Appendix J. Road Safety Audit - Stage F1

SNC·LAVALIN

ATKINS
Member of the SNC-Lavalin Group

N25 Waterford to Glenmore

Stage F Part 1 Road Safety Audit

Kilkenny County Council

August 2020

Notice

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Document history

Revision	Purpose description	Origin-ated	Checked	Reviewed	Author-ised	Date
Rev 0	Draft Issue	CJP	CJP	MD	MD	06/07/2020
Rev 1	Amended Following Client Review	CJP	CJP	MD	MD	24/07/2020
Rev 2	Final	CJP	CJP	MD	MD	26/08/2020
Rev 3	Final	CJP	CJP	MD	MD	18/09/2020

Client signoff

Client	Kilkenny County Council
Project	N25 Waterford to Glenmore
Job number	5190130
Client signature	Seamus Foley
date	18/09/2020

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1. Introduction

1.1. Background

This report describes the findings of a Stage F Part 1 Road Safety Audit associated with the proposed improvement of the N25 from Waterford to Glenmore road scheme.

Six potential route options/sub-options were scrutinized as part of the audit process.

The scheme study area and route options are illustrated in the following Figure.

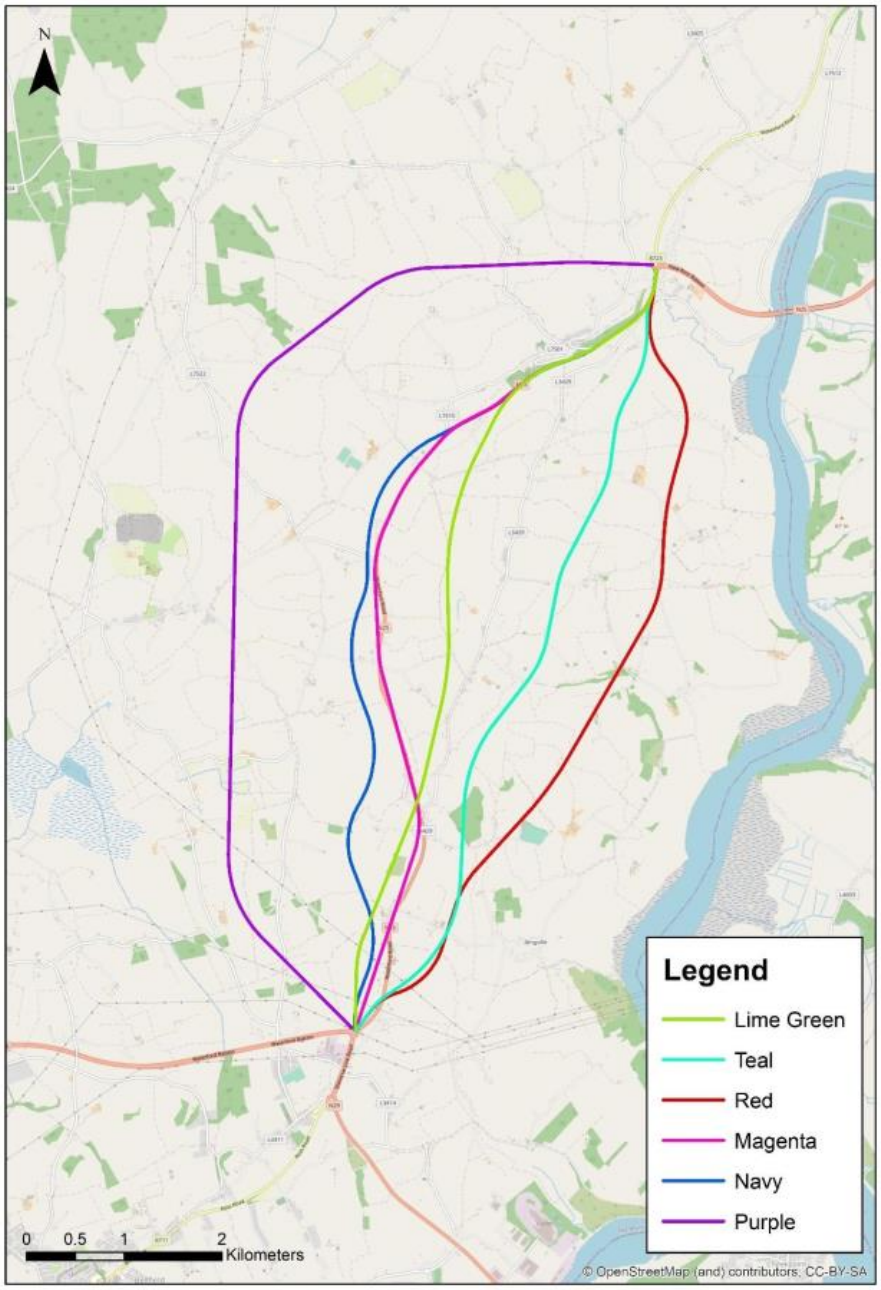

Figure 1.1 - Study Area and Route Options

The Audit has been completed by Atkins on behalf of Kilkenny County Council

1.2. Scheme Information

The N25 is a vital link in the national road network in the south east. The N25 connects Cork at one end to the port of Rosslare at the other end, with Waterford City located just off the N25 and to the south west of the study area. The N25 provides access to five of the country's major ports, Cork, Ringaskiddy, Waterford, New Ross and Rosslare.

This section of the national road network under consideration is a single carriageway road with at grade junctions and direct accesses, is rural in nature and is situated in County Kilkenny between the townland of Luffany to the south and Jamestown to the north. The village of Glenmore is adjacent to the existing N25 towards the northern end of the project extents. The project will interface with the N25 New Ross Bypass (opened in January 2020) and the N25 Waterford City Bypass (opened in October 2009) both of which are a Type 1 cross section.

The existing N25 carries 12,340 AADT, with an elevated portion of HGVs, in excess of the LOS D capacity of a standard type 1 single carriageway (11,600AADT). This would indicate that existing traffic flows and operations along this section of the N25 may be volatile and vulnerable to instability when subject to minor disruptions or incidents.

The Stage F audit has been undertaken at the feasibility stage of scheme design, which corresponds with Phase 2 of project management as set out in TII Publication PE-PMG-02041 Project Management Guidelines.

This Stage F Part 1 audit has examined several options for a scheme and has assessed the potential road safety problems for each option.

The report has been divided into two main sections. The first section is a summary of the key road safety issues identified for each option, considered in turn. The second part of the report deals with the road safety ranking of each option considered, relative to one another.

1.3. Site Inspection

The study included a desktop appraisal of the routes presented by the Design Team.

A site visit was undertaken on the morning of Tuesday 30th of June by the audit team. Weather conditions were mild and dry with dry road surfaces. Traffic volumes were light to moderate along the existing N25 route.

1.4. The Audit Team

The Road Safety Audit Team members were as follows:

Team Leader:	Martin Deegan, BEng (Hons) MSc CEng MICE
Team Member:	Colin J Prendeville, BEng (Hons) CEng MIEI CIHT

1.5. Drawings

The following drawings were examined as part of the Stage F Part 1 Road Safety Audit process:

Table 0-1 Drawing List

Route Name	Drawing Number	Drawing Title	Date
Purple	5190130-ATK-ZZ-ZZ-SK-RE-0050 – 0053	PRELIMINARY CORRIDOR OPTIONS PLAN - PURPLE CORRIDOR	11.06.20
Navy	5190130-ATK-ZZ-ZZ-SK-RE-0054 – 0056	PRELIMINARY CORRIDOR OPTIONS PLAN - NAVY CORRIDOR	11.06.20
Magenta	5190130-ATK-ZZ-ZZ-SK-RE-0057 – 0059	PRELIMINARY CORRIDOR OPTIONS PLAN - MAGENTA CORRIDOR	27.07.20
Lime Green	5190130-ATK-ZZ-ZZ-SK-RE-0060 – 0062	PRELIMINARY CORRIDOR OPTIONS PLAN – LIME GREEN CORRIDOR	11.06.20
Teal	5190130-ATK-ZZ-ZZ-SK-RE-0063 – 0065	PRELIMINARY CORRIDOR OPTIONS PLAN - TEAL CORRIDOR	07.09.20
Red	5190130-ATK-ZZ-ZZ-SK-RE-0066 – 0068	PRELIMINARY CORRIDOR OPTIONS PLAN - RED CORRIDOR	07.09.20
Purple	5190130-ATK-ZZ-ZZ-SK-RE-0101 – 0108	RELIMINARY CORRIDOR OPTIONS PLAN AND PROFILE - PURPLE CORRIDOR	11.06.20
Navy	5190130-ATK-ZZ-ZZ-SK-RE-0125	RELIMINARY CORRIDOR OPTIONS PLAN AND PROFILE - NAVY CORRIDOR	11.06.20
Magenta	5190130=ATK-ZZ-ZZ-SK-RE-0141 – 0147	RELIMINARY CORRIDOR OPTIONS PLAN AND PROFILE - MAGENTA CORRIDOR	11.06.20
Lime Green	5190130-ATK-ZZ-ZZ-SK-RE-0161 – 0167	RELIMINARY CORRIDOR OPTIONS PLAN AND PROFILE – LIME GREEN CORRIDOR	11.09.20
Teal	5190130-ATK-ZZ-ZZ-SK-RE-0185 – 0190	RELIMINARY CORRIDOR OPTIONS PLAN AND PROFILE - TEAL CORRIDOR	07.09.20
Red	5190130-ATK-ZZ-ZZ-SK-RE-0210 – 0215	RELIMINARY CORRIDOR OPTIONS PLAN AND PROFILE - RED CORRIDOR	07.09.20
Purple	5190130-ATK-ZZ-ZZ-SK-RE-0109 – 0112	PRELIMINARY CORRIDOR OPTIONS PLAN AND PROFILE - PURPLE CORRIDOR	11.06.20
Navy	5190130-ATK-ZZ-ZZ-SK-RE-0132	PRELIMINARY CORRIDOR OPTIONS PLAN AND PROFILE - NAVY CORRIDOR	11.06.20
Lime Green	5190130-ATK-ZZ-ZZ-SK-RE-0168 – 0170	PRELIMINARY CORRIDOR OPTIONS PLAN AND PROFILE – LIME GREEN CORRIDOR	11.06.20
Teal	5190130-ATK-ZZ-ZZ-SK-RE-0191 – 0194	PRELIMINARY CORRIDOR OPTIONS PLAN AND PROFILE - TEAL CORRIDOR	07.09.20
Red	5190130-ATK-ZZ-ZZ-SK-RE-0216 – 0220	PRELIMINARY CORRIDOR OPTIONS PLAN AND PROFILE - RED CORRIDOR	23.07.20

1.6. Documents

The following data was examined as part of the Stage F Part 1 Road Safety Audit process:

Table 0-2 Table of Documents

Document Number	Report Title	Date
5190130-SYS-XX-XX-RP-TM-0002	N25 Waterford to Glenmore Traffic Modelling Report	13.05.2020

1.7. Relaxations and departures

Please refer to Appendix B which details the departures and relaxations which were reviewed as part of this audit.

