

Application for Departure from Standard

Project Name	M2P - Petone to Melling Walking and cycling path	Date:	15/11/2019
Client Name	NZTA	Ref:	DS-P2M-01
Client Project Manager	Chris Robertson NZTA		
AECOM Project Manager	Section 9(2)(a)	Author	Section 9(2)(a)
KiwiRail Project Manager	Section 9(2)(a)		
Subject	Application for Clearance Departure from Standard		

1.0 Engineering Services Document Name and Number

Departure from Standard - **T-ST-DE-5215 Public Pathways on the Rail Corridor**
C-ST-FO-4110 Formation
T-ST-DE-5212 Clearances

2.0 Departure Required

This application is to request a permanent clearance departure for the P2M - Petone to Melling walking and cycling path project which is currently in the initial construction phase of works.

This departure application is for four sections along the project alignment which will require reduced clearances due to: the location the Korokoro Bridge structure, the existing rail safety turnout, the close proximity of the available corridor width at Hutt Road and the SH2 southbound lane at the northern end of the project.

This document gathers previous documentation and communication around the clearances review and approvals with NZTA and KiwiRail through the consenting and detailed design phases of the project.

3.0 Project Background

The 3.5km Petone to Melling walking and cycling path was developed through 2013-2015 as part of the Wellington to Hutt Valley Link project (W2HV), also forming a key connection to Wellingtons proposed Great Harbour Way. This section directly connects to the Ngauranga to Petone walking and cycling path (N2P) to the south (planned construction 2021-2023).

The key outcomes of the W2HV project include:

- Provides for the increased number of walkers and cyclists who cycle or walk between Wellington and the Hutt Valley;
- Provides a separated walking and cycling facility that will increase the safety for walkers and cyclists;
- Reduces the impact of storm events/sea level rise will have on the Hutt Valley Rail Line;
- Provides for operational resilience wherein the W2HV Link could act as a response and recovery route in the event of a catastrophic event along SH2 between Ngauranga and Petone.

Maintenance access within the rail corridor is retained where practical. Along the remainder of the route access gates are to be provided to allow KiwiRail access from the new path.

The project is currently in the early construction phase with completion during 2021.

4.0 Proposal of Departure Requested

This application is for a departure from the KiwiRail Standards:

- **T-ST-DE-5215 Public Pathways on the Rail Corridor**, which states a minimum clearance from any trackside fencing to a proposed pathway shall be at least 5.0m from track centreline.
- **C-ST-FO-4110 Formation**, which shows an acceptable clearance of 6.0m for vehicle maintenance access and clearance to track centreline.
- **T-ST-DE-5212 Clearances**, which states acceptable clearances to the rail structure gauge.

The proposed extent of the clearance departures for the P2M project are as follows:

- Departure 1 – Hutt Road Vicinity; 3.0m track clearance
Km 10.106 to Km 10.361 (M2P Ch 170m to Ch 430m)
- Departure 2 – Korokoro Bridge; 5.0m track clearance
Km 10.670 to Km 10.790 (M2P Ch 740 to Ch 860)
- Departure 3 – Rail Safety Track Turnout; 2.1m track clearance
Km 11 189 to Km 11 239 (M2P Ch 1250 to Ch 1315)
- Departure 4 – North of Safety Turnout; 3.0m track clearance
Melling Line Km 0.5m to Km 1.781 (M2P Ch 1775 to Ch 3066)

4.1 Departure 1 – Hutt Road Vicinity

Standard: *T-ST-DE-5215 Public Pathways on the Rail Corridor*

Reduced clearances between 3.0m - 5.0m from track centreline to the walking and cycling path fence – Km 10.106 to Km 10.361. Relevant documents to the review of this clearance are attached and as follows:

- Alignment plans SK-7601-11
- Typical section SK-7625, this typical denotes a retaining wall but other areas exclude a wall.

We are seeking a clearance departure to 3.0m from track centreline to fence from Section 8 of the Standard, which states a minimum clearance from any trackside fencing to a proposed pathway shall be at least 5.0m from track centreline.

This 3.0m clearance meets the requirements of Standard T-ST-DE-5212 Clearances for normal rail operation. We note that a gated access point has been included in the design to facilitate maintenance access into this area with the reduced clearances.

4.2 Departure 2 – Korokoro Bridge Area

Standard: *C-ST-FO-4110 Formation – 6.0m maintenance access*

Korokoro Bridge Area Km 10.670 to Km 10.790 - Clearance minimum 5.0m. Relevant documents to this clearance are attached and as follows:

- Alignment plans SK-7601-11
- Typical section SK-7621

This section of the walking and cycling path includes maintenance access from Km 10.630 to Km 11.109. The majority of this section meets the standard clearance of 6.0m from track centreline, however 120m in the Korokoro Bridge vicinity reduces to 5.0m from track centreline.

We are seeking a clearance departure to 5.0m from track centreline to match what is currently in operation at the moment with a 2.5m maintenance access that is 2.5m from track centreline. We note this width is reduced from the standard but allows sufficient width for vehicles to access between the outside of the toe of the ballast and the fence line if required.

4.3 Departure 3 – Rail Safety Track Turnout

Standards: *T-ST-DE-5212 Clearances and T-ST-DE-5215 Public Pathways on the Rail Corridor*

Rail Safety Track Turnout - Clearance 2.1m to fence line Km 11 127 to Km 11 237. Relevant documents to this clearance are attached and as follows:

- Alignment plans SK-7601-11
- Typical section SK-7622
- Email confirmation of safety turnout remaining in position – Dated 1 Dec 2017.
- Email and confirmation of clearance acceptance 2.1m - Dated 6 Dec 2017

This very restricted clearance is shown on plan Sk7622. The path width in this area has been reduced from the standard and the existing road restraint barrier replaced with a narrower section to help increase the clearances to the existing track centreline. Possible relocation of the safety track turnout was reviewed but there has been agreement to leave the safety track in place and accept the reduced clearance.

This 2.1m track clearance has been accepted with KiwiRail on the premise that the track is a rail safety turnout only for use in emergencies and not an operational main. Maintenance for this section of track can be accessed either end of the turnout area if required.

4.4 Departure 4 – North of Safety Turnout to Project End

Standard: *T-ST-DE-5215 Public Pathways on the Rail Corridor*

Melling Line reduced clearances between 3.0m - 5.0m from track centreline to the path fence – Km 0.5 to Km 1.781. Relevant documents to the review of this clearance are attached and as follows:

- Alignment plans SK-7601-11
- Typical section SK-7625, this typical denotes a retaining wall but other areas exclude a wall.

We are seeking a clearance departure to 3.0m from track centreline to fence from Section 8 of the Standard, which states a minimum clearance from any trackside fencing to a proposed path shall be at least 5.0m from track centreline.

This 3.0m clearance meets the requirements of Standard T-ST-DE-5212 Clearances for normal rail operation. We note that additional measures such as gated access points along this section may facilitate maintenance activities with the reduced clearance.

5.0 Safety Risk Assessment Report

A Safety Risk Assessment Report has not been completed for this application, however all safety and operational items raised by KiwiRail through the design phase approvals have been addressed in the final design of the project.

