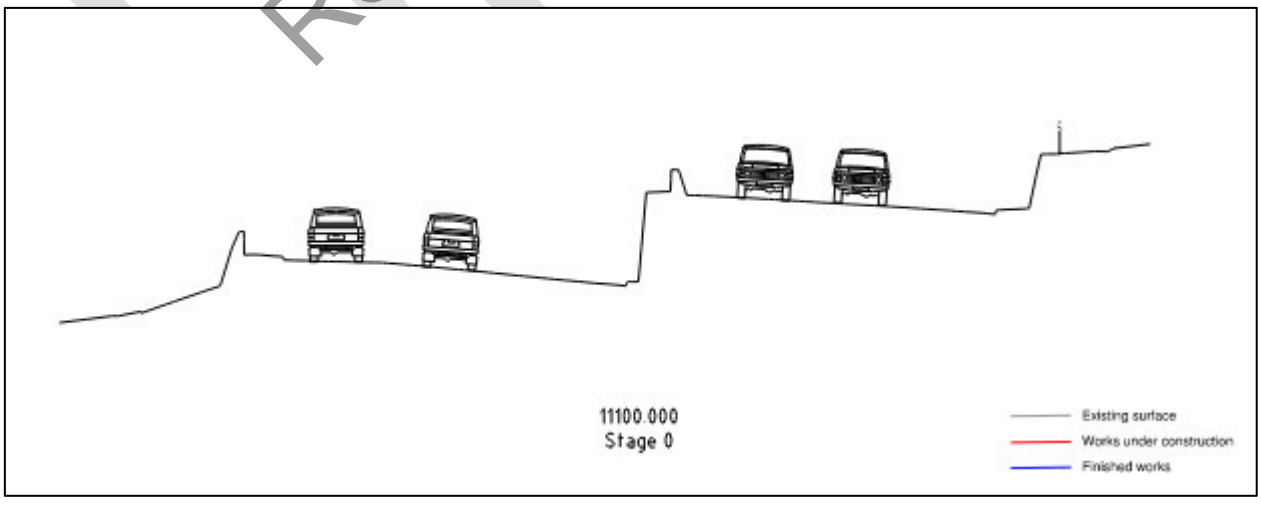


Figure 16 Section 2A Ch 11 100 – Stage 0

3.2.2 Ch 11 100 - Stage 1

Stage 1 involves:

– Closing inner northbound lane and place temporary barriers and re-line mark the pavements to reduce current lane widths to allow for new works to be constructed
– Excavating embankment and construct new pavement.

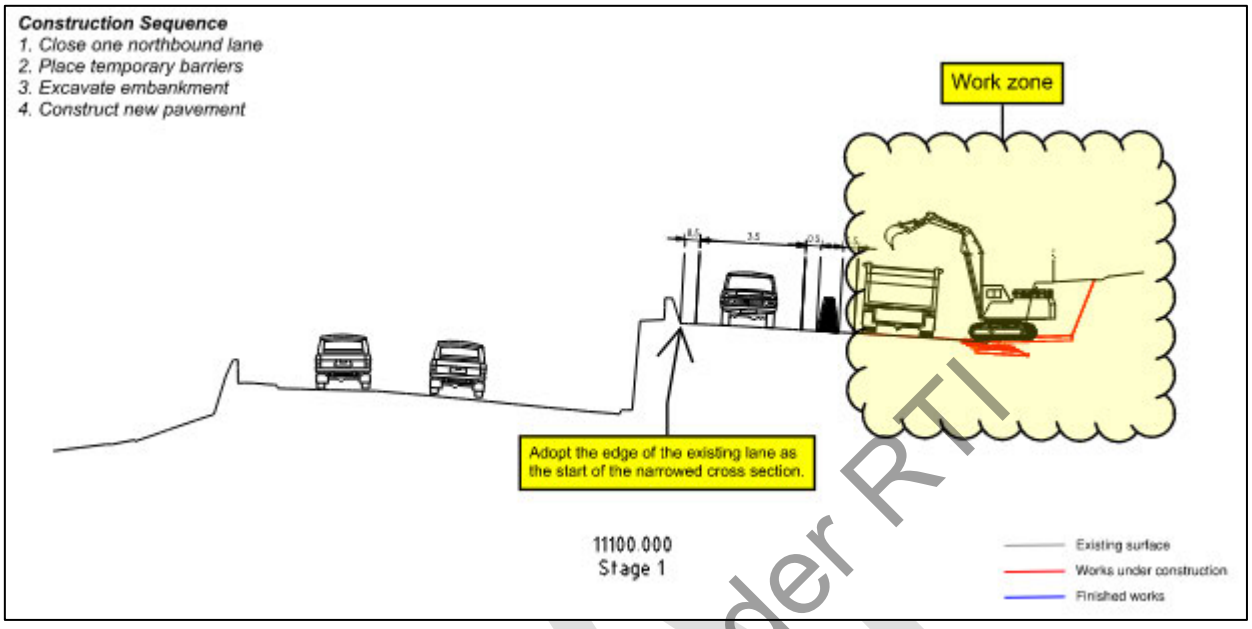


Figure 17 Section 2A Ch 11 100 – Stage 1

3.2.3 Ch 11 100 - Stage 2

Stage 2 involves:

– Closing inner southbound lane
– Placing temporary barriers and re-line mark the southbound pavement to reduce current lane widths to allow for new works to be constructed in the median of the Southern Outlet
– Removing existing rock faced retaining wall and drainage
– Creating a drainage path behind the temporary barriers to allow the southbound carriageway to drain, note that any rain during this period will be damaging to any works under way
– Constructing the new retaining structure and drainage. Note that this will require southbound lane closures to allow for cranes to setup and move formwork and pre-cast panels and for concrete trucks to park while discharging to concrete pumps
– Constructing new pavement to southbound carriageway.

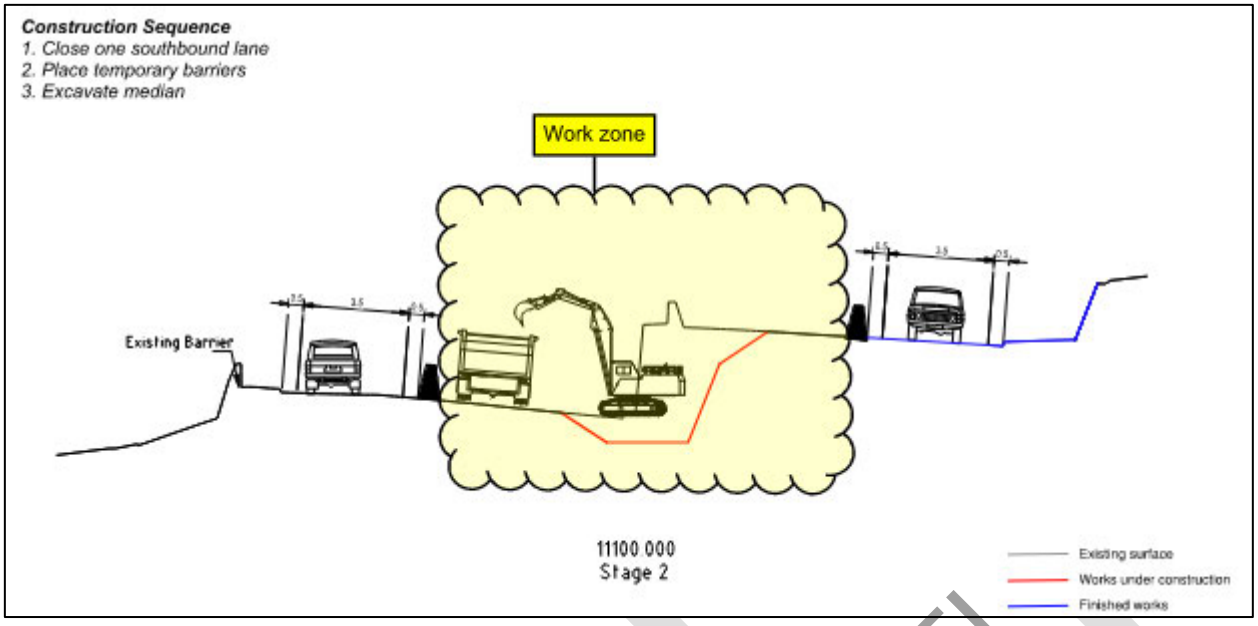


Figure 18 Section 2A – Stage 2

3.2.4 Ch 11 100 - Stage 3

Stage 3 involves:

– Construct the new retaining structure, drainage, and pavement.

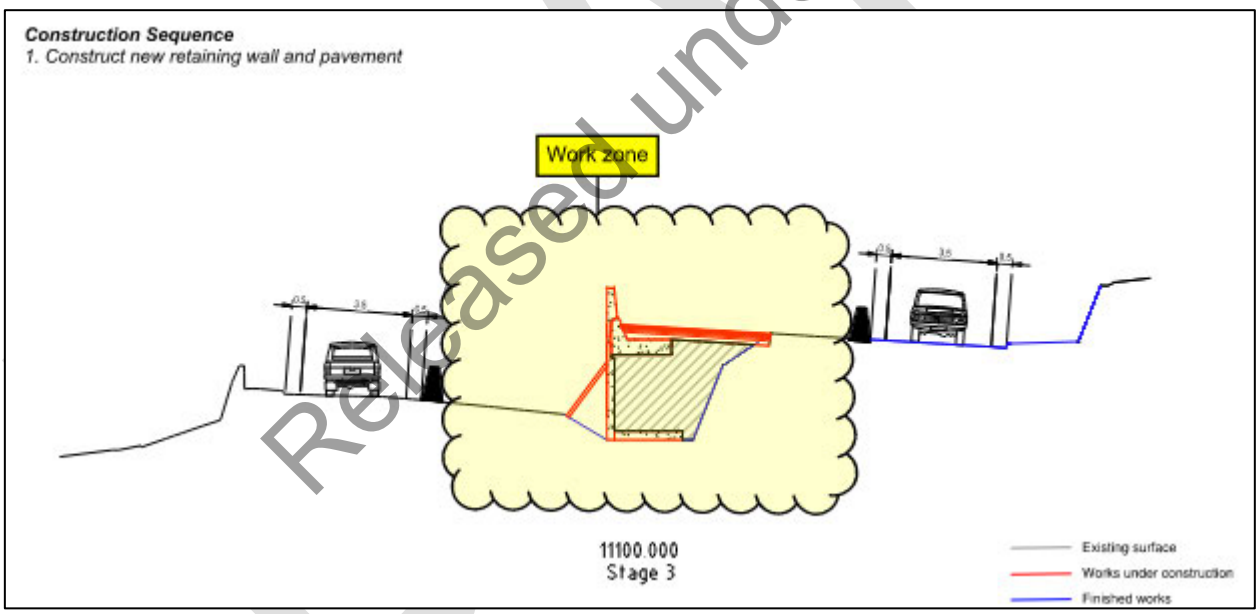


Figure 19 Section 2A Ch 11 100 - Stage 3

3.2.5 Ch 11 100 - Stage 4

Stage 4 involves:

– Removing temporary barriers to northbound carriageway and open to two lanes
– Completing inner southbound works.

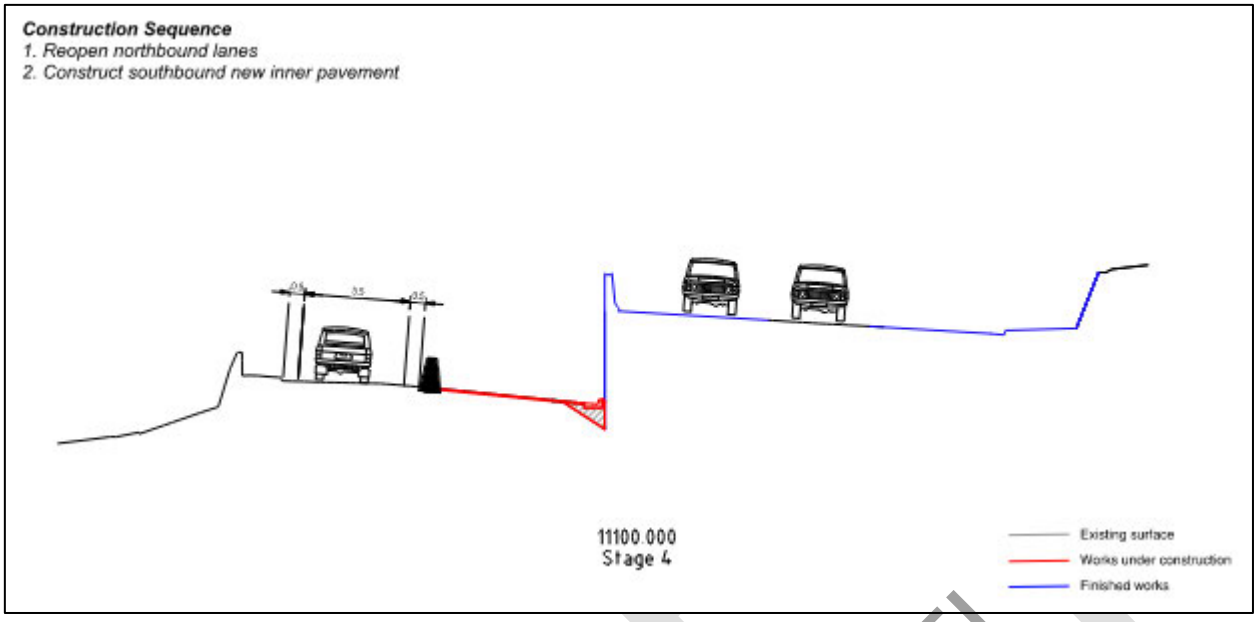


Figure 20 Section 2A Ch 11 100 - Stage 4

3.2.6 Ch 11 100 - Stage 5

Stage 5 involves:

– Swapping southbound traffic to inner lane
– Completion of outer lane and shoulder works.

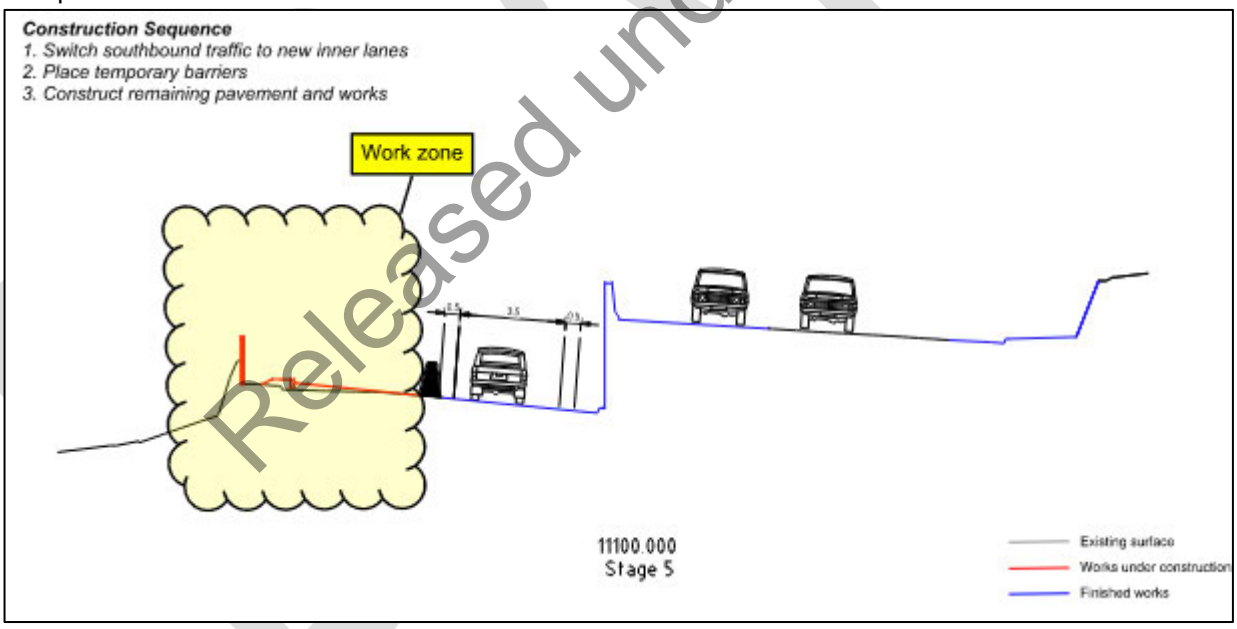


Figure 21 Section 2A Ch 11 100 - Stage 4

3.2.7 Ch 11 100 - Stage 6

Stage 6 involves:

– Remove temporary barriers to southbound carriageway
– Completion of median works, asphalt surfacing, linemarking, and clean-up.

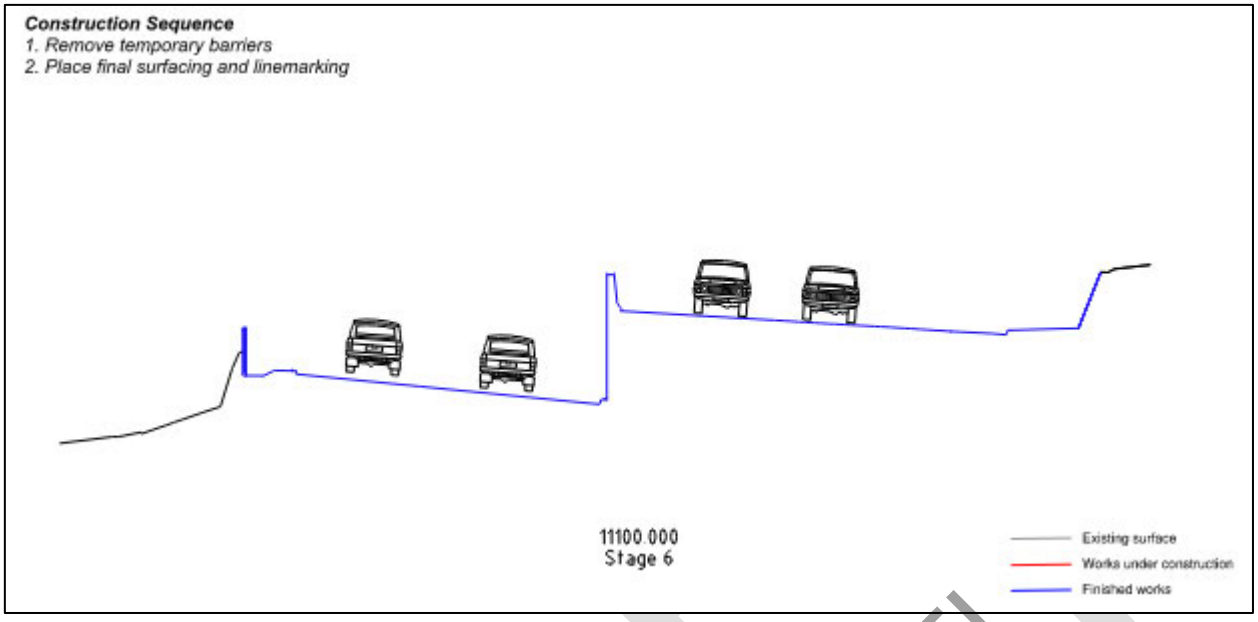


Figure 22 Section 2A Ch 11 100 - Stage 4

3.3 Section 2A – Ch 11 300

Stage 1 is the section from 10 830 to 11 500. It consists of a new central retaining wall, minor pavement widening, and pavement overlay.

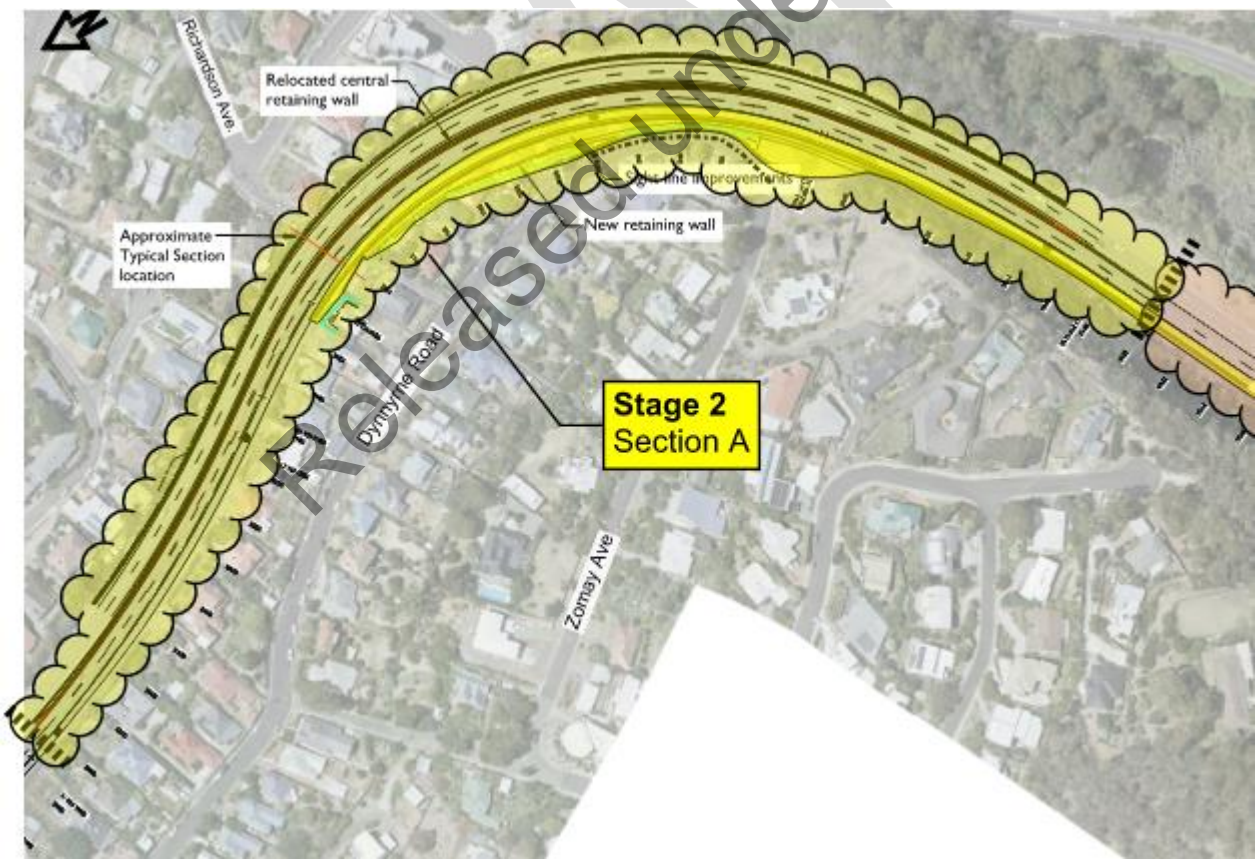


Figure 23 Stage 2 - Section 2A

3.3.1 Ch 11 300 - Stage 0

Stage 0 involves:

– Setting up the site camp and laydown areas
– Installing project signs, VMS signs, or other infrastructure that will be required
– Works around the site that do not need permanent barriers, such as clearing and grubbing and minor earthworks to allow for service relocations
– Removing existing islands and paving them where required for future traffic staging.
– Demolishishg the existing dwellings and use the site for a temporary camp / laydown area.

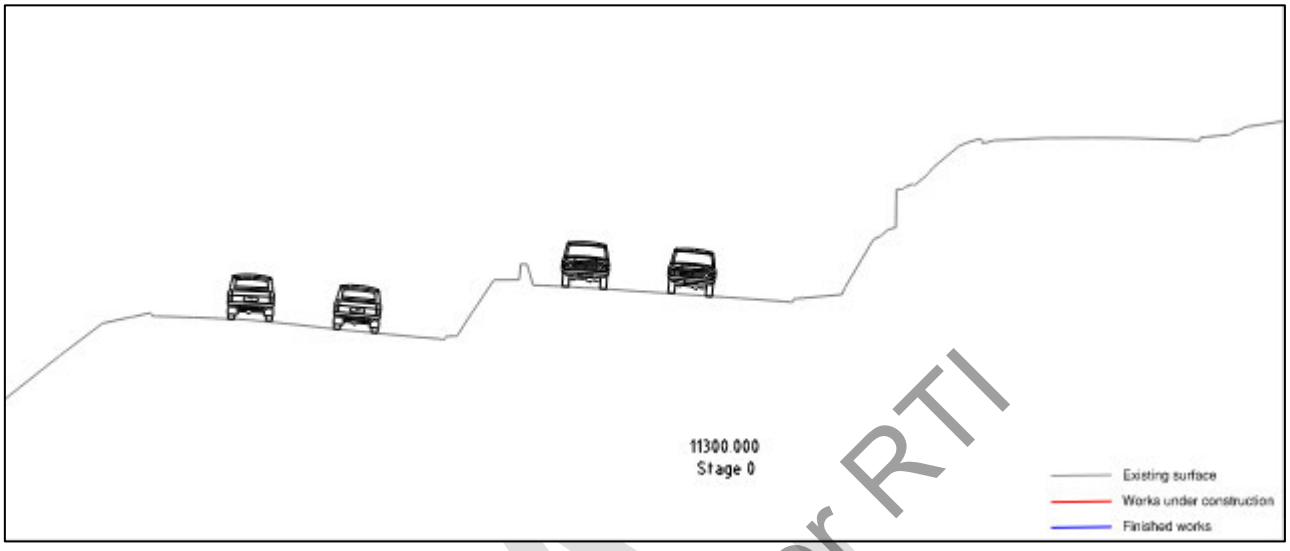


Figure 24 Section 2A – Stage 0

3.3.2 Ch 11 300 - Stage 1

Stage 1 involves:

– Placing temporary barriers and re-line mark the pavements to reduce current lane widths to allow for new works to be constructed on both the Southern Outlet and Dynnyrne Road
– Excavating embankment and construct new retaining wall
– Constructing pavement widening for transit lane
– Constructing temporary pavement widening if required to allow for median retaining wall construction.

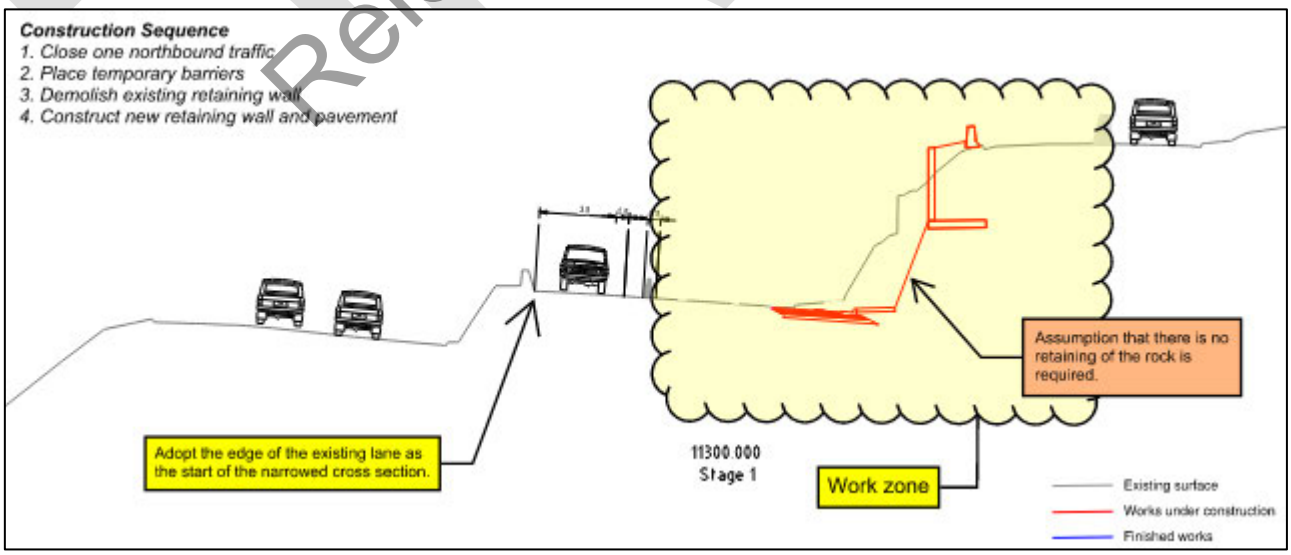


Figure 25 Section 2A – Stage 1

3.3.3 Ch 11 300 - Stage 2

Stage 2 involves:

- Shifting northbound traffic on to new pavement including temporary pavement widening if required
- Placing temporary barriers and re-line mark the southbound pavement to reduce current lane widths to allow for new works to be constructed in the median of the Southern Outlet
- Removing existing rock faced retaining wall and drainage
- Creating a drainage path behind the temporary barriers to all ow the southbound carriageway to drain, note that any rain during this period will be damaging to any works under way
- Constructing the new retaining structure and drainage. Note that this will require southbound lane closures to allow for cranes to setup and move formwork and pre-cast panels and for concrete trucks to park while discharging to concrete pumps
- Constructing new pavement to southbound carriageway.

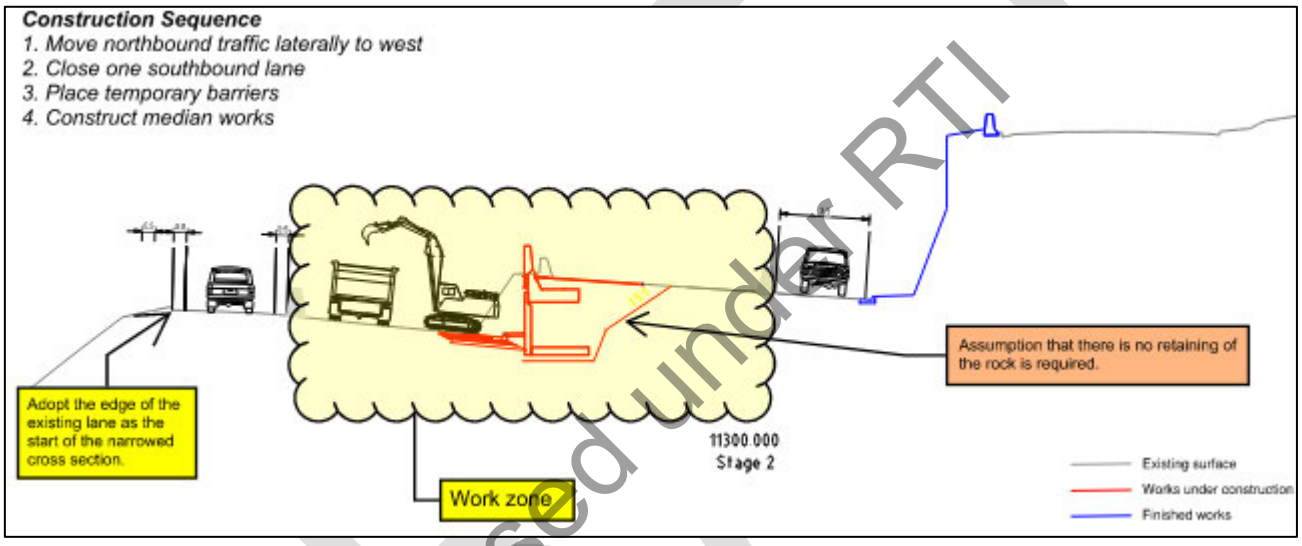


Figure 26 Section 2A – Stage 2

Stage 3 involves:

- Moving traffic laterally to the inner side of the pavement
- Completing construction of the south bound outer lanes northbound

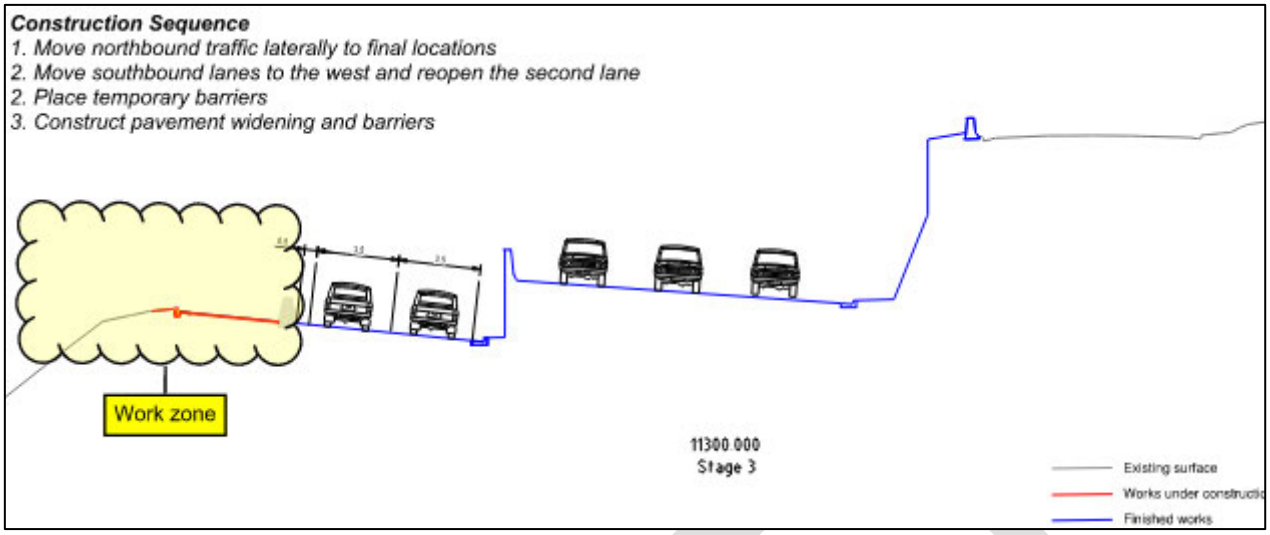


Figure 27 Section 2A – Stage 3

3.3.4 Ch 11 300 - Stage 4

Stage 4 involves:

– Removing temporary barriers to southbound carriageway
– Completion of median works, asphalt surfacing, linemarking, and clean-up.

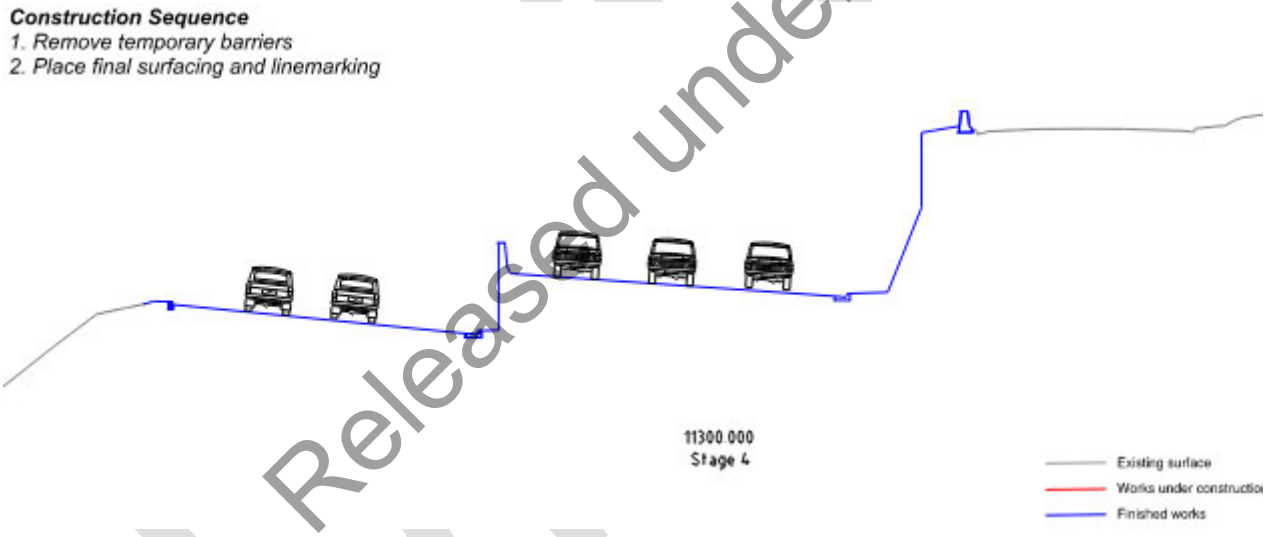


Figure 28 Section 2A – Stage 4

3.4 Section 2B

Stage 2B is the section from 11 500 to 11 770. It consists mostly of minor pavement widening.

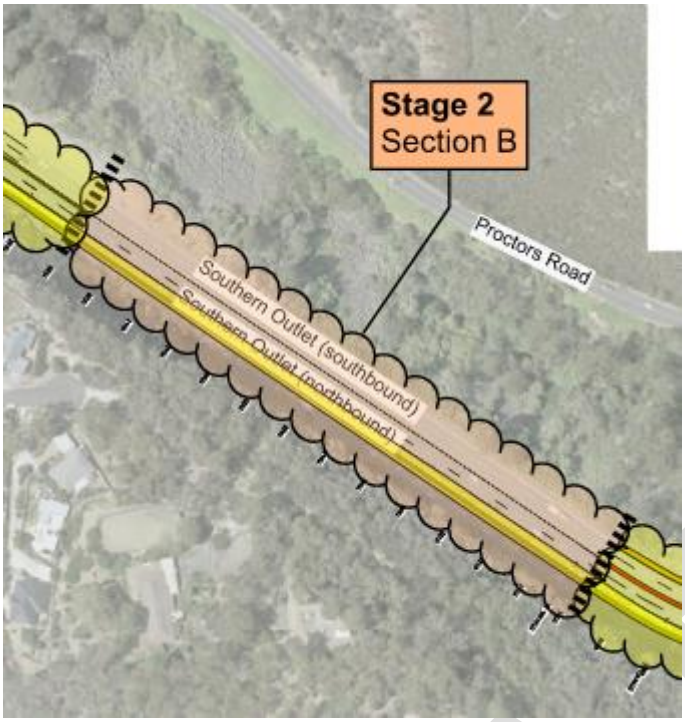


Figure 29 Stage 2 – Section 2B

3.4.1 Ch 11 660 - Stage 0

Stage 0 involves:

- Setting up the site camp and laydown areas
- Installing project signs, VMS signs, or other infrastructure that will be required
- Works around the site that do not need permanent barriers, such as clearing and grubbing and minor earthworks to allow for service relocations
- Removing existing islands and paving them where required for future traffic staging.

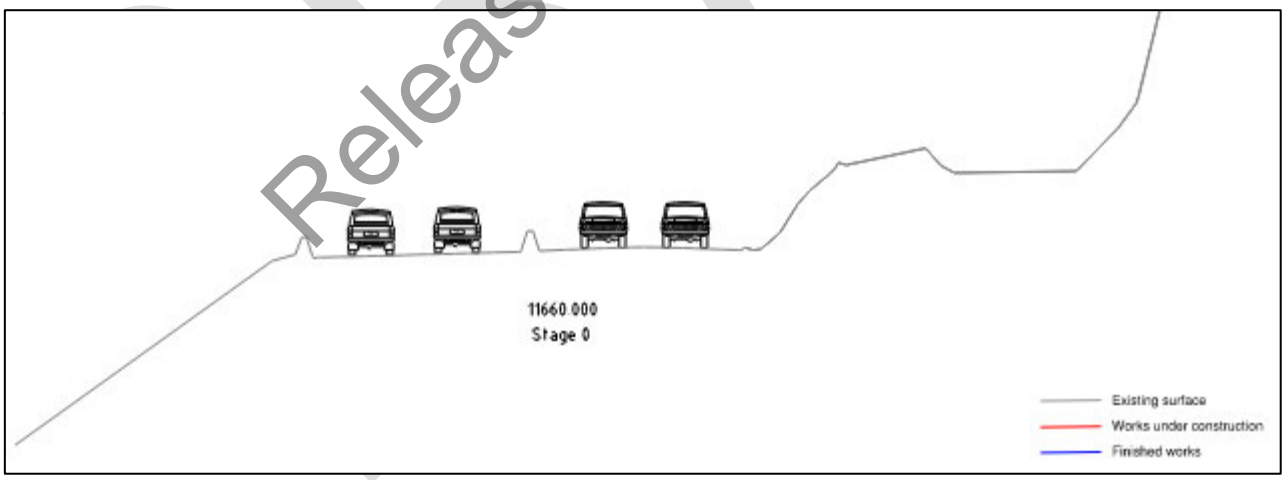


Figure 30 Section 2B – Stage 0

3.4.2 Ch 11 660 - Stage 1

Stage 1 involves:

- Removing the existing median barrier and replace with a temporary barrier

– Placing temporary barriers and re-line mark the pavements to reduce current lane widths to allow for new works to be constructed
– Undertaking the earthworks necessary to cut back the existing embankment
– Constructing new pavement.