1.8. Road Safety Audit Compliance

This Road Safety Audit has been carried out in accordance with the procedures and scope set out in TII publication numbers GE-STY-01024 Road Safety Audit (formerly NRA DMRB, Volume 5, Section 2, Part 2 Standards HD 19) and GE-STY-01027 Road Safety Audit Guidelines (Formerly NRA DMRB, Volume 5, Section 2, Part 2 Standards HA 19).

As part of the road safety audit process, the Audit Team have examined only those issues within the design which relate directly to road safety.

The road safety audit process is not a design check, therefore verification or compliance with design standards or any other criteria have not formed part of the audit process.

The problems described in this report are considered by the Audit Team to require action in order to improve the safety of the scheme and minimise the risk of collision occurrence.

These should be given consideration by the design team in the development of the final design and selection of the preferred option.

2. Road Safety Hazards Identified

2.1. Overview of Purple Route

The overall route length is 11.586 km. The route is completely offline. The purple route is the longest route of all options proposed. There are 8 locations where the route crosses existing roads and provision of an over / underpass is proposed.

The plans do not contain any online junctions. Pedestrian and cyclists will continue to use the existing N25 which will be reduced to a regional road and speed reduced to 80kph .

2.2. Proximity of Arms

Location: Chainage 0m mainline
The arms of the roundabout are positioned in relatively close proximity to each other. This may lead to conflict where drivers fail to adequately cater for opposing drivers.

Hazard
Shunt, side-swipe and side-impact collisions due to proximity of roundabout arms.

2.3. Long Downhill Gradients

Location: Chainage 0 to 1760m, 2600 to 4600m & 6320 to 7960 mainline
Drivers are travelling downhill over approximately 2km at three locations. This may lead to higher driving speeds on the down-hill sections and lead to potential conflict such as loss-of-control. Long uphill gradients may pose challenges for heavy-goods vehicles and which may also lead to conflict such as swipe and shunt collisions as a result of vehicle lane changes where overtaking is required.

Hazard
Higher downhill speeds and increased over overtaking on uphill sections leading to conflict such as loss-of-control and shunt and swipe collisions.

2.4. Tight Horizontal Alignment

Location: Chainage circa 100m Sheet 01 of 08, Chainage circa 90m Sheet 02 of 08
The proposed side roads appear to have a relatively tight alignment with a 90m curve. Drivers are approaching these curves on straight sections of road where speed may be higher and may fail to navigate this alignment which may result in loss-of-control.

Hazard
Loss-of-control due to tight horizontal alignment.

2.5. Overview of Navy Route

The overall route length is 9.456 km. Navy is the second longest of the proposed routes. A considerable amount of the route is offline with approximately 30% online. There are 4 locations where the route crosses existing roads and provision of an over / underpass is proposed.

This option contains two online junctions; one for north bound traffic and one for southbound traffic. Pedestrian and cyclists will continue to use the existing N25 which will be reduced to a regional road and speed reduced to 80kph.

2.6. Curved Alignment and Downgrade

Location: Chainage 350m mainline
The proposed horizontal alignment combined with down gradient may lead to an increased risk of speed and loss-of-control.

Hazard
Loss-of-control and horizontal alignment.

2.7. Minor Road

Location: Chainage 3000m mainline
The proposed side road appears to have a relatively tight alignment which has a straight section of road leading to it which may increase approach speeds. Drivers may fail to navigate this alignment and result in loss-of-control.

Hazard
Loss-of-control and horizontal alignment.

2.8. Compact Junctions

Location: Chainage circa 3000 and 3100m
The proposed compact junctions may be difficult for drivers to negotiate and this could lead to shunt collisions due to braking on the mainline or loss-of-control where drivers enter the junction at speed.

Hazard
Shunt and loss-of-control due to tight geometry.

2.9. Higher Downhill Speeds

Location: Chainage circa 0m to 3380m and Chainage circa 8300m to 9200m
Drivers are effectively travelling downhill over more than 3km. This may lead to higher driving speeds on the down-hill movements and potential conflict may arise such as loss-of-control. Correspondingly, the uphill gradients may pose challenges for heavy-goods vehicles which may also lead to conflict due to increased lane changes and overtaking of slower moving vehicles..

Hazard
Higher downhill speeds and increased over overtaking on uphill sections leading to conflict such as loss-of-control and shunt and swipe collisions.

2.10. Overview of Magenta Route

The overall route length is 9.321 km. A considerable amount of the route is online with approximately 65% online and 35% offline. There are no over / underpasses proposed for this option.

There are no pedestrian or cyclists facilities proposed; pedestrian and cyclist movements will continue along the existing N25. Existing private and agricultural movement will be maintained of which there will be approximately 14 junctions and 50 accesses that will be served directly by the proposed magenta option.

2.11. Conflict with Vulnerable Road Users and Vehicles

Location: Scheme Wide
A considerable section of the route will remain online. This may create challenges for cyclists and pedestrians where they are in conflict with traffic which may travel at high speed.

Hazard
VRU collisions with general traffic.

2.12. Conflict with Local Traffic and Through Vehicles

Location: Scheme wide
The proposed scheme will result in local traffic travelling with high speed through traffic. Some local traffic may include slow farm machinery where a speed differential and potential conflict is likely. This may lead to conflict with merging / diverging traffic at slower speeds and traffic changing lanes.

Hazard
Conflict with local and through traffic due to speed differential resulting in shunt, side-impact and swipe collisions.

2.13. Higher Downhill Speeds

Location: Chainage circa 0m to 3300m
Drivers are effectively travelling downhill over more than 3km. This may lead to higher driving speeds on the downhill section and potential conflict such as loss-of-control. Correspondingly, the uphill gradients may pose challenges for heavy-goods vehicles which may also lead to conflict due to increased lane changes and overtaking of slower moving vehicles.

Hazard
Higher downhill speeds and increased over overtaking on uphill sections leading to conflict such as loss-of-control and shunt and swipe collisions.

2.14. Frequent Accesses Leading to Conflict

Location: Scheme Wide
The presence of accesses along the route will naturally increase the risk of conflict where drivers are slowing, stopping and cutting across through traffic.

Hazard
Shunt, side-swipe and side-impact collisions due to provision of accesses along route.

2.15. Overview of Lime Green Route

The overall route length is 8.88 km, 75% of the route is offline with the remaining 25% online. There are 4 locations where the route crosses existing roads and provision of an over / underpass is proposed.

This option contains two online junctions; one for north bound traffic and one for southbound traffic. Pedestrian and cyclists will continue to use the existing N25 which will be reduced to a regional road and speed reduced to 80kph.

2.16. Curved Alignment and Downgrade

Location: Chainage 350m mainline
The proposed horizontal alignment combined with down gradient may lead to an increased risk of speed and loss-of-control.

Hazard
Loss-of-control collisions due to speed and horizontal alignment.

2.17. Minor Road

Location: Chainage 2500m mainline
The proposed side road has a relatively tight alignment which has a straight section leading to it. Drivers may fail to navigate this alignment and result in loss-of-control.

Hazard
Loss-of-control and horizontal alignment.

2.18. Compact Junctions

Location: Chainage circa 2500 and 2900m
The proposed compact junctions may be difficult for drivers to negotiate and this could lead to shunt collisions due to braking on the mainline or loss-of-control where drivers enter the junction at speed.

Hazard
Shunt and loss-of-control due to tight geometry.

2.19. Higher Downhill Speeds

Location: Chainage 0m to 3480m, 3480m to 4700m and 7740 m to 8600m
Drivers are effectively travelling downhill over relatively long distances some up to 3.5km. This may lead to higher driving speeds on the down-hill movements and potential conflict may arise such as loss-of-control. Correspondingly, the uphill gradients may pose challenges for heavy-goods vehicles which may also lead to conflict due to increased lane changes and overtaking of slower moving vehicles..

Hazard
Higher downhill speeds and increased over overtaking on uphill sections leading to conflict such as loss-of-control and shunt and swipe collisions.

2.20. Overview of Teal Route

The overall route length is 8.691 km. The majority of the route is offline with only 3% online at the northern tie-in location. There are 7 locations where the route crosses existing roads and provision of an over / underpass is proposed.

This option does not contain online junctions. Pedestrian and cyclists will continue to use the existing N25 which will be reduced to a regional road and speed reduced to 80kph.

2.21. Curved Alignment and Downgrade

Location: Chainage 350m mainline
The proposed horizontal alignment combined with down gradient may lead to an increased risk of speed and loss-of-control.

Hazard
Loss-of-control collisions.

2.22. Minor Road Alignment

Location: Chainage 3900m mainline
The proposed side road has a relatively tight horizontal alignment. There are straight sections leading to these curves. Drivers may fail to navigate this alignment and result in loss-of-control.

Hazard
Loss-of-control collisions.

2.23. Higher Downhill Speeds

Location: Chainage circa 0m to 2900m, 2900m to 3900m and 7480m to 8691m
Drivers are effectively travelling downhill over relatively long distances some up to 3km. This may lead to higher driving speeds on the down-hill movements and potential conflict may arise such as loss-of-control. Correspondingly, the uphill gradients may pose challenges for heavy-goods vehicles which may also lead to conflict due to increased lane changes and overtaking of slower moving vehicles.

Hazard
Higher downhill speeds and increased over overtaking on uphill sections leading to conflict such as loss-of-control and shunt and swipe collisions.

2.24. Minor Road Alignment

Location: Chainage 7250m mainline
The proposed side road has a relatively tight alignment with a series of reverse curves. Drivers may fail to navigate this alignment and result in loss-of-control. Additionally drivers may cut through the curves where they may conflict with opposing drivers.

Hazard
Loss-of-control and head-on collisions due to tight alignment.

2.25. Overview of Red Route

The overall route length is 8.991 km. The majority of the route is offline with only 2% online at the northern tie-in location. There are 9 locations where the route crosses existing roads and provision of an over / underpass is proposed.

This option does not contain online junctions. Pedestrian and cyclists will continue to use the existing N25 which will be reduced to a regional road and speed reduced to 80kph.