6.0 Recommendation

It is recommended that KiwiRail approve the above Departures with reduced clearance from track centreline to trackside fence for the P2M project.

Attachments:

- Overall alignment and detailed alignment plans : SK 7601-11
- Typical Sections : SK 7621-25
- Safety Turnout emails (Options/Review) 1 Dec and 6 Dec 2017
- KiwiRail Review/Approvals Spreadsheet – Tender Nov 2017
- KiwiRail Documents - Reference Only:
 - *T-ST-DE-5215 Public Pathways on the Rail Corridor*
 - *C-ST-FO-4110 Formation*
 - *T-ST-DE-5212 Clearances*

Section 9(2)(a)

Author

Section 9(2)(a)



15/11/2019

Date

Section 9(2)(a)

Authorised

15/11/2019

Date

Released under the Official Information Act 1982

KiwiRail Authorisation:

Approver Name

Signature _____

Approver Name

Signature _____

Approver Name

Signature _____

Approver Name

Signature _____

Date:

Professional Heads' Final Decision

APPROVE / REJECT

Name

Signature

Date

Condition(s):

Released under the Official Information Act 1982

Section 9(2)(a)

From: Leah Murphy <Leah.Murphy@kiwirail.co.nz>
Sent: Friday, 1 December 2017 12:32 PM
To: Section 9(2)(a)
Cc: Chris Nally; Section 9(2)(a); Section 9(2)(a)
Subject: Submission of 100% design drawings to KR

Thanks Section 9(2)(a) and Section 9(2)(a). It will be really useful to have a combined set of drawings thank you! However for the purpose of submitting these to our technical heads and Michael McKeon, I understand there are some issues that came up during the tender discussions should be reflected in the design drawings. Section 9(2)(a) is in the process of documenting these issues, but in brief,

- The location of the cable route in relation to the secant walls for the Petone underpass needs to be understood. We need to understand how they will be treated in the construction methodology (and if in the way, how far they can be slewed etc). Cutting these services would be a very large undertaking (aka the same as moving the duct route associated with moving the Petone Safety Track) and is unlikely to be palatable.
- How the fibre that is above ground near the Normandale Underpass will be treated. We would assume it needs to be put underground.
- Understand what is in the cable pit that is in the cycleway that is noted as needing to be moved and what the implications are.

This still leaves outstanding

- The design of the cycleway beside the Petone Safety Track
- Agreement about the final number of traction structures that need to be moved

As agreed we can review the documents in the absence of understanding the last two items, but it would be ideal to get these resolved first. If they can be resolved at the same time as the issues noted above that could work well!

Happy to discuss.

Leah

Leah Murphy | Project Manager, Urban Cycleway Projects

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I work part-time. Most weeks I am in the office on Monday and Tuesday all day and work Wednesday, Thursday and Friday mornings. I often travel and email correspondence during these days is sporadic.

From: Section 9(2)(a) @aecom.com]
Sent: Friday, 1 December 2017 8:58 a.m.
To: Leah Murphy <Leah.Murphy@kiwirail.co.nz>
Cc: Chris Nally <Chris.Nally@nzta.govt.nz>; Section 9(2)(a) @vitruvius.co.nz>; Section 9(2)(a) Section 9(2)(a) @aecom.com>
Subject: RE: Meeting notes 23 November 2017 (draft)

Hi Leah/Section 9(2)

Section 9(2) has sent you the tender drawings for the project and the design statement for Normandale Underpass. My apologies, I forgot to add the KiwiRail reference to the design statement. Please replace the title page of the design statement with the attached.

Regards

Section 9(2)(a)

Manager - Civil Infrastructure, Wellington

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From: Section 9(2)(a)

Sent: Tuesday, 28 November 2017 6:26 p.m.

To: Leah Murphy

Cc: Chris Nally; Section 9(2)(a); Section 9(2)(a)

Subject: Re: Meeting notes 23 November 2017 (draft)

Will do. Thanks

Sent from my iPhone

On 28/11/2017, at 17:42, Leah Murphy <Leah.Murphy@kiwirail.co.nz> wrote:

Thanks Section 9(2)(a). I assume that you will include KiwiRail reference for the underpasses in all documentation.

Petone Underpass KiwiRail reference is Bridge 11 Wairarapa
Normandale Underpass KiwiRail reference is Bridge 1C Melling
Thanks!

Leah

Leah Murphy | Project Manager, Urban Cycleway Projects

Phone: Section 9(2)(a) | Mobile: Section 9(2)(a) | Email:

leah.murphy@kiwirail.co.nz

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<image001.jpg>

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I work part-time. Most weeks I am in the office on Monday and Tuesday all day and work Wednesday, Thursday and Friday mornings. I often travel and email correspondence during these days is sporadic.

From: Section 9(2)(a) [redacted]@aecom.com]
Sent: Tuesday, 28 November 2017 3:22 p.m.
To: Leah Murphy <Leah.Murphy@kiwirail.co.nz>; Chris Nally <Chris.Nally@nzta.govt.nz>
Cc: Section 9(2)(a) [redacted]@vitruvius.co.nz>; Section 9(2)(a) [redacted]@aecom.com>
Subject: RE: Meeting notes 23 November 2017 (draft)

Hi Leah

We will proceed with option A. Section 9(2)(a) [redacted] will contact you and arrange for the drawings to be delivered to you.

With regard to changes since the 85% drawings delivered to you in August, the attached spreadsheet shows a summary of comments received from the various KiwiRail departments on the 85% design, which have been addressed and are incorporated into the 100% drawings that will be delivered.

Both underpass design statements will also be delivered. The remaining item from the Normandale underpass 85% review was the design calcs for the transition zones either side of the underpass – these are now included in the design statement.

Regards

Section 9(2)(a) [redacted]
Manager - Civil Infrastructure, Wellington
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From: Leah Murphy [<mailto:Leah.Murphy@kiwirail.co.nz>]
Sent: Friday, 24 November 2017 5:14 p.m.
To: Section 9(2)(a) [redacted]; Chris Nally
Cc: Section 9(2)(a) [redacted]
Subject: RE: Meeting notes 23 November 2017 (draft)

Hi Team

Regarding the progress of design approval for the Petone to Melling cycleway, and as discussed at our meeting on 30 October, I had been waiting for track geometry of the Petone Safety Track and a memo to explain how the tender drawings are different to what was received at the 85% stage before sending the drawings for review with our Professional Heads and Michael McKeon. Apologies if I have received these in the meantime.

However, in light of the latest request from KiwiRail **not** to shift the Petone Safety Track, we could

- a. Proceed with the review of the drawings as they stand but with the knowledge that the safety track section will change and consult on that change in parallel. We would also need to note that the final list of traction poles to be moved will be reviewed and approved separately.
- b. Wait until we have a proposal from NZTA/Aecom for the location of the safety run out and get those drawings approved by relevant Professional Heads and Michael McKeon first

If you would like me to proceed with option a, then please provide:

- A combined set of drawings (it is time consuming to print or view for review purposes lots of sparse files)
- A memo explaining the differences between the last set issued to KiwiRail for our review (85%). I attach the spreadsheet you sent over before our last meeting)
- The design report for Petone Underpass (Bridge 11 Wairarapa) if it has been updated after our last meeting. I have an updated report for the Normandale Underpass (Bridge 1C Melling), dated 31 October 2018 that I can arrange to get reviewed along with the rest of the drawings. I assume this has the comments from our earlier meeting and review taken into account (aka 100 year design life). Or would the team like to delay approval of that that underpass for now.