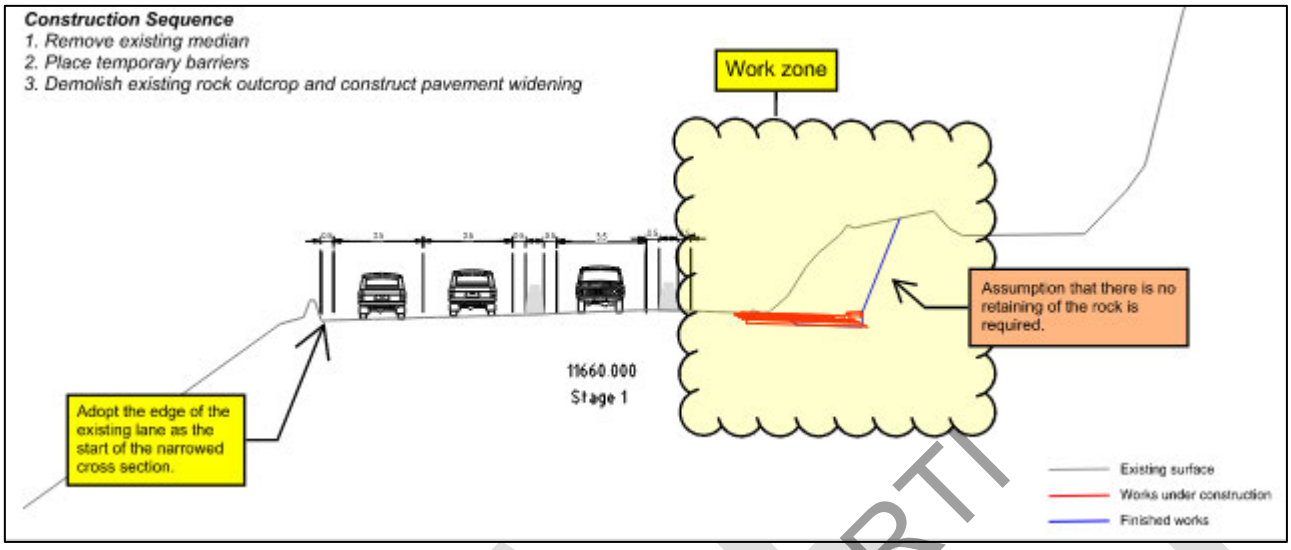


Figure 31 Section 2B – Stage 1

3.4.3 Ch 11 660 - Stage 2

Stage 2 involves:

– Moving the northbound traffic laterally to the west Complete construction of third lane northbound
– Placing temporary barriers and re-line mark the pavements to reduce current lane widths to allow for northbound traffic to be moved laterally west creating workspace for the median works. Note that some works will require to be done off peak to allow for the closure of the southbound inner lane.

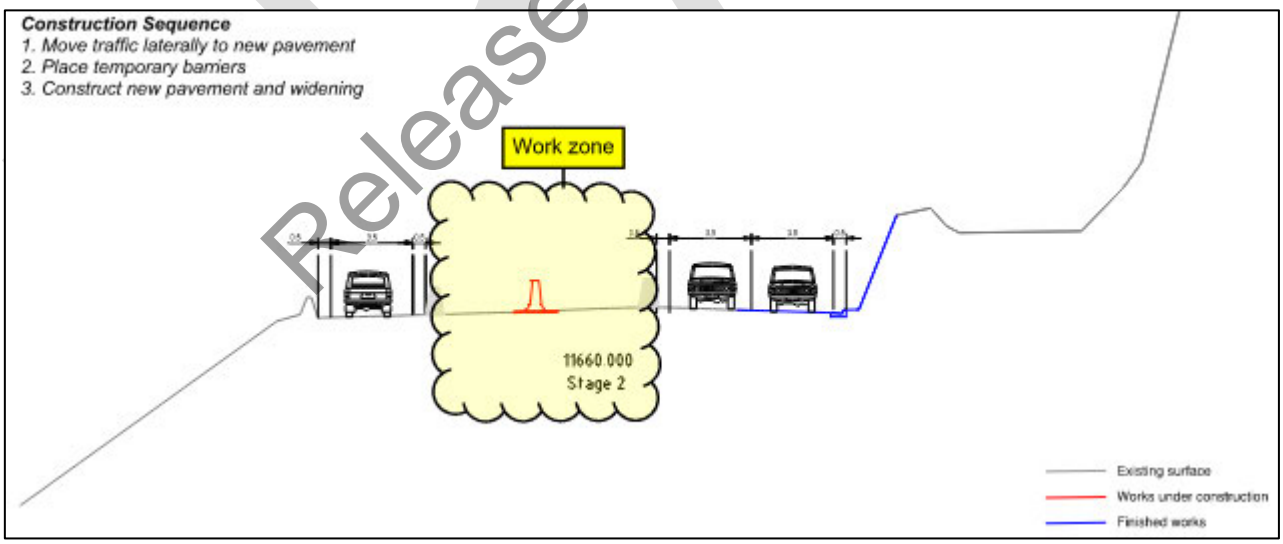


Figure 32 Section 2B – Stage 2 Off Peak Period

3.4.4 Ch 11 660 - Stage 3

Stage 3 involves:

– Removing temporary barriers to southbound carriageway
– Completion of median works, asphalt surfacing, linemarking, and clean-up.

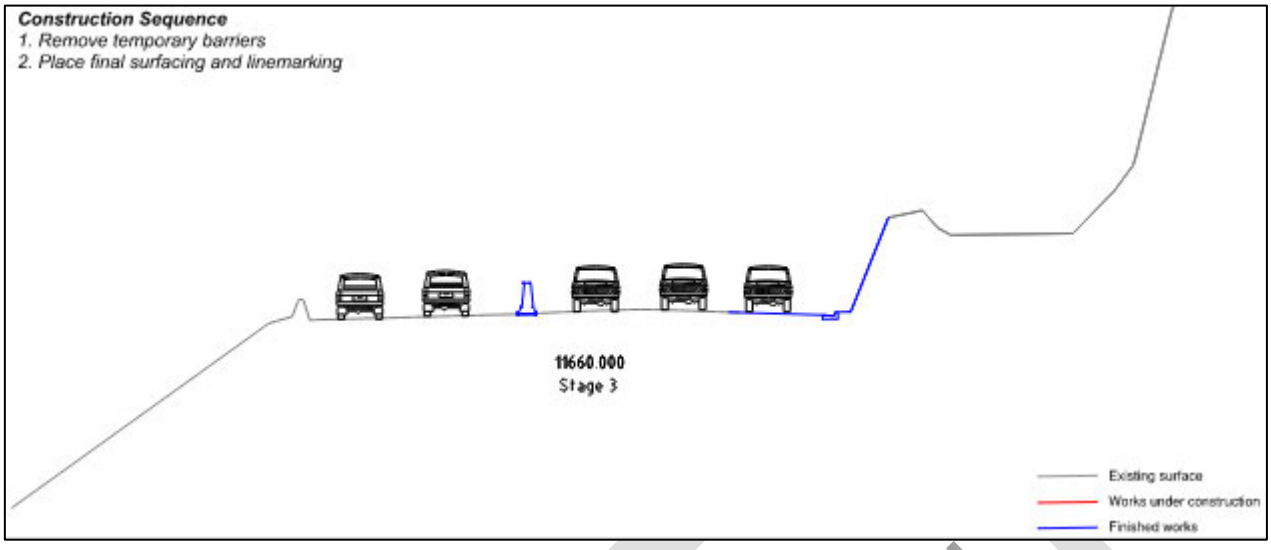


Figure 33 Section 2B – Stage 3

3.5 Section 2C

Stage 2C is the section from 11 770 to 12 190. It consists of minor pavement widening and overlay.

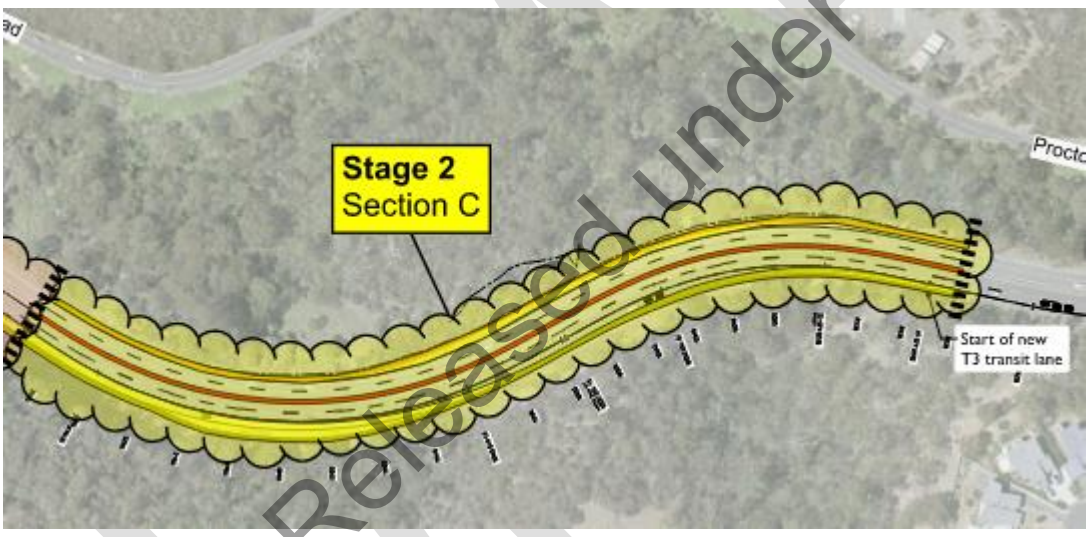


Figure 34 Stage 2 – Section 2B

3.5.1 Ch 12 000 - Stage 0

Stage 0 involves:

- Setting up the site camp and laydown areas
- Installing project signs, VMS signs, or other infrastructure that will be required
- Works around the site that do not need permanent barriers, such as clearing and grubbing and minor earthworks to allow for service relocations
- Removing existing islands and paving them where required for future traffic staging.

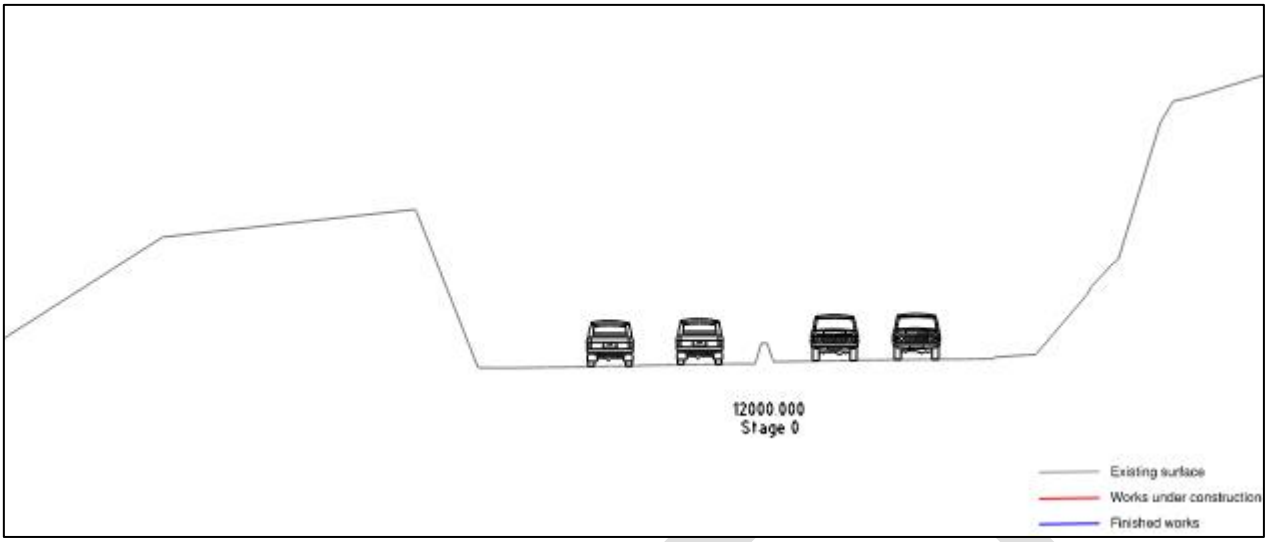


Figure 35 Section 2C – Stage 0

3.5.2 Ch 12 000 - Stage 1

Stage 1 involves:

– Removing the existing median barrier and replace with a temporary barrier
– Placing temporary barriers and re-line mark the pavements to reduce current lane widths to allow for new works to be constructed
– Undertaking the earthworks necessary to remove the rock outcrop
– Constructing new barrier and pavement.

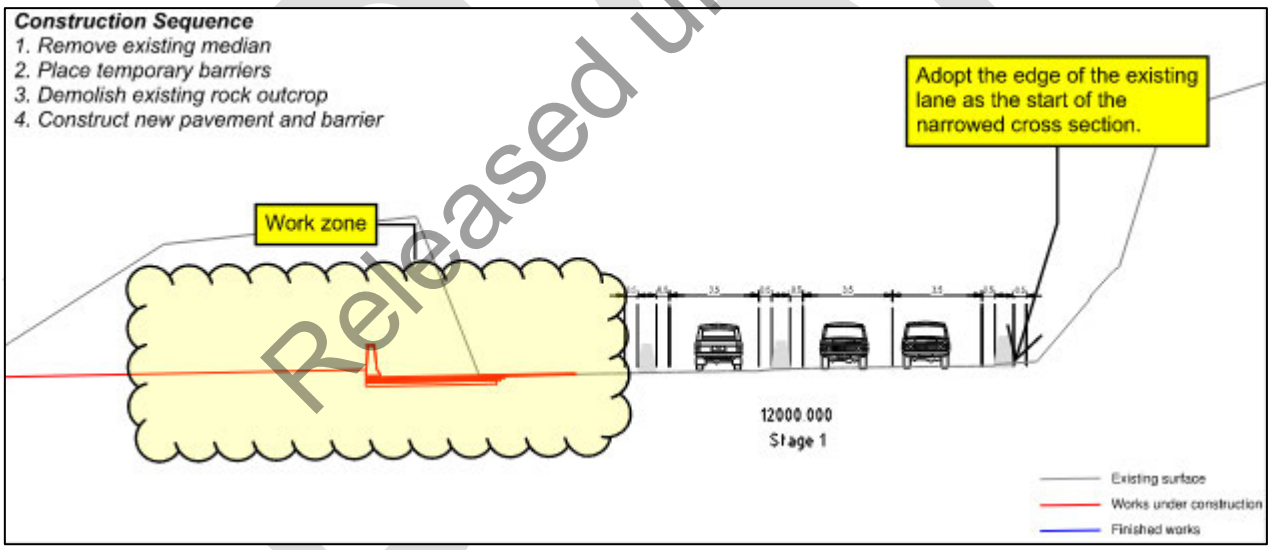


Figure 36 Section 2C – Stage 1

3.5.3 Ch 12 000 - Stage 2

Stage 2 involves.

– Shifting traffic on to new southbound construction
– Placing temporary barriers and re-line mark the pavements to reduce current lane widths to allow for northbound traffic to be moved laterally creating workspace for the western widening
– Constructing pavement widening.

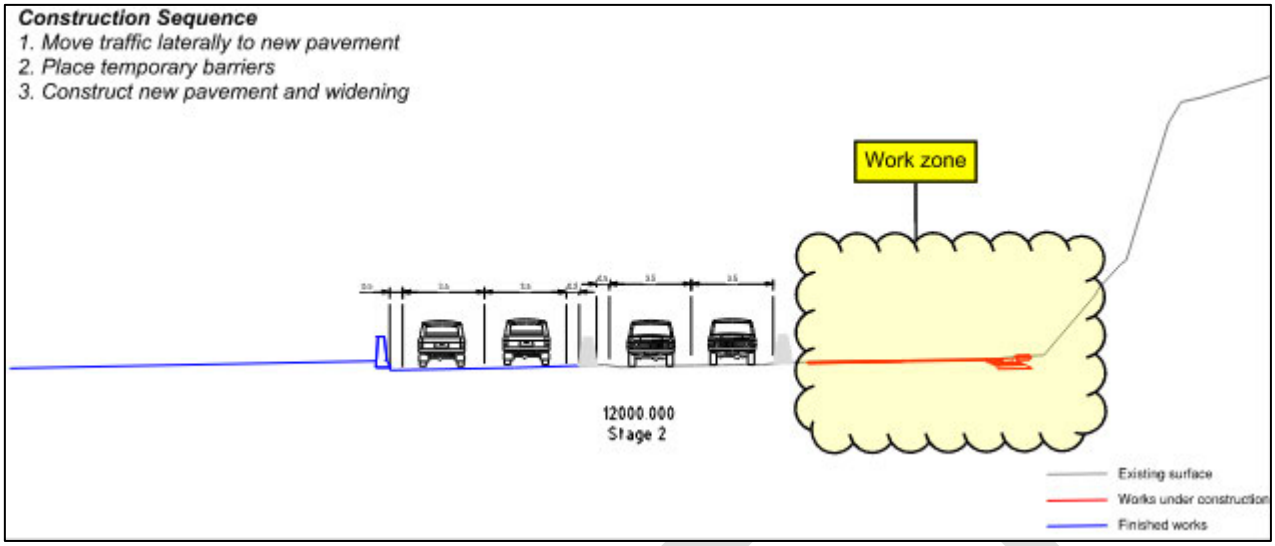


Figure 37 Section 2C – Stage 2

3.5.4 Ch 12 000 - Stage 3

Stage 3 involves:

– Moving the northbound traffic laterally to the west Complete construction of third lane northbound
– Placing temporary barriers and re-line mark the pavements to reduce current lane widths to allow for northbound traffic to be moved laterally west creating workspace for the median works.

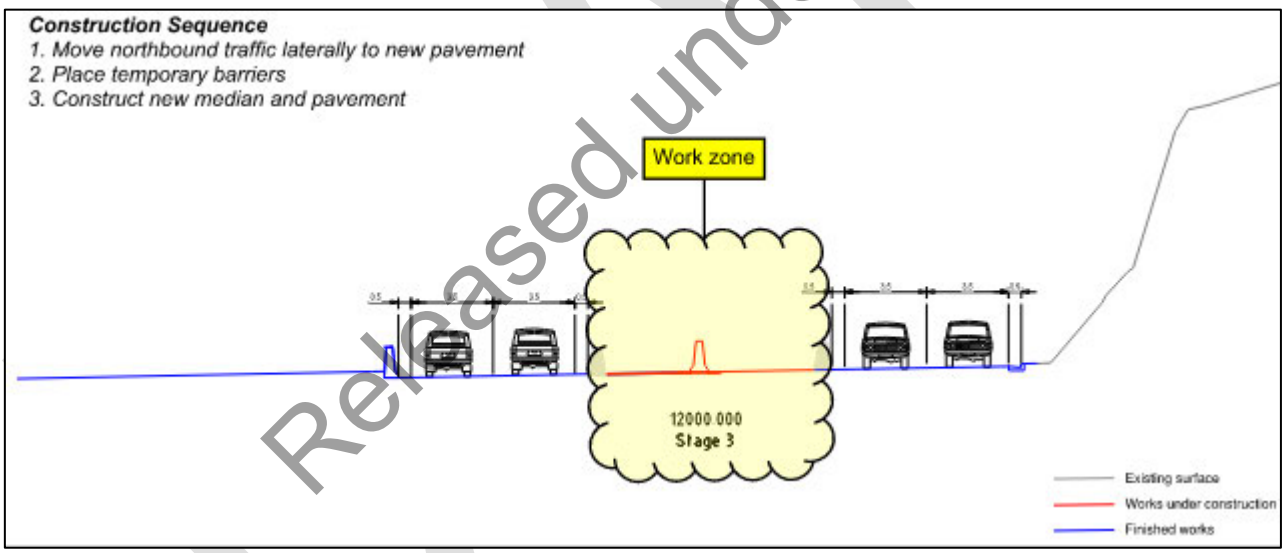


Figure 38 Section 2C – Stage 3

3.5.5 Ch 12 000 - Stage 4

Stage 4 involves:

– Removing temporary barriers to southbound carriageway
– Completion of median works, asphalt surfacing, linemarking, and clean-up.

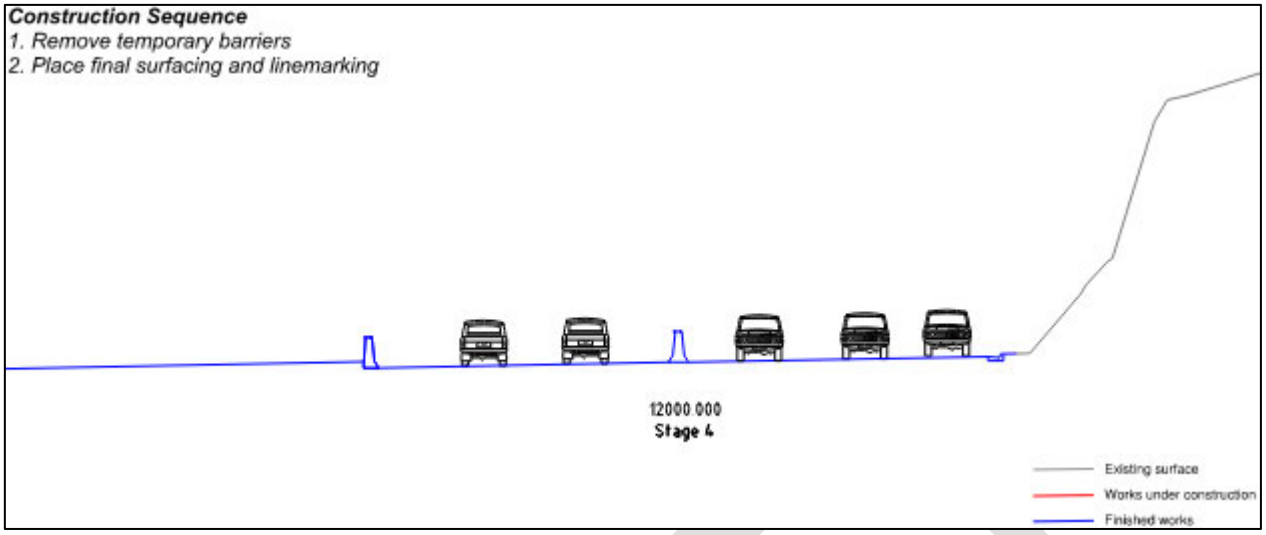


Figure 39 Section 2C – Stage 4

4. Alternative construction staging and sequencing

An alternative construction staging and sequencing strategy was produced to provide an alternative to full time lane closures for Stage 2. This alternative staging is for Stage 2 only.

Stage 2 has been further divided into 3 sections

– Section 2A 10 830 to 11 500 – Contains the new central retaining wall
– Section 2B 11 500 to 11 770 – Contains minor pavement widening
– Section 2C 11 770 to 12 190 – Contains minor pavement widening and overlay.

For the purpose of this assessment, it is assumed that construction of the road infrastructure will be provided in accordance with standard approved construction methods evidenced by similar projects.

The sequence and staging plans are based on maintaining the current level of traffic lanes on the roads for peak times.

The main criteria adopted for the staging methodology in this review are:

– Maintaining the existing number of lanes and capacity to cater for the current traffic volumes
– Reduction in speed limits
– Maintain full functionality of interchange at all times
– Any existing lighting will ideally be maintained during construction. Temporary lighting may be required until final lighting is operational
– New pavement opened to traffic in various stages will be to the layer below the final wearing course to allow for temporary marking and traffic control devices be installed without compromising the integrity and condition of the final AC layer
– Tie-in with existing pavements will need to be carried out under traffic, either off peak or at night by profiling and replacement with deep lift asphalt pavement
– Installation of traffic barriers and construction of temporary pavements in existing medians, islands and roundabouts should be carried out as night work
– Linemarking or flexible delineators (stick and stomps) should be used to separate opposing traffic movements. Construction sites will be delineated and protected as per the requirements of MRTS.02 and the MUTCD
– Barrier protection devices using temporary concrete barriers as a minimum to protect workers, work areas and other road users.

However, there will be instances where the above criteria cannot be met, and these will be highlighted as part of this memorandum.

The staging plans in this memorandum are a high-level overview and do not purport to be comprehensive. The traffic staging plans will need to be developed further to comply with all requirements of the contract and will need to be approved by the Administrator prior to construction.

4.1 Section 2A

Section A is the section from 10 830 to 11 500. It consists of a new central retaining wall, minor pavement widening, and pavement overlay.

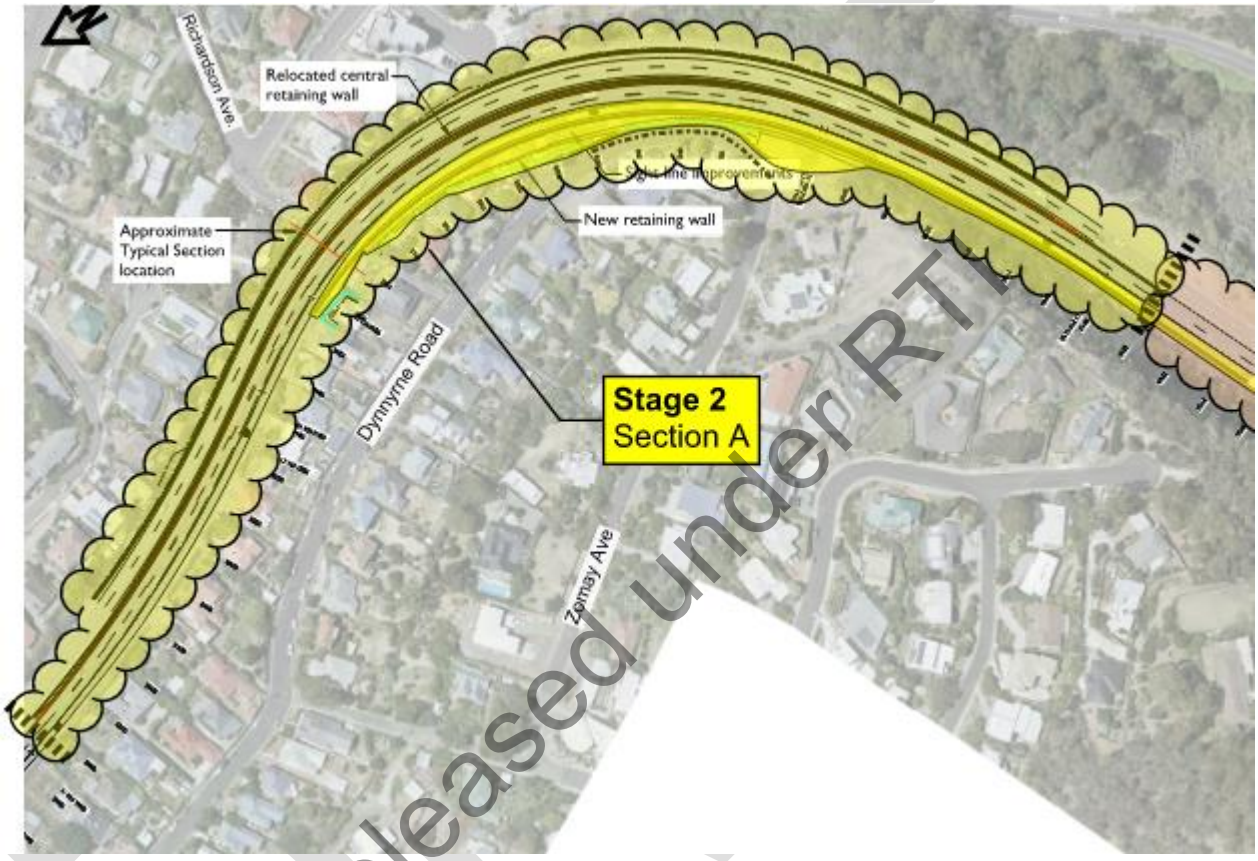


Figure 40 Stage 2 - Section 2A

4.1.1 Ch 11 100 - Stage 0

Stage 0 involves

- Setting up the site camp and laydown areas
- Installing project signs, VMS signs, or other infrastructure that will be required
- Works around the site that do not need permanent barriers, such as clearing and grubbing and minor earthworks to allow for service relocations
- Removing existing islands and paving them where required for future traffic staging.
- Demolish the existing dwellings and use the site for a temporary camp/ laydown area.

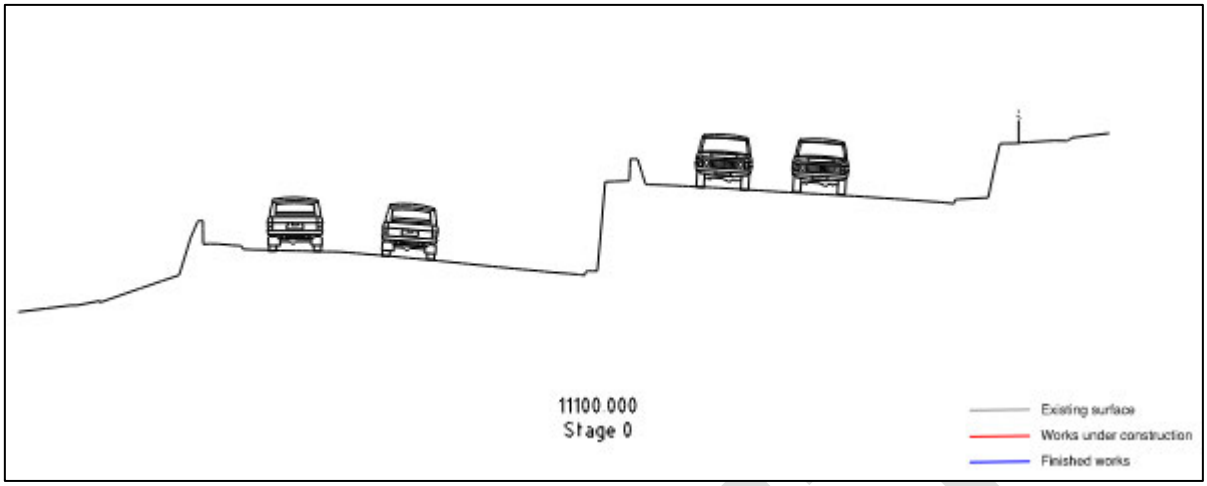


Figure 41 Section 2A Ch 11 100 - Stage 0

4.1.2 Ch 11 100 - Stage 1

Stage 1 involves:

- Placing temporary barriers and re-line mark the pavements to reduce current lane widths to allow for new works to be constructed
- Excavating embankment and construct new retaining wall
- Constructing pavement widening for transit lane
- Constructing temporary pavement widening if required to allow for median retaining wall construction.

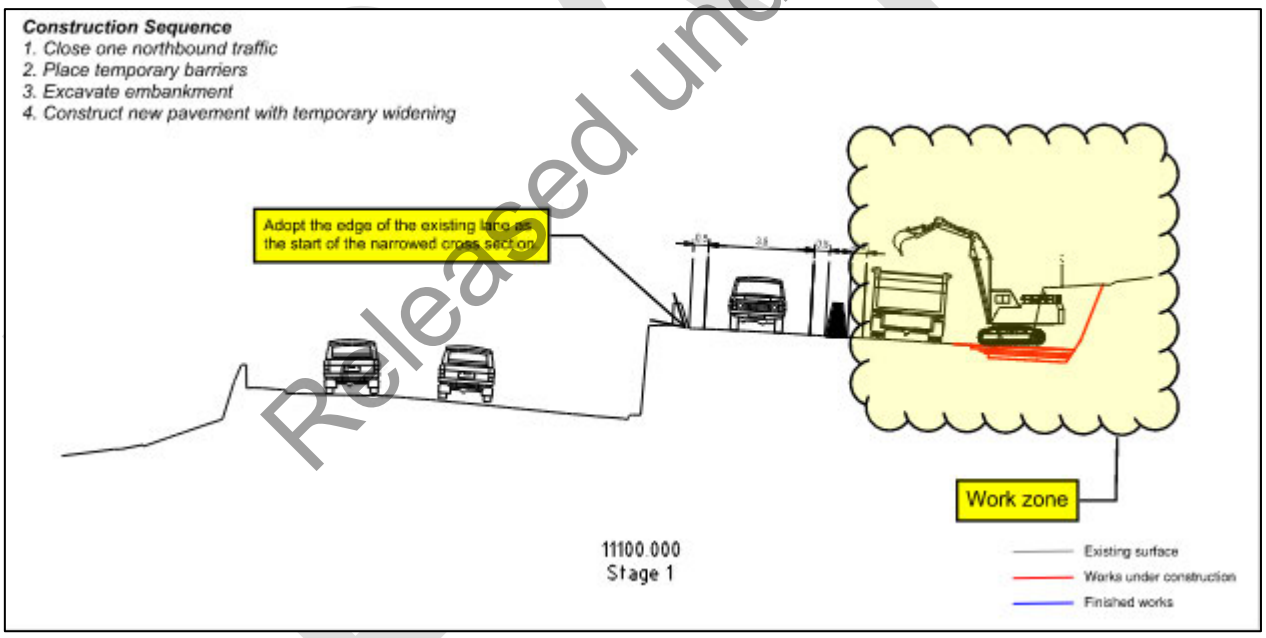


Figure 42 Section 2A Ch 11 100 - Stage 1

There is an option where the lane can be open at peak times by the contractor moving barriers and opening the lane.

4.1.3 Ch 11 100 - Stage 2

Stage 2 involves:

- Shifting northbound traffic on to new pavement including temporary pavement widening if required

– Placing temporary barriers and re-line mark the southbound pavement to reduce current lane widths to allow for new works to be constructed in the median of the Southern Outlet
– Removing existing rock faced retaining wall and drainage
– Constructing the new retaining structure and drainage. Note that this will require southbound lane closures to allow for cranes to setup and move formwork and pre-cast panels and for concrete trucks to park while discharging to concrete pumps
– Constructing new pavement to southbound carriageway.

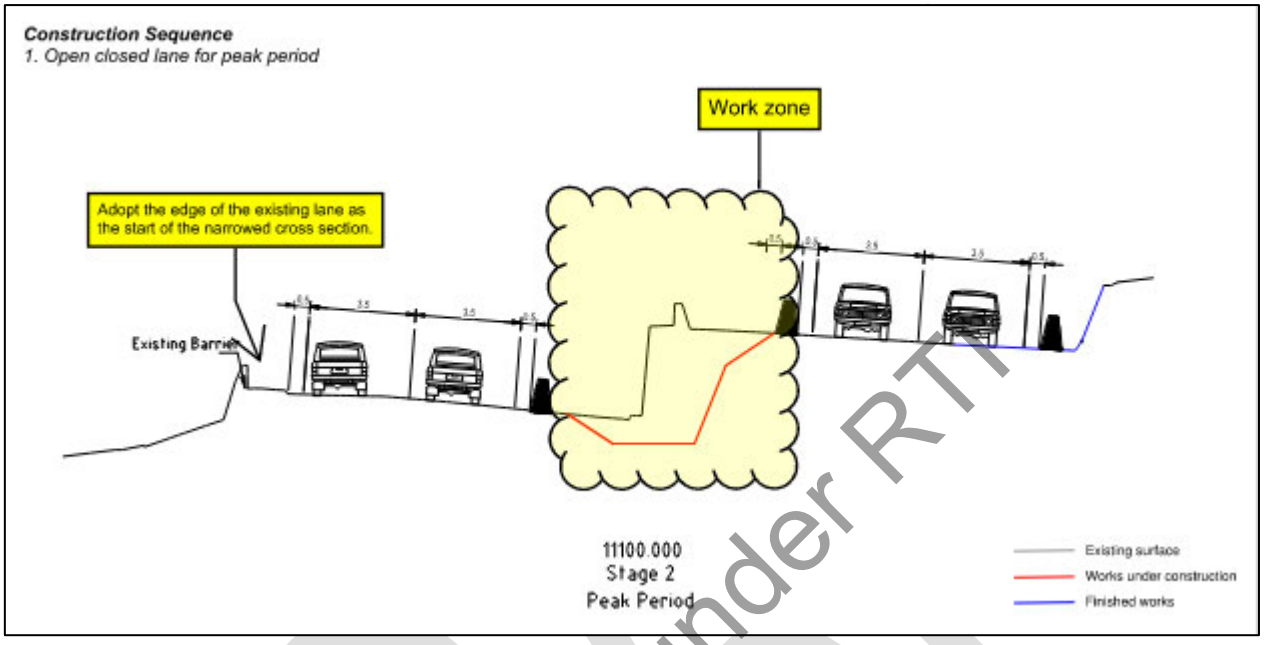


Figure 43 Section 2A Ch 11 100 - Stage 2 Peak Period

– In approved off peak times, temporarily close one southbound traffic lane to allow machinery and material access to the work space.

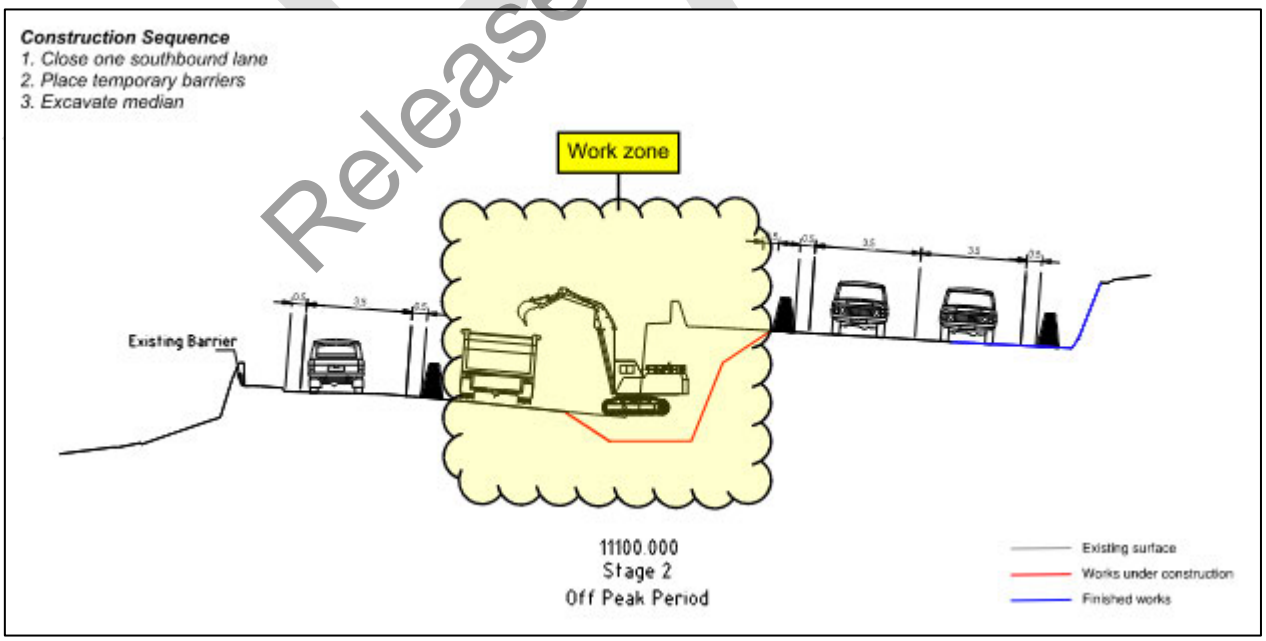


Figure 44 Section 2A Ch 11 100 - Stage 2 – Off Peak Period

4.1.4 Ch 11 100 - Stage 3

Stage 3 involves:

– Completing construction of the median retaining wall, drainage, and pavement works
– Two southbound lanes could remain open as the contractor will most likely access from the west side.

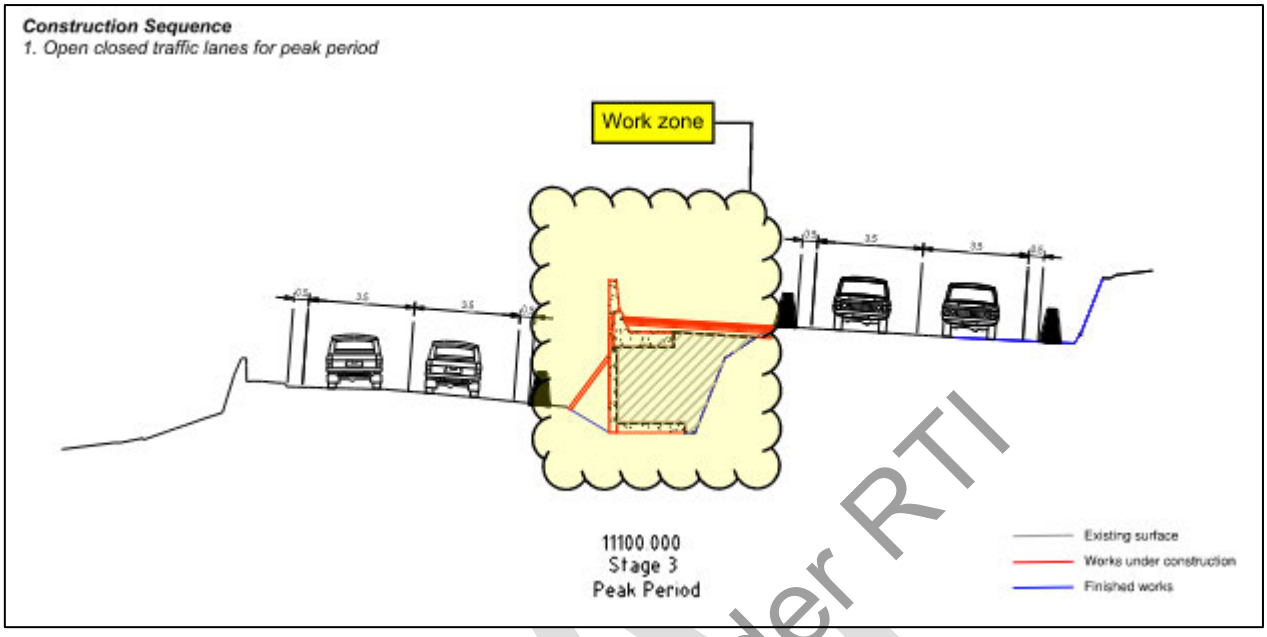


Figure 45 Section 2A Ch 11 100 - Stage 3 peak

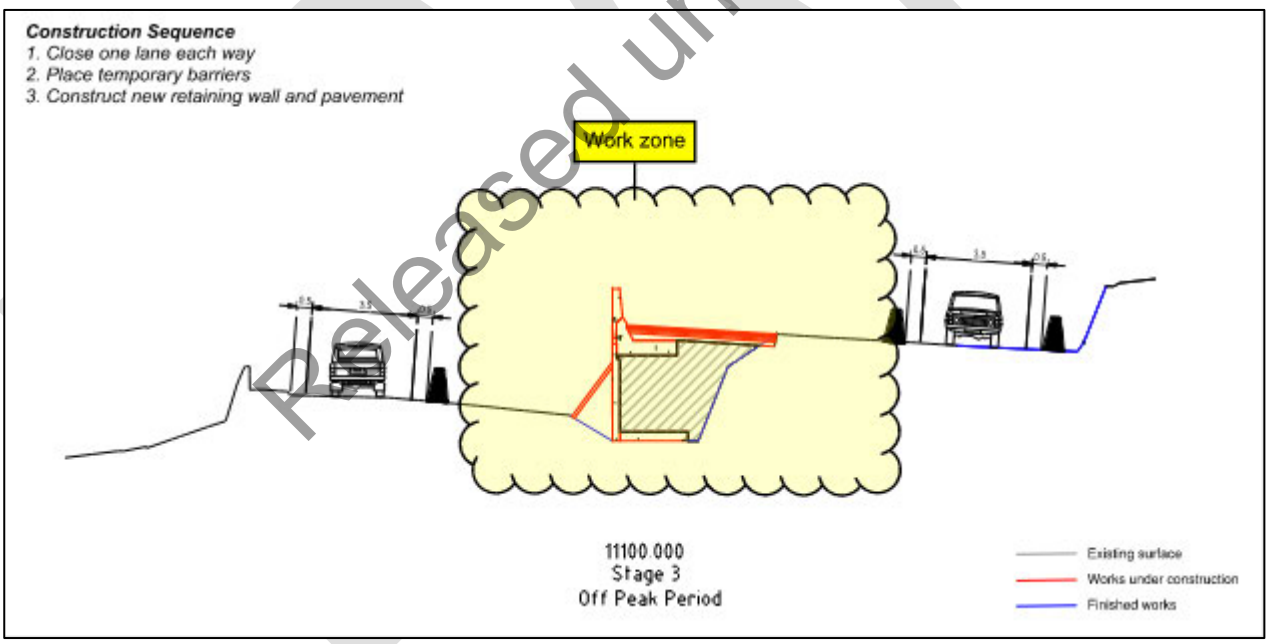


Figure 46 Section 2A Ch 11 100 - Stage 3 Off peak

4.1.5 Ch 11 100 - Stage 4

Stage 4 involves:

– Opening closed northbound lane and realign to median to allow northbound shoulder works to be completed
– Completion of southbound inner lane works.