2.26. Higher Downhill Speeds

Location: Chainage 0m to 1500m, 2400 m to 3400m, 4440 m to 5800m & 5800 m to 68000m
Drivers are effectively travelling downhill over four sections along the route, each section approximately 1km in length. This may lead to higher driving speeds on the down-hill movements and potential conflict may arise such as loss-of-control. Correspondingly, the uphill gradients may pose challenges for heavy-goods vehicles which may also lead to conflict due to increased lane changes and overtaking of slower moving vehicles.

Hazard
Higher downhill speeds and increased over overtaking on uphill sections leading to conflict such as loss-of-control and shunt and swipe collisions.

2.27. Minor Road Alignment

Location: Chainage 6400m mainline
The proposed side road has a relatively tight alignment including a 90 degree bend to the east. Drivers may fail to navigate this alignment and result in loss-of-control.

Hazard
Loss-of-control due to tight alignment.

3. Route Comparison & Ranking

3.1. Route Comparison

3.1.1. Vulnerable Road Users – All Route Options

Pedestrian and cyclist provision are proposed to remain on the existing N25 alignment as required. Offline options will not have provision for vulnerable road users.

3.1.2. Other Criteria

3.1.2.1. Purple Route

The purple route is longest route at 11580m. The option has 7 departures/relaxations which is the lowest of all options. The purple route has a total of 8 minor road crossings.

This option does not have any junctions or private accesses associated with it.

3.1.2.2. Navy Route

The navy route is second longest in length at 9456m.This option has 12 departures and relaxations associated with the mainline which is the largest of all options. There is a compact junction provided for north and south bound traffic.

The route utilises circa 2.8km of the existing N25 which is the second highest percentage of all the options. The navy route has a total of 4 minor road crossings.

3.1.2.3. Magenta Route

The magenta route has a total length of 9312m. This route has no new junctions proposed however the route utilises approximately 6km of the existing N25 which is the highest of all options. This is the only that has private / agricultural accesses onto the route.

There are no side road crossing associated with the Magenta option. This option has 19 departures and relaxations.

3.1.2.4. Lime Green Route

The lime green Route measures circa 8.88km in length. This option has 11 departures and relaxations associated with the mainline. There is a compact junction provided for north and south bound traffic in a similar manner to the Navy option.

25% of the route utilises the existing N25 with the remaining 6.5km offline. The Lime green route has a total of 4 minor road crossings.

3.1.2.5. Teal Route

The teal route is the shortest option at 8690m. The option has nine departures/relaxations which is the second highest of all options along with the magenta route. The teal route has a total of 7 minor road crossings. There is one at grade junction provided for north bound traffic in a similar manner to the Red option.

The Teal route has a total of 7 minor road crossings.

3.1.2.6 Red Route

The red route is the shortest option at 8991m. The option has six departures/relaxations which is the second lowest of all options. The red route has a total of 9 minor road crossings. There is one at grade junction provided for north bound traffic in a similar manner to the Teal option.

The Red route has a total of 10 minor road crossings.

3.2. Ranking of Route Options

3.2.1. Assessment Criteria

The main assessment criteria for comparing the routes included:

- Overall horizontal and vertical alignment
- Impacts on vulnerable road users (VRU's)
- Number of junctions
- Number of side road crossings
- Number of private accesses
- Departures and relaxations

3.2.2. Horizontal and Vertical Alignment

The 'Horizontal and Vertical Alignment' row is a measure of the overall proposed alignment and whether there are aspects in the proposals that may lead to conflict and difficulty for drivers such as accesses, junctions, tight curves and steep crests.

3.2.3. VRU Impacts

The 'VRU Impacts' (Vulnerable Road User) row considers the likely impact on pedestrians and cyclists. Pedestrian and cyclist provision are not specifically proposed for any option. Where offline routes are proposed vulnerable road user provision will not be made on the new alignment however existing activity will continue on the current N25.

Where a proposed route is to stay 'online', this is expected to have a greater negative impact on vulnerable road users where the proposal may sever existing movements or in some locations high speed traffic may be interacting with occasional vulnerable road users.

3.2.4. Number of Junctions

The number of junctions along a route will naturally increase the risk of conflict. The below table details the proposed number of junctions for each option which is then considered in terms of overall ranking. The less junctions being the safer in terms of road safety.

3.2.5. Side Road Crossings

Additional side road crossing are deemed to have a greater negative impact in terms of road safety where by the structures associated with these crossings are a hazard for drivers and where increased risk is created by their provision for both the mainline and minor road itself.

3.2.6. Number of Accesses

The number of accesses on a proposed route will impact on safety performance. The magenta route which is predominantly online is the only option with direct accesses onto it.

3.2.7. Departures and Relaxations

Route options with fewer Departures and Relaxations were ranked higher than those with more.

3.3. Overall Route Comparison and Ranking

3.3.1. Comparison of Existing Road Environment to Proposed Routes

All the proposed options with the exception of the Magenta option represent a significant improvement to the existing N25 and a potentially significant improvement to safety on the route.

3.3.2. Assessment

Each route option has been assessed relative to the other options.

The following table sets out the assessment results.

Table 0-3 Route Comparison table

Option	Length (m) (Online)	VRU Impacts	No. of Junctions	Side Road Crossings	Accesses	Departures and Relaxations (Mainline)
Purple	11586 (0)	Preferred	0	8	0	7
Navy	9456 (2836)	Neutral	2	4	0	12
Magenta	9312 (6052)	Less Preferred	15	0	50	19
Lime Green	8884 (2221)	Neutral	2	4	0	11
Teal	8691 (260)	Preferred	1	7	0	9
Red	8991 (179)	Preferred	1	10	0	6

3.3.3. Summary Option Ranking Based on Road Safety

The ranking provided in the following table represents the relative road safety based ranking of the route options with respect to each other.

Table 0-4 Summary Road Safety Option Ranking

Option	Preference
Purple	1
Red & Teal	2
Lime	3
Navy	4
Magenta	5

3.3.4. Context – Giving Consideration to Other Non-Road Safety Criteria

The preferred route in terms of road safety is not necessarily the emerging preferred route for the scheme. The finding of the Stage F1 Road Safety Audit is used in the wider criteria of safety as set out in Unit 7.0 – Multi Criteria Analysis of the TII PAG and should be considered in context with the schemes other environmental, physical activity, accessibility and inclusion, integration and economy criteria also set out in Unit 7.0.

Audit Team Statement

We certify that we have examined the drawings and data listed in Chapter 1 of this Report.

The Road Safety Audit has been carried out with the sole purpose of identifying any features of the design which could be removed or modified in order to improve the road safety aspects of the scheme.

No one on the Audit Team has been otherwise involved with the design of the measures audited.

Road Safety Audit Team

Martin Deegan
Audit Team Leader
Road Safety Engineering Team
ATKINS

Signed: 

Date: 18/09/2020

Colin J Prendeville
Audit Team Member
Road Safety Engineering Team
ATKINS

Signed: 

Date: 18/09/2020

Appendix A: Audit Team Approval

Our Ref: 5767468/4575/Stage F

re: N25 N25 Waterford to Glenmore

APPROVAL OF ROAD SAFETY AUDIT TEAM, Stage F

Dear Milan Gajic,

The following members of the proposed road safety audit team are approved to carry out the Stage F road safety audit of N25 N25 Waterford to Glenmore.

1. Colin James Prendeville - Atkins - Leader
2. Martin Deegan - Atkins - Leader

A copy of all audit reports, design team response and exception reports must be uploaded through RSAAS. Successful upload of these reports and completion of the audit approval process is necessary for any further audit approval on this scheme.

Yours sincerely,

Lucy Curtis

Regional Road Safety Engineer
roadsafetyaudits@tii.ie

Appendix B: Departures & Relaxations

Departure /Relaxation Number	Departure /Relaxation Location	Carriageway Type/ Road Cross Section	Design Speed (kmph)	Start Chainage (m)	End Chainage (m)	Departure /Relaxation Type	Standard Required	Standard Provided	Reason for Departure/Relaxation
Mainline									
DEP-Navy-001	Mainline - Southbound	Type 1 Dual	100	130	220	Horizontal curvature and visibility	Minimum Horizontal radius of 720m and SSD of 215m.	Horizontal radius of 600m and SSD of 120m.	Existing horizontal curvature is maintained and tie-ins with the recently constructed New Ross roundabout and impacts the SSD correspondingly.
DEP-Navy-002	Mainline - Southbound	Type 1 Dual	100	220	460	Horizontal curvature and visibility	Minimum Horizontal radius of 720m and SSD of 215m.	Horizontal radius of 600m and SSD of 90m.	Existing horizontal curvature is maintained and tie-ins with the recently constructed New Ross roundabout and impacts the SSD correspondingly.
DEP-Navy-003	Mainline - Southbound	Type 1 Dual	100	460	527	Horizontal curvature and visibility	Minimum Horizontal radius of 720m and SSD of 215m.	Horizontal radius of 600m and SSD of 120m.	Existing horizontal curvature is maintained and tie-ins with the recently constructed New Ross roundabout and impacts the SSD correspondingly.
DEP-Navy-004	Mainline - Southbound	Type 1 Dual	100	5927.7	6113.8	Gradient	Minimum Gradient 3% .	Gradient 5% .	To follow the existing terrain and to optimise the earthwork volume
DEP-Navy-005	Mainline - Southbound	Type 1 Dual	100	7800.6	7863.6	Gradient	Minimum Gradient 3% .	Gradient 4.8% .	To follow the existing terrain and to optimise the earthwork volume
DEP-Navy-006	Mainline - Southbound	Type 1 Dual	100	8711	9144	Gradient	Minimum Gradient 3% .	Gradient 4.4% .	To follow the existing terrain and to optimise the earthwork volume
DEP-Navy-007	Mainline - Northbound	Type 1 Dual	100	9200	9220	Visibility	Minimum SSD of 215m.	SSD of 120m.	Tie-ins with the Luffany roundabout and impacts the SSD correspondingly.
DEP-Navy-008	Mainline	Type 1 Dual	100	9400	9445.579	Roundabout	Provision of 5 or more arm roundabouts is not recommended on National roads as per Clause 6.6.1 of DN-GEO-03060	5 arm roundabout proposed	Existing 4 arm Luffany roundabout retained and additional arm included for the proposed N25.
DEP-Navy-009 - 016	Mainline	Type 1 Dual	100	0 2910 4040 4960 5970 6990 7770 8050	20 2930 4060 4980 5990 7010 7790 8070	Drainage	Minimum waterfilm depth	Not calculated but potentially greater waterfilm depth	Combination of application of super elevation and gradients too steep ot too shallow.