I look forward to hearing from you early next week and will be on standby for an updated set of combined drawings either by an email link or a memory stick!

Leah
Leah Murphy | Project Manager, Urban Cycleway Projects

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leah.murphy@kiwirail.co.nz

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<image001.jpg>

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From: [Section 9\(2\)\(a\)](#) [[@aecom.com](#)]

Sent: Friday, 24 November 2017 4:19 p.m.

To: Leah Murphy <Leah.Murphy@kiwirail.co.nz>; Chris Nally <Chris.Nally@nzta.govt.nz>; Daniel Pou <Daniel.Pou@gw.govt.nz>

Cc: Duane Greyling <Duane.Greyling@kiwirail.co.nz>; Michael McKeon <Michael.McKeon@kiwirail.co.nz>; Peter Fisher <Peter.Fisher@kiwirail.co.nz>; [Section 9\(2\)\(a\)](#) <[Section 9\(2\)\(a\)@vitruvius.co.nz](mailto:Section 9(2)(a)@vitruvius.co.nz)>

Subject: RE: Meeting notes 23 November 2017 (draft)

Thanks Leah

One change, highlighted in yellow below.

Regards

[Section 9\(2\)\(a\)](#)

Manager - Civil Infrastructure, Wellington

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From: Leah Murphy [<mailto:Leah.Murphy@kiwirail.co.nz>]
Sent: Friday, 24 November 2017 3:48 p.m.
To: Chris Nally; Section 9(2)(a) ; Daniel Pou
Cc: Duane Greyling; Michael McKeon; Peter Fisher; Section 9(2)(a)
Subject: Meeting notes 23 November 2017 (draft)

Please see draft notes below – any comments or correction welcome. I will send out a final set next week.

Petone to Melling cycleway - constructability and construction timetable
Meeting notes
Kaiwharawhara office
23 November 2017

Attendees KiwiRail: Michael McKeon, Duan Greyling, Peter Fisher, Section 9(2)(a) and Leah Murphy
NZTA/Aecom: Chris Nally, Section 9(2)(a)
GWRC: Daniel Pou

1. Situation overview
 - KR: It is a busy corridor, refer to in principle agreement letter, recognise that this cycleway is part of larger project, KR gave in ppl in March this year to allow this part of the project to move fwd. But please note caveats in that letter. Over the past couple of months, the impact on rail operations has become more significant than expected. There are now up to about 30 traction structures that we have been asked to move, we have also identified that the Petone signal cable route is proposed to be severed and recommissioned. Please be aware that it took 11 days to put this in and we needed local and international signals experts to do it. We would like to talk with NZTA about some compromises to reduce the overall impact of the project on rail operations.
 - NZTA: keen to understand why so many traction structures are impacted, as had understood it to be less. Keen to understand what the road blocks are and to work together to remove these.
2. What are the 'road blocks' from KR perspective:
 - 3.1 Safety run out
 - The proposal to move the Petone Safety Track means the Petone signal route also needs to be moved. KR does not need a separate maintenance road. Can we compromise on this in the design please. If we do not move the Petone Safety Track, it would also avoid moving some traction poles.
 - Offset to the cycleway fence should be 5m, but we assume this is not available here, it should be a minimum of 3m. Our track structural minimum distance from an operational track is 2.75m
 - Need to discuss construction activities. If going to foul the safety run off then need a BOL.
 - ACTION: NZTA to propose a new layout of the cycleway in this section, without moving the Safety Track and without providing for a KiwiRail maintenance track. Please present to KiwiRail for review and comment. Please show the width of the cycleway and the offset of the fence from the Safety Track centreline.
 - 3.2 Signal 209? To confirm situation with this signal.
 - 3.3 Normandale underpass
 - Need to move four traction poles to enable this
 - Is the position of the underpass firm? Yes, all neighbours have been consulted. NZTA confirm that the location is firm
 - NZTA hope to get a 4 day BOL at Queen's Birthday, that's what they have told tenderers

- GW note that there is not allowance for this in the agreement between GW and KR
- Therefore need to get a memo with information about why block is needed and what other options have been considered. We minimise use of buses at all times and especially avoid blocking the peak. Complaints go up dramatically if the peak is blocked. GW decide if it is okay however. If possible to get an evening peak / or any additional peak available on the train.
- ACTION: NZTA to send a memo to Wayne Hastie at GW to ask for this block. To include Tuesday 5 June
- Please prepare construction methodology has been written with overhead wires up, it is a big job to take it down and put up again
- Track work: KiwiRail will do it either with internal teams from other parts of NZ or a contractor to KiwiRail
- ACTION: can KR tentatively book staff or contractors for Queens Birthday
- ACTION: KR to prepare and provide to NZTA an indicative programme that includes time needed for track work etc incl resources and costs
- 3.5 Petone Underpass
 - NZTA would like to have a block next Christmas. Last methodology was for 8 days no trains passing.
 - KR is not in a position to be able to agree or commit to a BOL over Christmas 2018. It is possible that KR would hold a BOL this Christmas on the Wairarapa Line and could undertake some more traction poles upgrades. We need to think about the whole network and what work is needed where ie including Kapiti. Will decide on blocks in Feb/Mar next year.
 - If not Christmas 2018, then it would be Christmas 2019. The Petone underpass is 3x the length of the other underpass, and it is deeper
 - ACTION: Suggest to NZTA that any agreements with a construction contractor allows for a block to be in either Christmas 2018 or 2019. -
- 3.6 Traction Pole moves
 - NZTA: Please provide list of traction poles that they understand are agreed to be moved (Done)
 - KR: to compare this with current schedule of poles to be moved
 - ACTION: KR NZTA to hold a meeting to discuss different understanding of the number of poles – NZTA thought it was about 18 poles, whereas our count was about 30 poles. And agree on cost and an approval process
 - Noting that there will be fewer without moving the safety run out
 - Discuss and confirm when each pole will be moved
- 3.7 Would like to use Easter Block for other activities.
 - ACTION KR: to book in Petone to Melling cycleway works into the Easter block. To provide information about the block including times available
- 3. Construction time table – would like to complete as much as possible before June 2018
 - At this stage NZTA hope to open path from Petone to Normandale in June 2018 (or soon thereafter) with path users needing to use the existing station underpass at Petone and other existing infrastructure from there
- 4. Project Agreement
 - ACTION: NZTA to get back to KR on the project agreement, noting that KR will not be able to agree to dates for BOL in the agreement
- 5. Design drawings
 - NZTA note that the latest set of design drawings reflect all comments by professional heads

- ACTION: LM to follow up with NZTA/Aecom to ensure we have the most recent set on file and to proceed with approval (excluding the safety run out and final list of traction poles to be moved).