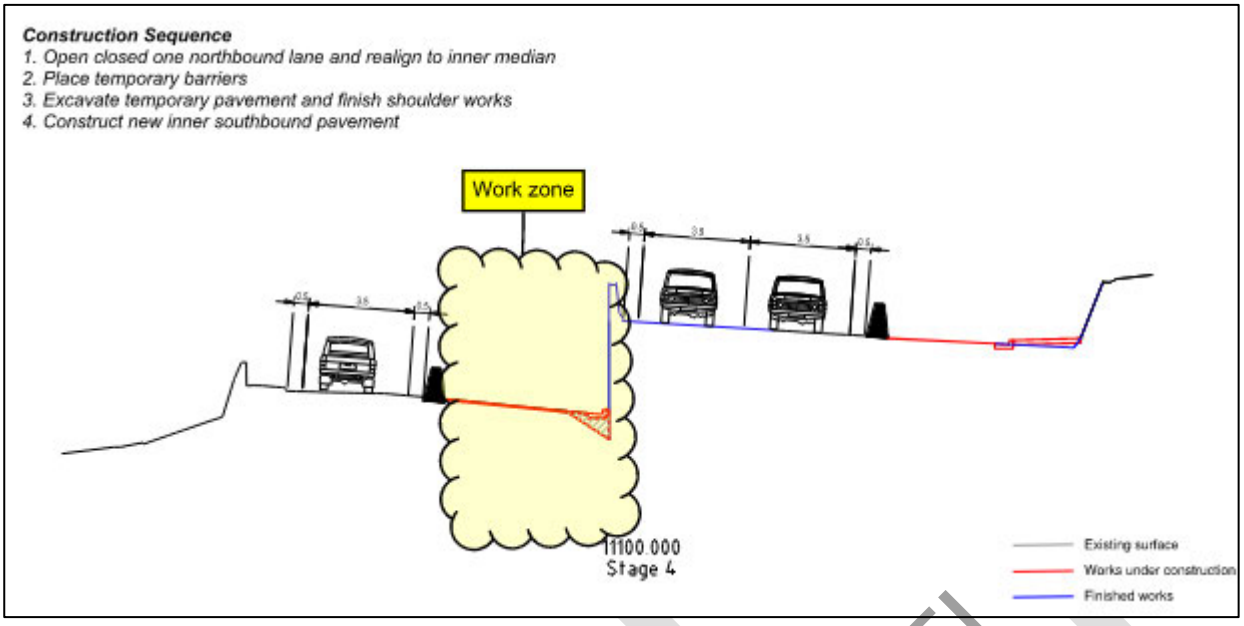


Figure 47 Section 2A Ch 11 100 – Stage 4

4.1.6 Ch 11 100 - Stage 5

Stage 5 involves:

– Swapping southbound traffic to completed inner lane
– Completion of outer lane and shoulder works.

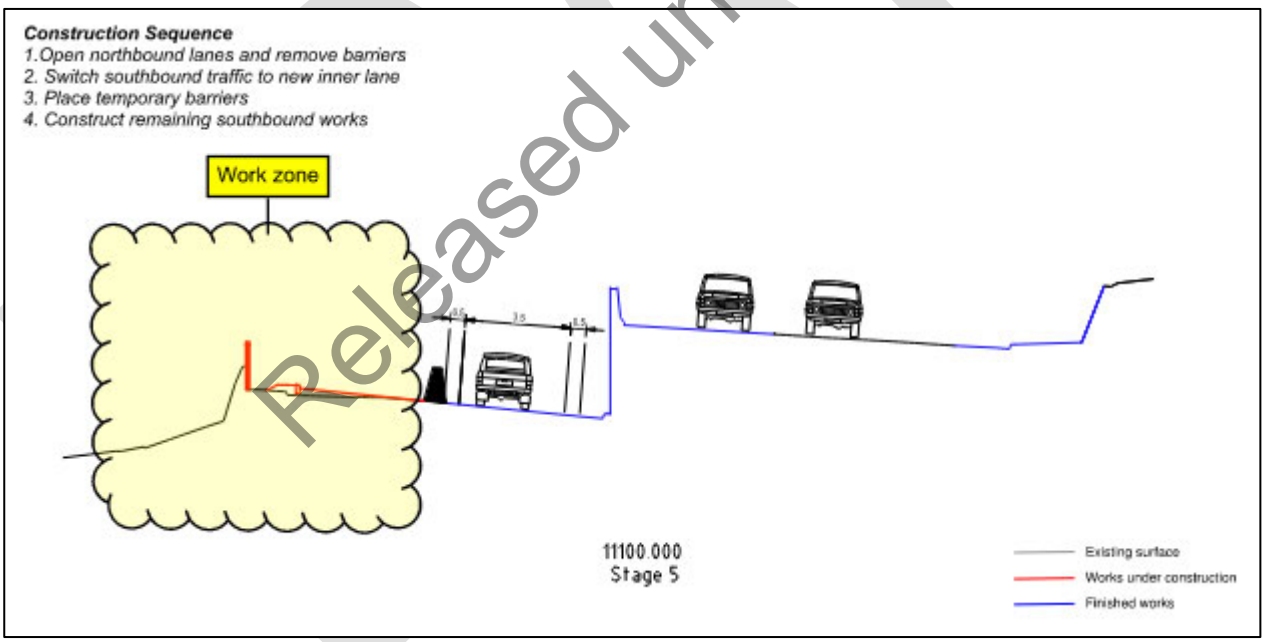


Figure 48 Section 2A Ch 11 100 - Stage 5

4.1.7 Ch 11 100 - Stage 6

Stage 6 involves:

– Removing temporary barriers to southbound carriageway
– Completion of median works, asphalt surfacing, linemarking, and clean-up.

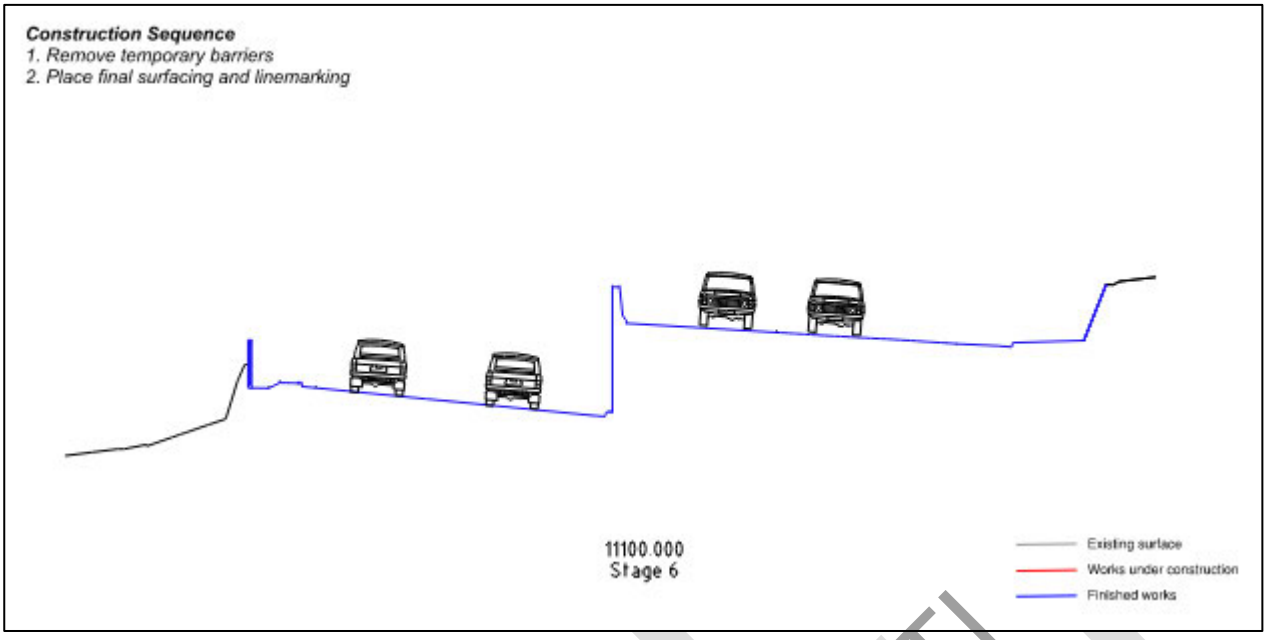


Figure 49 Section 2A Ch 11 100 - Stage 6

4.1.8 Ch 11 300 - Stage 0

Stage 0 involves:

- Setting up the site camp and laydown areas
- Installing project signs, VMS signs, or other infrastructure that will be required
- Works around the site that do not need permanent barriers, such as clearing and grubbing and minor earthworks to allow for service relocations
- Removing existing islands and paving them where required for future traffic staging.
- Demolish the existing dwellings and use the site for a temporary camp/ laydown area.

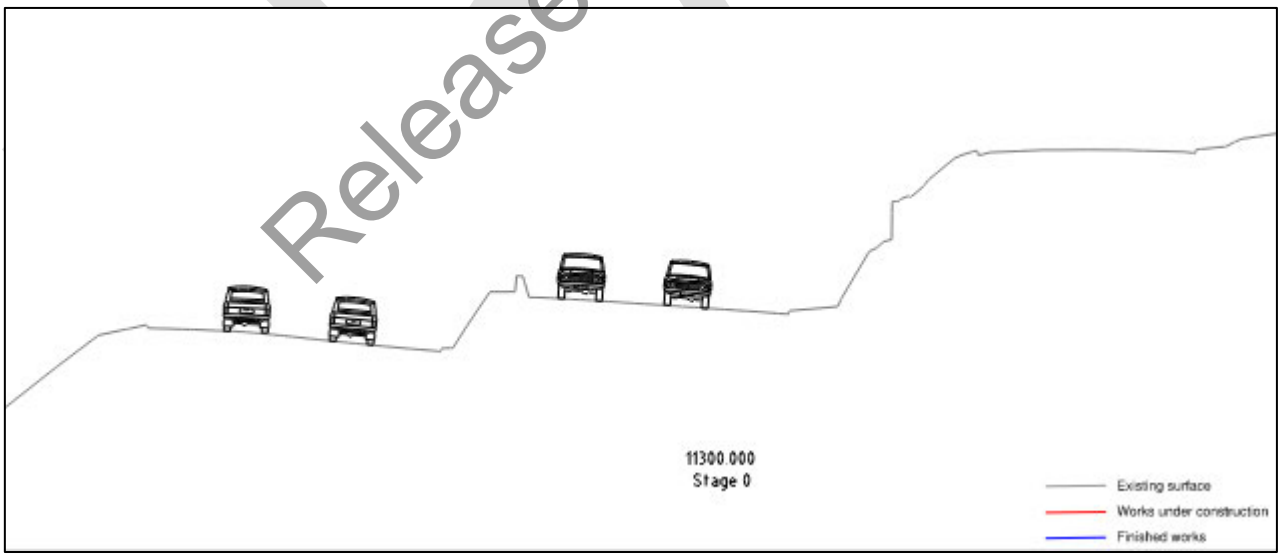


Figure 50 Section 2A Ch 11 300 - Stage 0

4.1.9 Ch 11 300 - Stage 1

Stage 1 involves:

– Placing temporary barriers and re-line mark the pavements to reduce current lane widths to allow for new works to be constructed on both the Southern Outlet and Dynnyrne Road
– Excavating embankment and construct new retaining wall
– Constructing pavement widening for transit lane
– Constructing temporary pavement widening if required to allow for median retaining wall construction.

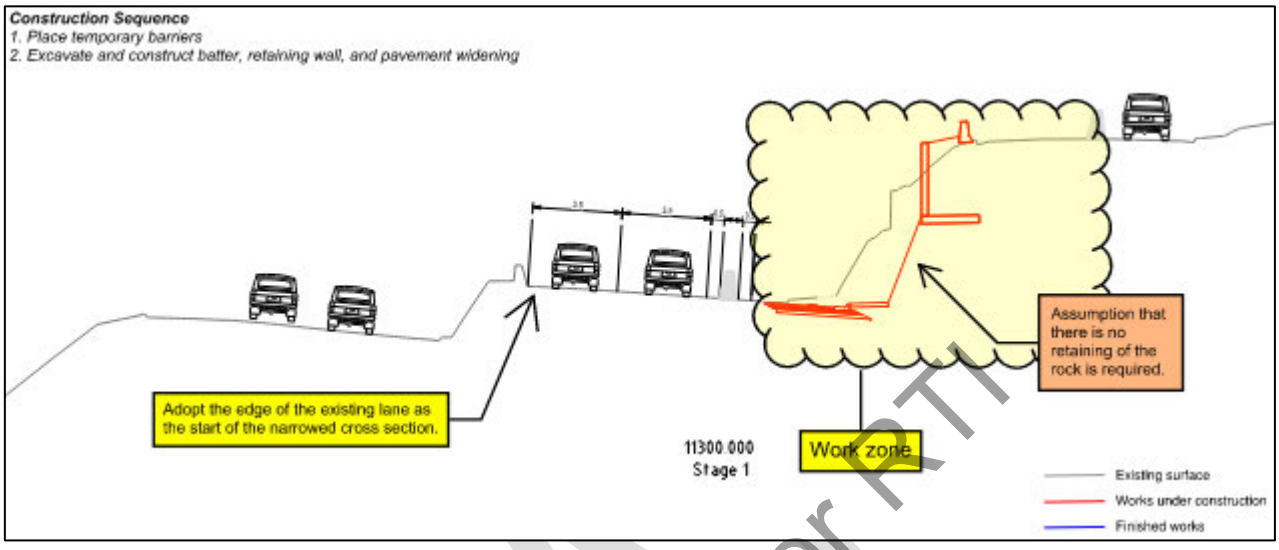


Figure 51 Section 2A Ch 11 300 - Stage 1

– In approved off peak times, temporarily close one northbound traffic lane to allow machinery and material access to the work space.

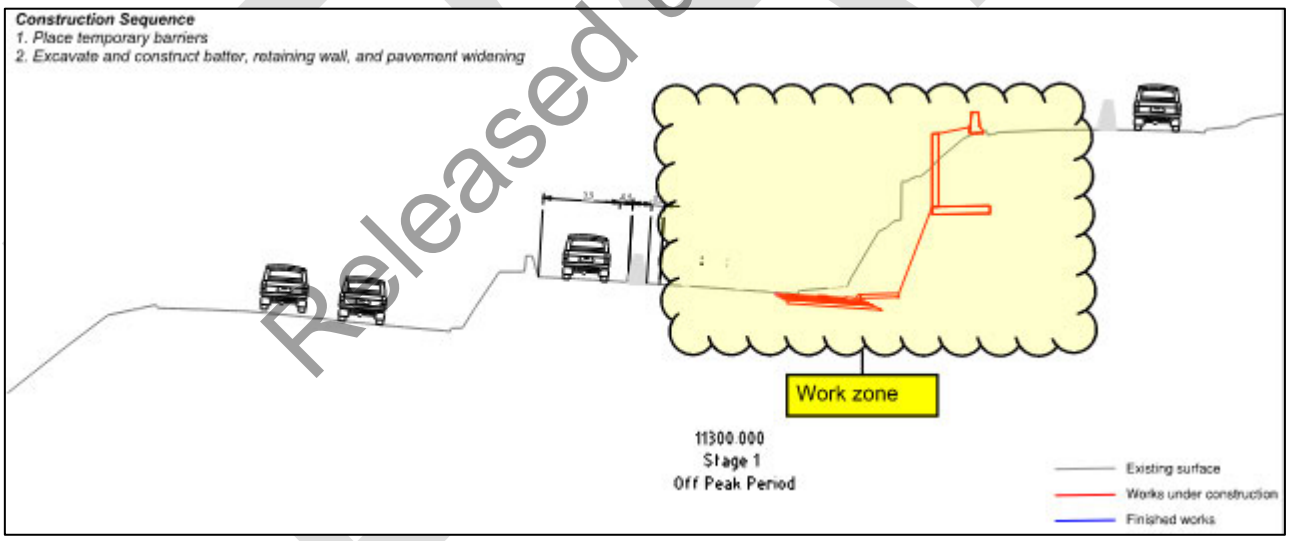


Figure 52 Section 2A Ch 11 300 - Stage 1 off peak

4.1.10 Ch 11 300 - Stage 2

Stage 2 involves:

– Shifting northbound traffic on to new pavement including temporary pavement widening if required
– Placing temporary barriers and re-line mark the southbound pavement to reduce current lane widths to allow for new works to be constructed in the median of the Southern Outlet
– Removing existing rock faced retaining wall and drainage

– Creating a drainage path behind the temporary barriers to all ow the southbound carriageway to drain, note that any rain during this period will be damaging to any works under way
– Constructing the new retaining structure and drainage. Note that this will require southbound lane closures to allow for cranes to setup and move formwork and pre-cast panels and for concrete trucks to park while discharging to concrete pumps
– Constructing new pavement to southbound carriageway.

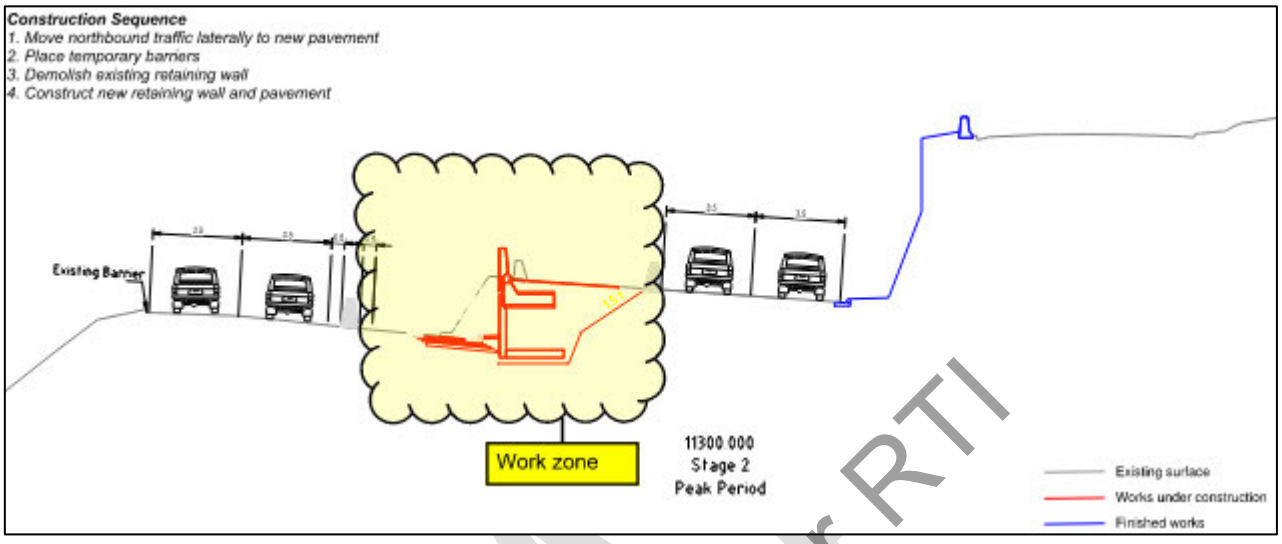


Figure 53 Section 2A Ch 11 300 - Stage 2 Peak Period

– In approved off peak times, temporarily close one southbound traffic lane to allow machinery and material access to the work space.

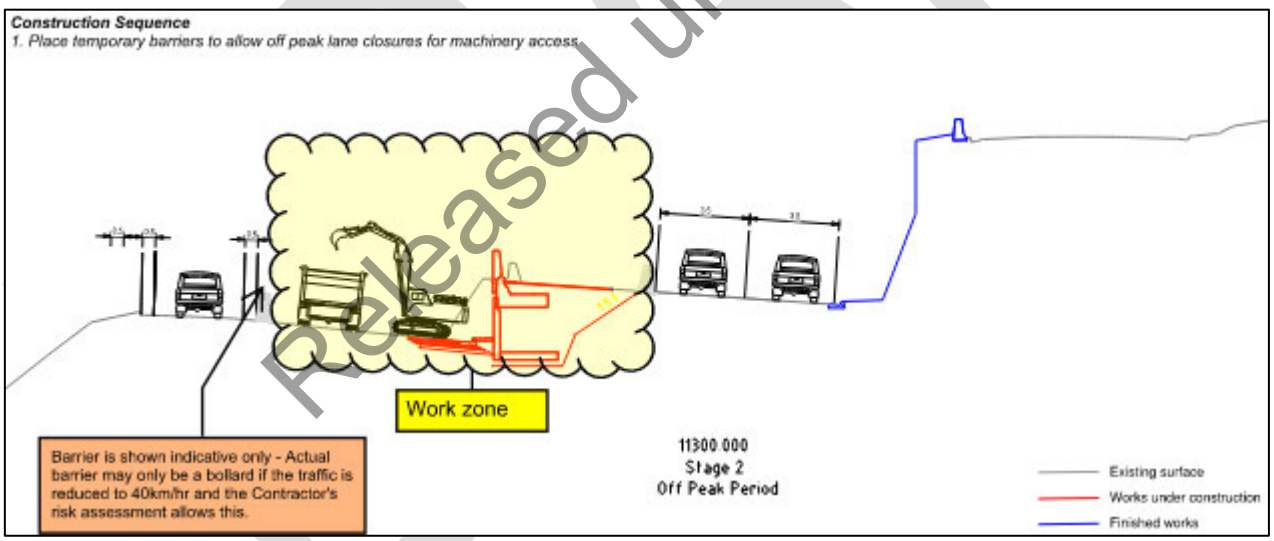


Figure 54 Section 2A Ch 11 300 - Stage 2 – Off Peak Period

4.1.11 Ch 11 300 - Stage 3

Stage 3 involves:

– Moving traffic laterally to the inner side of the pavement
– Completing construction of the south bound outer lanes northbound

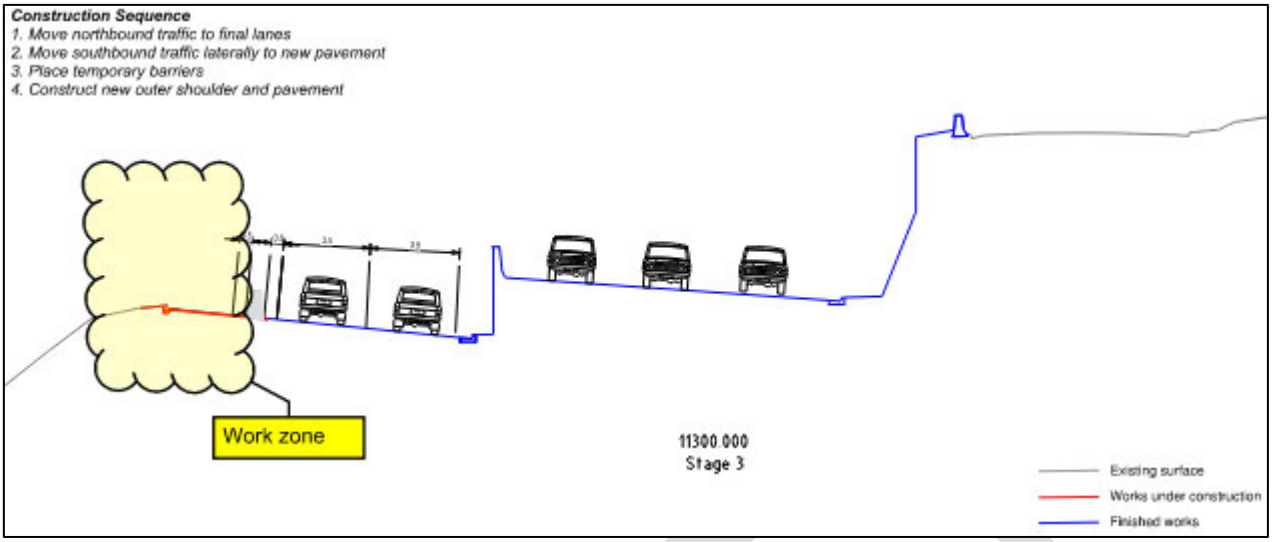


Figure 55 Section 2A Ch 11 300 - Stage 3

4.1.12 Ch 11 300 - Stage 4

Stage 4 involves:

– Removing temporary barriers to southbound carriageway
– Completion of median works, asphalt surfacing, linemarking, and clean-up.

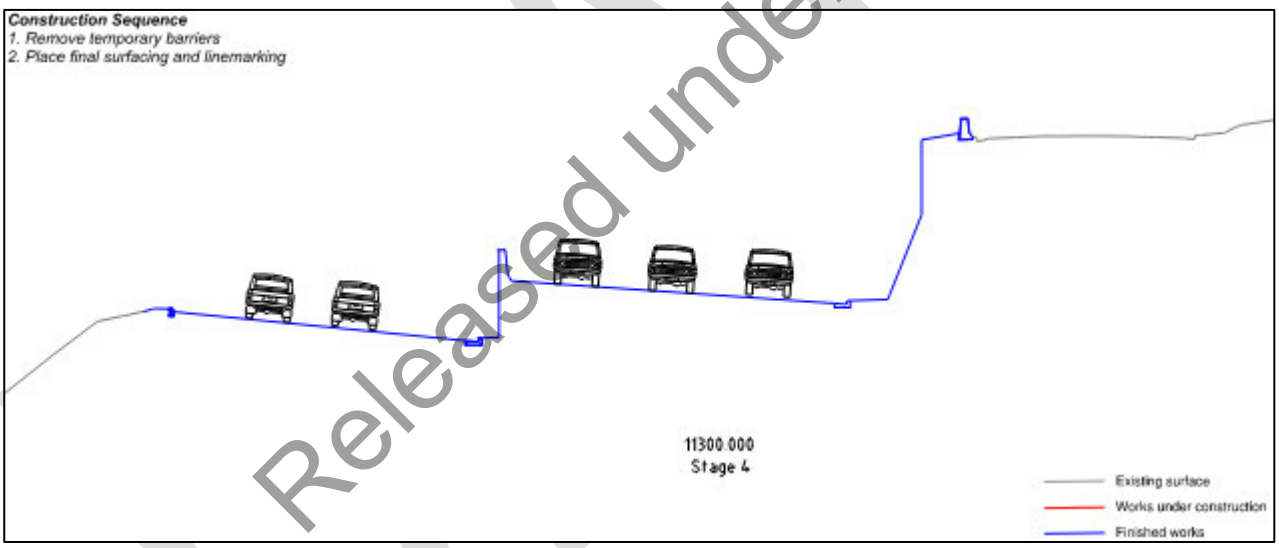


Figure 56 Section 2A Ch 11 300 - Stage 4

4.2 Section 2B

Section 2B is the section from 11 500 to 11 770. It consists mostly of minor pavement widening.

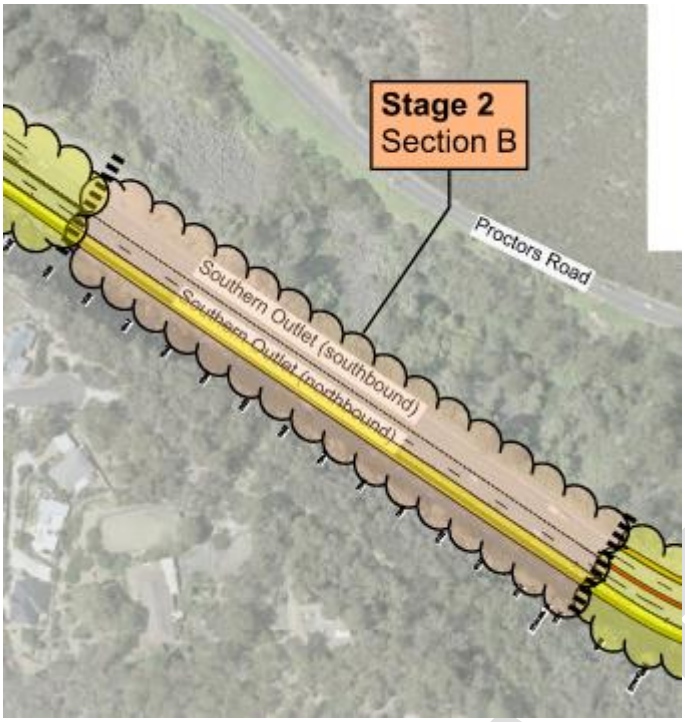


Figure 57 Stage 2 – Section 2B

4.2.1 Stage 0

Stage 0 involves:

- Setting up the site camp and laydown areas
- Installing project signs, VMS signs, or other infrastructure that will be required
- Works around the site that do not need permanent barriers, such as clearing and grubbing and minor earthworks to allow for service relocations
- Removing existing islands and paving them where required for future traffic staging.

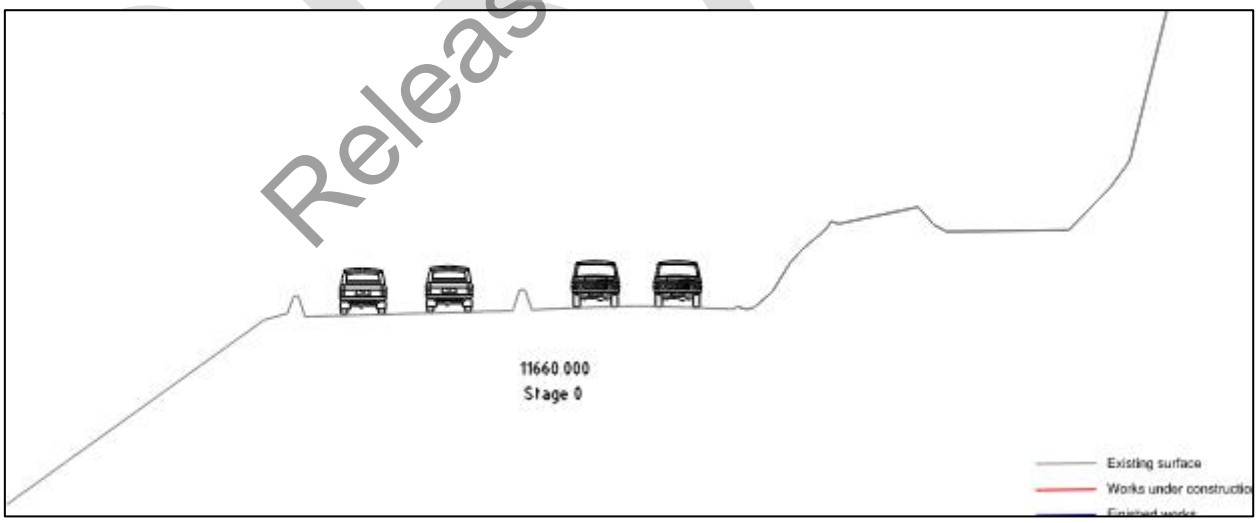


Figure 58 Section 2B – Stage 0

4.2.2 Stage 1

Stage 1 involves:

- Removing the existing median barrier and replace with a temporary barrier

– Placing temporary barriers and re-line mark the pavements to reduce current lane widths to allow for new works to be constructed
– Undertaking the earthworks necessary to cut back the existing embankment. Machinery can work behind barriers and stockpile on site in preparation for a lane closure.

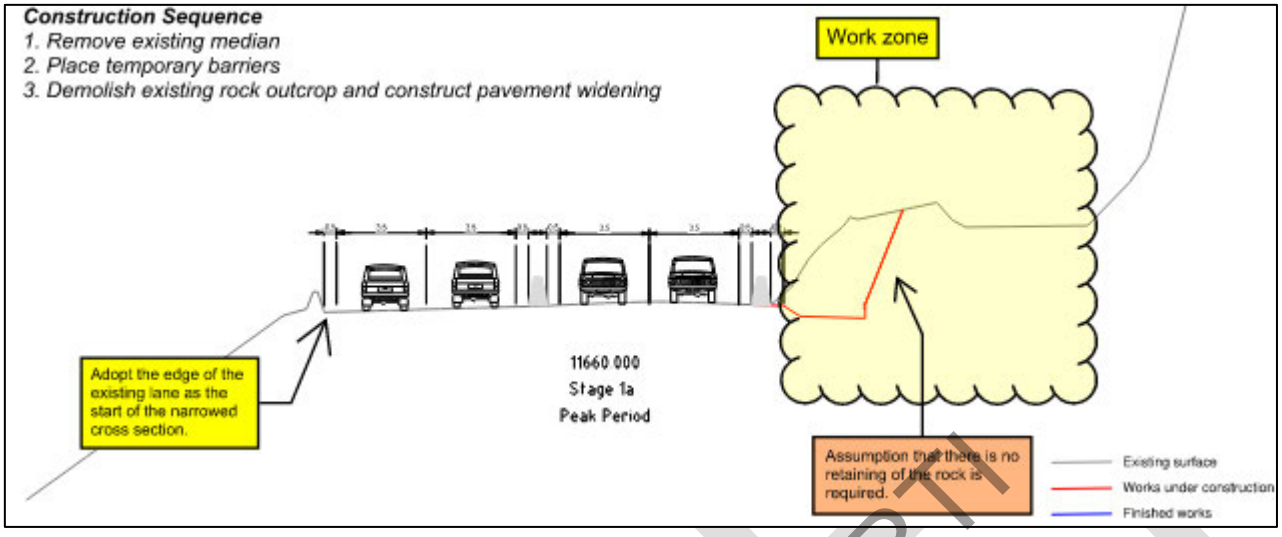


Figure 59 Section 2B – Stage 1a peak period

– In approved off peak times, temporarily close one northbound traffic lane to allow machinery and material access to the work space.

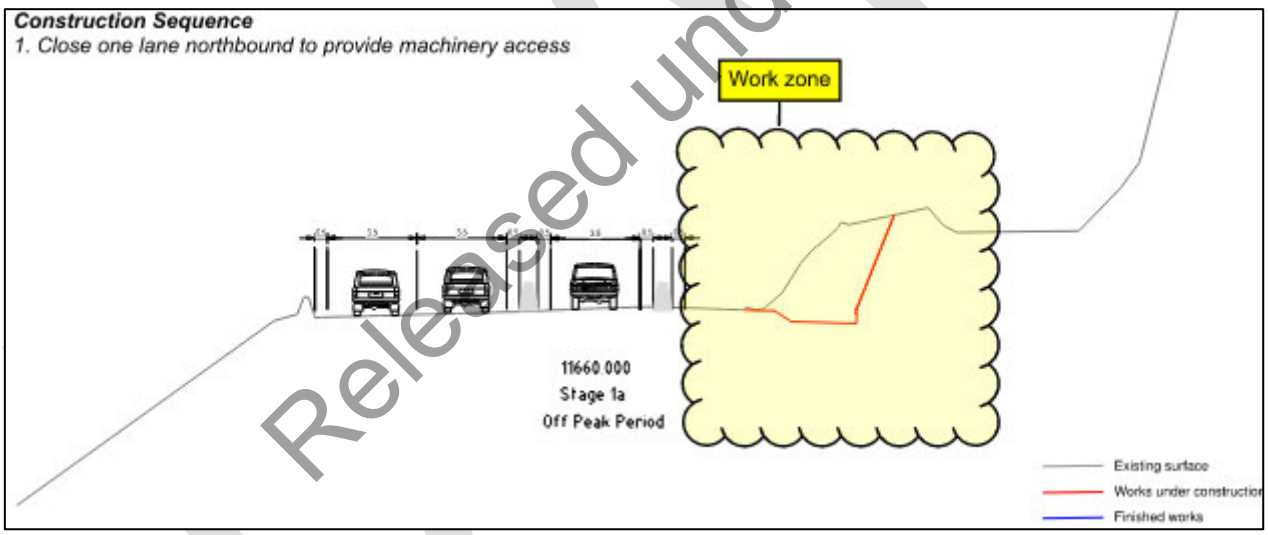


Figure 60 Section 2B – Stage 1a off peak period

– Once the excavation is undertaken the northbound traffic lanes will need to be closed to one lane until the pavement is placed and ready for traffic.

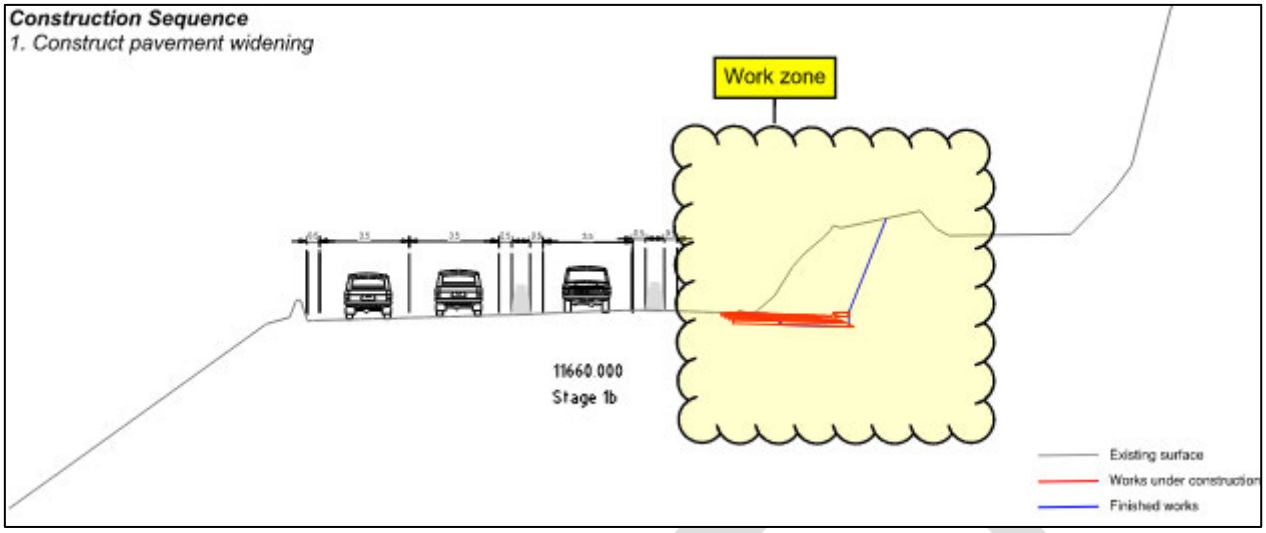


Figure 61 Section 2B – Stage 1b

4.2.3 Stage 2

Stage 2 involves:

– Moving the northbound traffic laterally to the west
– Closing one southbound lane
– Constructing median works.