REL-Navy-001	Mainline - Southbound	Type 1 Dual	100	0	118	Visibility	Minimum SSD of 215m.	SSD of 160m.	Existing horizontal curvature is maintained and tie-ins with the recently constructed New Ross roundabout and impacts the SSD correspondingly.
REL-Navy-002	Mainline - Southbound	Type 1 Dual	100	271.08	477.7	Gradient	Minimum Gradient 3% .	Gradient 4% .	To follow the existing terrain and to optimise the earthwork volume
REL-Navy-003	Mainline - Southbound	Type 1 Dual	100	2226.6	2542.3	Gradient	Minimum Gradient 3% .	Gradient 4% .	To follow the existing terrain and to optimise the earthwork volume
REL-Navy-004	Mainline - Southbound	Type 1 Dual	100	4024.933	4075.219	q (Rate of increase of	Minimum q= 0.3	Minimum q= 0.6	Existing alignment retained.
Accommodation Bridge 1									
DEP-Navy-ACC Bridge 1-001	Accommodation Bridge 1 (SW	Type 3 Single	60	50	150	Visibility	SSD of 90m.	SSD of 70m.	The minimum site distance is 89.5
DEP-Navy-ACC Bridge 1-002	Accommodation Bridge 1 (NE	Type 3 Single	60	40	240	Visibility	SSD of 90m.	SSD of 70m.	The minimum site distance is 89.5
Accommodation Bridge 2									
DEP-Navy-ACC Bridge 2-001	Accommodation Bridge 2	Type 3 Single	60	322	517.8	Gradient	Minimum Gradient 7%	Gradient 8%	Existing terrain warrants the proposed gradient
Accommodation Bridge 4									
DEP-Navy-ACC Bridge 4-001	Accommodation Bridge 4	Type (0.5+2.5+2.5+.05)	42	161	221.6	Gradient	Minimum Gradient 7%	Gradient 8%	Existing terrain warrants the proposed gradient
Compact grade Separated Junction 1									
DEP-Navy-Compact Grade separated Junction 1-001	Compact Grade separated Junction 1	Type (3.65+0.6+3.65)	30	80	130	Visibility	Minimum SSD 70	SSD 50	Horizontal curve radius with the vertical alignment induces the reduced visibility.

Departure/Relaxation Number	Departure/Relaxation Location	Carriageway Type/ Road Cross Section	Design Speed (kmph)	Start Chainage (m)	End Chainage (m)	Departure /Relaxation Type	Standard Required	Standard Provided	Reason for Departure/Relaxation
Mainline									
DEP-MAGENTA-ML-001	Mainline (South Bound)	Type 1 Dual	100	140	296	Horizontal alignment, Visibility	Minimum Horizontal radius of 720,Mimium SSD of 215	Horizontal radius of 610,SSD of 120	Existing horizontal curvature is maintained and tie-ins with the recently constructed New Ross roundabout impacts the SSD & Gradient correspondingly.
DEP-MAGENTA-ML-002	Mainline (South Bound)	Type 1 Dual	100	296	498	Horizontal alignment, Visibility & Gradient	Minimum Horizontal radius of 720,Mimium SSD of 215 & Minimum Gradient of 3%	Horizontal radius of 610,SSD of 120 &Gradient of 3.495%	
DEP-MAGENTA-ML-003	Mainline (South Bound)	Type 1 Dual	100	498	560	Horizontal alignment, Visibility	Minimum Horizontal radius of 720,Mimium SSD of 215	Horizontal radius of 610,SSD of 120	
DEP-MAGENTA-ML-004	Mainline	Type 1 Dual	100	6860	6910	Junction design	Maximum longitudinal gradient of 4%	Maximum longitudinal gradient of 5% at junction	Existing alignment is maintained and tie-ins over the on-line widening sections and junctions maintained.
DEP-MAGENTA-ML-005, 006, 007, 008 and 009	Mainline	Type 1 Dual	100	Varies	Varies	Drainage	Maximum waterfilm depth	Not calculated but longitudinal gradients of 0.5% sat roll overs	Existing alignment is maintained and tie-ins over the on-line widening sections and junctions maintained.
DEP-MAGENTA-ML-010, 011 and 012	Mainline	Type 1 Dual	100	Varies	Varies	Dwell Area	Maximum dwell area of 2%	Not calculated but existing side roads sub standard and they are being maintained	Existing alignment is maintained and tie-ins over the on-line widening sections and junctions maintained.
DEP-MAGENTA-ML-013 - 019	Mainline	Type 1 Dual	100	40 3940 4610 5290 5570 6760 7480	60 3960 4630 5310 5590 6790 7510	Drainage	Minimum waterfilm depth	Not calculated but potentially greater waterfilm depth	Combination of application of super elevation and gradients too steep ot too shallow.
REL-MAGENTA-ML-001	Mainline (South Bound)	Type 1 Dual	100	0	60	Visibility	Minimum SSD of 215	SSD of 120	Existing horizontal curvature is maintained and tie-ins with the recently constructed New Ross roundabout and impacts the SSD & Gradient correspondingly.
REL-MAGENTA-ML-002	Mainline (South Bound)	Type 1 Dual	100	60	140	Horizontal alignment, Visibility	Minimum Horizontal radius of 720,Mimium SSD of 215	Horizontal radius of 610,SSD of 160	
REL-MAGENTA-ML-003	Mainline (South Bound)	Type 1 Dual	100	560	590	Visibility	Minimum SSD of 215	SSD of 160	
REL-MAGENTA-ML-004	Mainline	Type 1 Dual	100	703	2503	Gradient	Minimum Gradient of 3%	Gradient of 3.03%	To optimise the earthwork volume
REL-MAGENTA-ML-005	Mainline	Type 1 Dual	100	2712	2835	Gradient	Minimum Gradient of 3%	Gradient of 3.448%	
REL-MAGENTA-ML-006	Mainline	Type 1 Dual	100	6858	6911	Gradient	Minimum Gradient of 3%	Gradient of 4.694%	
REL-MAGENTA-ML-007	Mainline	Type 1 Dual	100	8922	9028	Gradient	Minimum Gradient of 3%	Gradient of 3.858%	
Accommodation Bridge 1									
DEP-MAGENTA-AB1-001	Accommodation bridge 1 (West Bound)	Type(0.5+2.5+2.5+0.5)	42	90	150	Visibility & Vertical Curve	Minimum SSD of 50 & Crest (K=6.5)	SSD of 40 & Crest (K=5)	To optimise the earthwork volume and impacts the SSD correspondingly.
DEP-MAGENTA-AB1-002	Accommodation bridge 1 (East Bound)	Type(0.5+2.5+2.5+0.5)	42	150	190	Visibility & Vertical Curve	Minimum SSD of 50 & Crest (K=6.5)	SSD of 40 & Crest (K=5)	To optimise the earthwork volume and impacts the SSD correspondingly.
REL-MAGENTA-AB1-001	Accommodation bridge 1	Type(0.5+2.5+2.5+0.5)	42	194	238	Gradient	Maximum Gradient of 8%	Gradient of 11%	Existing terrain warrants the proposed gradient

Departure/Relaxation Number	Departure/Relaxation Location	Carriageway Type/ Road Cross Section	Design Speed (kmph)	Start Chainage (m)	End Chainage (m)	Departure /Relaxation Type	Standard Required	Standard Provided	Reason for Departure/Relaxation
Mainline									
DEP-Purple-ML-001	Mainline	Type 1 Dual	100	143	222	Gradient	Minimum Gradient 3% .	Gradient 5% .	To optimise the earthwork volume
DEP-Purple-ML-002	Mainline	Type 1 Dual	100	5686	5823	Gradient	minimum Gradient 3% .	Gradient 5% .	To optimise the earthwork volume
DEP-Purple-ML-003	Mainline	Type 1 Dual	100	6823	7873	Gradient	minimum Gradient 3% .	Gradient 5% .	To optimise the earthwork volume
DEP-Purple-ML-004	Mainline	Type 1 Dual	100	11309	11362	Gradient	minimum Gradient 3% .	Gradient 5% .	To optimise the earthwork volume
DEP-Purple-ML-005	Mainline	Type 1 Dual	100	0	100	Roundabout	Provision of 5 or more arm roundabouts is not recommended on National roads as per Clause 6.6.1 of DN-GEO-03060	5 arm roundabout proposed	Existing 4 arm New Ross roundabout retained and additional arm included for the proposed N25.
DEP-Purple-ML-006	Mainline	Type 1 Dual	100	11500	11586.3	Roundabout	Provision of 5 or more arm roundabouts is not recommended on National roads as per Clause 6.6.1 of DN-GEO-03060	5 arm roundabout proposed	Existing 4 arm Luff any roundabout retained and additional arm included for the proposed N25.
DEP-Purple-ML-007	Mainline	Type 1 Dual	100	9260	9280	Drainage	Minimum waterfilm depth	Not calculated but potentially greater waterfilm depth	Combination of application of super elevation and gradients too steep ot too shallow.
REL-Purple-ML-001	Mainline	Type 1 Dual	100	2840	4249	Gradient	minimum Gradient 3% .	Gradient 3.767% .	To optimise the earthwork volume
Accommodation Bridge 1									
DEP-Purple-AB1-001	Accommodation Bridge 1 (South Bound)	Type 3 Single	60	100	130	Visibility & Horizontal alignment Transition Length	Minimum SSD of 90m, radius of 720 & q=0.3	SSD of 70m,Radius of 90 & q=0.6	To follow the existing alignment
REL-Purple-AB1-001	Accommodation Bridge 1	Type 3 Single	60	28.594	100	Horizontal alignment Transition Length	Minimum radius of 720 & q=0.3	Radius of 90 & q=0.6	To follow the existing alignment and minimize the existing earthwork volume
REL-Purple-AB1-002	Accommodation Bridge 1	Type 3 Single	60	130	136.612	Horizontal alignment Transition Length	Minimum radius of 720 & q=0.3	Radius of 90 & q=0.6	To follow the existing alignment
REL-Purple-AB1-003	Accommodation Bridge 1	Type 3 Single	60	138	196	Vertical Alignment	Crest (K=17)	Crest (K=13)	To optimise the earthwork volume
REL-Purple-AB1-004	Accommodation Bridge 1 (North Bound)	Type 3 Single	60	210	230	Visibility	SSD of 90m.	SSD of 70m.	To optimise the earthwork volume
Accommodation Bridge 2									
DEP-Purple-AB2-001	Accommodation Bridge 2	Type 3 Single	60	34.856	148.929	Horizontal alignment	Minimum radius of 720	Radius of 90 & Transition Length of 45 on both side	To follow the existing alignment
DEP-Purple-AB2-002	Accommodation Bridge 2 (North Bound)	Type 3 Single	60	280	310	Visibility, Horizontal alignment & Gradient	SSD of 90m,q=0.3 & Gradient 7%	SSD of 70m, q=0.6 & Gradient 7.5%	To optimise the earthwork volume
REL-Purple-AB2-001	Accommodation Bridge 2	Type 3 Single	60	193.913	271	Horizontal alignment	Minimum radius of 720 & q=0.3	Radius of 180 & q=0.6	To follow the existing alignment
REL-Purple-AB2-002	Accommodation Bridge 2	Type 3 Single	60	271	280	Horizontal alignment & Gradient	Minimum radius of 720,q=0.3 & Gradient 7% .	Gradient 7.5 % & q=0.6	To optimise the earthwork volume
REL-Purple-AB2-003	Accommodation Bridge 2	Type 3 Single	60	310	329	Gradient	minimum Gradient 7% .	Gradient 7.5% .	To optimise the earthwork volume
Accommodation Bridge 3									
DEP-Purple-AB3-001	Accommodation Bridge 3	Type 3 Single	60	56	120	Gradient	minimum Gradient 7% .	Gradient 10.5% .	Existing terrain warrants the proposed gradient
DEP-Purple-AB3-002	Accommodation Bridge 3 (West Bound)	Type 3 Single	60	120	167	Visibility & Gradient	SSD of 90m & minimum Gradient 7% .	SSD of 70m & Gradient 10.5% .	Existing terrain warrants the proposed gradient