Leah Murphy | Project Manager, Urban Cycleway Projects

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Section 9(2)(a)

From: Section 9(2)(a)
Sent: Thursday, 7 December 2017 3:58 p.m.
To: Chris Nally
Cc: Section 9(2)(a)
Subject: RE: P2M - Safety Runout Option
Attachments: 60306339-FIG-0003.pdf

Hi

Revised sketch taking on board a 2.1m clearance to centre of safety runout and 0.6m deflection to our light poles

Regards

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From: Section 9(2)(a)
Sent: Thursday, 7 December 2017 8:47 a.m.
To: 'Chris Nally'
Cc: Section 9(2)(a)
Subject: RE: P2M - Safety Runout Option

FYI, the kerb and channel (which is included in the shoulder on the state highway side of the cycle path) is 0.3m wide, so usable space, adopting a 0.5m shoulder to the fence (which is effectively a shyline), would equate to 1.8m path width (where the wheels could run) or 2.0m if we can get the OK for a 0.6m deflection to the light poles that are positioned behind the kerb.

Section 9(2)(a)

Manager - Civil Infrastructure, Wellington

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From: Chris Nally [<mailto:Chris.Nally@nzta.govt.nz>]

Sent: Wednesday, 6 December 2017 5:36 p.m.

To: Section 9(2)(a)

Cc: Section 9(2)(a); Section 9(2)(a)

Subject: RE: P2M - Safety Runout Option

Hi Section 9(2)(a).

Thanks for the clarification. I am getting feedback from relevant parties here to see that we can make this work.

Cheers

Chris Nally / Senior Project Manager

Project Delivery Portfolio

System Design and Delivery

DDI Section 9(2)(a) / M Section 9(2)(a)

E Chris.Nally@nzta.govt.nz / w nzta.govt.nz

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From: Section 9(2)(a) [redacted] [@vitruvius.co.nz](mailto:Section 9(2)(a)@vitruvius.co.nz)
Sent: Wednesday, 6 December 2017 5:02 p.m.
To: Chris Nally; Section 9(2)(a) [redacted]
Cc: Section 9(2)(a) [@aecom.com](mailto:Section 9(2)(a)@aecom.com)
Subject: RE: P2M - Safety Runout Option

Chris

As mentioned the minimum permissible clearance will be 2100mm from track c/l to the fence.

Many Thanks

Section 9(2)(a) [redacted] | Civil Engineer | Vitruvius
Section 9(2)(a) [redacted] P: Section 9(2)(a) [redacted]
E: Section 9(2)(a) [@vitruvius.co.nz](mailto:Section 9(2)(a)@vitruvius.co.nz)

From: Chris Nally [<mailto:Chris.Nally@nzta.govt.nz>]
Sent: Friday, 1 December 2017 8:09 AM
To: Section 9(2)(a) [redacted] [@vitruvius.co.nz](mailto:Section 9(2)(a)@vitruvius.co.nz)>
Subject: FW: P2M - Safety Runout Option

Hi Section 9(2)(a) [redacted]

Please see the attached plan for the cycleway and safety runout. This is only an initial draft at this stage to give an indication of effects. I have run it past the interested people at the Agency and we are prepared to accept the narrowing of the cycleway to allow the runout to stay in its' current position. Please discuss with Mike and advise if you are happy with this compromise.

Cheers

Chris Nally / Senior Project Manager

Project Delivery Portfolio
System Design and Delivery

DDI Section 9(2)(a) / M Section 9(2)(a)

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From: Section 9(2)(a) [@aecom.com](mailto:Section 9(2)(a)@aecom.com)

Sent: Thursday, 30 November 2017 1:06 p.m.

To: Chris Nally

Cc: Section 9(2)(a)

Subject: P2M - Safety Runout Option

Hi Chris

Following on from our meeting with KiwiRail last Friday, please find attached AECOM's suggestion to remove the need to relocate the safety runout. Our suggestion is based on no maintenance track is needed beyond the safety runout (as per current situation) and we have reduced the cycleway corridor width to 3m, which gives a path width (excluding shoulders of 2.0m) over approximately 100m of length. The attached provides a table showing the distance from the cycleway fence to the centre of the runout rail.

The traction pole requiring relocation (as a result of this suggested layout) is the portal at KiwiRail chainage 11.120km, as it lies within the KiwiRail maintenance track. The others shown to be relocated come from the KiwiRail traction pole replacement project

Regards

Section 9(2)(a)

Manager - Civil Infrastructure, Wellington

D Section 9(2)(a) M Section 9(2)(a)