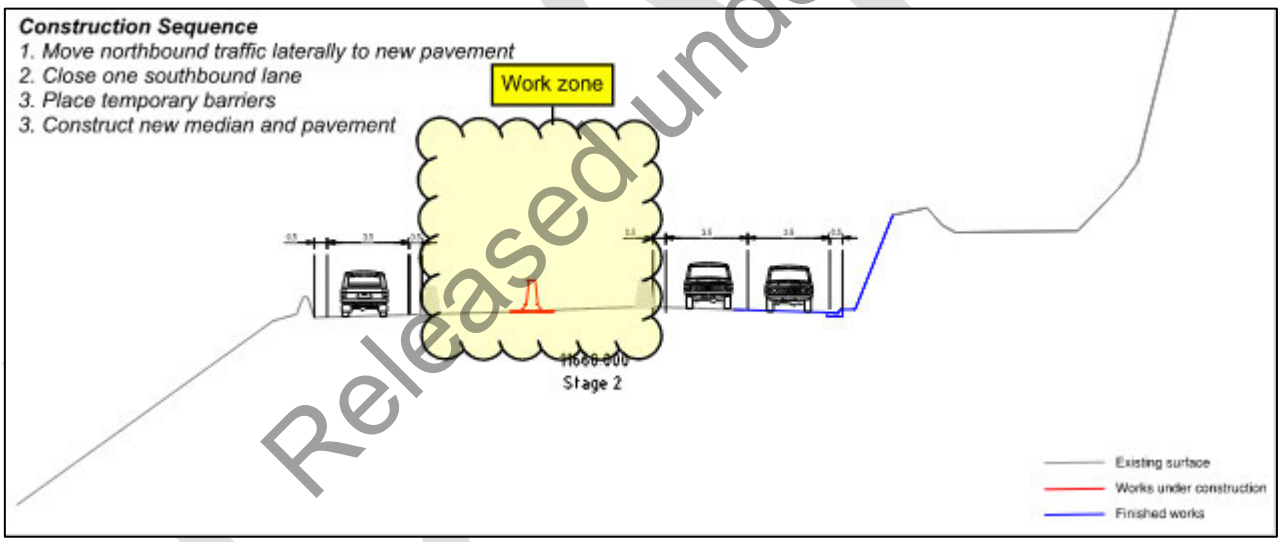


Figure 62 Section 2B – Stage 2

4.2.4 Stage 3

Stage 3 involves:

– Moving traffic to final lanes
– Completion of median works, asphalt surfacing, linemarking, and clean-up.

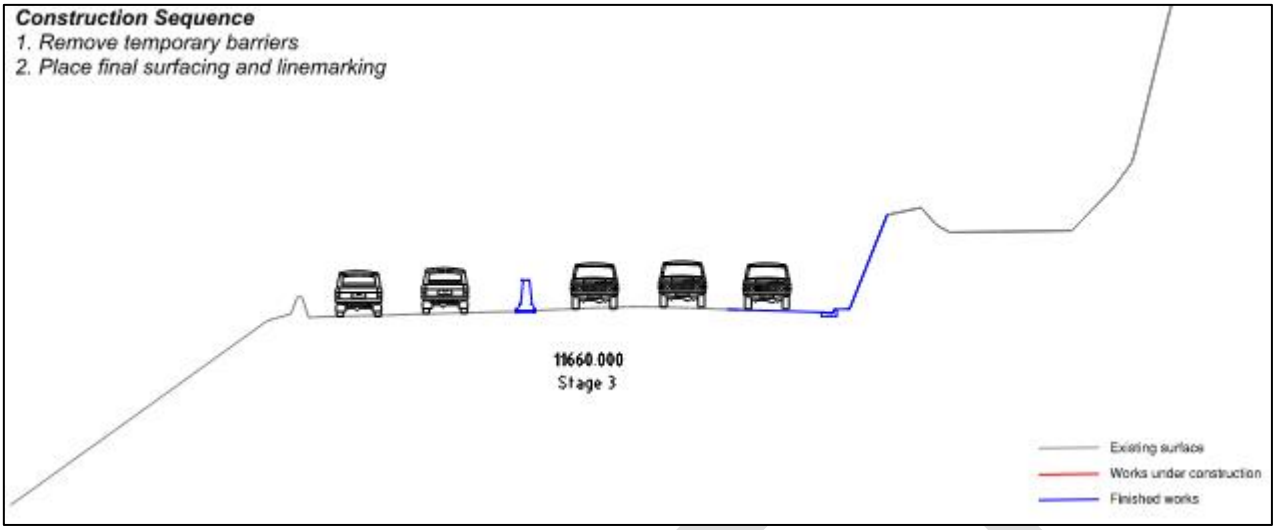


Figure 63 Section 2B – Stage 3

4.3 Section 2C

Section 2C is the section from 11 770 to 12 190. It consists of minor pavement widening and overlay.

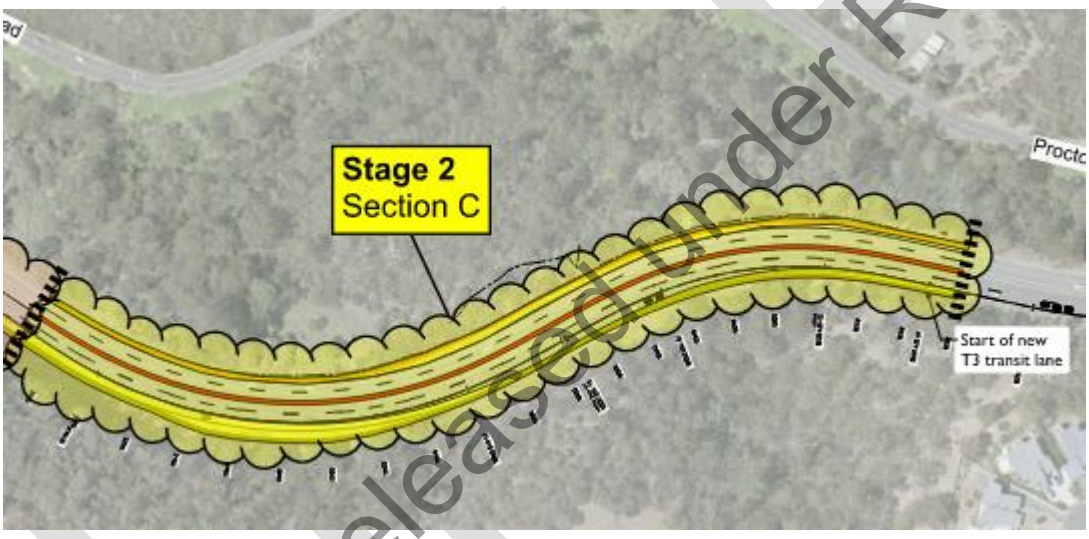


Figure 64 Stage 2 – Section 2B

4.3.1 Stage 0

Stage 0 involves

- Setting up the site camp and laydown areas
- Installing project signs, VMS signs, or other infrastructure that will be required
- Works around the site that do not need permanent barriers, such as clearing and grubbing and minor earthworks to allow for service relocations
- Removing existing islands and paving them where required for future traffic staging.

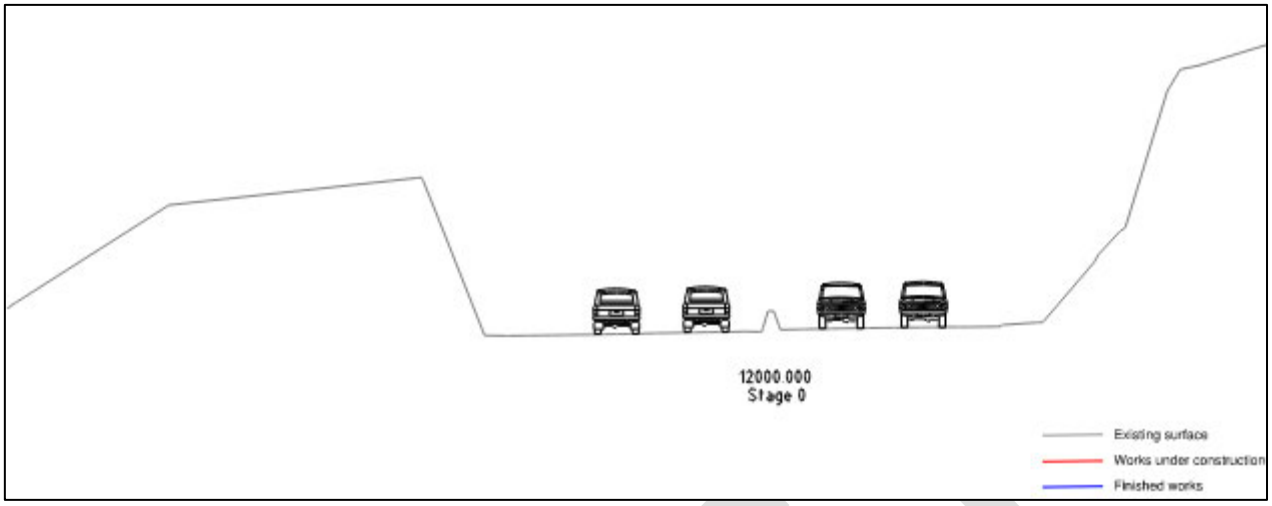


Figure 65 Section 2C – Stage 0

4.3.2 Stage 1

Stage 1 involves:

– Removing the existing median barrier and replace with a temporary barrier
– Placing temporary barriers and re-line mark the pavements to reduce current lane widths to allow for new works to be constructed
– Undertaking the earthworks necessary to remove the rock outcrop
– Constructing new barrier and pavement.

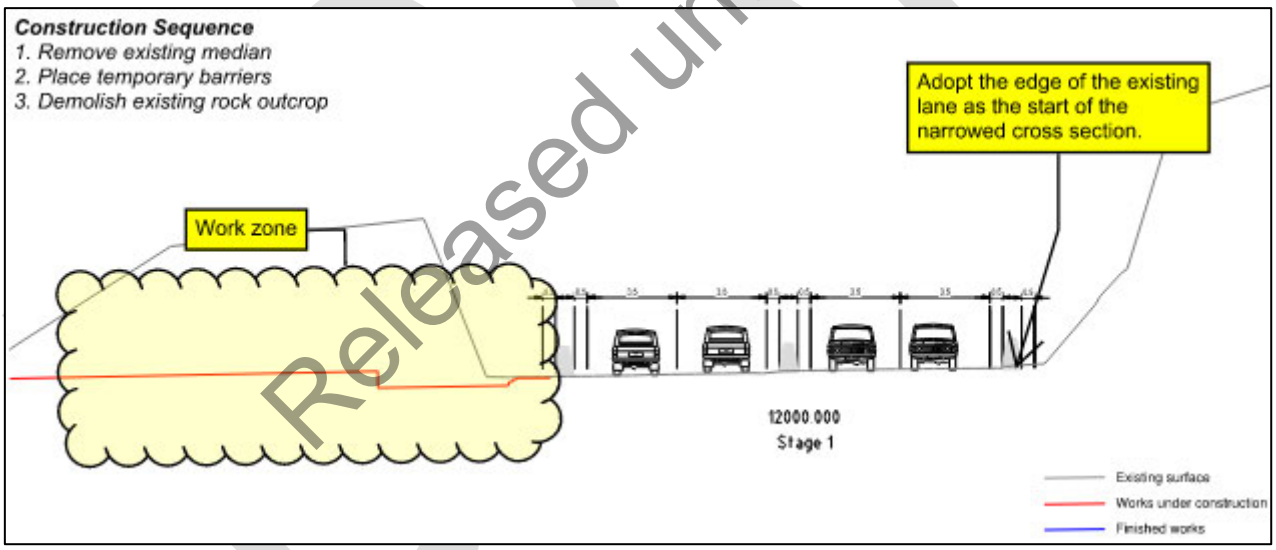


Figure 66 Section 2C – Stage 1a

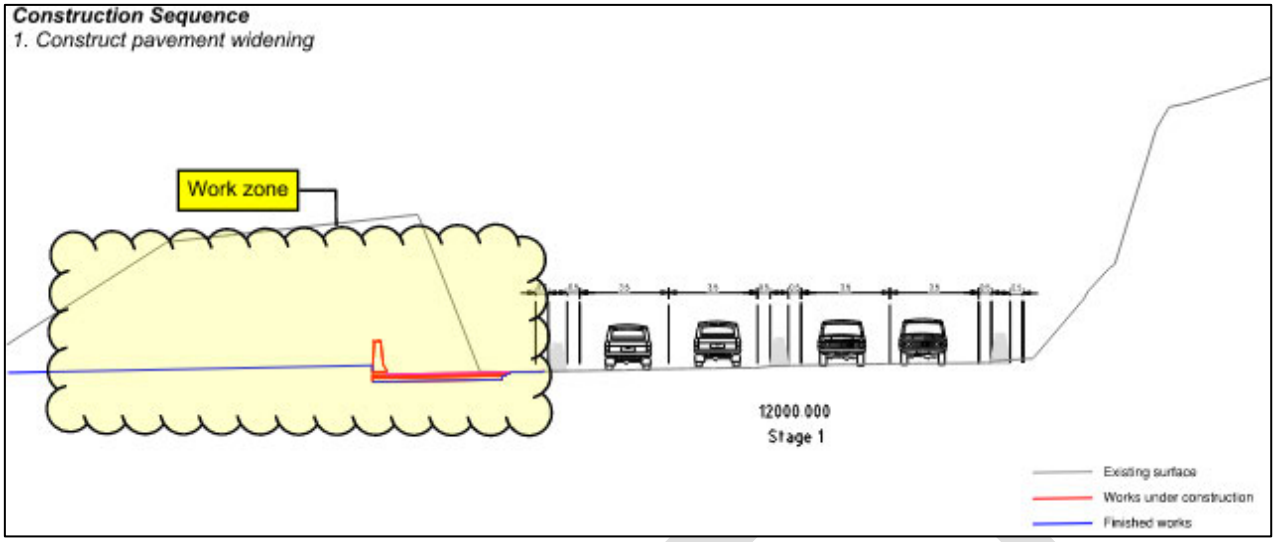


Figure 67 Section 2C – Stage 1b

4.3.3 Stage 2

Stage 2 involves

- Shifting traffic on to new southbound construction
- Placing temporary barriers and re-line mark the pavements to reduce current lane widths to allow for northbound traffic to be moved laterally creating workspace for the western widening
- Constructing pavement widening.

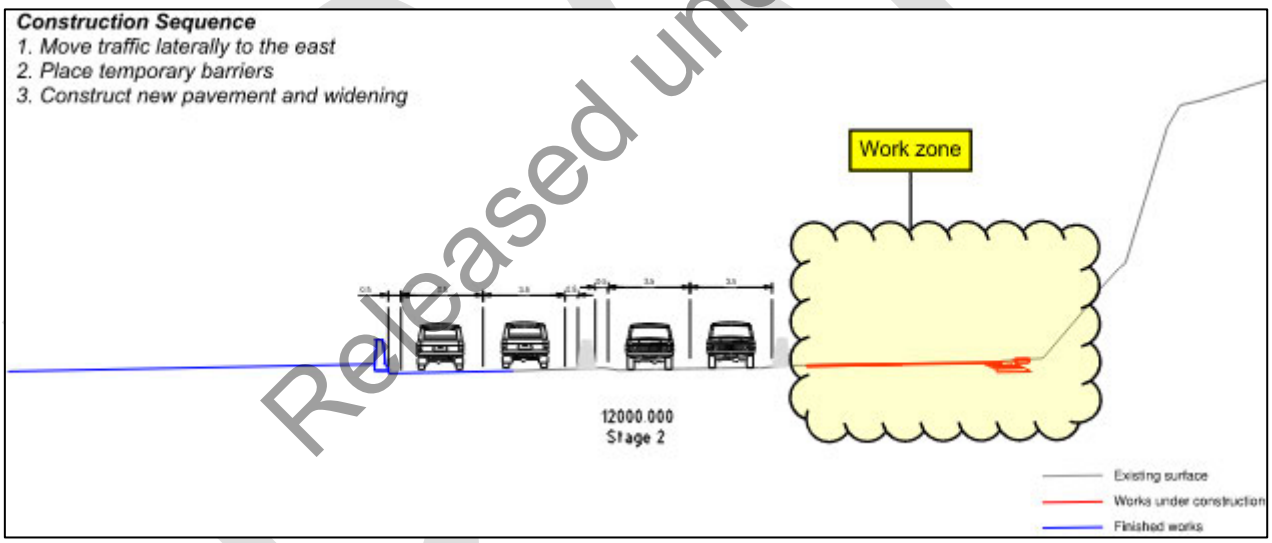


Figure 68 Section 2C – Stage 2

4.3.4 Stage 3

Stage 3 involves:

- Moving the northbound traffic laterally to the west Complete construction of third lane northbound
- Placing temporary barriers and re-line mark the pavements to reduce current lane widths to allow for northbound traffic to be moved laterally west creating workspace for the median works.

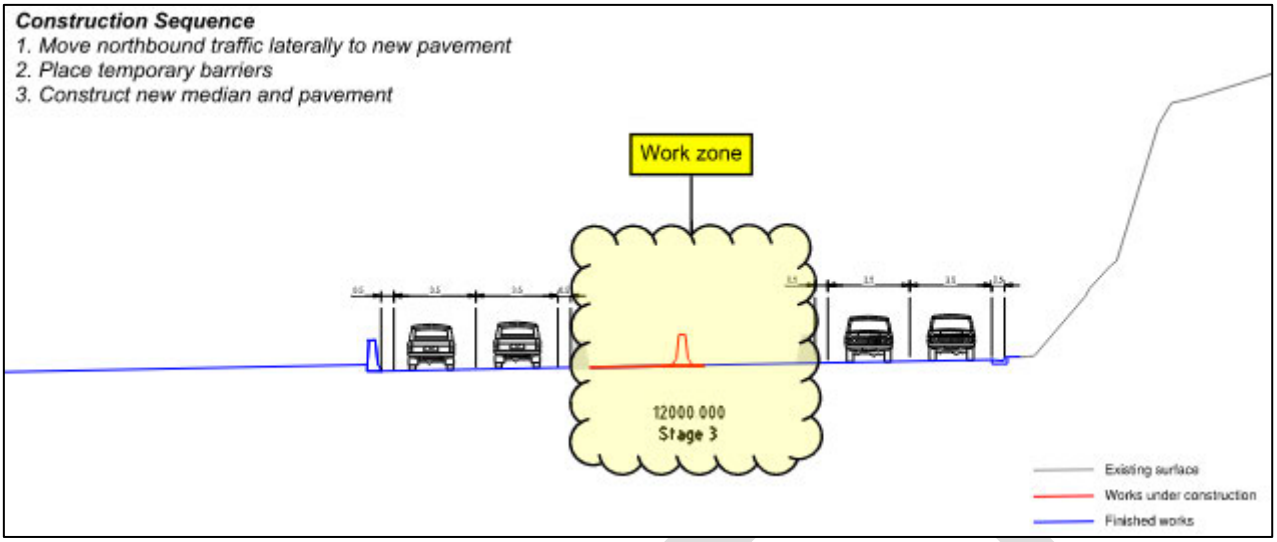


Figure 69 Section 2C – Stage 3

4.3.5 Stage 4

Stage 4 involves:

– Removing temporary barriers to southbound carriageway
– Completion of median works, asphalt surfacing, linemarking, and clean-up.

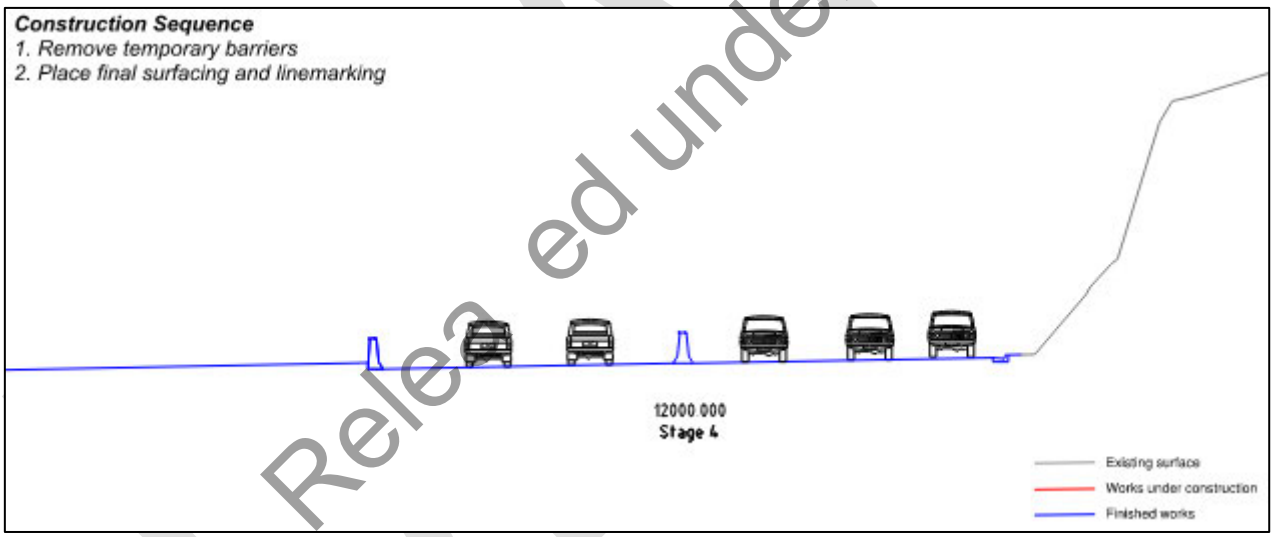


Figure 70 Section 2C – Stage 4

5. Key constructability areas for review

In these areas, sections have been selected to demonstrate any issues that may be an issue in construction.

5.1 Pedestrian and cyclists

Pedestrian do not appear to be a major issue as they are only in the Stage 1 section where there are currently footpaths to both sides of the road.

5.2 Proximity to existing dwellings

The excavation required for this project is in large part in rock. Generally rock work will cause vibrations which can cause damage to existing dwellings. The noise of the operation can also be a nuisance factor to residents. This will restrict the hours of operation for these activities.

A blasting assessment is being carried out which should form the basis of the contractor's plans.

5.3 Traffic

The Southern Transit Outlet is a busy arterial road into Hobart as well as being the only major corridor. This presents issues for traffic management in that alternative routes are not viable. Therefore any traffic management scheme must cater for a minimum of two lanes open at peak periods with the ability to close to one lane off peak to allow for construction activities that require two vehicles to pass in the area during activities such as concrete pumping in to the formwork. The use of precast concrete will reduce the in-situ concrete work but there will still be a significant amount of concrete for footings and stitch pours.

The contractor also needs to be able to access the median so the ability to create work entry areas that operate safely under traffic will be a critical factor. This has not been fully assessed as part of this constructability review.

5.4 Existing services

There appears to be several major services in the area that will need to be relocated or protected before these works, if possible.

A full review of services impacts has not been made as part of this review.

5.5 Constrained corridor

The constrained corridor for Stage 2 will create difficulties for construction. The ability to close lanes to a single lane in each direction off peak will be crucial to allow for many operations to occur, such as using a crane to set up formwork and to move pre-cast panels and allowing room for a concrete pump and truck to operate.

5.6 Pavement construction

Consideration to the type of pavement for the widenings. To construct a new granular pavement will require long term lane closures to a two lanes or less depending on the location, which may not be practical given the nature of the road.

The location of pavement joint may not suit the traffic staging which would require more restrictive lane closures.

5.7 Compounds and laydown areas

To be able to construct this project efficiently, the Contractor will need several areas for compounds, site offices, and lay down areas. The project team should identify and nominate areas for the contractor's use.

The resumed properties would provide small areas for the contractor to use, as will the area east of chainage 12 000 once the blasting has finished.

5.8 Stormwater during construction

The low side of the roads are being reconstructed with new retaining walls and drainage. However during construction these will need to be removed. The gradient of the site is such that the stormwater will have reasonably high velocities which could cause major damage to the works if a storm event happens while the drainage has not yet been reinstated.

Managing the stormwater runoff and preventing aquaplaning will need to be part of the contractor's management plans and addressed in his risk assessment.

5.9 Construction vehicles

Construction vehicles will need to enter the median as part of the works. The entrance and exit gates will need to be carefully planned.

The longitudinal grades are in excess of 3% in places. This will require a reasonable length of acceleration lane to enable a truck to merge safely with existing traffic. Exiting on the downgrade may be a possibility however this is only achievable while the road is closed to one lane northbound.

Figure 71 Possible laydowns northern end of project

Figure 72 Possible laydowns southern end of project

6. Issues that may require further investigation

6.1 Service conflicts

Further review of the service impact should be undertaken. This initial constructability review did not assess these in detail as it was reviewing the project at a high level to determine any major issues that could not be overcome.

It is not expected that any services would cause major issues at this stage.

6.2 Pavement construction issues

The design of the pavement or its make-up was not reviewed as part of this constructability review. A review of the pavement should be undertaken to assess the joint lines compared to the traffic staging to assess if there are any major staging issues.

The make-up of the pavement should be reviewed to consider the impacts to the timing and staging of the project.

6.3 Stormwater Design

The stage 1 stormwater design was not available at the time of the review. The stormwater for stage 1 and 2 will need to be reviewed once they are available.

7. Conclusion

The project as presented in the design plans has a number of significant constructability issues that need to be resolved in subsequent design phases. Below are the considered to be the major issues.

- The narrow corridor width will require lane closures to one lane during periods to allow for many construction activities. This will need to be considered by the Client and allowed for in the working times and lane availability in the contract.
- Maintaining pedestrian movements through the site will require careful consideration as footpath closures are required.
- Cyclists have not been considered as there are no dedicated facilities. However it is expected that there would be many on road cyclists in this area and the narrow lanes will present difficulties. A strategy needs to be considered to manage cyclists during construction.
- The existing properties are located close to the construction. They will be impacted by noise and vibration. Consultation should be undertaken with residents prior to the project proceeding.
- The project is such that there is no viable access to allow for construction except from the highway. This will be a constant impact on through traffic.
- There is a lack of viable alternate routes for through traffic such that the expecting reduction in traffic of up to 15 % during roadworks is unlikely to occur. Consideration to restrictions on work hours to allow for the traffic will impact on the duration of construction.

Regards

out of scope

Out of scope
Senior Technical Director

Memorandum

November 11, 2022

To		**Contact No.**	
Copy to		**Email**	Out of scope @ghd.com
From	Prepared by: Out of scope Reviewed by: Approved by:	**Project No.**	125564320
Project Name	Southern Outlet Transit Lane		
Subject	Draft Travel Demand Methodology		

1. Introduction

The Southern Outlet Transit Lane is one of the sub-projects in the Hobart City Deal Southern Projects (Southern Projects) seeking to encourage modal shift in favour of public transport to address congestion and accessibility issues along the southern corridor in Tasmania. The longer-term vision is to induce behavioural change by providing users with the opportunity and the motivation to change their transport habits.

The Southern Outlet Transit Lane involves the construction of an additional northbound transit lane on the Southern Outlet, between Olinda Grove and Macquarie Street, Hobart. The lane will operate as a T3 lane for use by buses, private vehicles carrying three or more occupants, taxis, and emergency service vehicles.

It is acknowledged that there will be significant disruption to traffic conditions in order to construct the High Occupancy Vehicle Lane (HOV), particularly the need to reduce to a single southbound lane for a period of 6 – 8 months during the construction which will require mitigation. GHD has been engaged to identify a proposed Travel Demand Management Strategy (TDM) to help mitigate the impacts of the construction of the HOV along the Southern Outlet between Olinda Grove and Macquarie Street. The purpose of the TDM Strategy is to:

1. Identify available interventions and mitigations to manage demand as required to support the identified construction traffic management of the Southern Outlet HOV Lane construction.
2. Provide advice on the management of residual traffic demand with the intention of avoiding significant impacts on the wider network.

1.1 Purpose of this Memorandum

This memorandum documents the recommend management strategy to enable the construction of a new HOV lane along the Southern Outlet between Olinda Grove and Macquarie Street. This memorandum has been prepared to facilitate approval of next phase investigations required.

1.2 Scope and limitations

This technical memorandum has been prepared by GHD for Department of State Growth. It is not prepared as, and is not represented to be, a deliverable suitable for reliance by any person for any purpose. It is not intended for circulation

or incorporation into other documents. The matters discussed in this memorandum are limited to those specifically detailed in the memorandum and are subject to any limitations or assumptions specially set out.

GHD has prepared this memorandum on the basis of information provided by the Client and others who provided information to GHD (which may also include Government authorities), which GHD has not independently verified or checked for the purpose of this memorandum. GHD does not accept liability in connection with such unverified information, including errors and omissions in the memorandum which were caused by errors or omissions in that information.

2. Review

Whilst the project will result in impacts during the entire construction program, a review of the risks associated with an unmitigated closure of one of the southbound travel lanes on the Southern Outlet for a 6-8 month periods indicates an unacceptable level of risk to the performance of the Hobart network, noting:

– Organic travel demand management that might be adopted by users will not suffice:
  - The theoretical capacity is lower than traffic volumes typically generated from 8:00 AM to 8:00 PM on weekdays and is also exceeding during weekends.
  - The peak period from approximately 3:00 PM to 7:00 PM requires reduction in demand of over 50% to be within the available capacity during construction.
  - The current bus service capacity is not sufficient to carry the displaced travel demand.
  - There are limited detour routes on the network, which cumulatively do not have sufficient capacity or appropriate condition to carry the required volume of traffic displaced from the construction route.
– The construction arrangement has insufficient resilience to cope if other road closures with interlinking impacts are to occur during the period, including any unplanned emergency closures.
– Delays and queueing have potential to cause network wide delays:
  - The scale of the travel demand, the construction location, and the available detour routes all have the potential to, if capacity is exceeded, significantly impact all CBD and main arterial routes, including those in the east and north.
  - Unmanaged delays will impact access for emergency services.
  - Unmanaged delays will disproportionately decrease the attractiveness of public transport – counterproductive to the project objectives and overarching objectives of the Department.
  - Unmanaged delays, and perceived lack of action to mitigate delays, may significantly impact on the Department's ability to build social license with the community and may have detrimental long-lasting impacts on future programs.

Conversely, the project construction period provides a rare catalytic environment to achieve the overarching project objectives and embed long standing behaviour change within the greater Hobart community.

Based on the aforementioned risk level, the following items selected in **Error! Reference source not found.** are recommended as required interventions. In order to substantially mitigate the risk to within a tolerable level, the recommended interventions should be undertaken as a full program of works. Where interventions are not adopted, or not adopted to the required scale, substantial risk will remain.

Table 1 Intervention selection

Section	Intervention	Include	Action required
Required interventions			
2 - Criticality	Criticality executive buy in	Yes	DSG to confirm
3 – Performance targets	Construction specifications	Yes	Refine and develop
3 – Performance targets	Construction network programming	Yes	Refine and develop

Section	Intervention	Include	Action required
Required interventions			
4 - Campaign	Prior awareness	Yes	Refine and develop
4 - Campaign	Prior education	Yes	Refine and develop
4 - Campaign	Live notifications	Yes	Refine and develop
4 - Campaign	Bicycle purchase / hire / share scheme	Yes	Refine and develop
4 - Campaign	Personal Mobility device system	Yes	Refine and develop
4 - Campaign	AT end of trip infrastructure	Yes	Refine and develop
4 - Campaign	Health campaign	Yes	Refine and develop
4 - Campaign	Carpooling campaign and incentives	Yes	Refine and develop
4 - Campaign	WFH campaign and incentives	Yes	Refine and develop
4 - Campaign	City programming	Yes	Refine and develop
4 - Campaign	Journey planning	Yes	Refine and develop
4 - Campaign	Gamified travel planning	Yes	Refine and develop
5 – Management	Incident response	Yes	Refine and develop
5 – Management	Emergency vehicle management	Yes	Refine and develop
5 – Management	Performance monitoring (variable and dynamic states)	Yes	Refine and develop
5 – Management	Contingency intervention triaging	Yes	Refine and develop
6 - Interventions	Sandy Bay Road / Channel Highway	Yes	Refine and develop
6 - Interventions	Huon Road	Yes	Refine and develop
6 - Interventions	Nelson Road	Yes	Refine and develop
6 - Interventions	Proctors Road	Yes	Refine and develop
6 - Interventions	New Tolmans Hill connection	One of these must be progressed.	Refine and develop preferred or both.
6 - Interventions	Southern Outlet Contraflow (Tidal flow PM operation)		
6 - Interventions	Detour route management	Yes	Refine and develop
7 – Population	Travel planning / interventions DSG	Yes	Refine and develop
7 – Population	Travel planning / interventions Public service	Yes	Refine and develop
7 – Population	Travel planning / interventions UTas	Yes	Refine and develop
7 – Population	Travel planning / interventions Schools	Yes	Refine and develop
7 – Population	Travel planning / interventions Private	Yes	Refine and develop
7 – Population	Kingston service locations	Yes	Refine and develop
8 – Active Transport	Last mile upgrades	Yes	Refine and develop
8 – Active Transport	Sandy Bay upgrades	Yes	Refine and develop
8 – Active Transport	Tolmans Hill upgrades	Yes	Refine and develop
8 – Active Transport	Mount Nelson upgrades	Yes, after others	Refine and develop
8 – Active Transport	Decision on broader network resilience	Yes	Refine and develop

Section	Intervention	Include	Action required
Required interventions			
9 – Public transport	Headway model	Yes	Refine and develop
9 – Public transport	Frequency increase	(if above doesn't happen)	Work on with headway model
9 – Public transport	Service uplift	Yes	Part of headway or frequency increases
9 – Public transport	Priority	Yes	Refine and develop
9 – Public transport	Huntingfield park and ride connectivity	Yes	Refine and develop
9 – Public transport	Kingston city connectivity	Yes	Refine and develop
9 – Public transport	Interchange bicycle / scooter hire	Yes	Refine and develop
9 – Public transport	Interchange on-demand service	Yes	Refine and develop
9 – Public transport	Pricing model	Yes	Refine and develop
9 – Public transport	Real time information	Yes	Refine and develop
9 – Public transport	Guaranteed ride home	Yes	Refine and develop
9 – Public transport	Safety and comfort improvements	Yes (as much as possible)	Refine and develop
10 – Supply and cost	Parking strategy	Yes	Refine and develop
Consider			
9 – Public transport	Service changes (and associated interchange infrastructure)	Limited by project timing	-
9 – Public transport	Ferry	Consider	With Dept to consider
10 – Supply and cost	Pricing strategies	Triaging intervention	With Dept to consider

Efficacy of risk mitigation is subject to assumptions, however the recommended approach in **Error! Reference source not found.** is recommended to facilitate reduction of risk levels within tolerable limits. The outcomes for the network will be largely dependent on the execution of measures and rely on public uptake to entirely mitigate risk, however by evidencing proactive management and providing sufficient capacity in feasible travel alternatives intolerable risks would be reduced.

3. Next steps

GHD is able to provide assistance to continue to refine and develop the interventions identified. Urgency is a critical for a number of the interventions and as such work by both GHD and internal Department teams (including work with local government) should commence as soon as possible.

Southern Outlet Highway

Stage 1 and 2 - Summary (DRAFT)

s38, s39

Code	Description	Quantity	UOM	Comments
A	**Southern Outlet Transit Line - Stage 1 (CH 9760 - CH10240)**			
1	Part-1 Project Specific Items	480	m	
2	Part-2 Earthworks	480	m	
3	Part-3 Drainage	480	m	
4	Part-4 Pavement	480	m	
5	Part-5 Bituminous Surfacing Asphalt	480	m	
6	Part-6 Traffic Facilities	480	m	
7	Part-7 Landscaping	480	m	
8	Part-8 Miscellaneous	480	m	
9	Part-10 Provisional Items	480	m	
	Sub-Total Direct Costs (Stage 1)	**480**	**m**	
10	Indirect Costs			
10.1	Preliminaries	32	%	
10.2	Environmental Management	1	%	
10.3	Design Cost	0	%	Design cost has been excluded from the Construction cost under Lump Sump (Construction only) contract consideration.
	Sub-Total Indirect Costs (Stage 1)	**480**	**m**	
11	Contractor's Risk and Escalation			
11.1	Contractor's Risk	7	%	
11.2	Contractor's Escalation	0	%	Escalation has been excluded from the Construction cost.
	Sub-Total Contractor's Risk and Escalation (Stage 1)	**480**	**m**	
12	**Contractor's Overheads & Margin (Stage 1)**	**12**	**%**	
13	**TOTAL CONSTRUCTION COSTS - STAGE 1 (Excl. GST)**	**480**	**m**	
B	**Southern Outlet Transit Line - Stage 2 (CH 10880 - CH 12180)**			
1	Part-1 Project Specific Items	1,300	m	
2	Part-2 Earthworks	1,300	m	
3	Part-3 Drainage	1,300	m	
4	Part-4 Pavement	1,300	m	
5	Part-5 Bituminous Surfacing Asphalt	1,300	m	
6	Part-6 Traffic Facilities	1,300	m	
7	Part-7 Landscaping	1,300	m	
8	Part-8 Miscellaneous	1,300	m	
9	Part-10 Provisional Items	1,300	m	
	Sub-Total Direct Costs (Stage 2)	**1,300**	**m**	
10	Indirect Costs			
10.1	Preliminaries	34	%	
10.2	Environmental Management	1	%	
10.3	Design Cost	0	%	Design cost has been excluded from the Construction cost under Lump Sump (Construction only) contract consideration.
	Sub-Total Indirect Costs (Stage 2)	**1,300**	**m**	
11	Contractor's Risk and Escalation			
11.1	Contractor's Risk	7	%	
11.2	Contractor's Escalation	0	%	Ecalation has been excluded from the Construction cost.
	Sub-Total Contractor's Risk and Escalation (Stage 2)	**1,300**	**m**	
12	**Contractor's Overheads & Margin (Stage 2)**	**12**	**%**	
13	**TOTAL CONSTRUCTION COSTS - STAGE 2 (Excl. GST)**	**1,300**	**m**	
14	**TOTAL CONSTRUCTION COSTS - STAGE1 + 2 (Excl. GST)**	**1,780**	**m**	
14	**Contingency**			
14.1	P50 Contingency	1	item	P50 Contingency for Stage 1 and Stage 2 based on Risk Register dated 6 July 2023
	Sub-Total Contingency - P50			
	TOTAL COSTS - P50 RISK-ADJUSTED (Excl. GST)			
15	**Client Costs**			
15.1	Design Cost	1	item	GHD's Detailed Design Cost provided on 6 July 2023 (excl. GST)
15.1	Professional Fees	Excluded		
15.1	Legal & Commercial Fees	Excluded		
15.1	Authority Fees	Excluded		
15.1	Insurance Fees	Excluded		
15.1	Client Direct Costs - Department of State Growth Project Management	6.80%		Department of State Growth Project Management (Client Costs) = 6.8% of the P50 Construction Costs including Contingent Risk.
15.1	Escalation on Client Costs	Excluded		
15.1	Land Acquisition Costs	Excluded		
	Sub-Total Client Costs			
	TOTAL PROJECT COSTS - P50 RISK-ADJUSTED + CLIENT COSTS (Excl. GST)			

Southern Outlet Highway
Stage 1 and 2 - Summary (DRAFT)

s38, s39

Code	Description	Quantity	UOM	Comments
A	**Southern Outlet Transit Line - Stage 1 (CH 9760 - CH10240)**			
1	Part-1 Project Specific Items	480	m	
2	Part-2 Earthworks	480	m	
3	Part-3 Drainage	480	m	
4	Part-4 Pavement	480	m	
5	Part-5 Bituminous Surfacing Asphalt	480	m	
6	Part-6 Traffic Facilities	480	m	
7	Part-7 Landscaping	480	m	
8	Part-8 Miscellaneous	480	m	
9	Part-10 Provisional Items	480	m	
	Sub-Total Direct Costs (Stage 1)	**480**	**m**	
10	Indirect Costs			
10.1	Preliminaries	32	%	
10.2	Environmental Management	1	%	
10.3	Design Cost	0	%	Design cost has been excluded from the Construction cost under Lump Sump (Construction only) contract consideration.
	Sub-Total Indirect Costs (Stage 1)	**480**	**m**	
11	Contractor's Risk and Escalation			
11.1	Contractor's Risk	7	%	
11.2	Contractor's Escalation	0	%	Escalation has been excluded from the Construction cost.
	Sub-Total Contractor's Risk and Escalation (Stage 1)	**480**	**m**	
12	**Contractor's Overheads & Margin (Stage 1)**	**12**	**%**	
13	**TOTAL CONSTRUCTION COSTS - STAGE 1 (Excl. GST)**	**480**	**m**	
B	**Southern Outlet Transit Line - Stage 2 (CH 10880 - CH 12180)**			
1	Part-1 Project Specific Items	1,300	m	
2	Part-2 Earthworks	1,300	m	
3	Part-3 Drainage	1,300	m	
4	Part-4 Pavement	1,300	m	
5	Part-5 Bituminous Surfacing Asphalt	1,300	m	
6	Part-6 Traffic Facilities	1,300	m	
7	Part-7 Landscaping	1,300	m	
8	Part-8 Miscellaneous	1,300	m	
9	Part-10 Provisional Items	1,300	m	
	Sub-Total Direct Costs (Stage 2)	**1,300**	**m**	
10	Indirect Costs			
10.1	Preliminaries	34	%	
10.2	Environmental Management	1	%	
10.3	Design Cost	0	%	Design cost has been excluded from the Construction cost under Lump Sump (Construction only) contract consideration.
	Sub-Total Indirect Costs (Stage 2)	**1,300**	**m**	
11	Contractor's Risk and Escalation			
11.1	Contractor's Risk	7	%	
11.2	Contractor's Escalation	0	%	Escalation has been excluded from the Construction cost.
	Sub-Total Contractor's Risk and Escalation (Stage 2)	**1,300**	**m**	
12	**Contractor's Overheads & Margin (Stage 2)**	**12**	**%**	
13	**TOTAL CONSTRUCTION COSTS - STAGE 2 (Excl. GST)**	**1,300**	**m**	
14	**TOTAL CONSTRUCTION COSTS - STAGE1 + 2 (Excl. GST)**	**1,780**	**m**	
14	**Contingency**			
14.1	P90 Contingency	1	item	P90 Contingency for Stage 1 and Stage 2 based on Risk Register dated 6 July 2023
	Sub-Total Contingency - P90			
	TOTAL COSTS - P90 RISK-ADJUSTED (Excl. GST)			
15	**Client Costs**			
15.1	Design Cost	1	item	GHD's Detailed Design Cost provided on 6 July 2023 (excl. GST)
15.1	Professional Fees	Excluded		
15.1	Legal & Commercial Fees	Excluded		
15.1	Authority Fees	Excluded		
15.1	Insurance Fees	Excluded		
15.1	Client Direct Costs - Department of State Growth Project Management	6.80%		Department of State Growth Project Management (Client Costs) = 6.8% of the P50 Construction Costs including Contingent Risk.
15.1	Escalation on Client Costs	Excluded		
15.1	Land Acquisition Costs	Excluded		
	Sub-Total Client Costs			
	TOTAL PROJECT COSTS - P90 RISK-ADJUSTED + CLIENT COSTS (Excl. GST)			