DEP-Purple-AB3-003	Accommodation Bridge 3 (West Bound)	Type 3 Single	60	167	220	Visibility & Vertical alignment	SSD of 90m & Crest (K-17)	SSD of 70m & Crest (K-10)	To optimise the earthwork volume
DEP-Purple-AB3-004	Accommodation Bridge 3 (East Bound)	Type 3 Single	60	220	277	Vertical alignment & Visibility	Crest (K-17) & SSD of 90m	Crest (K-10) & SSD of 70m	To optimise the earthwork volume
REL-Purple-AB3-001	Accommodation Bridge 3	Type 3 Single	60	11	56	Vertical alignment	Sag (K-13)	Sag (K-10)	To optimise the earthwork volume
REL-Purple-AB3-002	Accommodation Bridge 3 (East Bound)	Type 3 Single	60	277	320	Visibility	SSD of 90m	SSD of 70m	To optimise the earthwork volume
REL-Purple-AB3-003	Accommodation Bridge 3	Type 3 Single	60	360	415	Vertical alignment	Sag (K-13)	Sag (K-10)	To optimise the earthwork volume
Accommodation Bridge 4									
DEP-Purple-AB4-001	Accommodation Bridge 4	Type 3 Single	60	64.55	80	Horizontal alignment & Vertical alignment	Minimum radius of 720,Q=0.3 & Sag (K-13)	Radius of 180, q=0.6 & Sag (K-6.5)	To optimise the earthwork volume
DEP-Purple-AB4-002	Accommodation Bridge 4 (West Bound)	Type 3 Single	60	80	91	Visibility, Horizontal alignment & Vertical alignment	SSD of 90m ,Minimum radius of 720, Q=0.3 & Sag (K-13)	SSD of 70m, Radius of 180, q=0.6 & Sag (K-6.5)	To follow the existing alignment
DEP-Purple-AB4-003	Accommodation Bridge 4 (West Bound)	Type 3 Single	60	91	110	Visibility, Horizontal alignment & Gradient	SSD of 90m ,Minimum radius of 720, Q=0.3 & minimum Gradient 7% .	SSD of 70m, Radius of 180, q=0.6,Gradient 10.5% .	Existing terrain warrants the proposed gradient
DEP-Purple-AB4-004	Accommodation Bridge 4 (West Bound)	Type 3 Single	60	110	128	Visibility, Horizontal alignment & Gradient	SSD of 90m ,Minimum radius of 720, Q=0.3 & minimum Gradient 7% .	SSD of 70m, Radius of 180, q=0.6,Gradient 10.5% .	Existing terrain warrants the proposed gradient
DEP-Purple-AB4-005	Accommodation Bridge 4 (West Bound)	Type 3 Single	60	128	174.47	Visibility & Horizontal alignment & Vertical alignment	SSD of 90m ,Minimum radius of 720 & Q=0.3 & Crest (K-17)	SSD of 70m, Radius of 180 & q=0.6 & Crest (K-9)	To follow the existing alignment
DEP-Purple-AB4-006	Accommodation Bridge 4 (West Bound)	Type 3 Single	60	174.47	190	Visibility & Vertical alignment	SSD of 90m & Crest (K-17)	SSD of 50m & Crest (K-9)	To optimise the earthwork volume
DEP-Purple-AB4-007	Accommodation Bridge 4 (East Bound)	Type 3 Single	60	180	245	Visibility & Vertical alignment	SSD of 90m & Crest (K-17)	SSD of 50m & Crest (K-9)	To optimise the earthwork volume
REL-Purple-AB4-001	Accommodation Bridge 4 (East Bound)	Type 3 Single	60	245	270	Visibility	SSD of 90m	SSD of 50m	To optimise the earthwork volume
REL-Purple-AB4-002	Accommodation Bridge 4	Type 3 Single	60	26	64.55	Vertical alignment	Sag (K-13)	Sag (K-6.5)	To optimise the earthwork volume
REL-Purple-AB4-003	Accommodation Bridge 4 (East Bound)	Type 3 Single	60	270	290	Visibility	SSD of 90m	SSD of 70m	To optimise the earthwork volume
REL-Purple-AB4-004	Accommodation Bridge 4	Type 3 Single	60	316	358	Vertical alignment	Sag (K-13)	Sag (K-6.5)	To optimise the earthwork volume
Accommodation Bridge 6									
DEP-Purple-AB6-001	Accommodation Bridge 6 (West Bound)	Type 3 Single	60	90	130	Visibility & Vertical alignment	Minimum SSD of 90m & Crest (K-17)	SSD of 40m & Crest (K-5)	To optimise the earthwork volume
DEP-Purple-AB6-002	Accommodation Bridge 6 (East Bound)	Type 3 Single	60	130	170	Visibility & Vertical alignment	Minimum SSD of 90m & Crest (K-17)	SSD of 40m & Crest (K-5)	To optimise the earthwork volume
DEP-Purple-AB6-003	Accommodation Bridge 6 (East Bound)	Type 3 Single	60	170	211	Gradient & Visibility	Gradient of 7% & Minimum SSD of 90m	Gradient of 15% & SSD of 50m	Existing terrain warrants the proposed gradient
DEP-Purple-AB6-003	Accommodation Bridge 6 (East Bound)	Type 3 Single	60	211	230	Gradient, Visibility & Horizontal alignment	Gradient of 7% , Minimum SSD of 90m , Minimum radius of 720, & Q=0.3	Gradient of 15%, SSD of 50m, Radius of 180 & q=0.6	Existing terrain warrants the proposed gradient
DEP-Purple-AB6-003	Accommodation Bridge 6 (East Bound)	Type 3 Single	60	230	246	Gradient & Horizontal alignment	Gradient of 7% , Minimum radius of 720, & Q=0.3	Gradient of 15%, Radius of 180 & q=0.6	Existing terrain warrants the proposed gradient
DEP-Purple-AB6-004	Accommodation Bridge 6	Type 3 Single	60	246	304	Vertical alignment & Horizontal alignment	Sag (K-13), Minimum radius of 720, & Q=0.3	Sag (K-6.5), Radius of 180 & q=0.6	To optimise the earthwork volume
REL-Purple-AB6-001	Accommodation Bridge 6 (West Bound)	Type 3 Single	60	30	90	Visibility	Minimum SSD of 90m	SSD of 50m	To optimise the earthwork volume
REL-Purple-AB6-002	Accommodation Bridge 6	Type 3 Single	60	304	321.405	Horizontal alignment	Minimum radius of 720, Q=0.3	Radius of 180, q=0.6	To optimise the earthwork volume
Accommodation Bridge 7									
DEP-Purple-AB7-001	Accommodation Bridge 7	Type (0.5+2.5+2.5+0.5)	42	0	120	Gradient	Minimum Gradient of 7%	Gradient of 10.1%	Existing terrain warrants the proposed gradient

REL-Purple-AB7-001	Accommodation Bridge 7	Type (0.5+2.5+2.5+0.5)	42	208.589	234.76	Horizontal alignment	Minimum radius of 360	Radius of 90	To optimise the earthwork volume
REL-Purple-AB7-002	Accommodation Bridge 7 (West Bound)	Type (0.5+2.5+2.5+0.5)	42	160	170	Visibility	Minimum visibility of 90	Visibility of 70	To optimise the earthwork volume
Accommodation Bridge 8									
DEP-Purple-AB8-001	Accommodation Bridge 7 (South Bound)	Type 3 Single	60	245	320	Visibility & Vertical alignment	Minimum SSD of 90m & Crest (K-17)	SSD of 70m & Crest (K-13)	To optimise the earthwork volume
DEP-Purple-AB8-002	Accommodation Bridge 7 (North Bound)	Type 3 Single	60	320	381	Visibility & Vertical alignment	Minimum SSD of 90m & Crest (K-17)	SSD of 70m & Crest (K-13)	To optimise the earthwork volume
REL-Purple-AB8-001	Accommodation Bridge 7 (South Bound)	Type 3 Single	60	210	245	Visibility	Minimum SSD of 90m	SSD of 70m	To optimise the earthwork volume
REL-Purple-AB8-002	Accommodation Bridge 7 (North Bound)	Type 3 Single	60	381	410	Visibility	Minimum SSD of 90m	SSD of 70m	To optimise the earthwork volume