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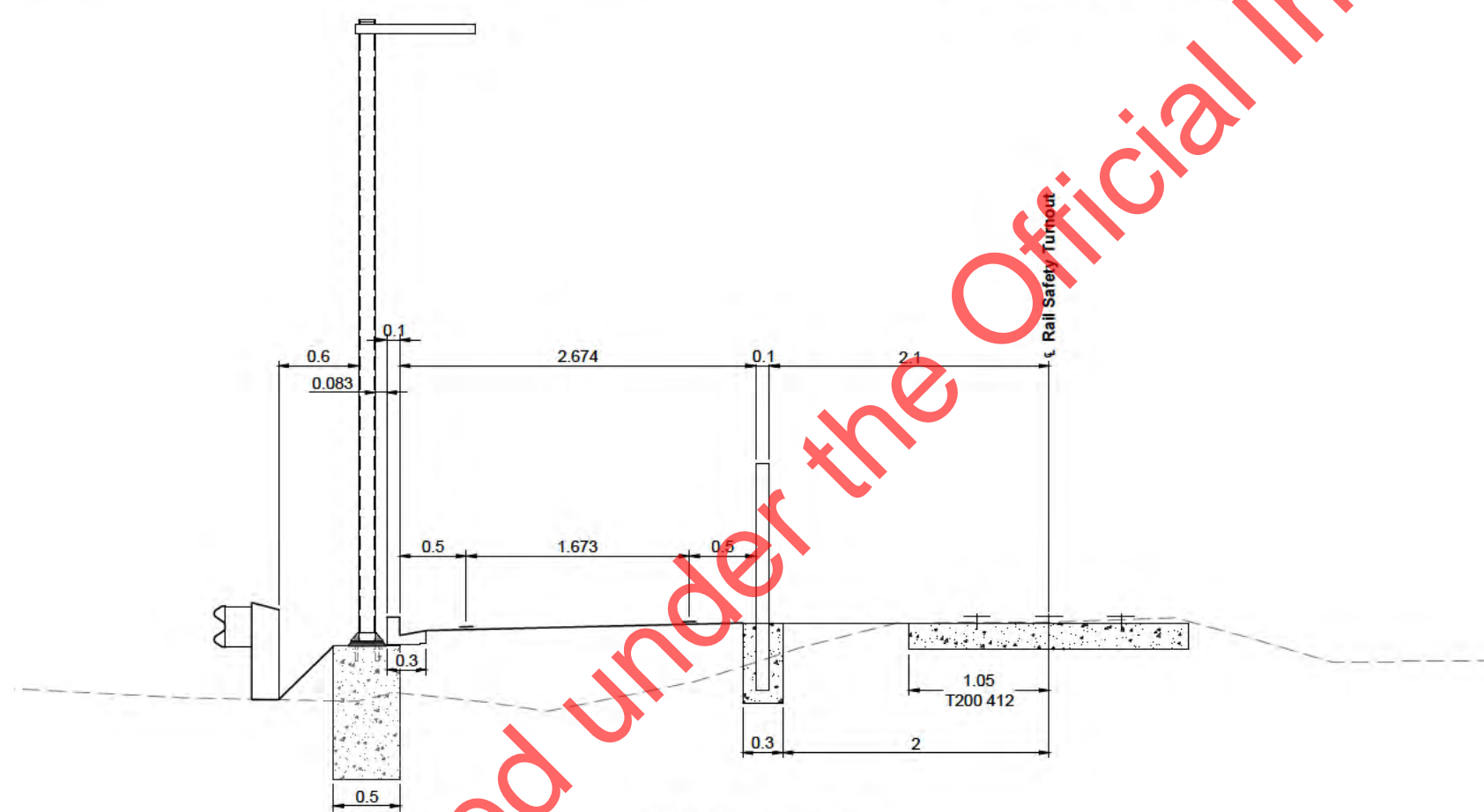
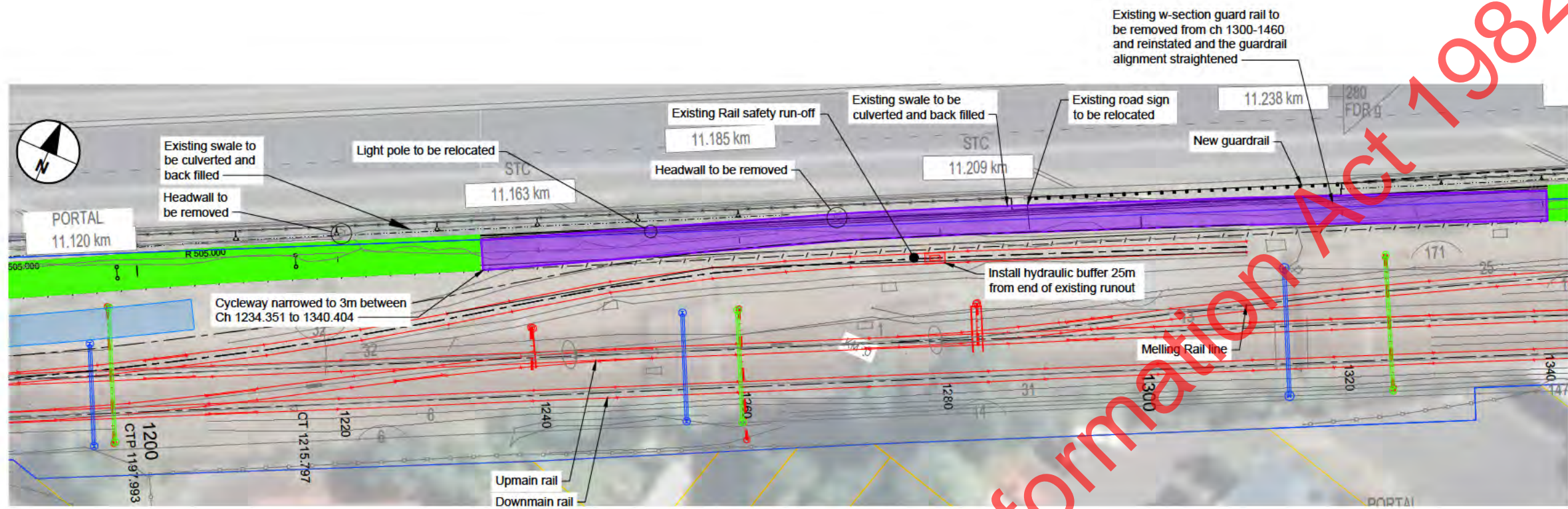
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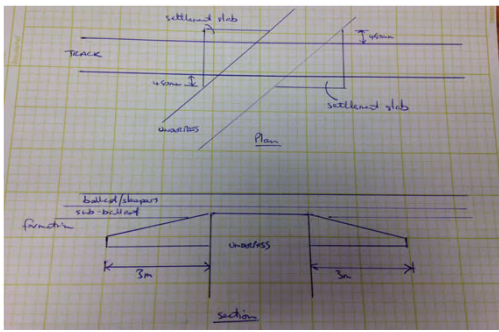
- Legend**
- Kiwi Rail indicative proposed maintenance access (~3m)
 - Cyclepath Standard Corridor width 3.5m
 - Cyclepath Corridor width 2.6m
- Legend**
- Existing traction pole (as per topo survey)
 - Existing traction pole to be removed by others (as per KiwiRail's Design)
 - Proposed traction pole location (as per KiwiRail's Design)