Southern Outlet Highway - Stage 1

Stage 1 - BOQ Summary (DRAFT)

s38, s39

Code	Description	Quantity	UOM	Comments
	Southern Outlet Transit Line - Stage 1 (CH 9760 - CH10240)			
1	Part-1 Project Specific Items	480	m	
2	Part-2 Earthworks	480	m	
3	Part-3 Drainage	480	m	
4	Part-4 Pavement	480	m	
5	Part-5 Bituminous Surfacing Asphalt	480	m	
6	Part-6 Traffic Facilities	480	m	
7	Part-7 Landscaping	480	m	
8	Part-8 Miscellaneous	480	m	
9	Part-10 Provisional Items	480	m	
	Sub-Total Direct Costs	**480**	**m**	
10	Indirect Costs			
10.1	Preliminaries	32	%	
10.2	Environmental Management	1	%	
10.3	Design Cost		%	Design cost has been excluded from the Construction cost under Lump Sump (Construction only) contract consideration.
	Sub-Total Indirect Costs	**480**	**m**	
11	Contractor's Risk and Escalation			
11.1	Contractor's Risk	7	%	
11.2	Contractor's Escalation		%	Escalation has been excluded from the Construction cost
	Sub-Total Contractor's Risk and Escalation	480	m	
12	Contractor's Overheads & Margin	12	%	
13	**TOTAL CONSTRUCTION COSTS (Excl. GST)**	**480**	**m**	
14	**Contingency**			
14.1	P50 Contingency			Please refer to Summary Tab for P50 Contingency allowance
14.1	P90 Contingency			Please refer to Summary Tab for P90 Contingency allowance
	Sub-Total Contingency - P50			
	Sub-Total Contingency - P90			
	TOTAL COSTS - P50 RISK-ADJUSTED (Excl. GST)			Please refer to Summary Tab
	TOTAL COSTS - P90 RISK-ADJUSTED (Excl. GST)			Please refer to Summary Tab
15	**Client Costs**			
15.1	Design Cost	1	item	Please refer to Summary Tab for Client's Design Cost allowance
15.1	Professional Fees	Excluded		
15.1	Legal & Commercial Fees	Excluded		
15.1	Authority Fees	Excluded		
15.1	Insurance Fees	Excluded		
15.1	Client Direct Costs - Department of State Growth Project Management	1	item	Please refer to Summary Tab for Department of State Growth Project Management (Client Costs)
15.1	Escalation on Client Costs	Excluded		
15.1	Land Acquisition Costs	Excluded		
	Sub-Total Client Costs			
	TOTAL PROJECT COSTS - P50 RISK-ADJUSTED + CLIENT COSTS (Excl. GST)			Please refer to Summary Tab
	TOTAL PROJECT COSTS - P90 RISK-ADJUSTED + CLIENT COSTS (Excl. GST)			Please refer to Summary Tab

DCWC Stage 1 - Cost Breakdown					
		DCWC R1 - Draft 05.07.2023			
Code	Description	Quantity	UOM	s38, s39	Comments/Assumptions
	Southern Outlet Transit Line - Stage 1 (CH 9760 - CH 10240)				
1	**PART-1 PROJECT SPECIFIC ITEMS**				
1.1	**Project Specific Items**	**1**	**item**		
1.1.1	Contract Establishment and Mobilisation including fully operational site office and amenities. (Max 2% of Tender Sum)	1	Item		Included under Preliminary
1.1.2	Independent Quality Assurance Verifier (Spec Clause 160.A3)	1	Item		Included under Preliminary
1.1.3	Maintenance during Defects Liability Period	1	Item		Included under Preliminary
1.1.4	Milling out and disposal of existing wearing course to a nom. depth of 40mm.	2,978	m²		Night Works
1.1.5	Supply and install Pavement Symbols, including glass beads and angular quartz in Extruded Thermoplastic: "T3 LANE"	2	No.		Included in "Part 6: Traffic Facilities"
1.1.6	Supply and install Pavement Symbols, including glass beads and angular quartz in Extruded Thermoplastic: "T3"	4	No.		Included in "Part 6: Traffic Facilities"
	Construct masonry retaining / boundary walls and footings including but not limited to excavation, protection of existing infrastructure, temporary works, supply and placement of all materials, disposal of spoil and reinstatement.				
1.1.7	Wall Type 1 - reinforced concrete footings	4	m³		Day works
1.1.8	Wall Type 1 - reinforced masonry wall	3	m³		
1.1.9	Wall Type 2 - reinforced concrete footings	15	m³		Day works
1.1.10	Wall Type 2 - reinforced masonry wall	30	m³		
1.1.11	Wall Type 3 - reinforced concrete footings	13	m³		Day works
1.1.12	Wall Type 3 - reinforced masonry wall	26	m³		
1.1.13	Construct path and steps between new footpath and existing LGAT entry path including reinstatement of gate.	1	Item		
1.1.14	Alter TasWater water main in Macquarie Street in accordance with the drawings and TasWater requirements.	1	Item		
1.1.15	Undertake accommodation works including relocation of structures, reinstatement of paths, garden beds etc as described in the relevant Notice of Accommodation Works.	1	Item		Cost has been excluded
1.1.16	Relocate LGAT Heritage Sign	1	No.		
1.1.17	Install TGSI at island cut throughs	17	m²		
1.2	**Demolition**	**1**	**item**		
1.2.1	Demolition of existing Pavement	1,636	m2		Day Works
1.2.2	Demolition of existing Footpath	398	m2		Day Works
1.2.3	Demolition of existing Fence Line	0	m		Day Works
1.2.4	Demolition of existing Barriers	64	m		Day Works
	TOTAL Part-1 Project Specific Items	**480**	**m**		
2	**PART-2 EARTHWORKS**				
2.1	**Excavation & Embankment**	**1**	**item**		
2.1.1	Clearing and grubbing	1,704	m2		Day Works
2.1.2	Removal of trees	30	no		
2.1.3	Excavation in all materials	4,077	m³		Allowance has been captured under Item 2.1.4 to 2.1.6
2.1.4	Pavement Box out	1,864	m3		Assumed day rate works
2.1.5	Retaining Wall - Excavation	98	m3		Assumed day rate works
2.1.6	Batter Slope Excavation	1,982	m3		Assumed day rate works
2.1.7	Extra Over Item 2.02 for rock	434	m³		Assumed day rate works; Allowed for 11% (Used same % allowance as GHD)
2.1.8	Extra Over Item for Contamination Disposal (Assume 5% of excavated spoil to be Category C contaminated)				Allowance for contamination disposal is included as Contingent Risk item
2.1.9	Subgrade material - Excavation, disposal and replacement	419	m³		Assumed day rate works; Both Type A & Type B pavement 150mm thick
2.2	**Existing Pavement**	**1**	**item**		
2.2.1	Existing pavement failure repairs	240	m²		Assumed day rate works; Assumed 20% of stage 1 footpath as failure repairs
2.3	**Batter Treatment**	**1**	**item**		
	Supply and placing of topsoil				
2.3.1	50mm deep	682	m²		
2.3.2	Raking Earth Excavation batter face	955	m²		
	TOTAL Part-2 Earthworks	**480**	**m**		
3	**PART-3 DRAINAGE**				
3.1	**Culverts & Endwalls**	**1**	**item**		
	Steel Reinforced Concrete pipes in new works				
	CH - No. of Barrels - Class				
	300mm dia pipe				
3.1.1	A-01 to A-02 - 1 - Cl 4	6	m		Day works: Qty taken off from Chainages sht210 &211
3.1.2	A-02 to EX A-03 - 1 - Cl 4	4	m		Day works: Qty taken off from Chainages sht210 &211
3.1.3	A1-01 to A-02 - 1 - Cl 4	10	m		Day works: Qty taken off from Chainages sht210 &211
3.1.4	EX B-04 to C-01 - 1 - Cl 4	30	m		Day works: Qty taken off from Chainages sht210 &211
3.1.5	C-01 to C-02 - 1 - Cl 4	23	m		Day works: Qty taken off from Chainages sht210 &211
3.1.6	C-02 to EX D-02 - 1 - Cl 4	6	m		Day works: Qty taken off from Chainages sht210 &211
	Removal of pipes≤ 600mm dia				
3.1.7	Cap and grout fill	30	m		Day Works
3.2	**Pits**	**1**	**item**		
	Construction of grated pits				
3.2.1	Grated Pit with Barrier kerb	6	No.		Day works
3.2.2	Double Grated Pit with Barrier kerb	1	No.		Day works
	Construction of access pits				
3.2.3	1,050 dia. - State Growth Access Pit	5	No.		Day works EXA-03,EXB-02,EXD-02,EXD-03,CO-1

3.2.4	Removal of existing pits	5	No.		XA-03,EXB-02,EXD-02,EXD-03,EO-1
3.2.5	New pipe connection into existing pits	3	No.		XB-04,.EXD-02
3.2.6	Connection of new pit into existing pipe	2	No.		04-E-01
3.3	**Subsoil Drains**	**1**	**item**		
3.3.1	Class 400 sub-soil drain <750 mm deep	435	m		y works
3.3.2	Class 1000 sub-soil drain <750mm deep	468	m		y works
3.4	**Kerbing**	**1**	**item**		
3.4.1	B1, barrier kerb/gutter	409	m		y works; des of road
3.4.2	M2, kerb	0	m		
3.4.3	Gutter crossings	13	m		
3.4.4	Kerb ramps	5	No.		
3.4.5	B1, barrier kerb/gutter, construction within existing pavement	32	m		y works
3.4.6	Gutter crossings, construction within existing pavement	12	m		
3.4.7	Kerb ramps, construction within existing pavements	1	No.		
	TOTAL Part-3 Drainage	**480**	**m**		
4	**PART-4 PAVEMENT**				
	Construction of Pavement	**1**	**item**		
4.01	Supply, spread and compact Sub-Base Class 3 material				
4.01a	150 mm depth	3,283	m²		y Works
4.02	Supply, spread and compact Sub-Base Class 4 material				
4.02a	150 mm depth	2,192	m²		y Works
4.02b	120 mm depth	1,092	m²		y Works
4.03	Supply, spread and compact Base Class 1 material				
4.03a	200 mm depth	3,330	m²		y Works
4.03b	Saw Cutting of existing surface/pavement	425	m		y Works
4.04	**Supply and Install Concrete Median / Traffic Island**	**1**	**item**		
4.04a	Traffic Islands	0	m2		
	TOTAL Part-4 Pavement	**480**	**m**		
5	**PART-5 BITUMINOUS SURFACING ASPHALT**				
5.1	**Asphalt**	**1**	**item**		
	Supply, deliver, place and compact including sweeping of Dense Graded Asphalt				
5.1.1	Nominally 14 mm size	5,771	m²		y works
5.1.2	Waterproofing Seal	2,793	m²		
5.1.3	Tack Coat	2,978	m²		
5.1.4	Resistance to polishing test (PSV) on Bituminous surfacing aggregates	1	No.		owance only
	TOTAL Part-5 Bituminous Surfacing Asphalt	**480**	**m**		
6	**PART-6 TRAFFIC FACILITIES**				
	Signs	**1**	**item**		
6.18	**Fabrication and installation of signs with maximum dimension (D)**				
6.18a	D ≤ 900mm fixed to existing post or structure				
6.18a.01	R5 Parking Control Signs	11	No.		
6.18a.02	R2-2B(R) (Ch. 9805)	1	No.		
6.18a.03	R2-3B(L) (Ch 9820)	1	No.		
6.18a.04	R7-9-2D (Ch 9825)	1	No.		
6.18a.05	SIGN 1R (Ch 9905)	1	No.		
6.18a.06	R2-4B (Ch 9910)	1	No.		
6.18b	D ≤ 900mm including supply and installation of post				
6.18b.01	R1-2B (Ch 9895)	1	No.		
6.18b.02	R2-3B(L) / SIGN 1R (Ch 9910)	1	No.		
6.18b.03	R2-3B(L) (Ch 9910)	1	No.		
6.18b.04	R1-2B (Ch 9920)	2	No.		
6.18b.05	R2-3B(L) (Ch 9920)	1	No.		
6.18b.06	R1-2B (Ch 9930)	2	No.		
6.18b.07	R5-35(R) (Ch 9970)	1	No.		
6.18b.08	R7-7-2C	4	No.		
6.18b.09	R5-35(L) / R5-2(R) (Davey St)	1	No.		
6.18d	900mm < D ≤ 1200mm including supply and installation of posts				
6.18d.01	W5-103 / R5-35(D) (Ch. 9865)	1	No.		
6.18d.02	D4-2-2A (Ch 9905)	1	No.		
6.18d.03	D4-2-2A (Ch 9910)	1	No.		
6.18d.04	D4-2-2A (Ch 9940)	1	No.		
6.18e	1200mm < D ≤ 1800mm fixed to existing posts or structure				
6.18e.01	SIGN 1S (Ch 10060)	2	No.		
6.18g	D > 1800mm fixed to existing posts or structure				
6.18g.01	G9-101 (Ch 10255)	1	No.		
6.18h	D > 1800mm including supply and installation of slip base posts and/or braces (unless stated otherwise)				
6.18h.01	SIGN 1F (Ch 9890)	1	No.		
6.18h.02	SIGN 1D / SIGN 1E (ch 9915)	1	No.		
6.18h.03	SIGN 1C (Ch 9925)	1	No.		
6.18h.04	SIGN 1A (Ch 10120)	1	No.		
6.19	**Relocation of existing signs**	**1**	**item**		
6.19b	2 posts unbraced				
6.19b.01	HCC Directional Sign (Ch 9820 - new posts)	1	No.		
6.2	**Removal of existing signs**	40	No.		
	Pavement Marking	**1**	**item**		
	Extruded Thermoplastic				
6.27	Supply and application of EXTRUDED THERMOPLASTIC pavement marking including glass beads and angular aggregate as required				
6.27d	B4, Barrier Line (Two Way Access)	27	m		
6.27e	C, Continuity Line	58	m		

s38, s39

6.27f	CC, Continuity Continuous Line	107	m	s38, s39	
6.27j	HL, Holding Line	33	m		
6.27l	L, Lane Line (Speed Limit above 60km/h)	763	m		
6.27m	L1, Lane Line (Speed Limit 60km/h or less)	528	m		
6.27n	L3, Lane Line (Special Purpose)	989	m		
6.27o	LC, Lane Line Continuous	173	m		
6.27u	SL, Stop Line	58	m		
6.27v	T, Turn with RRPM	86	m		
6.27w	W, Pedestrian Walkway	196	m		
6.27x	Supply and install Pavement Symbols, including glass beads and angular quartz in Extruded Thermoplastic: "T3 LANE"	2	No.		Transferred from Part 1: Project Specific Items
6.27y	Supply and install Pavement Symbols, including glass beads and angular quartz in Extruded Thermoplastic: "T3"	4	No.		Transferred from Part 1: Project Specific Items
	Chevrons				
6.32	Supply and application of chevrons with:				
6.32b	Standard Waterbourne Paint	42	m²		
	Pavement Arrows				
6.34	Supply and install pavement arrows including glass beads and angular quartz in Extruded Thermoplastic				
6.34a	Left or right only	17	No.		
6.34b	Straight ahead only	12	No.		
	RRPM's				
6.45	Supply and application of raised pavement markers				
6.45b	Uni directional yellow	2	No.		
6.45c	Uni directional white	198	No.		
6.45d	Bi directional yellow	40	No.		
	Retro Reflectivity Measurement				
6.48	Line Marking Retro Reflectivity measurement				
6.48a	(20-30 days) - Longitudinal Markings	1	No of Sites		
6.48b	(20-30 days)- other markings	1	No of Sites		
6.48c	(160-180 days)- Longitudinal Markings	1	No of Sites		
6.48d	(160-180 days) - other markings	1	No of Sites		
	Traffic Signals	**1**	**item**		
	Intersection : Macquarie Street and Southern Outlet Highway				
6.49	Removal/ Relocation of existing				
6.49a	Existing HCC Directional sign to be Reinstated on small island adjacent to the existing location	1	no		
6.49b	Existing Light Pole to be relocated	1	no		
6.49c	Existing JUP to be removed	1	no		
6.50	Installation of New Equipment				
6.50a	New 2T Traffic Pole	1	no		
6.50b	New Traffic Signal Post	10	no		
6.50c	New Pedestrian push button-post	6	no		
6.50d	New Traffic Signal Pits	12	no		
6.50e	New Vehicular Traffic Controller Cabinet	1	no		
6.50f	Cable and Conduit connection (To Davey Street Approach)	27	m		Assumed 2 x 100 dia, Cable + Conduits, Rate includes excavation and backfill
	Intersection : Davey Street and Southern Outlet Highway				
6.51	Removal/ Relocation of existing				
6.51a	Existing Traffic Controller Cabinet to be removed and returned to the Principal	1	no		
6.51b	Existing Light Pole to be relocated	1	no		
6.51c	Existing JUP to be removed	1	no		
6.52	Installation of New Equipment				
6.52a	New Traffic Controller Cabinet and Extension Housing for CCTV	1	no.		
6.52b	New CCTVs to replace existing	1	no		
6.52c	New Traffic Signal Post	14	no		
6.52d	New Pedestrian push button-post	9	no		
6.52e	New Traffic Signal Pits	15	no		
6.52f	Cable and Conduit connection (To Davey Street Approach)	77	m		Assumed 2 x 100 dia, Cable + Conduits
	TOTAL Part-6 Traffic Facilities	**480**	**m**		
7	**PART-7 LANDSCAPING**				
	General	**1**	**item**		
7.03	Handseeding	682	m²		
	Fences and Gates	**1**	**item**		
7.10e	Steel post and welded mesh	12	m		
7.10f	Paling	6	m		
7.12	Relocate gates	2	No.		
7.13	Remove existing fence	84	m		
7.14	New Steel Fencing - To match existing	0	m		
	Footpaths and Islands	**1**	**item**		
7.15	Construction of paved footway	307	m²		
7.16	Construction of paved traffic islands including kerbing and all infill materials	194	m²		
	TOTAL Part-7 Landscaping	**480**	**m**		
8	**PART-8 MISCELLANEOUS**				
8.01a	**Construct access**	**1**	**item**		
	CH - Side - Type - Area				
8.01a.01	9785 - Left - RC - 18m2				
8.01a.02	9870 - Left - RC - 28m2				
8.01b	Driveway	53	m2		
8.02	Inspection of buildings	113	No.		

8.05	**Service Relocation - Excavation and Backfill of trenches for:**	**1**	**item**	s38, s39	
8.05a	Electricity	307	m		Day Works; All electrical servitudes on drawing 200-203 existing Allowance updated to cater for relocation works
8.05b	Telecommunications	124	m		All Telecommunication servitudes on drawing 200-203 relocate
8.05c	Electricity (E)	451	m		Day Works; All electrical servitudes on drawing 200-203 New Allowance updated to cater for new utilities only
8.05d	Electricity (U)	382	m		Day Works; All electrical servitudes on drawing 200-203 New Allowance updated to cater for new utilities only
8.05e	Electricity (TL)	255	m		Day Works; All electrical servitudes on drawing 200-203 New Allowance updated to cater for new utilities only
8.05f	ITS	839	m		Drawing 101-103 New
8.05g	New LED Street lights	13	No.		
8.06	Provision of Environmental Completion Audit	1	Item		Included in Preliminary
8.08	Environmental Management	1	Item		Included in Preliminary
8.1	Traffic Management	16	wks.		
8.2	Allowance to protect existing services	1	Item		
	TOTAL Part-8 Miscellaneous	**480**	**m**		
9	**PART-10 PROVISIONAL ITEMS**				
9.1	Audit Surveys	1.00	Item		Provisional allowance for $10,000 is made for audits.
	TOTAL Part-10 Provisional Items	**480**	**m**		
	Sub-Total Direct Costs	**480**	**m**		

Southern Outlet Transit Line - GHD

Stage 2 BOQ Summary (DRAFT)

s38, s39

Code	Description	Quantity	UOM	Comments
	Southern Outlet Transit Line - Stage 2 (CH 10880-CH 12180)			
1	Part 1 - Project Specific Items	1,300	m	
2	Part 2 - Earthworks	1,300	m	
3	Part 3 - Drainage	1,300	m	
4	Part 4 - Pavement	1,300	m	
5	Part 5 - Bituminous Surfacing	1,300	m	
6	Part 6 - Traffic Facilities	1,300	m	
7	Part 7 - Landscaping	1,300	m	
8	Part 8 - Miscellaneous	1,300	m	
9	Part 10 - Provisional Items for Schdule of Rates Contract or Variation Schedule for Lump Sum Contract	1,300	m	
	Sub-Total Direct Costs	**1,300**	**m**	
10	Indirect Costs			
10.1	Preliminaries	34	%	
10.2	Environmental Management	1	%	
10.3	Design Cost		%	esign cost has been excluded from the Construction cost nder Lump Sump (Construction only) contract consideration.
	Sub-Total Indirect Costs	**1,300**	**m**	
11	Contractor's Risk and Escalation			
11.1	Contractor's Risk	7	%	
11.2	Contractor's Escalation		%	scalation has been excluded from the Construction cost.
	Sub-Total Contractor's Risk and Escalation	1,300	m	
12	Contractor's Overheads & Margin	12	%	
13	**TOTAL CONSTRUCTION COSTS (Excl. GST)**	**1,300**	**m**	
14	**Contingency**			
14.1	P50 Contingency			lease refer to Summary Tab for P50 Contingency allowance
14.1	P90 Contingency			lease refer to Summary Tab for P90 Contingency allowance
	Sub-Total Contingency - P50			
	Sub-Total Contingency - P90			
	TOTAL COSTS - P50 RISK-ADJUSTED (Excl. GST)			lease refer to Summary Tab
	TOTAL COSTS - P90 RISK-ADJUSTED (Excl. GST)			lease refer to Summary Tab
15	**Client Costs**			
15.1	Design Cost	1	item	lease refer to Summary Tab for Client's Design Cost allowance
15.1	Professional Fees	Excluded		
15.1	Legal & Commercial Fees	Excluded		
15.1	Authority Fees	Excluded		
15.1	Insurance Fees	Excluded		
15.1	Client Direct Costs - Department of State Growth Project Management	1	item	lease refer to Summary Tab for Department of State Growth roject Management (Client Costs)
15.1	Escalation on Client Costs	Excluded		
15.1	Land Acquisition Costs	Excluded		
	Sub-Total Client Costs			
	TOTAL PROJECT COSTS - P50 RISK-ADJUSTED + CLIENT COSTS (Excl. GST)			lease refer to Summary Tab
	TOTAL PROJECT COSTS - P90 RISK-ADJUSTED + CLIENT COSTS (Excl. GST)			lease refer to Summary Tab

GHD - Southern Outlet Transit Line (DRAFT)

Stage 2 Cost Breakdown

DCWC Stage 2 - Cost Breakdown

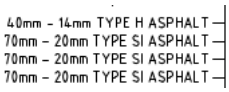
DCWC R1 - Draft 05.07.2023

Code	Description	Quantity	UOM	s38, s39	Comments/Assumptions
	Southern Outlet Transit Line - Stage 2 (CH 10880-CH 12180)				
1	**PART 1 - PROJECT SPECIFIC ITEMS**				
1.1	**Project Specific Items**	**1**	**item**		
1.1.1	Contract Establishment and Mobilisation including fully operational site office and amenities. (Max 2% of Tender Sum)	1	item		Included under Preliminaries
1.1.2	Regulation layer to make up reclaimed surface to design levels.	150	m3		
1.1.3	Independent Quality Assurance Verifier (Spec Clause 160.A3)	1	item		Included under Preliminaries
1.1.4	Road Safety Audits	1	item		Included under Preliminaries
1.1.5	Maintenance during Defects Liability Period	1	item		Included under Preliminaries
1.1.6	Milling out and disposal of existing wearing course to a nom. depth of 40mm.	34,555	m2		Qty = the overall existing pavement area in Stage 2
1.1.7	Supply and install Pavement Symbols, including glass beads and angular quartz in Extruded Thermoplastic: "T3 LANE"	1	no.		Included under "Part 6 - Traffic Facilities: Pavement Markings"
1.1.8	Supply and install Pavement Symbols, including glass beads and angular quartz in Extruded Thermoplastic: "T3"	6	no.		Included under "Part 6 - Traffic Facilities: Pavement Markings"
1.1.9	Supply and install insitu concrete median barrier footings (B6298) supply and placement of all materials (concrete volume provided).	1,033	m3		DAY and NIGHT WORKS; Concrete Median Barrier Footing
1.1.10	Supply and install precast concrete median barrier footings (B6298) supply and placement of all materials (concrete volume provided).	200	m3		RFI No. 16 notes that this item referring to the parapet barrier DCWC has included the allowance under "Part 6 - Traffic Facilities: Road Safety Barrier Systems"
1.1.11	Supply and install insitu concrete median retaining wall footings (B6298) supply and placement of all materials (concrete volume provided).	586	m3		DAY and NIGHT WORKS; Concrete Median Retaining wall Footing
1.1.12	Supply and install precast concrete median retaining wall footings (B6298) supply and placement of all materials (concrete volume provided).	335	m3		RFI No. 17 notes that this item refers to the panels of the median retaining wall. DCWC has included under "Part 6 - Traffic Facilities: Road Safety Barrier Systems"
1.1.13	Supply and install retaining wall, noise wall precast panels (B6298) supply and placement of all materials (concrete volume provided).	371	m3		DAY and NIGHT WORKS; RFI No. 17 notes that this item refers to the panels of the median retaining wall.
1.1.14	Supply and install retaining wall, noise wall insitu footings (B6300 and B6301) supply and placement of all materials (concrete volume provided).	175	m3		DAY WORKS; Allowance associated with B6300 and B6301
1.1.15	Supply and install retaining wall, noise wall precast panels (B6300 and B6301) supply and placeme of all materials (concrete volume provided).	138	m3		DAY WORKS; Allowance associated with Precast Panel (B6300 and B6301)
1.1.16	Supply and install insitu concrete footings for traffic barrier for Dynnyrne road including supply and placement of all materials (concrete volume provided)	190	m3		DAY WORKS; Allowance associated with (Dynnyrne Road)
1.1.17	Supply and install precast concrete footings for traffic barrier for Dynnyrne road including supply and placement of all materials (concrete volume provided)	20	m3		RFI No. 16 notes that this item referring to the parapet barrier DCWC has included the allowance under "Part 6 - Traffic Facilities: Road Safety Barrier Systems"
1.1.18	Reinstatement of Dynnyrne Road to match new barrier levels	1	item		
1.1.19	Supply and install 125mm thick reinforced shotcrete	325	m2		
1.1.20	Supply and install 1.8m high chainwire fence, footings and retaining wall connections	93	m		
1.1.21	Supply and install 'VEE' kerb 600mm wide with 50mm deep channel including but not limited to excavation, protection of existing infrastructure, supply and placement of all materials, disposal of spoil and reinstatement.	97	m		
1.1.22	Supply and install DN225 RCP Class 4 (Line L)	49	m		
1.1.23	Modify grated pit Type A, Type B and Type C	1	no.		
1.1.24	Provide a 2m wide smooth area behind barrier	34	m2		
1.1.25	Supply and install DN250 PN16 PE100 water main including, excavation in all materials, boring, all fittings, thrust blocks, backfill and connection to existing	1	item		Included under below line item "New Utilities"
1.1.26	Supply and install DN150 DICL PN16 sewer main including, excavation in all materials, all fittings, DN150 PVC-U DWV SN8 SCJ property connection, backfill and connection to existing	1	item		Included under below line item "New Utilities"
1.1.27	Supply and install 150mm thick concrete slab (sight line)	1,394	m2		
1.1.28	Supply and install new 900mmx600mm (internal) pit with solid lid	1	no.		
1.1.29	Supply and place rock pitching around manhole M-03	1	item		
1.2	**Demolition**	**1**	**item**		
1.2.1	Demolish existing median barrier - concrete traffic barriers with extended steel bar on top	359	m		Included under Part 5
1.2.2	Remove existing median barrier - F-type barriers	1,174	m		Included under Part 5
1.2.3	Remove existing safety barrier - W beam safety barriers	670	m		Included under Part 5
1.2.4	Removal of existing kerb and channel	2,125	m		DAY WORKS
1.2.5	Demolish existing concrete pavement along the northbound of Southern Outlet Hwy	644	m2		NIGHT WORKS
1.2.6	Demolishing existing properties for road widening				Noted. This cost item has been excluded as managed as separate contract.
1.2.7	Demolishing existing signages, including footing				Noted. This cost item has been excluded as managed as separate contract.
1.2.8	Demolishing existing trees - up to 10 metres high (incl. clear vegation in working areas)				Noted. This cost item has been excluded as managed as separate contract.
1.2.9	Demolishing CCTV camera and pole along the northbound of Southern Outlet Hwy	1	no		DAY WORKS
1.2.10	Demolishing solar panel and pole along the northbound of Southern Outlet Hwy	1	no		DAY WORKS
1.2.11	Demolishing rock retaining wall - median area	1,380	m2		DAY and NIGHT WORKS
1.2.12	Demolishing rock retaining wall - residential area	658	m2		DAY WORKS
1.2.13	Demolishing full depth pavement - 400mm	13,769	m2		NIGHT WORKS
1.3	**Utilities Protection**	**1**	**item**		The following are the utilities services along Southern Outlet with protection required due to the location adjacent/beneath the workplace where excavation work to be carried out
1.3.1	Existing service protection - Sewer	118	m		NIGHT WORKS
1.3.2	Existing service protection - Stormwater	219	m		NIGHT WORKS
1.3.3	Existing service protection - Electricity	74	m		NIGHT WORKS
1.4	**Utilities Demolition**	**1**	**item**		
1.4.1	Demolition - ITS Electrical and Comms Cables	598	m		Allowance for termination and abandoning of existing conduits.
1.4.2	Demolition - Sewer Main	66	m		NIGHT WORKS
1.4.3	Demolition - Sewer Main Hole	5	no		NIGHT WORKS
1.4.4	Demolition - Stormwater Pits	19	no		Included under "Part 3 - Drainage"
1.4.5	Demolition - Stormwater Pipes	252	m		Included under "Part 3 - Drainage"
1.4.6	Demolition - Water	67	m		Included under "Part 3 - Drainage"
1.5	**New Utilities**	**1**	**item**		Includes allowance for New ITS works
1.5.1	New Utilities - Sewer (150 DICL PN16 - 1.5m deep), including DN150 DICL PN16 sewer main, excavation in all materials, backfill and DN1050 Man Holes (MH S2 & S3)	33	m		DAY WORKS; Extent of works is based on DWG 1245 and 1246
1.5.2	New Utilities - Sewer (150 PVC-U SN4 - 1.5m deep), including, 150 PVC-U SN4 sewer main, excavation in all materials, backfill and DN150 PVC-U Inspection Shaft (IS or S4)	32	m		DAY WORKS; Extent of works is based on DWG 1245 and 1246
1.5.3	New Utilities - Sewer (100 PVC-U SN8) including 100 PVC-U SN8 sewer main, excavation in all materials, backfill and connection to existing	38	m		DAY WORKS; Extent of works is based on DWG 1245 and 1246
1.5.4	New Utilities - DN150 DICL PN16 sewer main, including, DN150 DICL PN16 sewer main, excavation in all materials, DN150 PVC-U DWV SN8 SCJ property connection, backfill, connection to existing and DN1050 Man Holes (MH S2 & S3)	1	item		NIGHT/DAY WORKS; Cost has been captured in Item 1.5.1 to 1.5.3
1.5.5	New Utilities - DN250 PN16 PE100 water main, including DN355 PE100 carrier pipe, DN250 PN16 PE100 water main, excavation in all materials, boring, all fittings, thrust blocks, backfill, connection to existing, entry/exit pits and 2nos of water pits	55	m		NIGHT WORKS
1.5.6	ITS System	1,958	m		Allowance from CH 10880 to CH12560

s38, s39

1.6	**Utilities Relocation**	**1**	**item**	
1.6.1	Relocation Utilities - Stormwater	138	m	NIGHT WORKS
1.6.2	Relocation Utilities - Underground Electricity	69	m	NIGHT WORKS
1.6.3	Relocation Utilities - Overhead Electricity (CH 11220-11280)	119	m	NIGHT WORKS;
1.6.4	Relocation Utilities - Gas			No allowance for Gas relocation.
1.7	**Temporary Works**	**1**	**item**	
1.7.1	Temporary hardstands for laydown area	8,066	m2	Allowance for 2 areas of hardstand: location 1 - existing properties to be demolished for road widening, location 2 - CH12440 adjacent to Proctors rd on the southern end of project based. Allowance for 250mm depth hardstand with crushed rocks
1.7.2	Re-line mark the pavements to enable staged construction works	8,639	m	Qty is based on extent of existing pavement x 50m of line marking per 200m2 of pavement
1.7.3	Allowance for temporary crane pads for precast panel installation	1,000	m2	Allowance for 500mm deep crushed rocks pads (50m2/each) to enable the installati of precast elements
1.7.4	Allowance to remove temporary hardstands post construction	8,066	m2	
1.7.5	Allowance to removal temporary crane pads post construction	1,000	m2	
1.8	**Rock fall protection (inclusive of temporary works to facilitate H2, H4 works and rock fall protection fence)**	**1**	**item**	Pricing for rock fall protection and associated temporary works includes: - H2 drape mesh construction, H4 rock anchors and cables, and rock fall fence) are not located within the existing carriageway. They could possibly be constructed off-line. - Currently there is a possible laydown area around chainage 11,900 that could provide access to the site. - Gaining access to the rock face from the laydown area will require removal of the existing rock bund and gabions.
1.8.1	Stage 0:			
1.8.2	Clearing and grubbing	3,715	m2	DAY WORKS
1.8.3	Temporary hardstands for laydown area at CH11,900 (assume 150mm depth)	1,565	m2	DAY WORKS
1.8.4	Temporary access track (assume 150mm depth)	2,150	m2	DAY WORKS
1.8.5	Stage 1:			
1.8.6	Removal of existing rock bund	42	m2	DAY WORKS Assuming that existing rock bund materials are to be retained and reused for reinstatement works.
1.8.7	Removal of existing gabion wall	645	m2	DAY WORKS; Assuming that existing gabion wall materials are to be retained and reused for reinstatement works.
1.8.8	Supply and installation of temporary fencing to enable rockfall fence installation	430	m	DAY WORKS; Allowance for temporary fencing is placed to protect road users from falling rocks during the construction of proposed rock fall protection works.
1.8.9	Allowance for earthbund (assumed 6m high earth bund)	6,240	m3	Reference GHD 's comment on 5/7/2023, allownace for earthbund has been removed as earthbund is deemed not required.
1.8.10	Staged removal of earthbund (removal to be carried out at every 2m height)	6,240	m3	Reference GHD 's comment on 5/7/2023, allownace for earthbund has been removed as earthbund is deemed not required.
1.8.11	Stage 2 - H4 works:			
1.8.12	Supply and installation of H4 rock anchors and cables located around CH11,840	72	m	DAY WORKS; Allowance for 12no. anchors. The qty is based on an area of 150m2 (10m high x 15m lateral extent), with anchors to placed at 2.5m spacing.
1.8.13	Stage 3 - H2 works:			
1.8.14	Supply and installation of H2 drape mesh located around CH11,750	1,085	m2	DAY WORKS
1.8.15	Supply and installation of spot bolts to ensure sufficient embedment length and subsequent ground support to Hazard H2 area	240	m	DAY WORKS; As the extent of spot bolting is subject to actual site condition and assessment, constructability advice has nominated a contingency allowance of 20 spot bolts (12m length each)
1.8.16	Stage 4 - Rock fence:			
1.8.17	Supply and installation of Rockfall Fence (2m high between CH11,440 to 11,515)	75	m	DAY WORKS
1.8.18	Supply and installation of Rockfall Fence (3m high between CH11,515 and 11,650)	135	m	DAY WORKS
1.8.19	Supply and installation of Rockfall Fence (2m high between CH11,650 to 11,870)	220	m	DAY WORKS
1.8.20	Stage 5 - Removal of temporary works and reinstatement:			
1.8.21	Removal of temporary hardstands for laydown area at CH11,900 (assume 150mm depth)	1,565	m2	DAY WORKS
1.8.22	Removal of temporary access track (assume 150mm depth)	2,150	m2	DAY WORKS; No allowance has been captured to remove the temporary access track between the rock wall and new fence. DCWC has considered the temporary access to be retained on site for for future maintenance purpose.
1.8.23	Reinstate existing rock bund			Assume reinstatement of existing rock bund is not required.
1.8.24	Reinstatement of existing gabion wall			Assumme reinstatement of existing gabion wall is not required.
1.8.25	Removal of temporary fencing	430	m	DAY WORKS
	TOTAL Part 1 - Project Specific Items	**1,300**	**m**	
2	**PART 2 - EARTHWORKS**			
2.1	**Excavation & Embankment**	**1**	**item**	
2.1.1	Clearing and grubbing	12,058	m2	DAY WORKS; Qty = total are of new barriers, new pavement area and adjacent areas along the Southern Outlet where proposed works to be carried out
2.1.2	Strip and remove topsoil	1,809	m3	DAY WORKS; Allowance for 150mm topsoil to be removed, no allowance for stockpile and reuse
2.1.3	Disposal Extra-Over Cost due to Contamination (Allowance for Category C only - Assume 10% of excavated materials to be disposed offsite Cat C only)			Allowance for contamination disposal has been removed from Direct Cost and included as Contingent Risk item
2.2	**Bulk Earthworks**	**1**	**item**	
2.2.1	Excavation in all materials	12,922	m3	NIGHT WORKS; The estimate considers 100% of excavated materials to be disposed off-site.
2.2.2	Extra Over Item 2.02 for rock	5,427	m3	NIGHT WORKS; DCWC has utilised 42% to calculate the extra over allownace for excavation in rock.
2.2.3	Disposal Extra-Over Cost due to Contamination (Allowance for Category C only - Assume 5% of excavated materials to be disposed offsite Cat C only)			The allowance for contamination disposal has been removed from Direct Cost and included as Contingent Risk item
2.3	**Detailed Earthworks**	**1**	**item**	
2.3.1	Subgrade material - Excavation, disposal and replacement	6,855	m3	NIGHTWORKS ; Consider this item refers box-out for pavement and imported fill as replacement.
2.3.2	Excavation for Retaining Wall	6,388	m3	NIGHT WORKS; The estimate considers 100% of excavated materials to be disposed off-site.
2.3.3	Extra Over for excavation in Rock (assume 42%)	5,562	m3	NIGHT WORKS; DCWC has utilised 42% to calculate the extra over allownace for excavation in rock.
2.3.4	Disposal Extra-Over Cost due to Contamination (Allowance for Category C only - Assume 5% of excavated materials to be disposed offsite Cat C only)			The allowance for contamination disposal has been removed from Direct Cost and included as Contingent Risk item
2.4	**Embankment**	**1**	**item**	
2.4.1	Subgrade material - Embankment	2,138	m3	NIGHT WORKS; Qty = the import fill as shown on the provided cross sections