Departure/Relaxation Number	Departure/Relaxation Location	Carriageway Type/ Road Cross Section	Design Speed (kmph)	Start Chainage (m)	End Chainage (m)	Departure /Relaxation Type	Standard Required	Standard Provided	Reason for Departure/Relaxation
Mainline									
DEP-TEAL-ML-001	Mainline	Type 1 Dual	100	250	518	Horizontal curvature, Transition Curve and gradient	Minimum Horizontal radius of 720m, q=0.3 and Gradient of 3%	Horizontal radius of 510m and q >0.6 & Gradient of 5%	Existing horizontal curvature is maintained and tie-ins with the recently constructed New Ross roundabout and impacts the Gradient correspondingly.
DEP-TEAL-ML-002	Mainline	Type 1 Dual	100	518	1107	Gradient	Minimum Gradient 3%	Gradient 5%	To follow the existing terrain and to optimise the earthwork volume
DEP-TEAL-ML-003	Mainline	Type 1 Dual	100	1942	2260	Gradient	Minimum Gradient 3%	Gradient 5%	To follow the existing terrain and to optimise the earthwork volume
DEP-TEAL-ML-004	Mainline	Type 1 Dual	100	3560	3802	Gradient	Minimum Gradient 3%	Gradient 5%	To follow the existing terrain and to optimise the earthwork volume
DEP-TEAL-ML-005	Mainline - Northbound	Type 1 Dual	100	410	570	Horizontal curvature, visibility & Gradient	Minimum Horizontal radius of 720m, q=0.3, SSD of 215m & Gradient of 3%.	Horizontal radius of 510m, q >0.6, SSD of 120m & Gradient 5%.	To tie-in with the recently constructed New Ross roundabout and To follow the existing terrain and to optimise the earthwork volume impacts the SSD correspondingly and gradient.
DEP-TEAL-ML-006	Mainline - Northbound	Type 1 Dual	100	570	630	Visibility & Gradient	Minimum SSD of 215m & Gradient of 3%.	SSD of 160m & Gradient 5%	To tie-in with the recently constructed New Ross roundabout and To follow the existing terrain and to optimise the earthwork volume impacts the SSD correspondingly and gradient.
DEP-Navy-007 - 022	Mainline	Type 1 Dual	100	20 500 560 1130 1250 1820 2130 2580 3110 3520 3950 4550 4990 5990 6670 8060	40 520 580 1150 1270 1840 2150 2590 3130 3540 3970 4570 5010 6010 6690 8080	Drainage	Minimum waterfilm depth	Not calculated but potentially greater waterfilm depth	Combination of application of super elevation and gradients too steep ot too shallow.
REL-TEAL-ML-001	Mainline - Southbound	Type 1 Dual	100	20	30	Visibility	Minimum SSD of 215m.	SSD of 160m.	Existing horizontal curvature is maintained and tie-ins with the recently constructed New Ross roundabout and impacts the SSD correspondingly.
REL-TEAL-ML-002	Mainline - Southbound	Type 1 Dual	100	30	130	Horizontal curvature and visibility	Minimum Horizontal radius of 720m and SSD of 215m.	Horizontal radius of 510m and SSD of 160m.	Existing horizontal curvature is maintained and tie-ins with the recently constructed New Ross roundabout and impacts the SSD correspondingly.
REL-TEAL-ML-003	Mainline	Type 1 Dual	100	130	250	Horizontal curvature and Transition Curve	Minimum Horizontal radius of 720m and q=0.3	Horizontal radius of 510m and q >0.6.	Existing horizontal curvature is maintained and tie-ins with the recently constructed New Ross roundabout and impacts the SSD correspondingly.
Accommodation Bridge 1									
DEP-TEAL-AB1-001	Accommodation Bridge 1	Type 3 Single	42	0	160	Gradient	Maximum gradient of 7%	Gradient is 8.5%	Existing terrain warrants the proposed gradient
REL-TEAL-AB1-001	Accommodation Bridge 1	Type 3 Single	42	52	126	Transition Length	minimum q=0.3	q=0.6	Reduced transition length to avoid run off on structures.
REL-TEAL-AB1-002	Accommodation Bridge 1	Type 3 Single	42	241	320	Transition Length	q=0.3.	q=0.6	Reduced transition length to avoid run off on structures.
Accommodation Bridge 2									
DEP-TEAL-AB2-001	Accommodation Bridge 2 (East bound)	Type 3 Single	60	321	380	Visibility &Vertical alignment	Minimum SSD of 90 & Crest (K=17)	SSD of 70 & Crest (K=10)	To optimise the earthwork volume
DEP-TEAL-AB2-002	Accommodation Bridge 2 (West bound)	Type 3 Single	60	400	456	Visibility &Vertical alignment	Minimum SSD of 90 & Crest (K=17)	SSD of 70 & Crest (K=10)	To optimise the earthwork volume
REL-TEAL-AB2-001	Accommodation Bridge 2 (East bound)	Type 3 Single	60	300	321	Visibility	Minimum SSD of 90	SSD of 70	To optimise the earthwork volume
REL-TEAL-AB2-002	Accommodation Bridge 2	Type 3 Single		380	400	Vertical alignment	Crest (K=17)	Crest (K=10)	To optimise the earthwork volume
REL-TEAL-AB2-003	Accommodation Bridge 2 (West bound)	Type 3 Single	60	456	480	Visibility	Minimum SSD of 90	SSD of 70	To optimise the earthwork volume
Accommodation Bridge 3									
DEP-TEAL-AB3-001	Accommodation Bridge 3	Type 3 Single	60	0	110	Gradient	Minimum gradient of 7%	Gradient is 9%	Existing terrain warrants the proposed gradient
DEP-TEAL-AB3-002	Accommodation Bridge 3 (West Bound)	Type 3 Single	60	110	150	Gradient & Visibility	Minimum gradient of 7% & SSD of 90	Gradient is 9% & SSD of 70	Existing terrain warrants the proposed gradient
DEP-TEAL-AB3-003	Accommodation Bridge 3 (East Bound)	Type 3 Single	60	210	240	Visibility, Vertical alignment & Transition Length	Minimum SSD of 90, K values (Crest-17, Sag-13) & q=0.3	SSD of 70, K values (Crest-10, Sag-6.5 & q=0.6	To optimise the earthwork volume
REL-TEAL-AB3-001	Accommodation Bridge 3	Type 3 Single	60	240	265	Transition Length & Vertical alignment	q=0.3, Sag K-13	q=0.6 & Sag K-6.5	To optimise the earthwork volume
REL-TEAL-AB3-002	Accommodation Bridge 3	Type 3 Single	60	265	316	Transition Length & Gradient	q=0.3 & Minimum gradient of 7%	q=0.6 &Gradient is 8%	Existing terrain warrants the proposed gradient
REL-TEAL-AB3-003	Accommodation Bridge 3	Type 3 Single	60	150	210	Vertical alignment	K=17	K=10	Reduced crest curve adopted to maintain vertical clearance.
REL-TEAL-AB3-004	Accommodation Bridge 3	Type 3 Single	60	316	363	Vertical alignment	K=17	K=10	Reduced crest curve adopted to maintain vertical clearance.
Accommodation Bridge 4									
REL-TEAL-AB4-001	Accommodation Bridge 4	Type 3 Single	60	21.436	64.436	Transition Length	q=0.3.	q=0.6	Reduced transition length due to back to back curves
REL-TEAL-AB4-002	Accommodation Bridge 4	Type 3 Single	60	78.636	121.636	Transition Length	q=0.3.	q=0.6	Reduced transition length due to back to back curves
REL-TEAL-AB4-003	Accommodation Bridge 4	Type 3 Single	60	166.943	209.943	Transition Length	q=0.3.	q=0.6	Reduced transition length due to back to back curves
REL-TEAL-AB4-004	Accommodation Bridge 4	Type 3 Single	60	238.68	281.68	Transition Length	q=0.3.	q=0.6	Reduced transition length due to back to back curves
Accommodation Bridge 5									
DEP-TEAL-AB5-001	Accommodation Bridge 5	Type (0.5+2.5+2.5+0.5)	42	0	12	Horizontal Alignment	Minimum Radius of 127	Radius 20	To tie in with existing road
DEP-TEAL-AB5-002	Accommodation Bridge 5	Type (0.5+2.5+2.5+0.5)	42	305	322	Horizontal Alignment	Minimum Radius of 127	Radius 20	To tie in with existing road
Accommodation Bridge 6									
REL-TEAL-AB6-001	Accommodation Bridge 6	Type 3 Single	60	120	250	Vertical alignment	Sag (K=13)	Sag (K=9)	To optimise the earthwork volume
REL-TEAL-AB6-002	Accommodation Bridge 6	Type 3 Single	60	250	460	Gradient	Minimum gradient of 7%	Gradient is 8%	Existing terrain warrants the proposed gradient
Accommodation Bridge 7									
DEP-TEAL-AB7-001	Accommodation Bridge 7 (West Bound)	Type 3 Single	60	30	50	Visibility & Vertical alignment	Minimum SSD of 90 & K=17 (Crest)	SSD of 50 & K=6.5 (Crest)	To optimise the earthwork volume
DEP-TEAL-AB7-002	Accommodation Bridge 7 (East Bound)	Type 3 Single	60	130	150	Visibility &Vertical alignment	Minimum SSD of 90 K=13 (Sag)	SSD of 70 &K=5 (Sag)	To optimise the earthwork volume
DEP-TEAL-AB7-003	Accommodation Bridge 7	Type 3 Single	60	150	190	Vertical alignment	K=13 (Sag)	K=5 (Sag)	To optimise the earthwork volume
DEP-TEAL-AB7-004	Accommodation Bridge 7 (West Bound)	Type 3 Single	60	190	200	Visibility & Vertical alignment	Minimum SSD of 90 & K=13 (Sag)	SSD of 70 & K=5 (Sag)	To avoid the existing buildings
DEP-TEAL-AB7-005	Accommodation Bridge 7	Type 3 Single	60	200	212	Vertical alignment	K=13 (Sag)	K=5 (Sag)	To optimise the earthwork volume
DEP-TEAL-AB7-006	Accommodation Bridge 7	Type 3 Single	60	212	250	Gradient	Minimum gradient of 7%	Gradient is 12%	To optimise the earthwork volume
DEP-TEAL-AB7-007	Accommodation Bridge 7	Type 3 Single	60	250	286.913	Horizontal Alignment & Vertical alignment	Minimum Radius of 127 & K=17 (Crest)	Radius 25 & K=6.5 (Crest)	To tie in with existing road and to avoid the existing buildings
DEP-TEAL-AB7-008	Accommodation Bridge 7 (East Bound)	Type 3 Single	60	286.913	310	Horizontal Alignment , Vertical alignment & Visibility	Minimum Radius of 127,K=17 (Crest) & Minimum SSD of 90	Radius 15, K=6.5 (Crest) & SSD of 40	To tie in with existing road and to avoid the existing buildings
REL-TEAL-AB7-001	Accommodation Bridge 7 (West Bound)	Type 3 Single	60	0	30	Visibility	Minimum SSD of 90	SSD of 50	To avoid the existing buildings
REL-TEAL-AB7-002	Accommodation Bridge 7	Type 3 Single	60	50	96	Vertical alignment	K=17 (Crest)	K=6.5 (Crest)	To optimise the earthwork volume
REL-TEAL-AB7-003	Accommodation Bridge 7 (East Bound)	Type 3 Single	60	100	130	Visibility	Minimum SSD of 90	SSD of 50	Horizontal curve radius with the vertical alignment induces the reduced visibility.