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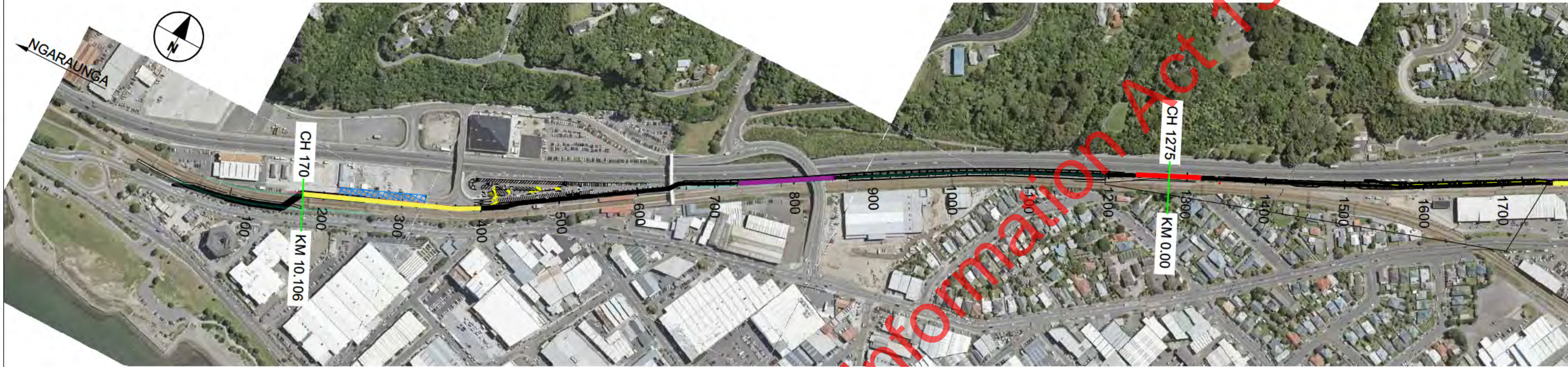
Ref	Date	AECOM ref	KiwiRail Representative	KiwiRail comment	Action Owner	Response 14/09/2017	Review 28/11/2017															
1	1/09/2017	Clause 3.2.3 of Normandale underpass design statement	Section 9(2)(a)	<p>Please adopt Importance level 3 for design of Normandale underpass also. Derailment of a Metro train with full passengers on the Melling branch line during peak hours, owing to failure of the Normandale underpass may result in multiple casualties and serious consequences. The risk of derailment of the train due to structural failure/settlement of the underpass makes underpass a real candidate for considering under the category of major structure(affecting crowds). Table 3.1 of the AS/NZS 1170.0 as below.</p> <p>The adequacy of the granular transition zone to ensure gradual change in stiffness of the track formation at the approaches of the 45degree skew underpass should be proved by the designers during the detail design stage.</p> <table border="1"> <caption>TABLE 3.1 CONSEQUENCES OF FAILURE FOR IMPORTANCE LEVELS</caption> <thead> <tr> <th>Importance level</th> <th>Description</th> <th>Consequences</th> </tr> </thead> <tbody> <tr> <td>Low</td> <td>Low consequence for loss of human life, or small or moderate economic, social or environmental consequences</td> <td>Minor structures (likely not likely to endanger human life)</td> </tr> <tr> <td>Medium</td> <td>Medium consequence for loss of human life, or considerable economic, social or environmental consequences</td> <td>Normal structures and structures not falling into other levels</td> </tr> <tr> <td>High</td> <td>High consequence for loss of human life, or very great economic, social or environmental consequences</td> <td>Major structures (affecting crowds)</td> </tr> <tr> <td>Exceptional</td> <td>Circumstances where failure could be catastrophic</td> <td>Exceptional structures</td> </tr> </tbody> </table>	Importance level	Description	Consequences	Low	Low consequence for loss of human life, or small or moderate economic, social or environmental consequences	Minor structures (likely not likely to endanger human life)	Medium	Medium consequence for loss of human life, or considerable economic, social or environmental consequences	Normal structures and structures not falling into other levels	High	High consequence for loss of human life, or very great economic, social or environmental consequences	Major structures (affecting crowds)	Exceptional	Circumstances where failure could be catastrophic	Exceptional structures	Section 9(2)(a)	Actioned - IL3 has been adopted for this structure.	Closed
Importance level	Description	Consequences																				
Low	Low consequence for loss of human life, or small or moderate economic, social or environmental consequences	Minor structures (likely not likely to endanger human life)																				
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Exceptional	Circumstances where failure could be catastrophic	Exceptional structures																				
2	1/09/2017	Clause 2 of Normandale and Petone underpass construction methodology	Section 9(2)(a)	<p>The adequacy of the granular transition zone to ensure gradual change in stiffness of the track formation at the approaches of the 45degree skew underpass should be proved by the designers during the detail design stage.</p> <p>The adequate system(Settlement slab,layered compacted material etc.) to ensure smooth transition and reduced differential settlement as per KiwiRail track standard at the approaches of the underpass has to be designed during the detail design stage. Please note that the KiwiRail document for the formation design is a guideline only and may not cater to the stiffness requirements of transition zones of 45 degree skew underpass.</p> <p>Leah –Please consult with civil team to clarify regarding the scope of using the mentioned KiwiRail-Formation documents for transition zones of 45 degree skew underpasses.</p>	Section 9(2)(a)	Design memorandum and revised dwgs to be submitted to KiwiRail. This allow for granular transition zones. Time constraints associated with Block of Line requires granular transition zones as opposed to concrete slabs, which require curing time which isn't available. Pre-casting slabs into underpass units carries unacceptable risks associated with adequate compaction beneath the "wings" and differential movement between underpass units from inadequate compaction.	Refer to dwgs 60306639-ST-005 60306639-ST-005 Details on the transition at Normandale is incorporated in the revised Design Statement															
3	1/09/2017			<p>Hi Team</p> <p>Please find below feedback from our structures and track professional heads on the 85% design drawings. Civil, signals and traction comments to come. Please let me know if you would like anything clarified. Also let me know if you'd like to meet to discuss or if you'd like to submit updated drawings for our review in the first instance.</p> <p>Also a meeting to discuss the safety run out needs to be arranged asap (will ensure it happens next week).</p> <p>As mentioned to Section on the phone yesterday, it would be great to get an updated program. Michael did a high level programme previously that could be adjusted to take into account the new situation with the Petone underpass. The more detail you can put in the better about the different tasks and when they are likely to happen would be great. This will help our local team understand what is likely to happen. Will this tender include the Petone underpass?</p> <p>I recognise that a more detailed construction programme will be developed once you get your construction contractor on board. We can go through a detailed exercise with the network services team at that stage to finalise the approach.</p> <p>Leah</p>	Section 9(2)(a)	Outline Construction Programme issued to KR via NZTA (Chris)	<p>The project is currently out to tender</p> <p>Award is scheduled for late January 2018 with a start on site late February 2018.</p> <p>The completion dates for the separable portions are:</p> <ul style="list-style-type: none"> SP1 Petone Stn to Normandale completion 31/05/2019 SP1A Normandale underpass completion 30/06/2018 SP2 Petone works completion 31/05/2019 SP1 Petone underpass completion 31/05/2019 															
4	1/09/2017	Dwg CI-0001 & DR-0001 & DR-0009 Dwg CI-0004 Dwg CI-0009 Dwg CI-0060 & CI-0061 & CI-0062 & CI-0063 Dwg ST-0020 & ST-0069 Draft design statement V2	Section 9(2)(a)	<p>From: Section 9(2)(a)</p> <p>A Underpass requires settlement slab</p> <p>Dwg CI-00004 B Buffer stop location to be verified, this will be req'd to be a hydraulic Oleo type. Signals still need to confirm the loss of approximately 25m of track is acceptable in the design stopping length</p> <p>Dwg CI-0009 C Underpass requires settlement slab</p> <p>Dwg CI-0060 & CI-0061 & CI-0062 & CI-0063 D Track drawing to show sufficient ballast shoulder on sleeper ends, has any allowance been made for current drainage profile as per std dwg CE100862</p> <p>Dwg ST-0020 & ST-0069 E GAP65 back fill not acceptable, requires settlement slab design to ensure gradual increase from soft formation to underpass concrete and profile to be at 90 deg to track direction, this is typically over a distance of 12-15m when increments F Track levels for a distance of at least 50m either side of to be taken to ensure reinforcement at correct levels and no vertical curve is installed G Requires separation layer between ballast and sub-ballast formation as per std dwg CE120535</p> <p>Draft design statement V2 H 2.8 – box section level is lower than 300mm below underside of sleeper as allowance needs to be made for separation layer, typically 75mm thick. Site conditions need to be verified by trial hole to confirm exact depth of existing material. I 3.0 – T200 Track Handbook is at version 6.1 J 3.2.5 – to prevent uneven settlement due to the 45 deg angle of the underpass a settlement slab is required for the length of the underpass where it intersects the rail corridor</p>	Section 9(2)(a)	<p>See item 2 above</p> <p>Awaiting response re adequacy of 25m length. Can incorporate 25m additional length of rail provided resolution of safety runout and associated traction pole locations can be agreed.</p> <p>See item 2 above</p> <p>The shoulder to the sleepers is indicative. Where this is affected by the proximity of the works to the track the correct shoulder will be provided. Where the KiwiRail access track is away from the sleeper ends there will be no change to the existing.</p> <p>We are maintaining the existing ground profile falls on the existing track areas adjacent the rail line within the 3m safety zone. Where this falls to the cyclopath we are providing subsoil drainage connecting to the SW system as per drawings in Agreement in principle</p> <p>E Refer to 2 above F Acknowledged. G Refer 2 above</p> <p>H - The top of the box unit is typically 400mm below the sleeper allowing for 300mm ballast and 100mm for waterproofing and a protection layer beneath the ballast. I - Noted J - Refer to note 2 above and see updated dwgs.</p>	<p>See item 2 above</p> <p>This relates to the Safety Run-out work which is now being omitted. P2M dwgs will be updated to show the revised cyclopath alignment with the safety run-out track unchanged.</p> <p>See item 2 above</p> <p>As previous comment</p> <p>These have been addressed</p> <p>As previous comment</p>															
5	1/09/2017	Structures	Section 9(2)(a)	<p>From: Section 9(2)(a)</p> <p>Feedback on 85% design stage: Structures</p> <p>A General I would expect that at this stage of the project, that the Structures Design Statements would be in a draft final state. B The documents contain track change highlighted sections etc. C The geotechnical report still refers to bridge structures at Petone. D Feedback provided through Steve on 28/8/17 (attached) appears not to have been taken into account E I understood that for Melling, we approved in principle to allow consultation but since then detail design must have progressed support the drawings? F PS1 & PS2 certificates to be submitted to KR at Detail Design (100%) stage.</p>	Section 9(2)(a)	<p>A to B - Noted C Geotechnical reports provided with design statements refer to underpass. D See responses above to Sonja's comments E TBA F PS1 and PS2 will be submitted</p>	As previous comment PS1 and PS2s can be provided for the two underpasses.															
6	1/09/2017	Structures	Section 9(2)(a)	<p>From: Section 9(2)(a)</p> <p>Specific comments A The design life of the Petone underpass is stated as 50 years in Drawing ST-0001. In the Design statement also the design working life is given as 50 years citing the reason that the underpass is to be relocated when the Petone to Grenada construction works are undertaken. A departure would be needed in accordance with KR standards, but the justification for changing from 100 years to 50 years is not sufficient and the standard of 100 year design life is required. (Design life for Normandale Underpass is 100 Years and designs for both structures are similar. B There is no provision of settlement slab or any other measures other than the Gap65 Backfill on the approaches of both the underpass. During our previous review remarks on this project we had highlighted this issue. The underpasses are aligned at approx. 45 degree skew to the track. We need clarity on the detail design for this risk. C Aside from detail regarding how the skew will be addressed from a design perspective, no provision is made for normal KR transition construction. (MF/DR to comment.) Refer to two drawings provide for Avondale project. D Whether the long term and short term settlement of precast box underpass was addressed in the design is not clear. In the Geotechnical studies done in 2016, the possibility of settlement criteria governing the design of foundation of the structure was highlighted. In the design statement issued in May 2017 it is stated that the settlement effects will be determined after the completion of forthcoming geotechnical investigations. Not sure when they will be considering this, since the present drawings provided are detail design one. Noting also that the geotech report still considers a bridge structure. E As we had previously requested, it will be better to use the bridge ID as Bridge 11 WL for all the documents related to Petone Underpass and Bridge 1C Melling line for Normandale underpass. These structure are already added to the KiwiRail data base as bridge number 11 in Wairarapa line and 1C in Melling line respectively. Please update all Design Statements and Drawings accordingly.</p>	Section 9(2)(a)	<p>A Underpass design revised to 100yrs. Review ramp design criteria and confirm.</p> <p>B Refer to 2 above</p> <p>C Refer to 2 above</p> <p>D Geotech reports accompanying design statements addresses settlement of underpasses in the short and long term. NZTA Physical works contract contains requirement to monitor settlement over the defects liability period and notify KiwiRail via Engineer to Contract for remedial action.</p> <p>E KiwiRail references added to dwgs</p>	<p>100 year design life</p> <p>Refer to 2 above</p> <p>Refer to 2 above</p> <p>Geotechnical assessment updated and included in the Design Statements. Post construction the predicted settlement to the underpass is zero. Settlement and deflections of the transition zones are given in the design statements.</p> <p>No change</p>															