2.4.2	Embankment construction	5,527	m3	s38, s39	NIGHT WORKS; Rate is based on Imported Type A fill for Embankment construction to the locations where new retaining wall at road median area to be built
2.5	**Batter Treatment**	**1**	**item**		
2.5.1	Supply and placing of topsoil - 50mm deep	1,370	m3		NIGHT WORKS
	TOTAL Part 2 - Earthworks	**1,300**	**m**		
3	**PART 3 - DRAINAGE**				
3.1	**Surface Drainage**	**1**	**item**		
3.1.1	Batter drains and aprons - Type 2 Single row	6	m		
3.2	**Culverts & Endwalls**	**1**	**item**		
	Steel Reinforced Concrete pipes in new works				
3.2.1	Line - No. of Barrels - Class				
3.2.3	300mm dia pipe:				
3.2.3.1	Line I2 - 1 - Class 4	25	m		DAY WORKS; I2-01 to I2-02; Line i2 Drainage profile; Dwg: 1201 & 1211
3.2.3.2	Line I3 - 1 - Class 4	9.53	m		DAY WORKS; I3-01 to I2-02; Line i3 Drainage profile; Dwg: 1201 & 1212
3.2.3.3	Line K - 1 - Class 4	11.68	m		NIGHT WORKS; Cross lane; K-1 to L-04; Line K Drainage profile; Dwg: 1200 & 1212
3.2.3.4	Line L - 1 - Class 4	19	m		DAY WORKS; L-04 to L-05; Dwg: 1200 & 1212
3.2.3.5	Line M -1 - Class 4	34	m		DAY WORKS; M3-01 to M-02; M4-01 to M-04; Dwg: 1202 & 1213
3.2.3.6	Line O - 1 - Class 4	2.25	m		DAY WORKS; O-1 to CONN O; Line O Drainage profile; Dwg: 1203 & 1214
3.2.3.7	Line P - 1 - Class 4	78.31	m		DAY WORKS; P-1 to P-2 to Conn P; Line P Drainage profile; Dwg: 1204 & 1214
3.2.3.8	Line Q - 1 - Class 4	3.76	m		NIGHT WORKS; Q-1 to Conn Q; Line Q Drainage profile; Dwg: 1204 & 1215
3.2.3.9	Line R - 1 - Class 4	3.67	m		NIGHT WORKS; R-1 to Conn R; Line R Drainage profile; Dwg: 1205 & 1215
3.2.3.10	Line S - 1 - Class 4	34.07	m		NIGHT WORKS; S-1 to EX-R03; Line S Drainage profile; Dwg: 1205 & 1215
3.2.3.11	Line T - 1 - Class 4	3.88	m		NIGHT WORKS; T-3 to Conn T; Line T Drainage profile; Dwg: 1206 & 1215
3.2.3.12	Line U - 1 - Class 4	1.68	m		DAY and NIGHT WORKS; U-01 to CONN U; Dwg: 1206 & 1215
3.2.3.13	Line V - 1 - Class 4	20	m		DAY and NIGHT WORKS; V-01 to CONN V; Dwg: 1207 & 1216
3.2.3.14	Line W - 1 - Class 4	24	m		DAY WORKS; W-01 to V-03; Dwg: 1207 & 1216
3.2.3.15	Line X - 1 - Class 4	1.99	m		DAY and NIGHT WORKS; X-1 to Conn X; Line X Drainage profile; Dwg: 1207 & 1216
3.2.4	375mm dia pipe:				
3.2.4.1	Line I - 1 - Class 4 (1.5m depth)	5	m		DAY and NIGHT WORKS; I-01 to I-02; Line i Drainage profile. On dwg 1210 chainage is 4.883m for new 375 dia pipe; Dwg: 1201&1210
3.2.4.2	Line I2 - 1 - Class 4 (2.4m depth)	29	m		NIGHT WORKS; I2-02 to I-03; Line i2 Drainage profile; Dwg: 1201&1211
3.2.5	450mm dia pipe:				
3.2.5.1	Line I - 1 - Class 4 (2m depth)	44	m		DAY and NIGHT WORKS; I-05 to I-06 & I-08 to I-09; Line i Drainage profile; Dwg: 1200, 1201, 1210, 1211
3.2.5.2	Line M - 1 - Class 4 (2m depth)	8.88	m		NIGHT WORKS M-01 to M-02; Line M Drainage profile; Dwg: 1201 & 1212
3.2.6	600mm dia pipe:				
3.2.6.1	Line M - 1 - Class 4 (1.2m depth)	5	m		DAY WORKS; M-03 to M-03A; Dwg: 1202 & 1213
3.2.6.2	Line M - 1 - Class 4 (3m depth)	85	m		NIGHT WORKS; M-02 to N-02; Line M Drainage profile; Dwg: 1202 & 1213
3.2.6.3	Line N - 1 - Class 4 (2.5m depth)	2.00	m		NIGHT WORKS; N-1 to Conn N; Line N Drainage profile; Dwg: 1202 & 1213
3.2.7	Removal of pipes≤ 600mm dia				
3.2.7.1	Under existing pavement	2	m		DAY and NIGHT WORKS
3.2.7.1	Cap and grout fill	328	m		NIGHT WORKS
3.3	**Pits**	**1**	**item**		
3.4	**Subsoil Drains**	**1**	**item**		
3.4.1	Class 400 sub-soil drain <750 mm deep	1,537	m		DAY WORKS
3.4.2	Class 1000 sub-soil drain <750mm deep	2,132	m		DAY WORKS
3.5	**Kerbing**	**1**	**item**		
3.5.1	B1, barrier kerb/gutter	1,222	m		DAY WORKS
3.5.2	B1, barrier kerb/gutter, construction within existing pavement	526	m		DAY WORKS
3.5.3	B2, barrier kerb, construction within existing pavement	346	m		DAY WORKS
	TOTAL Part 3 - Drainage	**1,300**	**m**		
4	**PART 4 - PAVEMENT**				



If CBR<5%, 150mm Class 3 cement treated,
CBR>10%, 150mm Class 4 crushed rock

s38, s39

4.1	**Supply, spread and compact Sub-Base Class 3 material**	**1**	**item**	
4.1.1	150 mm depth Cement Treated	5,323	m²	NIGHT WORKS; Assume 42% of pavement areas are on rocks based on the quantity provided by GHD. Reference typical details on Sheet 1010, 150mm Class 3 cement treated if CBR>10 and on rock
4.2	**Supply, spread and compact Sub-Base Class 4 material**	**1**	**item**	
4.2.1	150 mm depth - Class 4 crushed rocks	12,673	m²	NIGHT WORKS; Reference typical details on Sheet 1010, 150mm crushed rocks to be provided if CBR>10%
4.3	**Saw Cutting of existing surface/pavement**	**1,658**	**m**	NIGHT WORKS
	TOTAL Part 4 - Pavement	**1,300**	**m**	
5	**PART 5 - BITUMINOUS SURFACING**			
5.1	**Asphalt**	**1**	**item**	
5.1.1	Supply, deliver, place and compact including sweeping of Dense Graded Asphalt			
5.1.2	Nominally 14 mm size seal	21,377	m²	NIGHT WORKS; Reference dwg 1010, typical full depth asphalt pavement detail, depth for 14mm Type H Asphalt is 40mm; Sheet no. 1170, existing wearing course shall be replaced with 40mm thick, 14mm Type H asphalt; Qty = Full depth pavement area + resheeting area
5.1.3	Nominally 20 mm size pavement, 3x70mm layers	11,906	m²	NIGHT WORKS; Reference dwg 1010, typical full depth asphalt pavement detail, depth for 20mm Type SI Asphalt is: 70mm x 3 layers to the area of Full depth pavement only
	TOTAL Part 5 - Bituminous Surfacing	**1,300**	**m**	
6	**PART 6 - TRAFFIC FACILITIES**			
6.1	**Road Safety Barrier Systems**	**1**	**item**	
6.1.1	Supply and installation of W-Beam Safety Barrier	13	m	DAY WORKS
6.1.2	Supply and installation of Thrie Beam Safety Barrier	616	m	DAY WORKS
6.1.3	Supply and installation of Concrete Safety Barrier	1,635	m	DAY and NIGHT WORKS
6.1.4	Supply and installation of W-Beam Safety Barrier			
6.1.5	Barrier to Thrie Beam transition pieces	2	No.	DAY WORKS
6.1.6	Supply and installation of Safety Barrier			
6.1.7	Thrie Beam Safety Barrier connection to Concrete Safety Barrier or Bridge Pylon (3402-4/P70-1)	1	Item	DAY WORKS
6.1.8	Remove existing barrier			
6.1.9	W-Beam Safety Barrier	670	m	DAY WORKS
6.1.10	Concrete Safety Barrier	1,533	m	DAY and NIGHT WORKS
6.2	**Delineators**	**1**	**item**	
6.2.1	Supply and installation of delineator holders and delineators			
6.2.2	Delineators on one (1) side	38	No.	
6.2.3	Delineators on two (2) sides	32	No.	
6.3	**Signs**	**1**	**item**	
6.3.1	Fabrication and installation of signs with maximum dimension (D)			
6.3.2	D ≤ 900mm fixed to existing post or structure			
6.3.3	W8-7C	2	No.	
6.3.4	W5-20C	2	No.	
6.3.5	D ≤ 900mm including supply and installation of post			
6.3.6	R7-7-2C	8	No.	
6.3.7	R4-1B(80)	2	No.	
6.3.8	1200mm < D ≤ 1800mm fixed to existing posts or structure			
6.3.9	SIGN 2S (Ch 12175)	4	No.	
6.3.10	D > 1800mm including supply and installation of slip base posts and/or braces (unless stated otherwise)			
6.3.11	SIGN 2A (Ch 12120)	1	No.	
6.3.12	SIGN 2B (Ch 12175)	1	No.	
6.3.13	Removal of existing signs	6	No.	
6.4	**Pavement Marking**	**1**	**item**	
6.4.1	Extruded Thermoplastic			
6.4.2	Supply and application of EXTRUDED THERMOPLASTIC pavement marking including glass beads and angular aggregate as required			
6.4.3	C, Continuity Line	129	m	
6.4.4	E2, Edge Line (Speed Limit above 60km/h)	5,183	m	
6.4.5	L, Lane Line (Speed Limit above 60km/h)	2,565	m	
6.4.6	L3, Lane Line (Special Purpose)	1,172	m	
6.4.7	Removal of Markings			
6.4.8	Remove Thermoplastic markings	250	m²	
6.4.9	RRPM's			
6.4.10	Supply and application of raised pavement markers			
6.4.11	Uni directional red	106	No.	
6.4.12	Uni directional yellow	108	No.	
6.4.13	Uni directional white	104	No.	
6.4.14	Retro Reflectivity Measurement			
6.4.15	Line Marking Retro Reflectivity measurement			
6.4.16	(20-30 days) - Longitudinal Markings	1	No of Sites	Provisional allowance
6.4.17	(20-30 days)- other markings	1	No of Sites	Provisional allowance
6.4.18	(160-180 days)- Longitudinal Markings	1	No of Sites	Provisional allowance
6.4.19	(160-180 days) - other markings	1	No of Sites	Provisional allowance
	TOTAL Part 6 - Traffic Facilities	**1,300**	**m**	
7	**PART 7 - LANDSCAPING**			
7.1	**General**			
7.1.1	Handseeding	1,370	m²	
7.2	**Fences and Gates**			
7.2.1	Remove existing fence	106	m	
	TOTAL Part 7 - Landscaping	**1,300**	**m**	
8	**PART 8 - MISCELLANEOUS**			
8.1	Inspection of buildings	271	No.	Provisional allowance for building inspection cost
8.2	Provision of Environmental Completion Audit	1	Item	Included in Preliminary
8.3	Environmental Management	1	Item	Included in Preliminary

				s38, s39	
8.4	Traffic Management	1	Item		
	TOTAL Part 8 - Miscellaneous	**1,300**	**m**		
9	**PART 10 - PROVISIONAL ITEMS FOR SCHDULE OF RATES CONTRACT OR VARIATION SCHEDULE FOR LUMP SUM CONTRACT**				
9.1	Extra Over Item 2.02 for rock	1,500.00	m³		Provisional allowance
9.2	Subgrade material - Excavation, disposal and replacement	350.00	m³		Provisional allowance
9.3	Existing pavement failure repairs	700.00	m²		Provisional allowance
9.4	Existing pavement failure repairs - subgrade Excavation, disposal and replacement	100.00	m³		Provisional allowance
9.5	Material excavated and replaced below pipe footings	11.00	m³		Provisional allowance
9.6	Rock excavation from trenches etc PQ	170.00	m³		Provisional allowance
9.7	Class 400 sub-soil drain <750 mm deep	100.00	m		Provisional allowance
9.8	Class 1000 sub-soil drain <750mm deep	100.00	m		Provisional allowance
9.9	Audit Surveys	1.00	Item		Provisional allowance
9.10	Provisional allowance for new pedestrian pathway	1.00	Item		Provisional allowance
	TOTAL Part 10 - Provisional items for Schedule of Rates Contract or Variation Schedule for Lump Sum Contract	**1,300**	**m**		
	Sub-Total Direct Costs	**1,300**	**m**		

RISK AND OPPORTUNITY REGISTER - SOUTHERN OUTLET HIGHWAY

RISK/ OPPORTUNITY IDENTIFICATION / INFORMATION		RESIDUAL RISK RATING			QUANTITATIVE RISK ASSESSMENT											
Risk ID	Description	Likelihood	Consequence	Risk Rating	Likelihood	Best Case	Most Likely	Worst Case	Omit Include	Distribution	Cost Distribution	Likelihood Distribution	Risk Quantity	Adjustment	Adjusted P50 Total	Adjusted P90 Total
INHERENT RISK																
1.0	DIRECT COST															
1.1A	Direct Cost (Stage 1)															
1.1A.1	Part 1 - Project Specific Items															
1.1A.2	Part 2 - Earthworks															
1.1A.3	Part 3 - Drainage															
1.1A.4	Part 4 - Pavement															
1.1A.5	Part 5 - Bituminous Surfacing															
1.1A.6	Part 6 - Traffic Facilities															
1.1A.7	Part 7 - Landscaping															
1.1A.8	Part 8 - Miscellaneous															
1.1A.9	Part 10 - Provisional items for Schdule of Rates Contract or Variation Schedule for Lump Sum Contract															
	Subtotal - Direct Cost (Stage 1)															
1.2A	Indirect Cost (Stage 1)															
1.2A.1	Preliminaries															
1.2A.2	Environmental Management															
1.2A.3	Contractor's Design Cost															
	Subtotal - Indirect Cost (Stage 1)															
1.3A	Contractor's Risk, Escalation & Margin (Stage 1)															
1.3A.1	Contractor's Risk															
1.3A.2	Contractor's Escalation															
1.3A.3	Contractor's Overheads & Margin															
	Subtotal - Contractor's Risk, Escalation & Margin (Stage 1)															
	SUBTOTAL - STAGE 1															
1.1B	Direct Cost (Stage 2)															
1.1B.1	Part 1 - Project Specific Items															
1.1B.2	Part 2 - Earthworks															
1.1B.3	Part 3 - Drainage															
1.1B.4	Part 4 - Pavement															
1.1B.5	Part 5 - Bituminous Surfacing															
1.1B.6	Part 6 - Traffic Facilities															
1.1B.7	Part 7 - Landscaping															
1.1B.8	Part 8 - Miscellaneous															
1.1B.9	Part 10 - Provisional items for Schdule of Rates Contract or Variation Schedule for Lump Sum Contract															
	Subtotal - Direct Cost (Stage 2)															
1.2B	Indirect Cost (Stage 2)															
1.2B.1	Preliminaries															
1.2B.2	Environmental Management															
1.2B.3	Contractor's Design Cost															
	Subtotal - Indirect Cost (Stage 2)															
1.3B	Contractor's Risk, Escalation & Margin (Stage 2)															
1.3B.1	Contractor's Risk															
1.3B.2	Contractor's Escalation															
1.3B.3	Contractor's Overheads & Margin															
	Subtotal - Contractor's Risk, Escalation & Margin (Stage 2)															
	SUBTOTAL - STAGE 2															
	TOTAL PROJECT COST (STAGE 1 & 2)															
CONTINGENT RISK																
2.0	DISCRETE CONTINGENT RISKS															
2.1.1.1	Unknown threatened flora and fauna damaged during construction															
2.1.2.1	Various buildings have been demolished near Davey Street to build the original highway - these ruins may be uncovered during construction and cause construction delay. Also has potential to cause planning delay or refusal during design phase															
2.1.4.4	Damage to neighbouring houses - Vibration caused by excavation works for pedestrian ramp may cause cracking or other damage to neighbouring houses															

[redacted] s39

2.1.4.5	Acoustic treatment for selected property owners
2.1.5.1	TasNetworks service clashes during construction delay project
2.1.5.2	TasWater service clashes during construction delay project
2.1.5.3	Telstra service clashes during construction delay project
2.1.5.6	Services - through rock
2.1.5.7	Unknown services not shown on DBYD (old town gas, etc.)
2.1.5.9	NBN service clashes during construction delay project
2.1.7.2	Increased construction costs - if rock is encountered in ground
2.1.7.3	Existing underpass collapse during construction of new median retaining wall
2.1.7.4	Potential prolongation due to location of project (main access road)
2.1.7.5	Numerous projects / events occuring at the same time causing temporary shutdown
2.1.7.6	Risk of encountering contaminated material (Cat C)
2.1.7.7	Risk of delay in project due to interface issues with specialist subcontractor (demolition & rock fall protection contractor) and main contractor

s39

RISK MANAGEMENT AS/NZS ISO 31000:2018

Likelihood	Impact	Combined	Risk Ranking	Percentage
Rare	Notable	RareNotable	Low	0.5%
Rare	Minor	RareMinor	Low	0.5%
Rare	Moderate	RareModerate	Low	0.5%
Rare	Major	RareMajor	Medium	0.5%
Rare	Catastrophic	RareCatastrophic	Medium	0.5%
Unlikely	Notable	UnlikelyNotable	Low	5.0%
Unlikely	Minor	UnlikelyMinor	Low	5.0%
Unlikely	Moderate	UnlikelyModerate	Medium	5.0%
Unlikely	Major	UnlikelyMajor	Medium	5.0%
Unlikely	Catastrophic	UnlikelyCatastrophic	High	5.0%
Possible	Notable	PossibleNotable	Low	29.5%
Possible	Minor	PossibleMinor	Medium	29.5%
Possible	Moderate	PossibleModerate	Medium	29.5%
Possible	Major	PossibleMajor	High	29.5%
Possible	Catastrophic	PossibleCatastrophic	High	29.5%
Likely	Notable	LikelyNotable	Medium	69.5%
Likely	Minor	LikelyMinor	Medium	69.5%
Likely	Moderate	LikelyModerate	High	69.5%
Likely	Major	LikelyMajor	High	69.5%
Likely	Catastrophic	LikelyCatastrophic	Very High	69.5%
Almost Certain	Notable	Almost CertainNotable	Medium	95.0%
Almost Certain	Minor	Almost CertainMinor	High	95.0%
Almost Certain	Moderate	Almost CertainModerate	High	95.0%
Almost Certain	Major	Almost CertainMajor	Very High	95.0%
Almost Certain	Catastrophic	Almost CertainCatastrophic	Very High	95.0%

Risk Matrix

Impact \ Likelihood	Rare	Unlikely	Possible	Likely	Almost Certain	Distribution
Notable	Low	Low	Low	Medium	Medium	Triang
Minor	Low	Low	Medium	Medium	High	Pert
Moderate	Low	Medium	Medium	High	High	Uniform
Major	Medium	Medium	High	High	Very High	Lognormal
Catastrophic	Medium	High	High	Very High	Very High	

Consequence	Min	ML	Max		
Notable	0.000%	0.188%	0.375%		
Minor	0.375%	0.563%	0.750%		
Moderate	0.750%	1.125%	1.500%		
Major	1.500%	2.250%	3.000%		
Catastrophic	3.000%	4.500%	6.000%		

$ 72,758,000

Consequence	Min	ML	Max
Notable	0	136,421	272,843
Minor	272,843	409,264	545,685
Moderate	545,685	818,528	1,091,370
Major	1,091,370	1,637,055	2,182,740
Catastrophic	2,182,740	3,274,110	4,365,480

Rating	Likelihood Description	%
Almost Certain (5)	-Over 90% probability; or -"Happens Often"; or -"Unlikely that it won't happen"	>90%
Likely (4)	-Greater than 50% probability; or -"Could easily happen"	50-89%
Possible (3)	-Greater than 10% probability; or -"Could happen, has occurred before".	10-49%
Unlikely (2)	-Greater than 1% probability; or -"Hasn't happened yet but could"	1-9%
Rare (1)	-Less than 1% probability; or -Conceivable, but only as a result of combinations of unusual events.	<1%

Consequence Definitions: What are the likely consequences in the event of a failure?

Rating	Community	Environment and Heritage	Legal and Compliance	Health and Safety	Reputation	Management Impact	Financial Impact	Program Impact
5 - Catastrophic	•Certain loss of trust by affected community leading to social unrest & outrage.	•Unacceptable impact on environmental values with high significance. •Unacceptable impact on heritage values with high significance.	•Major litigation with significant damage costs •Potential prosecution by authorities •Court or NGO- imposed fine	•Multiple fatalities or significant irreversible effects to 10's of people	•Reputation and standing of the Department affected locally, national and internationally •Catastrophic loss of confidence by key stakeholders	•Requires management at Ministerial level •Requires new or amended Legislation	•Project unable to proceed •Loss of Federal funding •Election commitment projects cancelled or deferred to balance budget	•Project is never able to proceed
4 - Major	•Prolonged community outrage	•Serious long term environmental impact •Partial loss of significant heritage values	•Major litigation •Class action •Possibility of custodial sentence for Senior Management	•Single fatality and/or severe irreversible disability to one or more persons	•Major embarrassment for the Department locally and nationally •Significant loss of confidence of key stakeholders	•Critical event that requires considerable Secretarial and General Manager time to manage over many months	•Additional funding required from Federal Government at project level •Additional funding required from State to balance program budget	•Project is delayed indefinitely
3 - Moderate	•Localised community disruption leading to actions requiring continual management attention	•Moderate impact but not affecting ecosystem function •Moderate impact on heritage values	•Major breach of regulation with punitive fine •Significant litigation involving many weeks of senior management time	•Hospitalisation required •Medium term injury/irreversible disability to one or more persons	•Community and stakeholder concern on a number of issues suggesting an inability to deliver results	•Significant event that can be managed with careful management attention •Will take some Branch-level Manager time over several weeks	•Other projects cancelled or deferred (Internal budget reallocation) •Scope reduction on other projects in the program	•Critical timeframe for delivery cannot be met
2 - Minor	•Short term community outrage or sustained but localised community disruption	•Minor impacts on environmental value •Minor impacts on heritage value	•Serious breach of regulation with investigation or report to authority with prosecution and/or moderate fine possible	•Reversible disability requiring medical treatment	•Issue raised by community and stakeholders •Negative perception of the Department in parts of the community or with key stakeholders	•Will require Group Manager attention over several days	•Scope reduction on the project •Internal budget reallocation	•Moderate delay against non-critical timeframe for delivery

Non Government Organisation

From: out of scope
To:
Subject: RE: SOTL - Cost Estimate
Date: Monday, 10 July 2023 1:37:48 PM

Hi

Please find below summary of ITS and rockface protection works as requested from Donald Cant Watts Corke.

s39

Kind Regards
out of scope
T: +61 3 out of scope

From: @stategrowth.tas.gov.au>
Sent: Monday, July 10, 2023 11:38 AM
To: out of scope @ghd.com>
Subject: RE: SOTL - Cost Estimate

Thanks out of scope.
Appreciate that.
See if they can include contingency in the ITS and rockface works, so we have a more realistic cost, rather than just the construction cost.

From: out of scope @ghd.com>
Sent: Monday, 10 July 2023 11:37 AM
To: @stategrowth.tas.gov.au>
Subject: RE: SOTL - Cost Estimate

Hi , I've called/emailed DCWC this morning for the estimate update.
Will keep trying & will let you know how I go.

Kind Regards
out of scope
T: +61 3 out of scope

From: [redacted]@stategrowth.tas.gov.au>
Sent: Monday, July 10, 2023 9:59 AM
To: out of scope [redacted]@ghd.com>
Subject: SOTL - Cost Estimate
Importance: High

Hi out of scope

Can you please a breakdown separating out the ITS and the rockface works? I need to report this to Adrian and Denise today.

Regards,

[redacted] | Project Manager
Programming and Delivery | Department of State Growth
Level 3, 4 Salamanca Place, Hobart TAS 7000 | GPO Box 536, Hobart TAS 7001
Phone: [redacted] | Mobile: out of scope
www.stategrowth.tas.gov.au

Courage to make a difference through

TEAMWORK | INTEGRITY | RESPECT | EXCELLENCE

In recognition of the deep history and culture of this island, I acknowledge and pay my respects to all Tasmanian Aboriginal people; the past, and present custodians of the Land.

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From: out of scope
To:
Cc: Out of scope
Subject: RE: SOTL - COS - Procurement for Rockface Protection Works
Date: Friday, 7 July 2023 12:43:09 PM
Attachments: image001.png

Hi

Please find attached to this email the DRAFT cost estimate for Southern Outlet for State Growth's review & comment.
The cost estimate was prepared by a sub-consultant Donald Cant Watts Corke (DCWC).

I can organise a meeting with DCWC if the department have any questions regarding the estimate.

s39

Kind Regards
out of scope

From: @stategrowth.tas.gov.au>
Sent: Friday, July 7, 2023 11:37 AM
To: out of scope @ghd.com>
Subject: RE: SOTL - COS - Procurement for Rockface Protection Works

Perfect! Thank you.
I might have some questions following the receipt of the cost estimate.

Thanks,

From: out of scope @ghd.com>
Sent: Friday, 7 July 2023 11:33 AM
To: @stategrowth.tas.gov.au>
Subject: RE: SOTL - COS - Procurement for Rockface Protection Works

Hi
I'll send through the cost estimate in the next hour & will respond to your email below following.

Kind Regards
out of scope

From: @stategrowth.tas.gov.au>
Sent: Friday, July 7, 2023 8:57 AM

To: out of scope @ghd.com>
Subject: FW: SOTL - COS - Procurement for Rockface Protection Works

Hi out of scope

Chasing this one today so the Contract Officer can send you an official can process this variation. Also, when will you likely to send the cost estimate for SOTL?

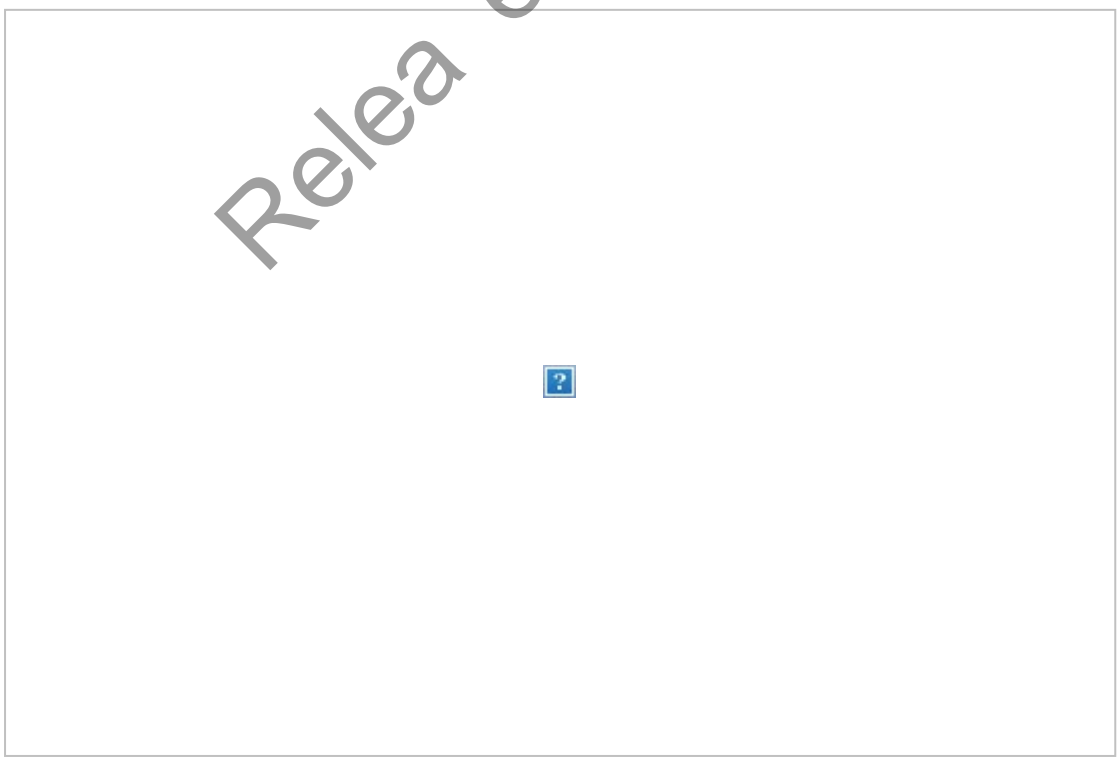
Thanks,

From:
Sent: Thursday, 6 July 2023 12:23 PM
To: out of scope @ghd.com>
Subject: SOTL - COS - Procurement for Rockface Protection Works

Hi out of scope

Another house keeping item, I refer to the two attached documents, can you please confirm they are for the same work?
They are both quoted as COS6. I am having trouble with our final contract sum not matching what you have in your COS.

There is also another COS6 dated raised by Damien last year for Stage 2 and 3 of the rockface assessment (this one had been approved).



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From: (A. Wilkie, MP)
To: Ferguson, Minister
Subject: Query Regarding Southern Outlet
Date: Thursday, 6 April 2023 10:02:45 AM

To whom it may concern,
A constituent has got in contact with our office wondering how traffic will be diverted once construction for the proposed fifth lane on the Southern Outlet begins. Are you able to provide us with a response to pass on?
Kind Regards,

| **Media Adviser**
M out of scope
Office of Andrew Wilkie MP
Independent Member for Clark
188 Collins Street HOBART TAS 7000
www.andrewwilkie.org
T (Hobart) | (Canberra) **E** @aph.gov.au

Deputy Premier
Treasurer
Minister for Infrastructure and Transport
Minister for Planning

Tasmanian Government

Level 10, Executive Building, 15 Murray Street, Hobart
Public Buildings, 53 St John Street, Launceston
GPO Box 123, Hobart TAS 7001
Phone: (03) 6165 7701; Email: Michael.Ferguson@dpac.tas.gov.au

Mr Andrew Wilkie MP
Federal Member for Clark
By email: andrew.wilkie.mp@aph.gov.au

Dear Mr Wilkie

Thank you for your email dated 6 April 2023 regarding the traffic management during construction of the Southern Outlet transit lane.

The Department of State Growth has advised me that the project is currently in the detailed design phase and the consultant is developing a travel demand management strategy to implement measures such as ride sharing, bus priority and possible detouring. This is a part of the end-to-end solution to support a greater uptake of public transport. Traffic management will also be put in place to ensure safety for the workers and road users during construction.

Detailed information on the travel demand management strategy will be published on the Transport website when they become available.

I trust this information is of assistance to you.

Yours sincerely

Michael Ferguson MP
Deputy Premier
Minister for Infrastructure and Transport

Ella Haddad MP

Labor Member for Clark

Hon Michael Ferguson MP
Minister for Infrastructure and Transport
Via email: michael.ferguson@parliament.tas.gov.au

Dear Minister

I write following representations from a constituent living on Dynnyrne Road.

My constituent has a number of questions about the forthcoming works near their home as part of the Southern Outlet Fifth Lane project.

My constituent would like to know when construction is expected to begin near Dynnyrne Road, and what mitigations are being put in place to ensure that noise is minimised for residents. My constituent would like to know if construction will occur regularly or occasionally at night, and when it is expected to be near particular houses along the road.

My constituent is also concerned about the three properties on Dynnyrne Road which have been acquired by Government for the project. My constituent notes that the properties have been left empty, and would like to know what the Government is doing to prevent squatting and vandalism at the properties. Alternatively, my constituent would be interested to hear whether the Government has explored the possibility of tenanting the properties instead of leaving them empty during the current housing crisis. My constituent would further like to know when the properties are scheduled to be demolished, and what information will be provided to neighbouring residents in the lead-up to the demolition.

My constituent is concerned that there has not been adequate information to residents – including property owners and tenants – so far, and would like to know what plans are in place to ensure consistent communication to residents as the works begin to take place.

Yours sincerely

Ella Haddad MP
MEMBER FOR CLARK

25 January 2023

a: 184 Collins Street
HOBART 7000
p: (03) 6212 2286
e: ella.haddad@parliament.tas.gov.au

Deputy Premier
Treasurer
Minister for Infrastructure and Transport
Minister for Planning

Level 10, Executive Building, 15 Murray Street, Hobart
Public Buildings, 53 St John Street, Launceston
GPO Box 123, Hobart TAS 7001
Phone: (03) 6165 7701; Email: Michael.Ferguson@dpac.tas.gov.au

Tasmanian Government

Ms Ella Haddad MP
Member for Clark
By email: ella.haddad@parliament.tas.gov.au

10 MAR 2023

Dear Ms Haddad

Thank you for your letter of 25 January 2023 regarding the Southern Outlet Transit Lane project, as raised by a resident of Dynnyrne Road.

As you are aware, the Southern Outlet Transit Lane (the transit lane) is part of the Hobart City Deal – Southern Projects, a suite of projects designed to keep Hobart moving by providing more options to travel around Hobart. The Southern Projects will make bus travel more attractive, providing choice and an easier ride for bus users all the way from the southern suburbs to Hobart.

The Southern Outlet between Kingston and Hobart carries one of the highest daily traffic volumes on our state's road network. Together with additional bus services and new park and ride facilities in Kingborough, the transit lane will give people transport choices, providing our growing population with access to fast and frequent public transport to the Hobart city centre.

After reviewing feedback from the public consultation process in 2021, as well as further site investigations and engineering considerations, the Department of State Growth (the department) identified a preferred option for the transit lane that minimises impacts to property, whilst still meeting the objectives of the project. The department is currently finalising a detailed design for this project which includes only three full property acquisitions on Dynnyrne Road and a further four partial property acquisitions in the project area.

The department is currently working on a traffic management strategy that will guide decisions about construction and the staging of works to minimise impacts as much as possible for road users and nearby properties. The department will work with the construction contractor on implementing that strategy. These decisions will be made considering traffic, constructability and safety requirements.

Details about how traffic will be managed and the exact timing of works close to properties on Dynnyrne Road will be provided to the Hobart community, including Dynnyrne Road residents ahead of construction. As with all projects, the department will aim to minimise impacts as far as possible and will inform road users about any potential traffic changes.

The tender for the transit lane project is expected to be advertised in September 2023, with construction anticipated to start in late 2023. Further details on the timing of construction will be provided to residents on Dynnyrne Road and to the broader community ahead of construction.

The department will work closely with the successful contractor to ensure that conditions relating to noise are applied and that impacts to nearby residents are minimised and that all appropriate measures are taken to reduce noise where possible during the construction period.

The Department of State Growth has acquired three full properties at 34, 40 and 42 Dynnyrne Road. The acquisition and demolition of these properties is required to facilitate the construction of the transit lane. There will be some noise and dust associated with the demolition works, and the department will ensure activities are carried out so that impacts to nearby residents are minimised as much as possible. Information about the demolition will be provided to residents once a contractor has been appointed.

The department has been engaging with stakeholders, including impacted landowners through the life of this project and will continue to do so. The department and its consultants have maintained contact with the affected property owners throughout the process, with discussions focusing on individual needs and personal circumstances. Property owners and residents in the project area will continue to be updated on project milestones.

I trust this information is of assistance to you in responding to your constituent's concerns.

Yours sincerely

Michael Ferguson MP
Deputy Premier
Minister for Infrastructure and Transport

Tasmanian Government

DEPARTMENT OF STATE GROWTH

Dept. Ref MR22/2406

Critical Date 1 November 2022

Meeting Briefing Note for the Minister for Infrastructure and Transport

SUBJECT: PUBLIC WORKS COMMITTEE HEARING - SOUTHERN OUTLET TRANSIT LANE

Minister's notation:

Meeting Date: **3 November 2022**

Attendees: **Public Works Committee**

Venue: **Committee Room, Henty House**

Address: **1 Civic Square, Launceston**

Background:

On 4 October 2022 the Department presented to the Public Works Committee on the Southern Outlet. Seven submissions were received, and nine witnesses attended the hearing.

Key issues raised were:

- Noise during construction.
- Industry capacity to undertake work.
- Witnesses' suggestion of implementing a 'softer' approach, such as increased bus services, before building the transit lane. The Huon economy called for a "comprehensive strategic public transport approach" including comfortable bus stops, parking near bus stops, undercover bike storage, attractive fare structures, easy access, zero-emission buses, widening times of services, better frequency, demand-responsive travel in smaller vehicles, streamlined bus transport structure.
- Traffic management during construction.
- Focus on other Southern projects including Park and Rides, bus services and Macquarie/Davey bus improvement measures.
- Concerns were raised on the approach to stakeholder engagement on property acquisition.
- Cost and project contingency – committee raised concerns whether the cost estimate or contingency are adequate.

The Chair of the Public Works Committee, Hon. Rob Valentine MLC, has requested that the Minister for Infrastructure and Transport appear before the Committee to address some concerns regarding the project, including the sequencing of this project and other related projects.

The Greater Hobart Traffic Solution commits $200.8 million in funding for short and long-term transport initiatives to manage peak commuter demand in the Hobart area.

This includes an allocation of over $55 million for the City Deal - Southern projects which includes $35 million for the Southern Outlet Transit lane.

The Southern Outlet transit lane project cannot be looked at in isolation. It is part of a suite of coordinated transport projects which will support more people to catch fast and frequent public transport to the Hobart city centre, reducing the number of private cars on the road and creating safer cycling and walking options.

The Southern Projects are comprised of:

- **Southern Outlet Transit Lane** – development of a transit lane on the Southern Outlet between Olinda Grove and Macquarie Street to improve access for public transport and emergency services. This includes an additional lane connecting the Southern Outlet to Macquarie street to relieve the bottleneck.
- **Macquarie and Davey Streets Bus Priority** –development of enhancements on Macquarie and Davey Streets for buses, cyclists and pedestrians. This includes improved bus stops and removal of parking and extension of clearways to improve traffic flow.
- **Kingborough Park and Ride** – creation of two new park and ride facilities in Kingborough at Huntingfield (174 vehicles) and Firthside (44 vehicles).

Significantly as part of the Southern Projects package of works, the Department of State Growth has added 65 express bus services each weekday between the southern suburbs and Hobart to improve travel around Hobart and make public transport a more viable, attractive option for commuters. This includes 33 express services for the Huntingfield Park and Ride, to support a shift towards greater public transport use in the Southern Corridor.

The transport improvements and additional bus services proposed by the Southern Projects aim to make public transport an attractive mode of choice and a real alternative to private car travel. Infrastructure improvements prioritise any additional road space for vehicles with the greatest person carrying capacity – buses, cars with three or more passengers, taxis, motor bikes and emergency vehicles. The extra lane is not for general traffic as this would induce demand and encourage more cars, a point well made by witnesses at the hearing.

There was some discussion at the Committee Hearing of why the Government did not solely focus on rolling out the Park and Ride facilities and additional express bus services and evaluating their impact prior to determining the need for the Southern Outlet Transit lane and bus improvement measures in Macquarie/Davey streets. The key reason for this integrated approach is that without the additional Transit lane and bus improvement measures, the additional buses will end up at the back of the queue on the Southern Outlet, just like the general traffic, and there will be no incentive to taking the bus. Furthermore a bad experience may mean that these customers are lost from bus travel for good.

A quality public transport product is a key pre-requisite for promoting mode shift and managing congestion as our population grows.

It is also the most cost-effective option to manage congestion noting the option to build a western bypass tunnel would cost in the order of $1million per metre with a travel time saving at most four minutes. Furthermore it would only cater for a small portion of travellers as approximately 75% of vehicles travelling north bound on the Southern Outlet have a CBD destination.

Construction of these transformative projects will commence in 2023.

The Department is working on a traffic demand strategy that will guide decisions about construction traffic management and the staging and sequencing of works. This will have a significant communications and behavioural change focus.

As with all projects, we will aim to minimise impacts as far as possible and will inform road users about any potential impacts and changes. These decisions will be made in consultation with the future contractor, considering both traffic, constructability and safety requirements. We are unable to provide any more specific detail on exactly how it will be managed at this stage.

In addition to the Southern Projects the Government is implementing a range of other comprehensive public transport initiatives that will provide the growing population in the Huon Valley and Kingborough regions with real choice on how they travel and an attractive alternative to private cars. This includes the $10 million all-access and all-weather bus stop project, $31.5 million to deliver a modern common ticketing solution, $20 million to deliver additional school and general access services to areas of high demand and $31 million to modernise Metro's bus fleet.

As such the concerns raised by the Circular Huon Economy and other witnesses at the Hearing in relation to the need for a focus on bus improvement measures and a comprehensive strategic public transport approach are being met.