Departure/Relaxation Number	Departure/Relaxation Location	Carriageway Type/ Road Cross Section	Design Speed (kmph)	Start Chainage (m)	End Chainage (m)	Departure /Relaxation Type	Standard Required	Standard Provided	Reason for Departure/Relaxation
Mainline									
DEP-LIME GREEN-ML-001	Mainline	Type 1 Dual	100	2060	2932	Gradient	maximum gradient of 3%	Gradient of 5%	To follow the existing terrain and to optimise the earthwork volume
DEP-LIME GREEN-ML-002	Mainline	Type 1 Dual	100	4202	4272	Gradient	maximum gradient of 3%	Gradient of 5%	To follow the existing terrain and to optimise the earthwork volume
DEP-LIME GREEN-ML-003	Mainline	Type 1 Dual	100	6270	6529	Gradient	maximum gradient of 3%	Gradient of 5%	To follow the existing terrain and to optimise the earthwork volume
DEP-LIME GREEN-ML-004	Mainline	Type 1 Dual	100	8800	8884.468	Roundabout	Provision of 5 or more arm roundabouts is not recommended on National roads as per Clause 6.6.1 of DN-GEO-03060	5 arm roundabout proposed	Existing 4 arm Luffany roundabout retained and additional arm included for the proposed N25.
DEP-LIME GREEN-ML-005	Mainline - Southbound	Type 1 Dual	100	130	220	Horizontal curvature and visibility	Minimum Horizontal radius of 720m and SSD of 215m.	Horizontal radius of 600m and SSD of 120m.	Existing horizontal curvature is maintained and tie-ins with the recently constructed New Ross roundabout and impacts the SSD correspondingly.
DEP-LIME GREEN-ML-006	Mainline - Southbound	Type 1 Dual	100	220	460	Horizontal curvature and visibility	Minimum Horizontal radius of 720m and SSD of 215m.	Horizontal radius of 600m and SSD of 90m.	Existing horizontal curvature is maintained and tie-ins with the recently constructed New Ross roundabout and impacts the SSD correspondingly.
DEP-LIME GREEN-ML-007	Mainline - Southbound	Type 1 Dual	100	460	527	Horizontal curvature and visibility	Minimum Horizontal radius of 720m and SSD of 215m.	Horizontal radius of 600m and SSD of 120m.	Existing horizontal curvature is maintained and tie-ins with the recently constructed New Ross roundabout and impacts the SSD correspondingly.
DEP-Navy-008 - 011	Mainline	Type 1 Dual	100	40 2450 7840 8320	60 2470 7860 8340	Drainage	Minimum waterfilm depth	Not calculated but potentially greater waterfilm depth	Combination of application of super elevation and gradients too steep ot too shallow.
REL-LIME GREEN-ML-001	Mainline	Type 1 Dual	100	55.918	555.112	Horizontal curvature	Minimum Horizontal radius of 720m.	Horizontal radius of 610m.	Existing horizontal curvature is maintained and tie-ins with the recently constructed New Ross roundabout.
REL-LIME GREEN-ML-002	Mainline	Type 1 Dual	100	296	499	Gradient	maximum gradient of 3%	Gradient of 3.495%	To follow the existing terrain and to optimise the earthwork volume
REL-LIME GREEN-ML-003	Mainline	Type 1 Dual	100	703	1962	Gradient	maximum gradient of 3%	Gradient of 3.030%	To follow the existing terrain and to optimise the earthwork volume
REL-LIME GREEN-ML-004	Mainline	Type 1 Dual	100	5606	5949	Gradient	maximum gradient of 3%	Gradient of 3.669%	To follow the existing terrain and to optimise the earthwork volume
Accommodation Bridge 1									
REL-LIME GREEN-AB1-001	Accommodation Bridge 1	Type (0.5+2.5+2.5+.05)	42	101	176	Gradient	maximum gradient of 7%	Gradient of 8%	To follow the existing terrain and to optimise the earthwork volume
Accommodation Bridge 2									
DEP-LIME GREEN-AB2-001	Accommodation Bridge 2	Type 1 Dual	42	153	312.395	Gradient	maximum gradient of 7%	Gradient of 10%	Existing terrain warrants the proposed gradient
DEP-LIME GREEN-AB2-002	Accommodation Bridge 2	Type 1 Dual	42	312.395	321	Horizontal curvature & Gradient	Minimum Horizontal radius of 127m & maximum gradient of 7%.	Horizontal radius of 90m & Gradient of 10%.	Existing terrain warrants the proposed gradient
REL-LIME GREEN-AB2-001	Accommodation Bridge 2	Type 1 Dual	42	0	20	Horizontal curvature	Minimum Horizontal radius of 127m.	Horizontal radius of 90m.	To reduce the length of the alignment towards the dwellings
REL-LIME GREEN-AB2-002	Accommodation Bridge 2	Type 1 Dual	42	20	39	Horizontal curvature & Gradient	Minimum Horizontal radius of 127m & maximum gradient of 7%.	Horizontal radius of 90m & Gradient of 8%.	To reduce the length of the alignment and to optimise the earthwork volume
REL-LIME GREEN-AB2-003	Accommodation Bridge 2	Type 1 Dual	42	39	54.5	Horizontal curvature	Minimum Horizontal radius of 127m.	Horizontal radius of 90m.	To reduce the length of the alignment towards the dwellings
REL-LIME GREEN-AB2-004	Accommodation Bridge 2	Type 1 Dual	42	321	360.819	Horizontal curvature	Minimum Horizontal radius of 127m.	Horizontal radius of 90m.	To reduce the length of the alignment towards the dwellings
Accommodation Bridge 3									
DEP-LIME GREEN-AB3-001	Accommodation Bridge 3 (West Bound)	Type 1 Dual	60	190	205	Horizontal curvature, Gradient & Visibility	Minimum Horizontal radius of 255m, maximum gradient of 7% & Minimum SSD of 90.	Horizontal radius of 180m, Gradient of 7.5% & SSD of 50	Minimum visibility of 69.1m.
DEP-LIME GREEN-AB3-002	Accommodation Bridge 3 (West Bound)	Type 1 Dual	60	205	212.624	Horizontal curvature, Vertical Curve & Visibility	Minimum Horizontal radius of 255m, Crest (K=17) & Minimum SSD of 90.	Horizontal radius of 180m, Crest (K=10) & SSD of 50	Minimum visibility of 69.1m.
DEP-LIME GREEN-AB3-003	Accommodation Bridge 3 (West Bound)	Type 1 Dual	60	212.624	230	Visibility & Vertical Curve	Minimum SSD of 90 & Crest (K=17)	Minimum SSD of 70 & Crest (K=10)	To optimise the earthwork volume
REL-LIME GREEN-AB3-001	Accommodation Bridge 3	Type 1 Dual	60	67	150.226	Gradient	Maximum gradient of 7%	Gradient of 7.5%	Existing terrain warrants the proposed gradient
REL-LIME GREEN-AB3-002	Accommodation Bridge 3	Type 1 Dual	60	150.226	170	Horizontal curvature & Gradient	Minimum Horizontal radius of 255m & maximum gradient of 7%	Horizontal radius of 180m & Gradient of 7.5%	To tie-in with the existing alignment.
REL-LIME GREEN-AB3-003	Accommodation Bridge 3 (West Bound)	Type 1 Dual	60	170	190	Horizontal curvature, Gradient & Visibility	Minimum Horizontal radius of 255m, maximum gradient of 7% & Minimum SSD of 90.	Horizontal radius of 180m, Gradient of 7.5% & SSD of 70	To optimise the earthwork volume
REL-LIME GREEN-AB3-004	Accommodation Bridge 3	Type 1 Dual	60	230	270	Vertical Curve	Crest (K=17)	Crest (K=10)	To tie-in with the existing alignment.
REL-LIME GREEN-AB3-005	Accommodation Bridge 3 (East Bound)	Type 1 Dual	60	270	299	Visibility & Vertical Curve	Minimum SSD of 90 & Crest (K=17)	Minimum SSD of 70 & Crest (K=10)	To optimise the earthwork volume
REL-LIME GREEN-AB3-006	Accommodation Bridge 3 (East Bound)	Type 1 Dual	60	299	330	Visibility	Minimum SSD of 90	SSD of 70	To optimise the earthwork volume
REL-LIME GREEN-AB3-007	Accommodation Bridge 3	Type 1 Dual	60	330.914	432.251	Horizontal curvature	Minimum Horizontal radius of 255m	Horizontal radius of 180m	To tie-in with the existing alignment.
Accommodation Bridge 4									
DEP-LIME GREEN-AB4-001	Accommodation Bridge 4	Type 1 Dual	60	0	29	Horizontal curvature & Vertical Curve	Minimum Horizontal radius of 255m & Crest (K=17)	Horizontal radius of 180m & Crest (K=6.5)	To tie-in with the existing alignment.
REL-LIME GREEN-AB4-001	Accommodation Bridge 4	Type 1 Dual	60	29	69.092	Horizontal curvature	Minimum Horizontal radius of 255m.	Horizontal radius of 180m.	To tie-in with the existing alignment.
REL-LIME GREEN-AB4-002	Accommodation Bridge 4 (West Bound)	Type 1 Dual	60	150	170	Visibility	Minimum SSD of 90	Minimum SSD of 70	Reduced Visibility due to vertical and horizontal alignment
REL-LIME GREEN-AB4-003	Accommodation Bridge 4 (West Bound)	Type 1 Dual	60	170	200	Visibility	Minimum SSD of 90	Minimum SSD of 50	Reduced Visibility due to vertical and horizontal alignment
REL-LIME GREEN-AB4-004	Accommodation Bridge 4 (East Bound)	Type 1 Dual	60	250	270	Visibility	Minimum SSD of 90	Minimum SSD of 50	Reduced Visibility due to vertical and horizontal alignment
REL-LIME GREEN-AB4-005	Accommodation Bridge 4 (East Bound)	Type 1 Dual	60	270	300	Visibility	Minimum SSD of 90	Minimum SSD of 70	Reduced Visibility due to vertical and horizontal alignment
REL-LIME GREEN-AB4-006	Accommodation Bridge 4 (East Bound)	Type 1 Dual	60	202	241	Vertical Curve	Crest (K=17)	Crest (K=6.5)	To optimise the earthwork volume
Compact grade Separated Junction 2									
DEP-LIME GREEN-Compact Grade separated Junction 2-001	Compact Grade separated Junction 2	Type (3.65+0.6+3.65)	30	100	180	Visibility	Minimum SSD 70	SSD 50	Horizontal curve radius with the vertical alignment induces the reduced visibility.
DEP-LIME GREEN-Compact Grade separated Junction 2-001	Accommodation Bridge 6	Type (3.65+0.6+3.65)	30	200	240	Visibility	Minimum SSD 70	SSD 50	Horizontal curve radius with the vertical alignment induces the reduced visibility.