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- 40.2 TRACK LEVEL SURVEYING**
- The existing track levels and horizontal position of each track shall be surveyed for 250m in both directions from each proposed underpass, or any other area where works have the potential to affect track levels, prior to any works commencing to establish a datum level for monitoring settlement during the construction. The survey shall be at 4m intervals. The levels of both left and right rails shall be recorded to the nearest mm.
- The final track levels and horizontal position shall also be surveyed to the same accuracy and at the same intervals at the end of the construction.
- 40.3 MONITORING FREQUENCY**
- Throughout dewatering or any other operations which may affect track levels, both rail levels and horizontal position shall be surveyed at the same positions as the initial survey on a daily basis, or as otherwise directed by the Engineer. If in a particular phase of construction, operations are not affecting the existing infrastructure, the monitoring frequency may be reduced at the Engineers discretion.
- The survey results including the displacements relative to the allowable magnitudes shall be made available to the Engineer for review within 24 hours. Should settlement occur outside the tolerances given in the table below, then the Engineer and KiwiRail must be contacted immediately to safeguard rail traffic and to carry out emergency repairs.

7	12/09/2017	Fencing/Lighting etc adjacent the rail line	Traction Team	<p>Hi Team</p> <p>Our traction team have reviewed the drawings and note the following (which I anticipate are addressed):</p> <p>A The review drawing notes include provision for our earthing and bonding requirements where the cycleway fence passes close to traction poles. As well as this, we will require the metal fence to be bonded to the rail via a spark gap in locations where the fence comes closer than 4m to the centre line of electrified tracks.</p> <p>B The cycle path includes many metal lighting/light poles. It appears that the majority of these poles are more than 4m from the centre line of electrified tracks. It should be noted that if designs change, so that some of these poles are closer to the track, then we will require electrical system separation from the MEN power supply system.</p>	<p>A Bonding requirements included in the specification</p> <p>B Noted. We have moved the poles to be outside of these limits. If this changes KiwiRail will be consulted on the specific case</p>	No change
8	12/09/2017	DWG CI-0001	Civil technical head	<p>A There are two culverts, one near the chainage 1000 (WL 10.916 km) and another at approx. chainage 1250 (WL 11.183 km) Both are approximately 1.7 m depth with inlet at the other side of SH and outlet at the RHS of the rail corridor.</p> <p>B There are intermediate manhole sumps between the track and the SH and these should be accessible for inspection and maintenance purposes.</p> <p>C These lids are going to be either below KR maintenance track or at the cycleway and allowance shall be made to adapt them into the finished surface (it may be need to raise some of the sumps?)</p>	<p>A Noted. These are shown on our service plans and have been accounted for in our stormwater design.</p> <p>B These have been accounted for in our stormwater design.</p> <p>C As above</p>	No change
9	12/09/2017	DWG CI-0060 and CI 0062 (typical section CH 780)	Civil technical head	<p>A At 0060 the KR maintenance track falls towards the track. The design should be as per CI 0061 with fall towards the limit between track and cycleway and subsoil drain.</p> <p>B Similar comment at 0061.</p> <p>C The maintenance track doesn't comply with KR Standard Formation & Drainage drawings (CE 100 862, sheet 2, drawing E)</p> <p>D Suggest to include the ballast shoulder profile in the cross sections and amend the access track height and drainage design according to that.</p>	<p>A The principal adopted has been to tie into the existing profile of the track area as per drawings in Agreement in Principle. Where it falls towards the rail then this is maintained.</p> <p>B As above</p> <p>C We are to review and amend to suit</p> <p>D We are tying into the track as efficiently as possible. This would increase the works significantly for no apparent benefit.</p>	<p>A No change to design principals</p> <p>B No change to design principals</p> <p>C No change to design. KiwiRail/NZTA to discuss betterment.</p> <p>D No change. Same response as 'C'.</p>
10	12/09/2017	DWG ST-0020 & ST-0069	Civil technical head	<p>Agree with Section 9(2)(a) comments about the underpass sections - design needs to be amended as noted by them.</p>	Noted - refer to 2 above	No change
11	12/09/2017		Leah Murphy	<p>I note that only outstanding feedback now is from signals. They are working through the issue of the turn out and signal 209. I will double check to see if they have other comments.</p>		
12	13/09/2017	Underpass transition zones	Section 9(2)(a)	<p>revisit on design stage: structures Section 9(2)(a)</p> <p>Aside from detail regarding how the skew will be addressed from a design perspective, no provision is made for normal KR transition construction. (MF/DR to comment.) Refer to two drawings provide for Avondale project. SEE SKETCH BELOW??</p> 	Refer to 2 above.	Refer to 2 above
13		Safety turnout	Chris Nally e-mail 21/09/2017		To be discussed 25/09/2017	Cycleway alignment amended to maintain current safety turn-out
14		Petone underpass - 100 year design life			To be discussed 25/09/2018	100 year design life adopted.
15		Approach settlement			To be discussed 25/09/2019 - see also comments above	Refer to 2 above.
16		Traction poles Signal poles 206			To be discussed 25/09/2020	Signal pole 206 is being resited as part of KiwiRails traction pole upgrades