APPROVED BY GARY SWAIN

Gary Swain
Deputy Secretary, Transport and Infrastructure Group

1 November 2022

Prepared by:		Cleared by:	
Position:	Project Director	Position:	CEO ITas
Email:	@stategrowth.tas.gov.au	Email:	@stategrowth.tas.gov.au
Phone:		Phone:	

Attachments:

Southern outlet transit lane – PSC lines

Document 21

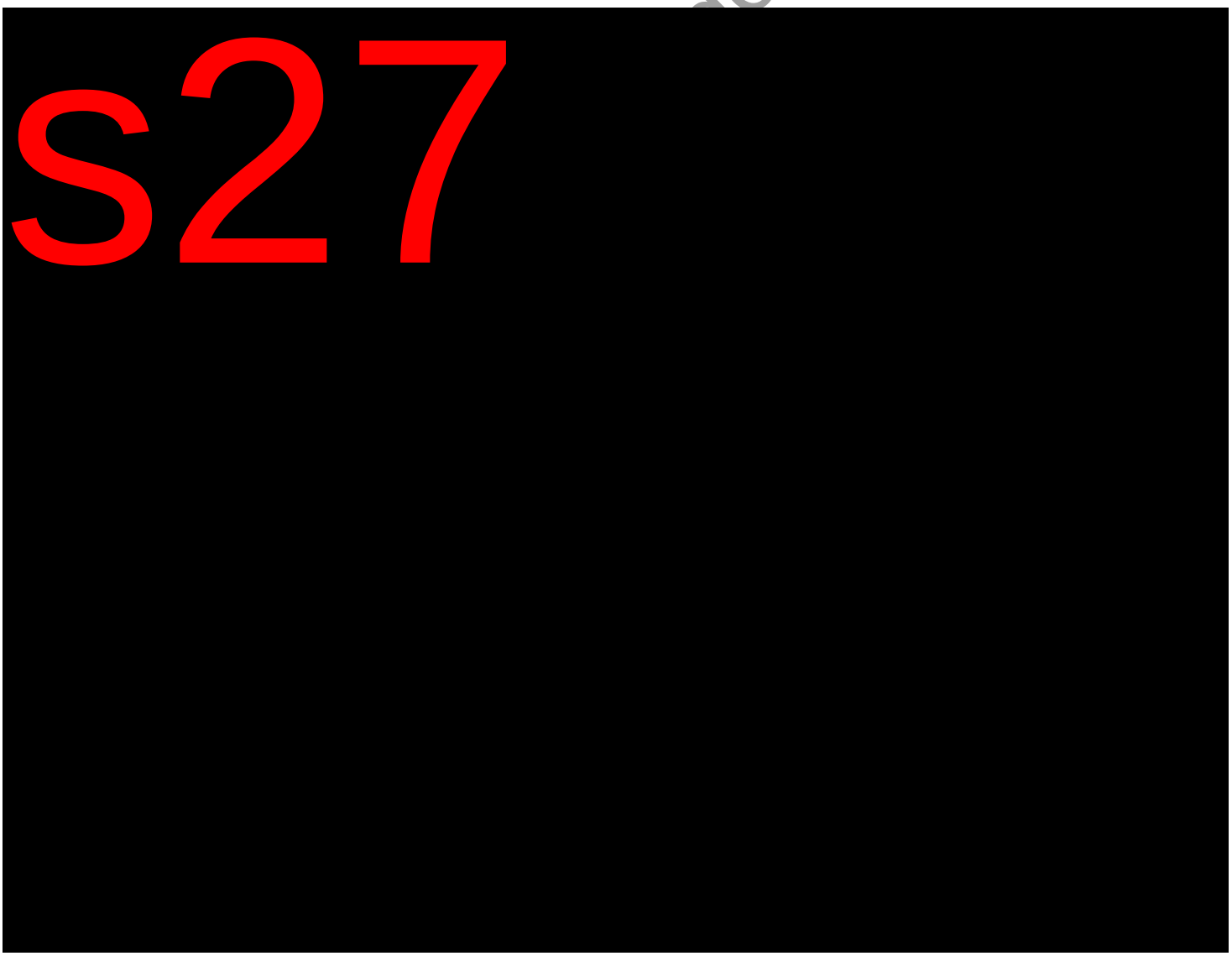
SPEAKING POINTS AND MEDIA LINES

Public Works Committee - Southern Outlet Transit Lane

Tuesday 4 October, 1.30pm

Key numbers

- Budget: $35 million (P90)
- Southern Outlet (north bound) Average Annual Daily Traffic volumes: 36,000 vehicles
- Morning peak city-bound traffic comparison:
    - Southern Outlet – 5,500 vehicles
    - Tasman Bridge – 11,493 vehicles
    - Brooker Highway (near Risdon Road) – 7,572 vehicles
- New bus services: 65 additional express bus services and a total of 70 new bus services between Hobart CBD and southern suburbs



Consultation

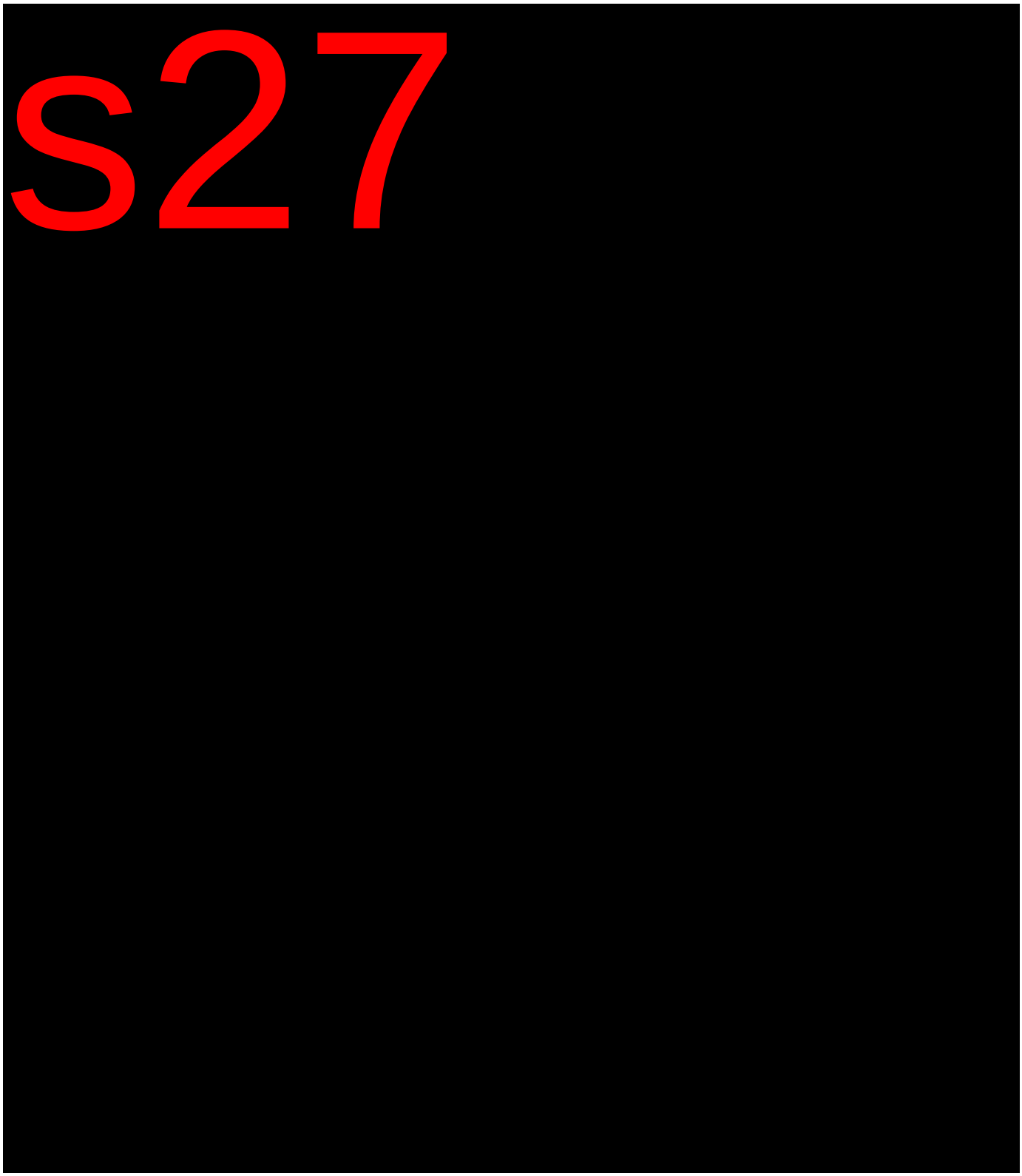
- We have been engaging with stakeholders including impacted landowners throughout the life of this project and will continue to do so.
- We have sought community feedback on this project on numerous occasions.
- In 2018, we delivered an online public consultation about the Southern Outlet bus lane proposal.
- In late 2019, two focus group meetings were held in Hobart and Kingborough to discuss local issues and obtain feedback to contribute to the planning and design processes of the Hobart Transport Vision, including the transit lane.

- The concept designs were released for general public comment during September 2021. This was to gain input from wider community who would be

Reports

All relevant reports and designs have been made available online for transparency and to keep the public informed.

- These reports include:
    - A 2017 concept options report
    - A summary report of the 2019 focus group meetings
    - Traffic modelling summary report
    - 2021 consultation feedback report
- We have also consulted with key members of Hobart City Deal and received support from all levels of government as well as key stakeholders such as the



Meeting minutes

External

11 January 2023

Project name	Southern Outlet & Tasman Bridge – Traffic Assessment and Management	**From**	out of scope
Subject	Kick off meeting	**Tel / email address**	6210 0727 / out of scope @ghd.com
Date / Time	10/01/2023	**Project no.**	DSG Ref - 3100B-3-53
Attendees inc. company	– DSG (SO-HOV) – DSG (Tasman) – DSG (Tasman – Sponsor) - DSG - DSG out of scope – GHD (PM) – GHD (PD) out of scope – GHD (Tasman PM) out of scope GHD (SO-HOV PM) out of scope GHD	**Apologies inc. company**	N/A
Copy to	-	**Location**	Teams
Objective	Agree tasks required from GHD and priority actions		

Item	Outcome / Discussion	Action	To be actioned by
Purpose	Confirm GHD scope and timing. – Both projects are scheduled at the same time – Required inputs for tender documentation – Urgency of information	– Note Design Complete / Construction procurement / Construction Start / Construction End FIFTH LANE STHN OUTLET (STAGE 1): Q2 2022-23 / Q3 2022-23 / Q1 2023-24 / Q4 2024-25 TASMAN BRIDGE: Q4 2022-23 / Q2 2022-23 / Q2 2023-24 / Q2 2025-26	-
Scope required	– A. Current scope = Traffic Assessments for Tasman Bridge (as per 3100B-3-53) – B. Management Plan – C. Project compounding impacts – to confirm scheduling	– GHD to progress current scope (A). – GHD to provide update to Sept 2021 proposal (Attachment 1) for Management Plan (B) to include Tasman Bridge and include compounding impacts (C) as well as indicative program. – DSG to approve increased scope.	SC SK/RH
Notes on scope	– Southern Outlet – key focus is long-term southbound single lane, daily works periods will occur across program also.	– Note in scope.	

Item	Outcome / Discussion	Action	To be actioned by
	– Tasman – daily works periods which may include up to full lane closure. – TB – Keep simple and focus on effective measures – SK – Need outputs to support the criticality – DM – Include demonstration of urgency and importance for executive buy in – RH – Need outputs for tender documentation – SC – Timeline is most critical particularly for progressing TDM – EJ – Political buy-in is critical and internal progress on items (i.e PT) – DV confirmed progress happening. – TB queried ability to work Tasman one side then the other – BD noted likely not possible for constructability	– DSG provide program of Greater Hobart construction scheduled that overlaps with SO-HOV or Tasman projects	SK/RH
Contract management	– Scopes A, B and C all under 3100B-3-53 – Relationship to project delivery contracts for tender documentation – GHD PM coordination (SC, BD, AL) for information sharing – Current DSG lead shared by RH and SK.	– SK/RH to confirm PM structure as project progresses	SK/RH (TBC)
SCEP Management	– Separate SCEPs for Tasman and SO-HOV – Keeping Hobart Moving Campaign – Engagement elements for preparing Management Plan – Engagement within implementing Management Plan including comms strategy – Objectives of individual and collective projects has some disagreement internally – DSG to take offline	– To be resolved – DSG to provide update from TIG meeting on Thurs (DM) – DSG to update SCEP management approach (SK/RH) – DSG to set meeting to discuss alignment of engagement team across the projects (RH) – DSG to workshop and provide advice on message preferences for individual and combined projects (DV,DM,SK,RH)	DM SK/RH RH (DV,DM,SK,RH)
Discussion on concurrent timing	– TB – Positive for messaging and comms – DV – Ability to use in narrative for comms, ability for interventions to extend well beyond a single project ‘scope’ therefore benefit in it being for the period rather than splitting – SC – Risk and resilience are key considerations. Executive level understanding of risk and buy-in to risk appetite critical. – Discussion on list of interventions – SC noted reducing list may go against recommended risk tolerance. – RH – Timing at this stage is set		
Timing of next steps	– GHD to provide proposal for scope components B and C as per line item 2. – Proposal to include timing requirements and deliverables program.		

Item	Outcome / Discussion	Action	To be actioned by
	– Timing is increasingly limited to deliver this before tender dates and construction dates. Collaborative working and fast turnarounds will be critical. Some intervention work may not be possible in the timeframe.		
Notes	-		

☒ Attachments:

1. **12556430_PMD-Q1403-B-COS 09:** Previous COS issued for 3100B-3-33, provided for reference of interventions and scope B to come

This confirms and records GHD's interpretation of the discussions which occurred and our understanding reached during this meeting. Unless notified in writing within 7 days of the date issued, we will assume that this recorded interpretation or description is complete and accurate.

NOTE: If the information in this report does not agree with your record of this meeting or if there are any omissions, will you kindly advise this office immediately, otherwise we shall assume its contents to be correct.

Distribution: All Present/Absent

Q1403
Amendment/Change Form

This Amendment/Change is effective this 17th day of November 2022, (the "Effective Date") between GHD Pty Ltd (hereinafter "GHD") and Department of State Growth (hereinafter "Client"). In consideration of the mutual promises set forth herein, GHD and Client agree to modify the project details for the Original Agreement between GHD and Client referenced herein.

Project details

Project name:	Southern Outlet Transit Lane – Detailed Design 3100B-3-33	**Project number:**	12556430
Effective Date of Original Agreement:	September 21, 2021	**Project Manager:**	

Description of proposed change:

COS 9 – Travel Demand Strategy - Phase 2 – Revision B

Following on from the initial phase of the Travel Demand Strategy which culminated in a workshop, **please find attached a memo outlining the next steps that are recommended**.

As discussed, due to the nature of the works in terms of scale, timing criticality and collaboration an indicative upper limit fee to support time charge of hours spent on approved tasks is provided. The upper limit is proposed as **$280,000 (excl. GST)**.

Attachments
Next Steps methodology

Current budgeted effort	$2,829,180	**Current completion date:**	December 24, 2022
This change (variation)	$280,000		
Revised budgeted effort total	$3,109,180	**Revised completion date:**	31/3/2023

In witness whereof, GHD and Client have caused this Agreement to be executed by their duly authorized representatives as of the Effective Date.

Memorandum

November 21, 2022

To		**Contact No.**	62100649
Copy to		**Email**	out of scope @ghd.com
From	Prepared by: out of scope Reviewed by: Approved by:	**Project No.**	125564320
Project Name	Southern Outlet Transit Lane		
Subject	Draft Travel Demand Methodology		

1. Introduction

The Southern Outlet Transit Lane is one of the sub-projects in the Hobart City Deal Southern Projects (Southern Projects) seeking to encourage modal shift in favour of public transport to address congestion and accessibility issues along the southern corridor in Tasmania. The longer-term vision is to induce behavioural change by providing users with the opportunity and the motivation to change their transport habits.

The Southern Outlet Transit Lane involves the construction of an additional northbound transit lane on the Southern Outlet, between Olinda Grove and Macquarie Street, Hobart. The lane will operate as a T3 lane for use by buses, private vehicles carrying three or more occupants, taxis, and emergency service vehicles.

It is acknowledged that there will be significant disruption to traffic conditions in order to construct the High Occupancy Vehicle Lane (HOV), particularly the need to reduce to a single southbound lane for a period of 6 – 8 months during the construction which will require mitigation. GHD has been engaged to identify a proposed Travel Demand Management Strategy (TDM) to help mitigate the impacts of the construction of the HOV along the Southern Outlet between Olinda Grove and Macquarie Street. The purpose of the TDM Strategy is to:

1. Identify available interventions and mitigations to manage demand as required to support the identified construction traffic management of the Southern Outlet HOV Lane construction.
2. Provide advice on the management of residual traffic demand with the intention of avoiding significant impacts on the wider network.

1.1 Purpose of this Memorandum

This memorandum documents the recommend management strategy to enable the construction of a new HOV lane along the Southern Outlet between Olinda Grove and Macquarie Street. This memorandum has been prepared to facilitate approval of next phase investigations required.

1.2 Scope and limitations

This technical memorandum has been prepared by GHD for Department of State Growth. It is not prepared as, and is not represented to be, a deliverable suitable for reliance by any person for any purpose. It is not intended for circulation

or incorporation into other documents. The matters discussed in this memorandum are limited to those specifically detailed in the memorandum and are subject to any limitations or assumptions specially set out.

GHD has prepared this memorandum on the basis of information provided by the Client and others who provided information to GHD (which may also include Government authorities), which GHD has not independently verified or checked for the purpose of this memorandum. GHD does not accept liability in connection with such unverified information, including errors and omissions in the memorandum which were caused by errors or omissions in that information.

2. Review

Whilst the project will result in impacts during the entire construction program, a review of the risks associated with an unmitigated closure of one of the southbound travel lanes on the Southern Outlet for a 6-8 month periods indicates an unacceptable level of risk to the performance of the Hobart network, noting:

– Organic travel demand management that might be adopted by users will not suffice:
  - The theoretical capacity is lower than traffic volumes typically generated from 8:00 AM to 8:00 PM on weekdays and is also exceeding during weekends.
  - The peak period from approximately 3:00 PM to 7:00 PM requires reduction in demand of over 50% to be within the available capacity during construction.
  - The current bus service capacity is not sufficient to carry the displaced travel demand.
  - There are limited detour routes on the network, which cumulatively do not have sufficient capacity or appropriate condition to carry the required volume of traffic displaced from the construction route.
– The construction arrangement has insufficient resilience to cope if other road closures with interlinking impacts are to occur during the period, including any unplanned emergency closures.
– Delays and queueing have potential to cause network wide delays:
  - The scale of the travel demand, the construction location, and the available detour routes all have the potential to, if capacity is exceeded, significantly impact all CBD and main arterial routes, including those in the east and north.
  - Unmanaged delays will impact access for emergency services.
  - Unmanaged delays will disproportionately decrease the attractiveness of public transport – counterproductive to the project objectives and overarching objectives of the Department.
  - Unmanaged delays, and perceived lack of action to mitigate delays, may significantly impact on the Department's ability to build social license with the community and may have detrimental long-lasting impacts on future programs.

Conversely, the project construction period provides a rare catalytic environment to achieve the overarching project objectives and embed long standing behaviour change within the greater Hobart community.

Based on the aforementioned risk level, the following items selected in Table 1 are recommended as required interventions. In order to substantially mitigate the risk to within a tolerable level, the recommended interventions should be undertaken as a full program of works. Where interventions are not adopted, or not adopted to the required scale, substantial risk will remain.

Table 1 Intervention selection

Section	Intervention	Include	Action required
Required interventions			
2 - Criticality	Criticality executive buy in	Yes	DSG to confirm
3 – Performance targets	Construction specifications	Yes	Refine and develop
3 – Performance targets	Construction network programming	Yes	Refine and develop

Section	Intervention	Include	Action required
Required interventions			
4 - Campaign	Prior awareness	Yes	Refine and develop
4 - Campaign	Prior education	Yes	Refine and develop
4 - Campaign	Live notifications	Yes	Refine and develop
4 - Campaign	Bicycle purchase / hire / share scheme	Yes	Refine and develop
4 - Campaign	Personal Mobility device system	Yes	Refine and develop
4 - Campaign	AT end of trip infrastructure	Yes	Refine and develop
4 - Campaign	Health campaign	Yes	Refine and develop
4 - Campaign	Carpooling campaign and incentives	Yes	Refine and develop
4 - Campaign	WFH campaign and incentives	Yes	Refine and develop
4 - Campaign	City programming	Yes	Refine and develop
4 - Campaign	Journey planning	Yes	Refine and develop
4 - Campaign	Gamified travel planning	Yes	Refine and develop
5 – Management	Incident response	Yes	Refine and develop
5 – Management	Emergency vehicle management	Yes	Refine and develop
5 – Management	Performance monitoring (variable and dynamic states)	Yes	Refine and develop
5 – Management	Contingency intervention triaging	Yes	Refine and develop
6 - Interventions	Sandy Bay Road / Channel Highway	Yes	Refine and develop
6 - Interventions	Huon Road	Yes	Refine and develop
6 - Interventions	Nelson Road	Yes	Refine and develop
6 - Interventions	Proctors Road	Yes	Refine and develop
6 - Interventions	New Tolmans Hill connection	One of these must be progressed.	Refine and develop preferred or both.
6 - Interventions	Southern Outlet Contraflow (Tidal flow PM operation)		
6 - Interventions	Detour route management	Yes	Refine and develop
7 – Population	Travel planning / interventions DSG	Yes	Refine and develop
7 – Population	Travel planning / interventions Public service	Yes	Refine and develop
7 – Population	Travel planning / interventions UTas	Yes	Refine and develop
7 – Population	Travel planning / interventions Schools	Yes	Refine and develop
7 – Population	Travel planning / interventions Private	Yes	Refine and develop
7 – Population	Kingston service locations	Yes	Refine and develop
8 – Active Transport	Last mile upgrades	Yes	Refine and develop
8 – Active Transport	Sandy Bay upgrades	Yes	Refine and develop
8 – Active Transport	Tolmans Hill upgrades	Yes	Refine and develop
8 – Active Transport	Mount Nelson upgrades	Yes, after others	Refine and develop
8 – Active Transport	Decision on broader network resilience	Yes	Refine and develop

Section	Intervention	Include	Action required
Required interventions			
9 – Public transport	Headway model	Yes	Refine and develop
9 – Public transport	Frequency increase	(if above doesn't happen)	Work on with headway model
9 – Public transport	Service uplift	Yes	Part of headway or frequency increases
9 – Public transport	Priority	Yes	Refine and develop
9 – Public transport	Huntingfield park and ride connectivity	Yes	Refine and develop
9 – Public transport	Kingston city connectivity	Yes	Refine and develop
9 – Public transport	Interchange bicycle / scooter hire	Yes	Refine and develop
9 – Public transport	Interchange on-demand service	Yes	Refine and develop
9 – Public transport	Pricing model	Yes	Refine and develop
9 – Public transport	Real time information	Yes	Refine and develop
9 – Public transport	Guaranteed ride home	Yes	Refine and develop
9 – Public transport	Safety and comfort improvements	Yes (as much as possible)	Refine and develop
10 – Supply and cost	Parking strategy	Yes	Refine and develop
Consider			
9 – Public transport	Service changes (and associated interchange infrastructure)	Limited by project timing	-
9 – Public transport	Ferry	Consider	With Dept to consider
10 – Supply and cost	Pricing strategies	Triaging intervention	With Dept to consider

Efficacy of risk mitigation is subject to assumptions, however the recommended approach in Table 1 is recommended to facilitate reduction of risk levels within tolerable limits. The outcomes for the network will be largely dependent on the execution of measures and rely on public uptake to entirely mitigate risk, however by evidencing proactive management and providing sufficient capacity in feasible travel alternatives intolerable risks would be reduced.

3. Next steps – Proposal

GHD is able to provide assistance to continue to refine and develop the interventions identified. Urgency is a critical for a number of the interventions and as such work by both GHD and internal Department teams (including work with local government) should commence as soon as possible.

Current proposed tasks for action, relative priority and tasks for confirmation are noted in Table 2.

It is proposed that this table will be updated following delivery of tasks, or confirmation of further items to manage the required scope.

Table 2 Management plan progress and initial approval activities

Section	Intervention	Timing Priority	GHD Action	Future action	Initial approval to proceed
Required interventions					
2 - Criticality	Criticality executive buy in	Critical	Criticality input	DSG to advise	Yes
3 – Performance targets	Construction specifications	December 2022	Input into specification	-	Yes
3 – Performance targets	Construction network programming	High	Local road impact review	DSG to advise	
4 - Campaign	Prior awareness	Moderate	TBC	Pending approval	Yes
4 - Campaign	Prior education	Moderate	TBC	Pending approval	
4 - Campaign	Live notifications	Moderate	TBC	Pending approval	
4 - Campaign	Bicycle purchase / hire / share scheme	Moderate	TBC	Pending approval	
4 - Campaign	Personal Mobility device system	Moderate	TBC	Pending approval	
4 - Campaign	AT end of trip infrastructure	Moderate	TBC	Pending approval	
4 - Campaign	Health campaign	Moderate	TBC	Pending approval	
4 - Campaign	Carpooling campaign and incentives	Moderate	TBC	Pending approval	
4 - Campaign	WFH campaign and incentives	Moderate	TBC	Pending approval	
4 - Campaign	City programming	High	TBC	Pending approval	
4 - Campaign	Journey planning	High	TBC	Pending approval	
4 - Campaign	Gamified travel planning	High	TBC	Pending approval	
5 – Management	Incident response	Moderate	Develop plan	-	
5 – Management	Emergency vehicle management	Moderate	Develop plan	-	
5 – Management	Performance monitoring (variable and dynamic states)	High	Develop plan	-	
5 – Management	Contingency intervention triaging	Pre-implementation	Develop plan	-	
6 - Detours	Sandy Bay Road / Channel Highway	High	Condition review and detour management strategy	DSG to advise	Yes – for consultation
6 - Detours	Huon Road	High	Condition review and detour	DSG to advise	

Section	Intervention	Timing Priority	GHD Action	Future action	Initial approval to proceed
Required interventions					
			management strategy		
6 - Detours	Nelson Road	High	Condition review and detour management strategy	DSG to advise	
6 - Detours	Proctors Road	High	Condition review and detour management strategy	DSG to advise	
6 - Detours	New Tolmans Hill connection	Critical	Refine and develop preferred or both.	DSG to advise	Yes
6 - Detours	Southern Outlet Contraflow (Tidal flow PM operation)			DSG to advise	
6 - Detours	Detour route management	High	Detour management network plan	DSG to advise	Yes – for consultation only
7 – Population	Travel planning / interventions DSG	High	TBC	Pending approval	Yes – Preliminary only
7 – Population	Travel planning / interventions Public service	High	TBC	Pending approval	
7 – Population	Travel planning / interventions UTas	High	TBC	Pending approval	
7 – Population	Travel planning / interventions Schools	High	TBC	Pending approval	
7 – Population	Travel planning / interventions Private	High	TBC	Pending approval	
7 – Population	Kingston service locations	High	TBC	Pending approval	
8 – Active Transport	Last mile upgrades	Critical	Develop plan	DSG to advise	Yes
8 – Active Transport	Sandy Bay upgrades	Critical	CoH consultation	DSG to advise	
8 – Active Transport	Tolmans Hill upgrades	Critical	CoH consultation	DSG to advise	
8 – Active Transport	Mount Nelson upgrades	High	CoH consultation	DSG to advise	
8 – Active Transport	Decision on broader network resilience	High	Directions group to confirm	DSG to advise	
9 – Public transport	Headway model	Critical	Advisory paper	DSG to advise	Yes
9 – Public transport	Frequency increase	Moderate	TBC	DSG to advise	

Section	Intervention	Timing Priority	GHD Action	Future action	Initial approval to proceed
Required interventions					
9 – Public transport	Service uplift	Critical	Service uplift advice	DSG to advise	
9 – Public transport	Priority	High	Concept development	DSG to advise	Yes
9 – Public transport	Huntingfield park and ride connectivity	High	Site review and proposals	Consultation with KC	For consultation only
9 – Public transport	Kingston city connectivity	High	Site review and proposals	Consultation with KC	
9 – Public transport	Interchange bicycle / scooter hire	High	Site review and proposals	Consultation with KC	
9 – Public transport	Interchange on-demand service	High	On-demand concept advice	DSG to advise	Yes
9 – Public transport	Pricing model	Moderate	Advisory paper	DSG to advise	Yes
9 – Public transport	Real time information	Moderate	Advisory paper	DSG to advise	Yes
9 – Public transport	Guaranteed ride home	Low	Advisory paper	DSG to advise	Yes
9 – Public transport	Safety and comfort improvements	High	Gap analysis and priority advice	DSG to advise	Yes
10 – Supply and cost	Parking strategy	High	Consultation with CoH	DSG to advise	Yes – for consultation
Consider					
9 – Public transport	Service changes (and associated interchange infrastructure)		-	No action	
9 – Public transport	Ferry		With DSG to consider		
10 – Supply and cost	Pricing strategies		With DSG to consider		

The scope, noting the urgency, will be delivered through an overarching Management Plan with approved components being progressed and further components discussed for approval through progress meetings.

The '**Initial approval to proceed'** column in Table 2 indicates tasks that are priority and submitted for approval within this proposal letter. Further tasks will be discussed and updates to the table submitted to the Department as the delivery components progress. The following parameters are provided to define the currently approved scope, team, fee, timing and deliverables:

Currently approved scope: Priority tasks will be undertaken first which include:

– **Overarching management:** Development of overarching Management Plan and regular meetings for coordination and progress updates.

– **Criticality paper provided for review:** Brief paper on the criticality of undertaking travel demand management interventions detailed in the strategy. The paper would support inputs into a briefing paper or similar to obtain executive support for the project and interventions.

- **PT Priority and Attractiveness advisory paper:** Brief paper reviewing the capacity needs of bus services to provide suitable level of commuter service to supplement the closure capacity reduction as well as roadmap to implement service uplift. The paper will also explore suggested elements to increase attractiveness and priority for PT such as on the benefits and roadmap to implement a headway model for bus services.
- **Campaign detail:** Developing briefing detail for the campaign interventions to support development of and roadmap for campaign.
- **Populations interventions detail:** Developing briefing detail for the populations interventions to further decision making for and implementation of travel planning. *Only to be progressed to the point for initial meeting with Department.*
- **Detours –** Review of detour approach and management plan:
  - **Tolmans Hill and Southern Outlet PT detour review:** Feasibility review of one or both detour routes to confirm suitability and provide gap analysis of upgrades required to service a detour for buses and emergency services.
  - **Local detours:** review of detour condition, capacity and required management to control demand on detours.
- **Construction specification input:** Development of traffic management advice for the specification development to support mitigation of construction closure risks.
- **Active transport upgrades plan:** Plan detailing potential Active Transport last mile or best 'quick win' upgrades in order of priority and ease of implementation including gap analysis for temporary or permanent upgrades recommended.
- **City of Hobart consultation:** Sessions with City of Hobart Mobility and City Futures areas to develop plans for intervention that require City of Hobart approval or implementation. Including broader City of Hobart consultation where possible (i.e Active Transport upgrades, City Programming and detours).
- **Kingborough Council consultation:** Sessions with Kingborough Council roads / traffic team to develop plans for intervention that require Kingborough Council approval or implementation. Including broader City of Hobart consultation where possible (i.e Active Transport upgrades, detours, campaign etc)
- **Huon Council consultation (TBC):** Sessions with Huon Council roads / traffic team to develop plans for intervention that require Huon Council approval or implementation. Including broader City of Hobart consultation where possible (i.e PT uptake).

Service uplift advisory paper: Brief paper GHD will then undertake high, moderate and lower priority tasks in that respectively to support timely delivery of the required elements. Relative priority may change over the course of delivery and will be updated accordingly and sent to / discussed with the Department for approval.

Delivery team:

Management: As part of GHD's existing contract for the Southern Outlet HOV Lane the project management will continue through Damien Guinane (PM) and Greg McGuire (PD). Due to the scale and nature of the works Samantha Chapman will be allocated as the Delivery Lead for all work within the Management Plan.

Disciplines: Delivery will draw on GHD's local and broader resources to deliver the breadth of services and the timing requirements for delivery. Based on the services that we understand may be required (with consideration to all Management Plan activities) this includes specialists across disciplines of:

- Traffic Engineering & Transport Planning
- Stakeholder Engagement advice
- Civil Design
- Road Safety
- Transport Advisory
- Communications and Collateral Development

– Transit Planning
– Project Management / Design Management

Fee:

Fee proposal: Due to the nature of the works in terms of scale, timing criticality and collaboration an indicative upper limit fee to support time charge of hours spent on approved tasks is provided. The upper limit is proposed as **$280 k (excl. GST**).

Fee development: The fee is indicative of the scale and quantity of work that the Department will likely required support from GHD to implement the Management Plan. Actual hours spent will be dependent on approved activities as the management plan progresses. The current fee development is based on the following discipline contributions in Table 3 and based on the Panel rates agreed to for the existing project contract.

Table 3 Fee development Summary

Discipline	Estimated time contribution (hours)
Traffic Engineering & Transport Planning	390
Stakeholder Engagement advice	84
Civil Design	180
Road Safety	88
Transport Advisory	112
Communications and Collateral Development	115
Transit Planning	44
Project Management / Design Management	134
Total	~1147

Deliverables:

Management Plan: The key deliverable will be a Management Plan which will comprise inputs for each approved activity area. The Management Plan will be issued to the Department as a working document to evidence progress and provide key updates for collaboration.

Project Workshops: Specific workshops may be required to complete the scope, with reference to the priority tasks the following workshops are identified:

– Workshop with City of Hobart
– Workshop with Kingborough Council
– Workshop with Huon Council (TBC)
– Workshop with DSG PT team (TBC)

Project Meetings: Additional to activities above, weekly project meetings are proposed. The DSG Project Manager / Sponsor will be invited to these along with a core technical advisory team from DSG. These meetings will discuss technical progress with reference to Table 2 and note further activities to be undertaken. These meetings will be predominantly to discuss specific details of the technical delivery however an updated table of activities will be issued to DSG's PM following indicating any new activities that are to be progressed as part of the Management Plan within the upper limit fee.

Timing: Key milestones:

Administration of project progress: Project updates will be managed through the weekly meetings and follow up activities table updated (submitted to DSG PM) .

Initial Milestones: Based on the priority tasks the following milestones in Table 4 are provided as an indication of the timing of activities. Detail on further milestones can be updated during progress updates.

Table 4 Indicative timing (*assumes approval to proceed 22/11/22 and provision of required materials / workshop attendees)

Activity	Timing*
City of Hobart Workshop	Prior to 1 Dec 2022
Kingborough Council Workshop	Prior to EOY
Criticality Paper	Prior to 1 Dec 2022
Campaign Detail	Prior to 1 Dec 2022
PT Paper (part 1 – service uplift requirements)	9 Dec 2022
Population interventions detail	9 Dec 2022
Detour Review (Part 1 – PT detours)	16 Dec 2022
Construction Specification Input	Prior to EOY -Aligned with broader delivery
Active transport plan	Prior to EOY
PT Paper (part 2 – attractiveness overview)	20 Jan 23
Detour Review (Part 2 – Detour management)	20 Jan 23

4. Next steps

Please confirm acceptance of the proposed approach to enable progression of the priority tasks and Management Plan.

Hobart Southern Outlet Transit Lane

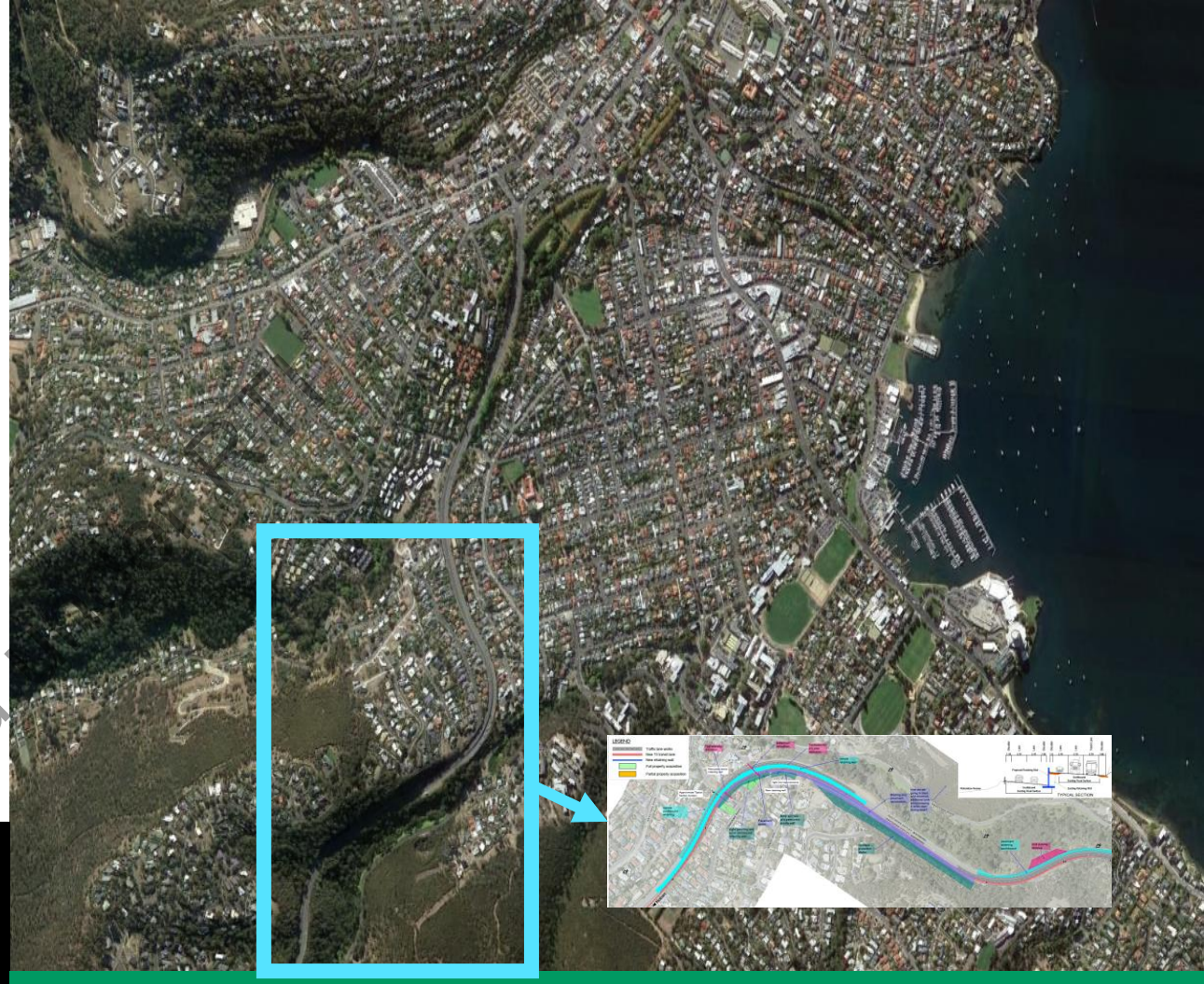
→ Travel Demand Management Strategy

Goals for today

- → **Understand priorities**
- **Feasibility of large scale TDM**
- **Clear next steps**

Context

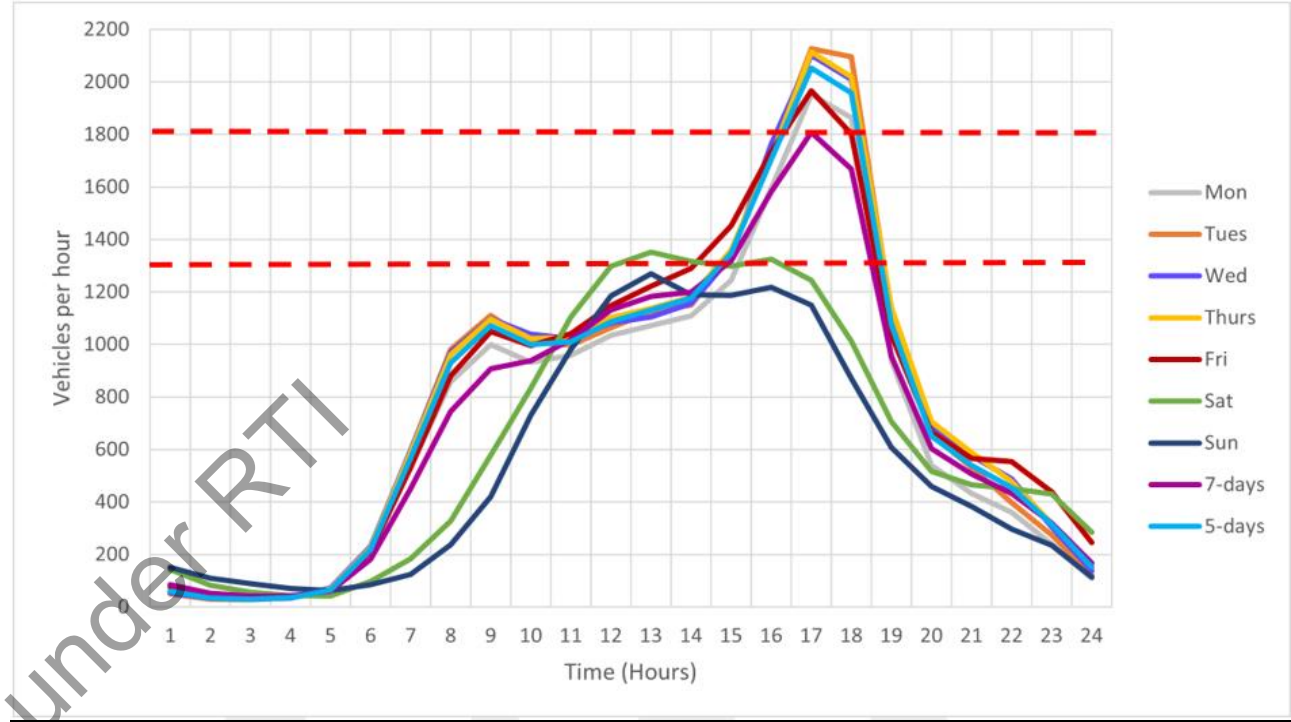
- Southbound single lane closure for period of 6-8 months to facilitate construction
- Estimated for March 2024 *(dependent on earlier phases of construction / contractor's program)*
- This is not the only closure / changed condition for the construction period but is considered the most significant and poses highest impact risk
- **Significant demand management required**



The simplest and most effective means of reducing demand through the construction zone is to reduce the number of trips made at all

Indicative Scale

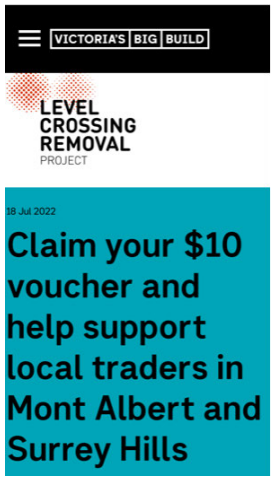
- Heavy commuter PM peak skew
- Volumes typically exceed 1,800 vph from 4 – 6 PM (weekdays)
- Volumes typically exceed 1,300 vph 3 - 7 pm
- May need to even be lower than 1,100 vph
- Highest peak is 2 hours but focus is 4 hours
- Averaged peak over the year is 2,100 vph
- Averaged peak over worst week is 2,400
- Worst hour 2021 was 2,500 (*September*)
- **Target should be 40-50% reduction and across a few hours**



Travel Demand Strategy Overview

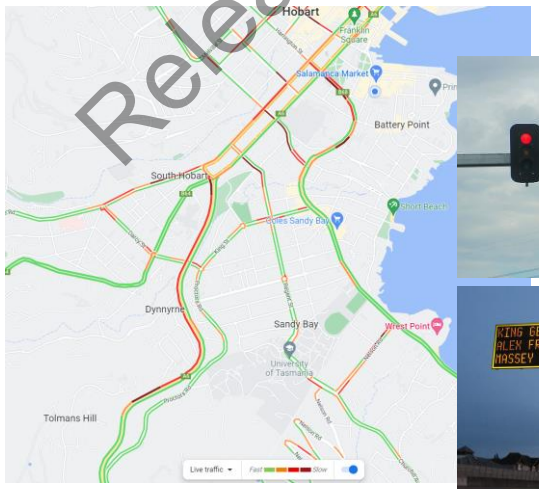
Campaign

- Advertise closure
- Mode shift promotions
- Work from home promotions
- Mode choice education
- City programming and partnerships
- On road information / web-based information



Monitor and Manage

- Slow vehicle turnouts
- Route monitoring
- Detour / impact monitoring
- Signal adjustments
- Variable speeds
- Breakdowns and towing



Mitigations

Populations, Operations and Options

- Key populations to reduce, retime and remode
- Operating the network differently (all R's) with route priority (route v route and modes on routes), delay management and 'cost' schemes
- ***Remode*** *– viable options, supporting those options*

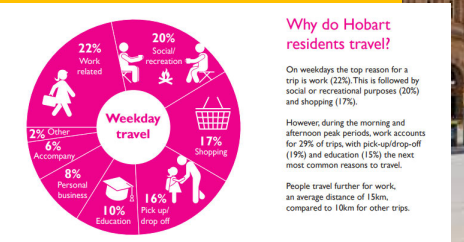


Table 2.4 Journey to work data

Mode	Kingborough	Huon Valley	Mount Nelson	Tolmans Hill
Car, as driver	10,595	4,146	720	202
Car, as passenger	996	395	67	30
Taxi	12	3	Unknown	Unknown

Data obtained from the Australian Bureau of Statistics, accessed May 2022

Reduce – Focus on populations

Retime – Focus on populations, spread needs to be wide to be effective

Reroute – Limited options, network management and operations

Remode – for some PT is the only option so we need to manage this dependance as well as providing this alternative

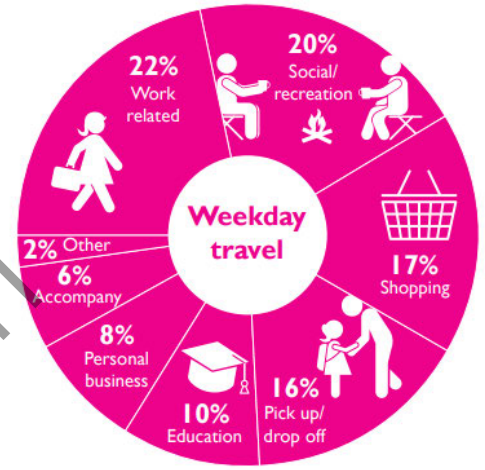
Todays focus

➔ **Large mitigations – understanding feasibility, barriers and key solutions**

This is not a long-list of interventions, this is focused on critical discussions

Populations

- Commuters are the larger population (22%)
- With education and drop off following comprising a majority when totaled (26%)
- Others are accessing services (up to 37%)
- These trips are more ‘likely out of catchment’ than other purposes so likely form a larger majority
- This is approximately the scale of change we need



Why do Hobart residents travel?