Departure/Relaxation Number	Departure/Relaxation Location	Carriageway Type/ Road Cross Section	Design Speed (kmph)	Start Chainage (m)	End Chainage (m)	Departure /Relaxation Type	Standard Required	Standard Provided	Reason for Departure/Relaxation
Mainline									
DEP-RED-ML-001	Mainline	Type 1 Dual	100	307	971	Gradient	maximum gradient of 3%	Gradient of 5%	To follow the existing terrain and to optimise the earthwork volume
DEP-RED-ML-002	Mainline	Type 1 Dual	100	2960	3207	Gradient	maximum gradient of 3%	Gradient of 5%	To follow the existing terrain and to optimise the earthwork volume
DEP-RED-ML-003	Mainline	Type 1 Dual	100	4622	5256	Gradient	maximum gradient of 3%	Gradient of 5%	To follow the existing terrain and to optimise the earthwork volume
DEP-RED-ML-004	Mainline	Type 1 Dual	100	6356	6882	Gradient	maximum gradient of 3%	Gradient of 5%	To follow the existing terrain and to optimise the earthwork volume
DEP-RED-ML-005	Mainline	Type 1 Dual	100	7895	8077	Gradient	maximum gradient of 3%	Gradient of 5%	To follow the existing terrain and to optimise the earthwork volume
DEP-RED-006 - 016	Mainline	Type 1 Dual	100	30 360 1110 1130 1920 3140 3810 6780 7630 8380 8740	50 380 1130 1150 1940 3160 3830 6800 7650 8400 8760	Drainage	Minimum waterfilm depth	Not calculated but potentially greater waterfilm depth	Combination of application of super elevation and gradients too steep ot too shallow.
REL-RED-ML-001	Mainline	Type 1 Dual	100	8630.917	8750.856	Horizontal curvature	Minimum Horizontal radius of 720m.	Horizontal radius of 510m.	Radius 510 used to tie-in with the Luffany roundabout .
Accommodation Bridge 1									
REL-RED-AB1-001	Accommodation Bridge 1 (North Bound)	Type 3 Single	60	280	370	Visibility	Minimum SSD of 90	SSD of 70	Minimum SSD is 89.5
REL-RED-AB1-002	Accommodation Bridge 1 (South Bound)	Type 3 Single	60	380	460	Visibility	Minimum SSD of 90	SSD of 70	Minimum SSD is 89.5
Accommodation Bridge 2									
DEP-RED-AB2-001	Accommodation Bridge 2	Type 3 Single	60	135	200	Gradient	maximum gradient of 7%	Gradient of 8.5%	Existing terrain warrants the proposed gradient
DEP-RED-AB2-002	Accommodation Bridge 2 (West Bound)	Type 3 Single	60	200	220	Visibility & Gradient	Minimum SSD of 90 & maximum gradient of 7%	SSD of 70 & Gradient of 8.5%	Existing terrain warrants the proposed gradient and impacts the SSD correspondingly.
DEP-RED-AB2-003	Accommodation Bridge 2 (West Bound)	Type 3 Single	60	220	240	Visibility & Gradient	Minimum SSD of 90 & maximum gradient of 7%	SSD of 50 & Gradient of 8.5%	Existing terrain warrants the proposed gradient and impacts the SSD correspondingly.
DEP-RED-AB2-004	Accommodation Bridge 2 (West Bound)	Type 3 Single	60	240	280	Visibility & Vertical Curve	Minimum SSD of 90 & Crest (K=17)	SSD of 50 & Crest (K=10)	To follow the existing terrain and to optimise the earthwork volume
DEP-RED-AB2-005	Accommodation Bridge 2 (East Bound)	Type 3 Single	60	300	350	Visibility & Vertical Curve	Minimum SSD of 90 & Crest (K=17)	SSD of 50 & Crest (K=10)	To follow the existing terrain and to optimise the earthwork volume
REL-RED-AB2-001	Accommodation Bridge 2	Type 3 Single	60	0	59.224	Horizontal Curvature & Transition Length	Minimum Radius of 255 & q=0.3	Radius of 180 & q=0.6	To tie-in with existing alignment
REL-RED-AB2-002	Accommodation Bridge 2	Type 3 Single	60	280	300	Vertical Curve	Crest (K=17)	Crest (K=10)	To follow the existing terrain and to optimise the earthwork volume
REL-RED-AB2-003	Accommodation Bridge 2 (East Bound)	Type 3 Single	60	350	390	Visibility	Minimum SSD of 90	SSD of 70	To follow the existing terrain and to optimise the earthwork volume
Accommodation Bridge 3									
DEP-RED-AB3-001	Accommodation Bridge 3	Type 3 Single	60	24	48.108	Gradient	maximum gradient of 7%	Gradient of 13%	Existing terrain warrants the proposed gradient
DEP-RED-AB3-002	Accommodation Bridge 3	Type 3 Single	60	48.108	160	Horizontal Curvature, Transition Length & Gradient	Minimum Radius of 255, q=0.3 & maximum gradient of 7%	Radius of 180, q=0.6 & Gradient of 13%	Existing terrain warrants the proposed gradient & To follow the existing terrain and to optimise the earthwork volume
DEP-RED-AB3-003	Accommodation Bridge 3 (East Bound)	Type 3 Single	60	160	197.78	Horizontal Curvature, Transition Length, Gradient & Visibility	Minimum Radius of 255, q=0.3, maximum gradient of 7% & Minimum SSD of 90	Radius of 180, q=0.6,Gradient of 13% & SSD of 70	Existing terrain warrants the proposed gradient and impacts the SSD correspondingly.
REL-RED-AB3-001	Accommodation Bridge 3	Type 3 Single	60	0	24	Vertical Curve	Sag (K=13)	Sag (K=9)	To follow the existing terrain and to optimise the earthwork volume
REL-RED-AB3-002	Accommodation Bridge 3 (East Bound)	Type 3 Single	60	197.78	240	Visibility	Minimum SSD of 90	SSD of 70	To follow the existing terrain and to optimise the earthwork volume
REL-RED-AB3-003	Accommodation Bridge 3 (West Bound)	Type 3 Single	60	260	330	Visibility	Minimum SSD of 90	SSD of 70	To follow the existing terrain and to optimise the earthwork volume
Accommodation Bridge 4									
DEP-RED-AB4-001	Accommodation Bridge 4	Type (0.5+2.5+2.5+.05)	42	0	174	Gradient	maximum gradient of 7%	Gradient of 12%	Existing terrain warrants the proposed gradient
Accommodation Bridge 6									
REL-RED-AB6-001	Accommodation Bridge 6	Type 3 Single	60	81.135	255.094	Horizontal Curvature	Minimum Radius of 255 & Q=0.3	Radius of 180 & q=0.6	To follow the existing alignment and to optimise the earthwork volume
Accommodation Bridge 8									
REL-RED-AB8-001	Accommodation Bridge 8	Type 3 Single	60	0	51.177	Horizontal Curvature	Minimum Radius of 255 & Q=0.3	Radius of 180 & q=0.6	To follow the existing alignment and to optimise the earthwork volume
Accommodation Bridge 9									
DEP-RED-AB9-001	Accommodation Bridge 9 (West Bound)	Type 3 Single	60	200	250	Visibility & Gradient	Minimum SSD of 90 & maximum gradient of 7%	SSD of 70 & Gradient of 8%	Existing terrain warrants the proposed gradient
DEP-RED-AB9-002	Accommodation Bridge 9 (East Bound)	Type 3 Single	60	300	312	Visibility & Vertical Curve	Minimum SSD of 90 & Crest (K=13)	SSD of 70 & Crest (K=10)	To follow the existing terrain and to optimise the earthwork volume
REL-RED-AB9-001	Accommodation Bridge 9	Type 3 Single	60	0	130.988	Horizontal Curvature & Gradient	Minimum Radius of 255, Q=0.3 & maximum gradient of 7%	Radius of 180, q=0.6 & Gradient of 8%	To follow the existing alignment and to optimise the earthwork volume
REL-RED-AB9-002	Accommodation Bridge 9	Type 3 Single	60	130.988	200	Gradient	Maximum gradient of 7%	Gradient of 8%	Existing terrain warrants the proposed gradient
REL-RED-AB9-003	Accommodation Bridge 9	Type 3 Single	60	242	300	Vertical Curve	Crest (K=13)	Crest (K=10)	To follow the existing terrain and to optimise the earthwork volume
REL-RED-AB9-004	Accommodation Bridge 9 (East Bound)	Type 3 Single	60	312	350	Visibility	Minimum SSD of 90	SSD of 70	To follow the existing terrain and to optimise the earthwork volume
REL-RED-AB9-005	Accommodation Bridge 9	Type 3 Single	60	421	443	Gradient	maximum gradient of 7%	Gradient of 8%	Existing terrain warrants the proposed gradient
REL-RED-AB9-006	Accommodation Bridge 9	Type 3 Single	60	462.703	597.706	Horizontal Curvature	Minimum Radius of 255 & Q=0.3	Radius of 180 & q=0.6	To follow the existing alignment and to optimise the earthwork volume
Accommodation Bridge 10									
DEP-TEAL-AB1-001	Accommodation Bridge 1	Type 3 Single	42	0	160	Gradient	Maximum gradient of 7%	Gradient is 8.5%	Existing terrain warrants the proposed gradient
REL-TEAL-AB1-001	Accommodation Bridge 1	Type 3 Single	42	52	126	Transition Length	minimum q=0.3	q=0.6	Reduced transition length to avoid run off on structures.
REL-TEAL-AB1-002	Accommodation Bridge 1	Type 3 Single	42	241	320	Transition Length	q=0.3.	q=0.6	Reduced transition length to avoid run off on structures.

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