On weekdays the top reason for a trip is work (22%). This is followed by social or recreational purposes (20%) and shopping (17%).

However, during the morning and afternoon peak periods, work accounts for 29% of trips, with pick-up/drop-off (19%) and education (15%) the next most common reasons to travel.

People travel further for work, an average distance of 15km, compared to 10km for other trips.

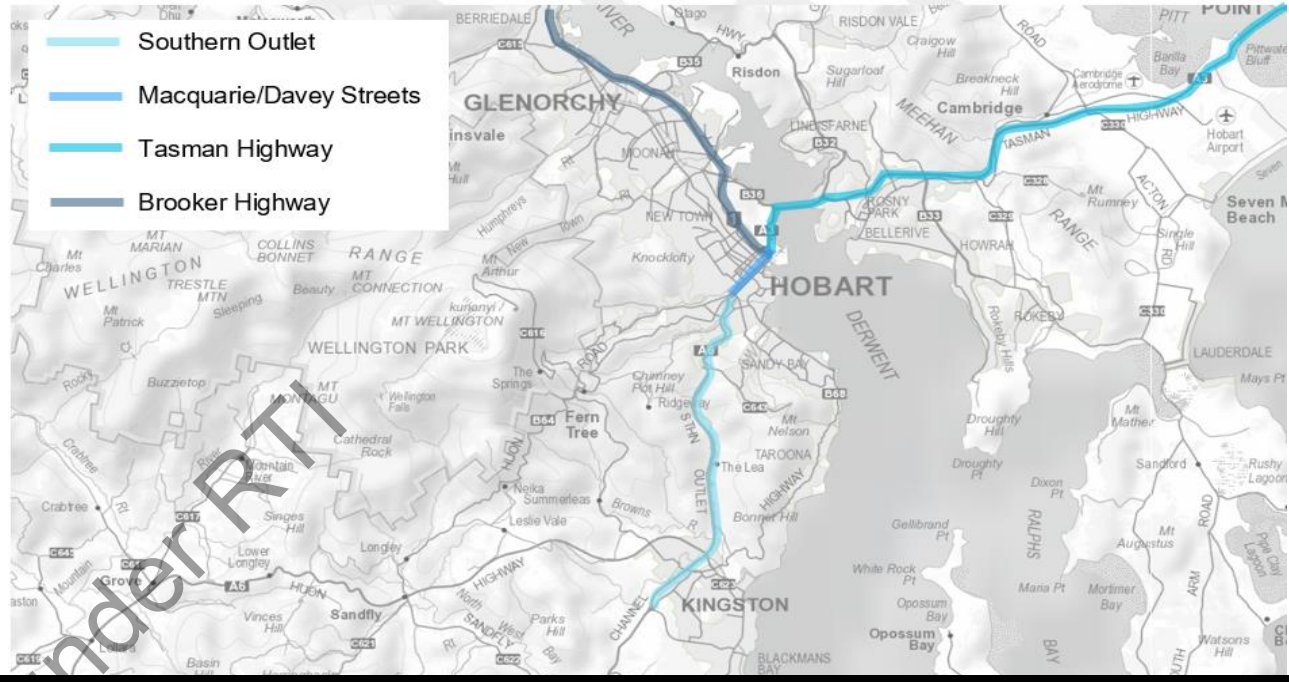
Options for discussion	Comments
Retiming	Schools, Utas, Major employers (Public service, RHH?, Woolworths etc)
Travel plans	Remode, end of trips access, work from home, pop up child-care
Work from home	Public service, UTas
Relocate services	Child-care pop-up, other services, more frequent service providers

**All need require consideration to social and economic impacts.*

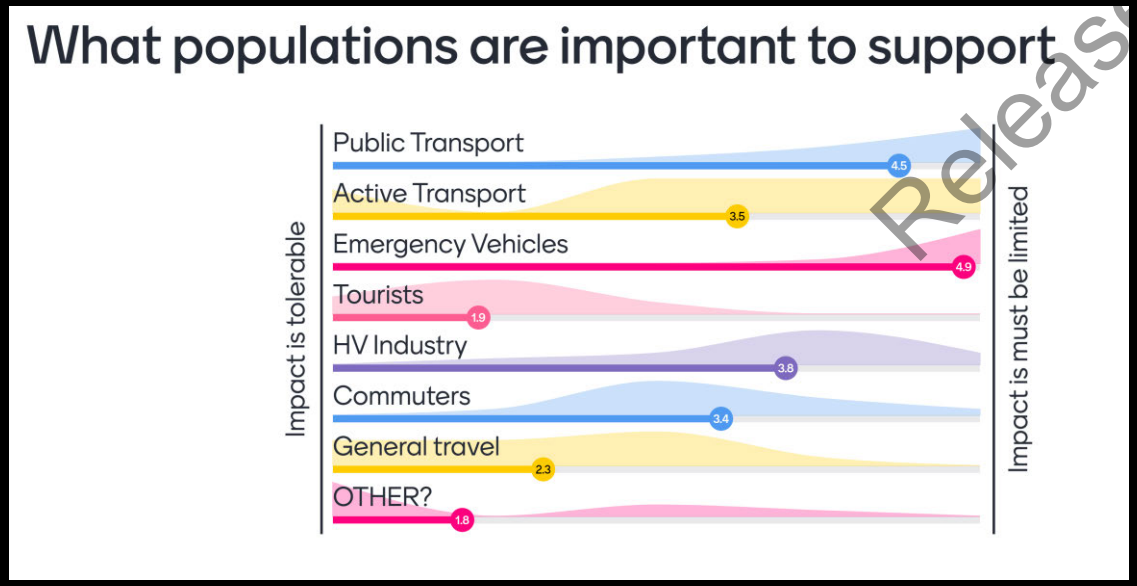
Risks and Priorities

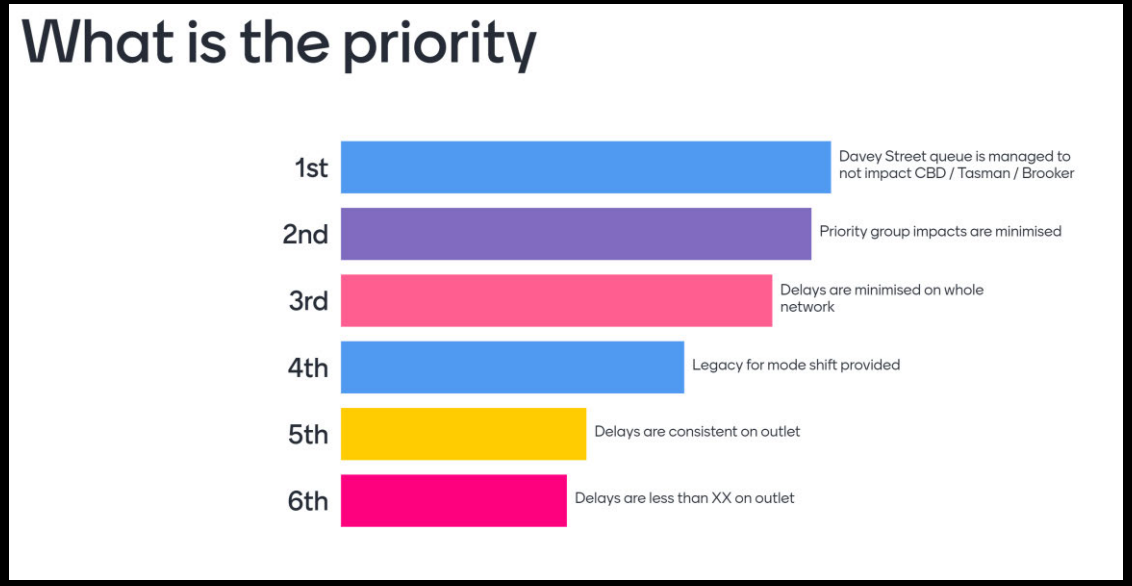
Intolerable risk = network breakdown (impacted CBD and arterials

- Travel time consistency impacted
- Delays to vehicles on outlet
- Delays to vehicles within network
- User group impacts



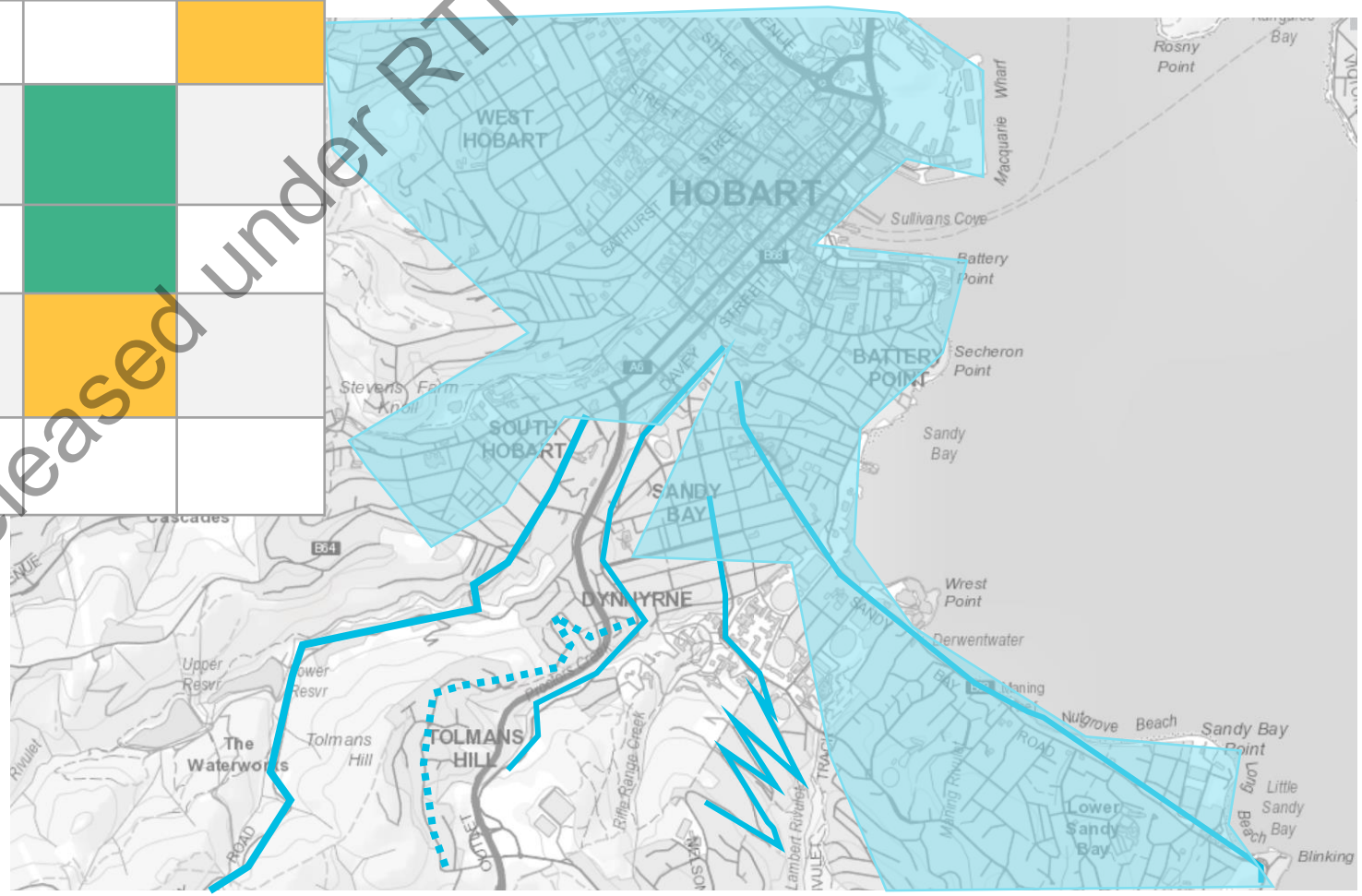
What matters most? – In workshop voting





Network Priority

	Bus Priority	AT Priority	Emergency Access	Limit Detour	General detour	Specific detour	HV access
Sandy Bay							
Huon Road							
Mount Nelson							
Proctors Road							
New Tolmans Hill							
SO Contraflow							



Remode – Options and Alternatives for discussion

- AT mode shift
  - **Shift population to AT (broader than Southern area) – quick wins, trials and ready to go projects**
- Ferry
  - **Connection from Kingston / Blackmans Bay**
  - **Slow but consistent alternative**
- Bus network
  - **Reliability / Frequency**
  - **Cost barriers and incentives**
  - **Supporting PT (i.e priority, access)**

Alternatives – PT focus

Barriers	Options for discussion
Pricing	Adjust zones, consider price elasticity
Reliability	Headway based services (needs to be supported by interchanges and on demand) (OR – RTI, Increased frequency)
Fleet	Lead time to increase fleet (OR – Assistance from other operators / procurement considerations)
Capacity / concentration of boarding	Guaranteed ride home service City programming and retiming initiatives
Network delays	Bus routes, bus priority locations, bus jumps and priority (AND – expectation management)
Catchments	New park and rides On-demand interchanges (Maranoa Heights, Spring Farm etc) AT connection to interchanges

Reduce – Focus on populations

Retime – Focus on populations

Reroute – Limited options, network management and operations

Remode – for some PT is the only option so we need to manage this dependance as well as providing this alternative

From here

➔ **Management plan and actions to be developed for the management of travel demand during construction period.**

Please note full long list was not part of this presentation.

From: out of scope
To:
Subject: Risk Workshop Feedback
Date: Monday, 19 June 2023 9:29:47 AM
Attachments: image001.png
image002.png
image003.png
image004.png
image005.png

Hi ,

Please find attached the updated Risk Register entries following the workshop – as working draft for information and comment.

If you could please share with the workshop attendees and collate back any further comments including comments on items not discussed within the workshop (medium risks).
Could you please advise timing for feedback – the risk register will inform the draft Intervention Plan delivery.

Below is documentation of changes made during / post workshop in relation to the contributions within the workshop session.

Risk ID	Workshop Comments	Amendments and Actions
1	"Can't' was deemed too strong of a term Separate risk for the out of the city impacts – Captured in risk ID 10	"Can't" changed to "timely" in risk description
2	Discussion of construction management scope	Further clarification required on scope of interventions for inclusion – currently retained as included
5	Key to communicate these themes now – most critical point for this risk	To capture need for immediate action in other parts of scope – noted for broader deliverables
19	Wording needs updating to include all operators and vehicle types Current problem around dropped trips	Word update to "diminishing" and operators/ fleet wording updated in risk description Added in wording for dropped trip risk and that it is an existing risk that we are changing impact and likelihood/consequence of
3	Efficiency and productivity words lacking – broader risks of smaller freight	Risk likelihood changed from possible to likely and consequence from major to catastrophic – overall high to very high Wording added around reliance on timed deliveries and smaller freight in risk description – also included consideration of other project construction materials
11	Amenity related – need two risks – one for the traffic delays and one for the amenity impacts on nearby properties	Tailored this risk (ID 11) and added new risk (ID 25) around noise/exhaust amenity impacts - same rating applied for both risks
16	Add Mona, Self's point, Nyrstar etc as users Revisit ID 3 for material supply via freight	Population and users north of bridge have now been covered in description and noted potential issues for Bridgewater impacting Tasman in description
17	Only concern around losing tidal flow and some comms issues	Risk consequence changed from catastrophic to major Wording updated for clarity on how construction state impacting ITS, both old and new and for any project, not

		just during changeover of Tasman bridge
4	Discussion of potentially catastrophic consequence Group was ok with the consequence, questioned whether both objectives covered Comment around duplication for this risk with AT focus	Both objectives should be covered by this risk - checked through other risks for this lens and added second risk objective as required Created new risk (ID 26) – refer line ID 8 for current AT reference with duplication of PT risk used (ID 4)
7	Incident management plan key to this risk Comments around planned events closures – refer risk ID 20 and ID 24	Noted for broader project.
8	Need to spell out the issues more – closures to Tasman detracts from walking/cycling, WFH not stimulating economy, etc.	Amended ID 8 wording to include WFH and other considerations Captured Tasman Bridge as its own component of new risk relating to AT (ID 26)
9	Crash situation is covered in ID 7, update this risk to just consider slow moving vehicles	ID 9 wording updated to consider slow moving vehicles rather than specific truck breakdown scenario Risk likelihood updated from likely to almost certain under new changes
10		Risk consequence updated from moderate to catastrophic based on previous discussions around issues with congestion in PM periods
13	Need to consider delays due to latent conditions Separate to just contractor skill piece, controversy around projects captured in ID14	Added risk of delay due to latent conditions with high rating (ID 27) Removed wording around controversy delays from ID 13 as captured in ID 14
20	Concurrent works changed from utility to include other projects (i.e., maintenance, council, other developers)	"Utility" specific wording removed Risk likelihood changed from possible to likely Working with councils raised, captured in broader scope as intervention
22	Consider timelines, is this by September? This is an overarching high-level risk and needs both objectives	Risk consequence raised from major to catastrophic and likelihood from possible to likely Both objectives added to risk
24	Issues around events outside the city (Bellerive oval, Kingston Twin Ovals)	Adjusted to reference higher impact events (outside the city) Risk likelihood changed from possible to likely Noted specific intervention measures for planned events
All	Add column around consequence definition categories	Added two columns for primary and secondary consequence definition categories and assigned categories for each risk

Thank you

Regards

out of scope
Transportation Market Leader - Tasmania

Senior Engineer – Transport

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Southern Outlet and Tasman Bridge - Traffic Assessment and Management - Risk Register - 19/06/2023

						Inherent Risk Ratings		
ID No.	Theme	Objective	Risk Description	Risk Consequence Definition - Primary	Risk Consequence Definition - Secondary	Likelihood	Consequence	Risk Level
1	Direct network impacts	Increasing accessibility and connectivity through increased mode share of active and public transport; and Delivery of good customer experience	There is a chance people can't gain timely access to the city for extended periods; due to capacity constraints on arterials; leading to small business impacts, financial hardship, resourcing issues for vital services, bad publicity, loss of public trust in Govt	Community	Reputation	E - Almost Certain	4 – Major	Very High
2	Disruption to services	Delivery of good customer experience	There is a chance that critical services (vehicles) don't have sufficient access through the city; due to inadequate demand management and supporting interventions; leading to delays getting patients' care, avoidable fatalities, ineffective emergency service provision, impacts to hygiene services	Health and Safety	Community	D - Likely	5 - Catastrophic	Very High
3	Disruption to services	Delivery of good customer experience	There is a chance that freight services don't have sufficient access through city; due to inadequate demand management and supporting interventions; leading to disruption for timed deliveries, spoiled freight, supply chain disruption (cost/availability) to businesses in Hobart/South/East and potential disruptions to construction materials for other projects	Community	Financial Impact	D - Likely	5 - Catastrophic	Very High
5	Attitudes and perception	Increasing accessibility and connectivity through increased mode share of active and public transport; and Delivery of good customer experience	There is a very high chance of significant frustration, anger in Greater Hobart transport stakeholders (commuters/employers/residents/business owners); due to inadequate provision, perception, or uptake of demand management; leading to severe loss of trust in Govt, State Roads, protests, bad publicity, public embarrassment, political escalation	Reputation	Community	E - Almost Certain	4 – Major	Very High
10	Direct network impacts	Increasing accessibility and connectivity through increased mode share of active and public transport; and Delivery of good customer experience	There is a chance of more commuters getting into CBD than can get out; due to concentrated leaving time with restricted capacity; leading to commuters marooned in the CBD or suffering significant or unusual delays	Community	Reputation	D - Likely	5 - Catastrophic	Very High
19	Disruption to services	Increasing accessibility and connectivity through increased mode share of active and public transport	There is a chance of Public Transport (Bus/Ferries) not being able to service increased demand during construction and given existing issues with dropped trips; due to driver shortage, fleet shortage, cultural concentration, or industrial action; leading to lack of uptake during construction, legacy impacts to bus usage, modal share, diminishing project objectives for greater uptake	Community	Management Impact	E - Almost Certain	4 – Major	Very High
22	Disruption to services	Increasing accessibility and connectivity through increased mode share of active and public transport; and Delivery of good customer experience	There is a chance we don't deliver required interventions in time; due to short timeframes; leading to failure of the network, or major project impacts (timeframe)	Reputation	Community	D - Likely	5 - Catastrophic	Very High
4	Attitudes and perception	Increasing accessibility and connectivity through increased mode share of active and public transport; and Delivery of good customer experience	There is a chance of reduction in user experience for PT and reduction in overall modal share; due to bus delays, lowered reliability, over-crowded buses; leading to further reduction in modal uptake of PT, and long term negative impacts to PT uptake, changed value proposition for PT users	Reputation	Community	D - Likely	4 – Major	High
7	Direct network impacts	Delivery of good customer experience	There is a chance of reduced resilience of the road network due to one or more compounding events occurring during the construction periods (e.g. water main burst, power line down, flooding, traffic incident) leading to effective "closure" of the city network, "no school day", small business impacts, financial hardship, resourcing issues for vital services, bad publicity, loss of public trust in Govt	Management Impact	Reputation	C - Possible	4 – Major	High
8	Direct network impacts	Increasing accessibility and connectivity through increased mode share of active and public transport	There is a chance of reinforcing behaviours not in line with project outcomes; due to alternative travel options not provided at a level of service to encourage use - i.e., active and public transport options are not a safe, efficient, reliable alternatives and initiatives such as working from home incentives remove users from the city; leading to increased private vehicle usage, increased congestion, reduced stimulation to the economy and no net benefit of the projects	Reputation	Community	C - Possible	4 – Major	High
9	Direct network impacts	Delivery of good customer experience	There is a chance of slow moving vehicles; due to single lane uphill section (SO SB); leading to significant delays, inability to clear Davey Street, network gridlock, political intervention, etc.	Community	Management Impact	E - Almost Certain	3 – Moderate	High
11	Direct network impacts	Increasing accessibility and connectivity through increased mode share of active and public transport; and Delivery of good customer experience	There is a chance of impact on indirectly affected areas; due to inadequate awareness of travel choices and alternatives provided to road users; leading to significant delays to areas outside control of contractors, deterioration of alternative routes, impacts to adjacent infrastructure (schools hospitals), reduction in active transport options in those areas (e.g. Taroona, Channel Highway, Bonnet Hill)	Community	Reputation	D - Likely	4 – Major	High
12	Attitudes and perception	Increasing accessibility and connectivity through increased mode share of active and public transport	There is a chance of deterioration of driver behaviour; due to frustration, lack of awareness of alternatives; leading to crashes, property damage, fatalities, further contingent events, congestion in unanticipated areas	Health and Safety	Community	D - Likely	3 – Moderate	High

ID No.	Theme	Objective	Risk Description	Risk Consequence Definition - Primary	Risk Consequence Definition - Secondary	Likelihood	Consequence	Risk Level
13	Construction delays	Increasing accessibility and connectivity through increased mode share of active and public transport	There is a chance that construction is stalled or delayed; due to contractor of inadequate size/capacity/skill; leading to prolonged disruption	Program Impact	Financial Impact	C - Possible	4 – Major	High
16	Disruption to services	Delivery of good customer experience	There is a chance of disruption to major industries (Nyrstar, Selfs Point Fuel, Bridgewater Bridge works) from water-based construction under Tasman Bridge; resulting in reduced flexibility of construction methodology; leading to greater intensity and duration of road network impacts	Community	Financial Impact	D - Likely	4 – Major	High
17	Disruption to services	Increasing accessibility and connectivity through increased mode share of active and public transport; and Delivery of good customer experience	There is a chance that the existing network ITS (i.e. LUMS, VSLS, etc.) is damaged; due to construction issues or challenges during works or commissioning of new systems; leading to inability to manage road network to general levels or inability to implement tidal flow to increase use of network management as form of intervention	Community	Management Impact	C - Possible	4 – Major	High
20	Direct network impacts	Delivery of good customer experience	There is a chance of unanticipated impacts on identified alternative detour routes; due to concurrent works; leading to increased magnitude of disruption, network shut-down	Community	Reputation	D - Likely	4 – Major	High
24	Direct network impacts	Delivery of good customer experience	There is a chance of reduced resilience of the road network; due to concurrent planned events requiring road closures (e.g. Run the Bridge, events at Blundstone/Kingston Twin Ovals); leading to exacerbated delay impacts which could include effective "closure" of the city network, "no school day", small business impacts, financial hardship, resourcing issues for vital services, bad publicity, loss of public trust in Govt	Reputation	Financial Impact	D - Likely	4 – Major	High
25	Direct network impacts	Delivery of good customer experience	There is a chance of amenity impact on indirectly affected areas; due to exhaust emissions and increased noise conditions around project sites; leading to impacts to adjacent infrastructure (schools hospitals), increases to the stakeholder catchment, bad publicity, loss of public trust in Govt	Community	Environment and Heritage	D - Likely	4 – Major	High
26	Attitudes and perception	Increasing accessibility and connectivity through increased mode share of active and public transport; and Delivery of good customer experience	There is a chance of reduction in user experience for AT and reduction in overall AT numbers; due to project closures negatively impacting AT routes (Tasman Bridge pathway closures) and the priority of vehicles on current AT corridors; leading to long term negative impacts to AT uptake and changed value proposition for AT users	Reputation	Community	D - Likely	4 – Major	High
27	Construction delays	Increasing accessibility and connectivity through increased mode share of active and public transport	There is a chance that construction is stalled or delayed; due to latent conditions within the project site; leading to prolonged disruption	Program Impact	Financial Impact	C - Possible	4 – Major	High
6	Direct network impacts	Delivery of good customer experience	There is a chance of airport access being impacted; due to extended capacity constraints on arterials; leading to missing of flights, loss of income, travel disruption, airport operational impacts, negative publicity	Community	Financial Impact	D - Likely	2 – Minor	Medium
14	Construction delays	Increasing accessibility and connectivity through increased mode share of active and public transport	There is a chance of a stop-work being called on one or more work sites; due to intense public backlash/discontent; leading to political will diminishing, pressure to rethink the projects	Program Impact	Financial Impact	B - Unlikely	4 – Major	Medium
15	Attitudes and perception	Delivery of good customer experience	There is a chance of inequitable pain share; due to the need for trade-offs and rapid action needed to get going; leading to loss of govt trust, socio-economic divides being created/argued in the public arena.	Reputation	Community	D - Likely	2 – Minor	Medium
18	Attitudes and perception	Increasing accessibility and connectivity through increased mode share of active and public transport	There is a chance of public revolt; due to perceived lack of action in preparing for project impact; leading to loss of social license, withdrawal of support for infrastructure projects, damage to greater Hobart transport vision and brands	Reputation	Financial Impact	C - Possible	3 – Moderate	Medium
21	Construction delays	Increasing accessibility and connectivity through increased mode share of active and public transport	There is a chance of politicisation of the projects; due to local and state politics, conflicting interests; leading to perverse project outcomes, planning approvals delays, compromises, reduced effectiveness of management strategies, worsened baseline prior to works, tension between levels of Govt	Reputation	Management Impact	C - Possible	3 – Moderate	Medium
23	Disruption to services	Increasing accessibility and connectivity through increased mode share of active and public transport; and Delivery of good customer experience	There is a chance we don't deliver required interventions in time; due to shortage of traffic management equipment; leading to delayed start, failure of the network, or major project impacts (timeframe)	Reputation	Financial Impact	C - Possible	3 – Moderate	Medium

From: out of scope
To:
Subject: SOTL - updated estimate
Date: Friday, 4 November 2022 11:12:09 AM
Attachments: image001.png
image002.png
image003.png
image004.png
image005.png
12556430-EST-E_Southern Outlet Cost Estimate_Prelim_20221104.pdf

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Hi ,
My feeling is that this estimate has a bit of contingency.
I've added in the noise walls, and adjusted some services and signals/ITS quantities to reflect where we're at.
I'm out of the office for the rest of the day (sorry, demo spec will be Monday now)
Give me a call if you need to discuss!
Kind Regards

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Team Leader – Transport
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I acknowledge the traditional owners of the land on which we work and live, and respect their ongoing custodianship of the land. I pay my respect to Tasmanian Aboriginal people, and Elders past and present

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Duplicate

Duplicate

Duplicate

From: Out of scope
To:
Subject: SOTL - Travel Demand Strategy
Date: Monday, 28 November 2022 5:06:35 PM
Attachments: image001.png
image002.png
image003.png
image004.png
image005.png
image006.png

Hi ,
The Cross Section around Cats Eye Corner looks like this (green line is inferred rock level):

To allow enough room for the Contractor to undertake works safely in between traffic flow it is likely that only 1 lane of traffic in each direction will be available.
There may be 3 lanes total depending on the outcome of the constructability review (ie if it is possible to complete most works including probs from the western side of the median wall), however the constructability review is still weeks from being completed (as per program).
Regardless, there will be major impact to traffic.
Tidal flow will be one consideration within the TDS variation.
As the variation is time and disbursements, if a single clear item solves our traffic issues (unlikely), then the variation works would stop there.
I would suggest that holding off approval of the variation until the completion of the constructability review is a major programming risk to the project.
Kind Regards

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From:
To:
Cc:
Subject: RE: Updated variation offer
Date: Thursday, 16 March 2023 2:16:35 PM
Attachments: image001.png
image002.png
image003.png
image004.png
image005.png

Hi ,

Further to our conversation this morning, I have some specific comments on the GHD proposal. has also put together some more general thoughts which she will circulate separately.

- The opening paragraph talks about understanding how and if the two projects can be run concurrently. Yes that is an important question, but even if the answer is "no", there will still be significant issues that need to be managed.
- I don't think that there will be a lot of value in volume capacity review . A simple comparison of current demand vs theoretical capacity will give an indication of roughly how many people will need to be moved by alternative means (to guide decisions about how many extra buses we need etc). There is not so much spare capacity on alternative routes that this will be able to be redistributed in a significant way. We could do amore detailed analysis but I don't think the extra precision will change the answer too much.
- The key risk scenario that I can see is that there are delays to outbound traffic on both the Southern Outlet and Tasman Bridge. This would result in overlapping queues on Davey and Macquarie, and create gridlock in and around the CBD. Inbound queues (even if from both projects concurrently) are more manageable (although not ideal, obviously), in that the impact is isolated to a particular part of the network, and the CBD is kept clear. Outbound queuing is primarily in the PM peak, but can and does occur in the morning and during the day too, particularly if capacity is restricted in any way.
- I prefer their Option 2 approach (Essential Priority Intervention Progression) but have some additional suggested inclusions:
    - The "Tolmans Hill and Southern Outlet PT detour review" could be renamed and refocussed towards public transport priority arrangements on approach to and through the project areas
    - Construction Management Planning needs to be included:
        - Working hours (maximise working hours while lanes are closed)
        - Contractual incentives to reduce and manage traffic delays
        - Traffic management on approaches to the project sites
        - Potential trial before finalising construction contract
    - Public transport improvements
        - How many extra buses are needed, where should we get them from, who should operate them, what other arrangements are needed (e.g. fare structure etc)?
        - Is it feasible to provide a ferry from Kingston area, and/or to increase ferry capacity from Eastern Shore (refer to WSP consultancy from Dusty)?
    - Incident response arrangements
        - Especially for Southern Outlet where traffic will be down to a single lane
        - Build on the existing incident response arrangements currently in place
    - The "local detours" from table 4 needs to move into Table 5, and be refocussed. Identification of alternative routes will be relatively easy to do, but the key issue is

what management measures need to be put in place to avoid excessive impacts on traffic flow / amenity etc.
    - E.g. if Proctors Road will get more use, are any local area traffic management measures needed to avoid impacts deeper into Sandy Bay residential areas?
    - If Huon Road might be used more, are there any improvements needed to cater for the increased volume?
- For each element, there needs to be an Action Plan, rather than just broad theoretical recommendations

Happy to discuss further as needed.

Regards,

| Manager Strategic Operations
Network Performance | Infrastructure Tasmania | Department of State Growth
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Phone:
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Courage to make a difference through

TEAMWORK | INTEGRITY | RESPECT | EXCELLENCE

In recognition of the deep history and culture of this island, I acknowledge and pay my respects to all Tasmanian Aboriginal people; the past, and present custodians of the Land.

From: @stategrowth.tas.gov.au>
Sent: Friday, 10 March 2023 8:56 AM
To: @stategrowth.tas.gov.au>
Cc: @stategrowth.tas.gov.au>
Subject: FW: Updated variation offer

Hi ,

and I had another meeting with GHD a few weeks ago, requesting for further clarifications on their proposed scope.

Please find attached updated proposal from GHD on the traffic assessment, mitigation and management for during construction period of the Tasman Bridge and Southern Outlet project.

Can you please review and advise?

Thanks,

From: Out of scope @ghd.com>
Sent: Thursday, 9 March 2023 12:59 PM
To:

Subject: Updated variation offer

Hi

Please find the updated variation offer, including some output examples attached.

Key changes made:

- Scope item 1 has been updated to include fee breakdown into stages, more detail of method and attached output summaries. We also specifically noted how we plan to work with the Department to tailor outputs to support the decisions making and conversations required
- Scope item 2 – we have updated to provide two options. Based on what we know to date we would suggest a very comprehensive package of interventions is progressed and that is how our proposal was formed to date. I understand that the Department is perhaps viewing it pragmatically in terms of what is able to be implemented in a short time frame and within Department's direct control, understanding this position a second option is proposed of just progressing a few options (which may be these options or others selected by the Department) if the Department would like us to get underway on some of the options initially with respect to

the benefit of at least implementing a few key interventions. Depending on the Departments decisions here our risk assessment as we progress can reflect the expected level of mitigation achieved.

- Scope item 3 & 4 no change

Please feel free to call if any questions or if you want to talk through
Regards

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Senior Engineer – Transport
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Tasmanian Government

DEPARTMENT OF STATE GROWTH

Dept. Ref	MIG23/1686
Critical Date	1 December 2023

NOTED
SIGNED: .....
DATE:

Issues Briefing Note for the Minister for Infrastructure and Transport

SUBJECT: SOUTHERN OUTLET TRANSIT LANE – TRAFFIC MANAGEMENT DURING CONSTRUCTION

Minister's notation:

Background:

The Southern Outlet between Kingston and Hobart carries one of the highest daily traffic volumes on our state road network. As the primary connection between Kingston and the Hobart CBD, there is a need to increase the efficiency and person-capacity of the roadway through the use of higher-occupancy vehicles such as buses and carpooling private vehicles.

The Southern Outlet Transit Lane (the project) includes the design for a northbound transit lane on the Southern Outlet between Olinda Grove and Macquarie Street. The lane will operate as a T3 lane for use by buses, private vehicles carrying three or more occupants, taxis and emergency service vehicles. Building an additional northbound lane will also improve access for public transport and emergency services along this critical road corridor.

Current Situation:

The detailed design of the Southern Outlet Transit Lane is nearing completion. During the development of the design, it was identified that the existing lane width and shoulder width on the Southern Outlet Highway are not sufficient to cater for the construction equipment to operate and maintain a safe distance from the adjacent live traffic. Expert advice provided to the Department of State Growth identifies that long term lane closures on the Southern Outlet Highway will be necessary during construction of the transit lane, to conduct the work safely in accordance with WorkSafe and Traffic Management standards. It was also identified that limited lane closures may be required for the rockface protection work.

The department is investigating different options during construction, to minimise the need for lane closures. These options include night works only, a combination of day and night works, or construction during off-peak hours only. These options will have implications on the cost and duration of construction, as well as the wellbeing of the residents living near the construction sites.

As well as consideration for the work hours during construction, the significant traffic disruptions could be mitigated with effective traffic management. The department will impose special conditions in the contract, mandating the contractor to implement traffic management to the department's requirements, such as prioritising buses, trucks and emergency vehicles during peak times or marshalling the buses through the traffic.

The department is continuing to develop a plan to minimise impacts on Hobart's transport network during the construction periods of the transit lane. Construction timing of the Tasman Bridge Pathway Upgrades (TBPU) project, and Southern Outlet Transit Lane will need to be carefully managed. The Travel Demand Management (TDM) strategy will also cover traffic impacts caused by the construction of the TBPU project and other concurrent construction projects in Hobart.

The TDM strategy will investigate the impact of other projects during delivery on the Hobart transport network and establish mitigation and communications activities to manage impacts. The TDM will consider a holistic approach to mitigation measures to enable the community to make choices about travel especially during peak times.

Financial Implications:

The financial implications of implementing the mitigation measures under the TDM strategy is in development and the traffic management during construction will form part of the contract sum.

Communications Strategy:

Key stakeholders will be consulted on the development of the TDM strategy and on potential interventions. The department will consult with key stakeholders in the coming months, on developing the best way forward to ensure traffic impacts are minimised during periods of major construction.

Information will be provided to road users on construction impacts and mitigation strategies to support behavioural change around transport choices ahead of construction starting. This will be covered in a communications plan which is being developed to ensure the Greater Hobart community is aware of the cohesive program of works that will ultimately give people a variety of options to move around Hobart, including easier, more convenient and more efficient active and public transport options.

Ahead of further announcements, the project pages on the Transport website will be updated to include information about the development of the TDM strategy. An operational media release will also be put out containing this information.

Who needs to know	Method of delivery	Tasked to	Timeframe
Road users and broader community	Operational media release	Stakeholder Communications	As required or at specific project milestone
Road users and broader community	Website update – Southern Outlet Transit Lane and Tasman Bridge Pathway Upgrades	Stakeholder Communications	As required or at specific project milestone

Gary Swain
Deputy Secretary Transport and Infrastructure

28 November 2023

Prepared by:		Cleared by:	
Position:	Project Manager	Position:	General Manager State Roads
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Phone:		Phone:	