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ALIGNMENT PLAN
Scale 1:5000 (A3)



ALIGNMENT PLAN
Scale 1:5000 (A3)

LEGEND:

- RAIL SAFETY TURN OUT CLEARANCE
- 3-5m CLEARANCE TO RAIL ☺
- 5-8m CLEARANCE TO RAIL ☺

15/11/2019 - KIWIRAIL DEPARTURE

Last saved by: 352(2019-11-15) Last Plotted: 2019-11-15
Filename: P:\60306339\6 CAD03-SKETCHES\P2M\60306339-SK-7601.DWG

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PROJECT: P2M DETAILED DESIGN
CLIENT: WAKA KOTAHI NZ TRANSPORT AGENCY

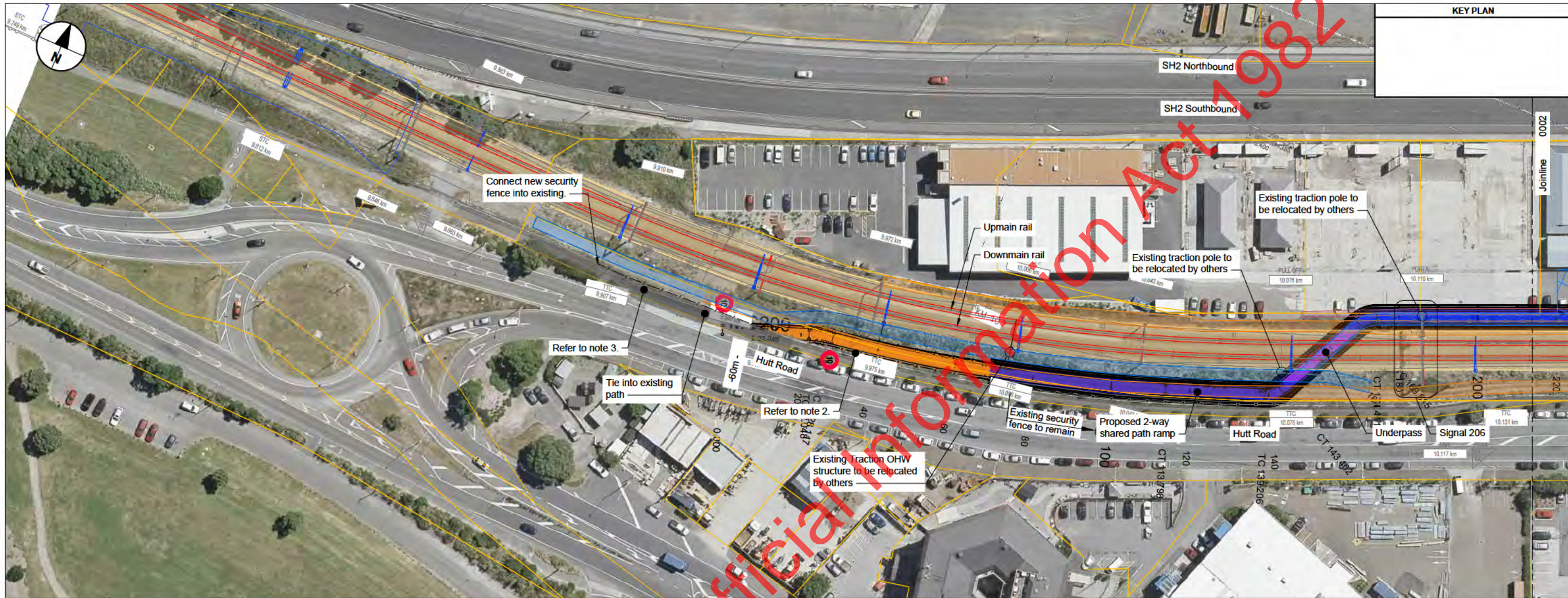
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PROJECT NUMBER: 60306339
SHEET TITLE: PETONE TO MELLING ALIGNMENT PLAN EXTENT OF KIWIRAIL DEPARTURES
SHEET NUMBER: 60306339-SK-7601

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Legend

- Kiwi Rail indicative clearance envelope (3m).
- Proposed path
- Shared path

Legend

- Existing traction pole (as per topo survey)
- Existing traction pole to be removed by others (as per KiwiRail's Design)
- Proposed traction pole location (as per KiwiRail's Design)

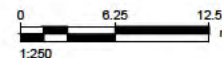
Notes:

- Dimensions shown are indicative only.
- Remove existing road/rail security fence between ramps and chainage ~60m and install new on revised alignment
- Tie proposed shared path into existing over 60m.
- Proposed fence adjacent to railway line to have an air gap and electrical bonding to traction poles
- Where existing runoff from rail is continuously away from rail, we will incorporate into cycleway drainage
- Where runoff is initially away from rail and then the existing ground falls back towards the rail. If the edge of the cycleway closest to the rail falls within this area (ie falling away from the rail) then this will be addressed in the drainage for the cycleway.
- Where the existing land falls towards the rail, then the stormwater falling on the cycleway will be addressed but the stormwater on the land between the edge of the cycleway and the rail will remain as per existing.
- For CCTV and lighting see drawing series 6036339-SL-*
- For retaining walls refer to drawing series 60306339-ST-*

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PROJECT NUMBER

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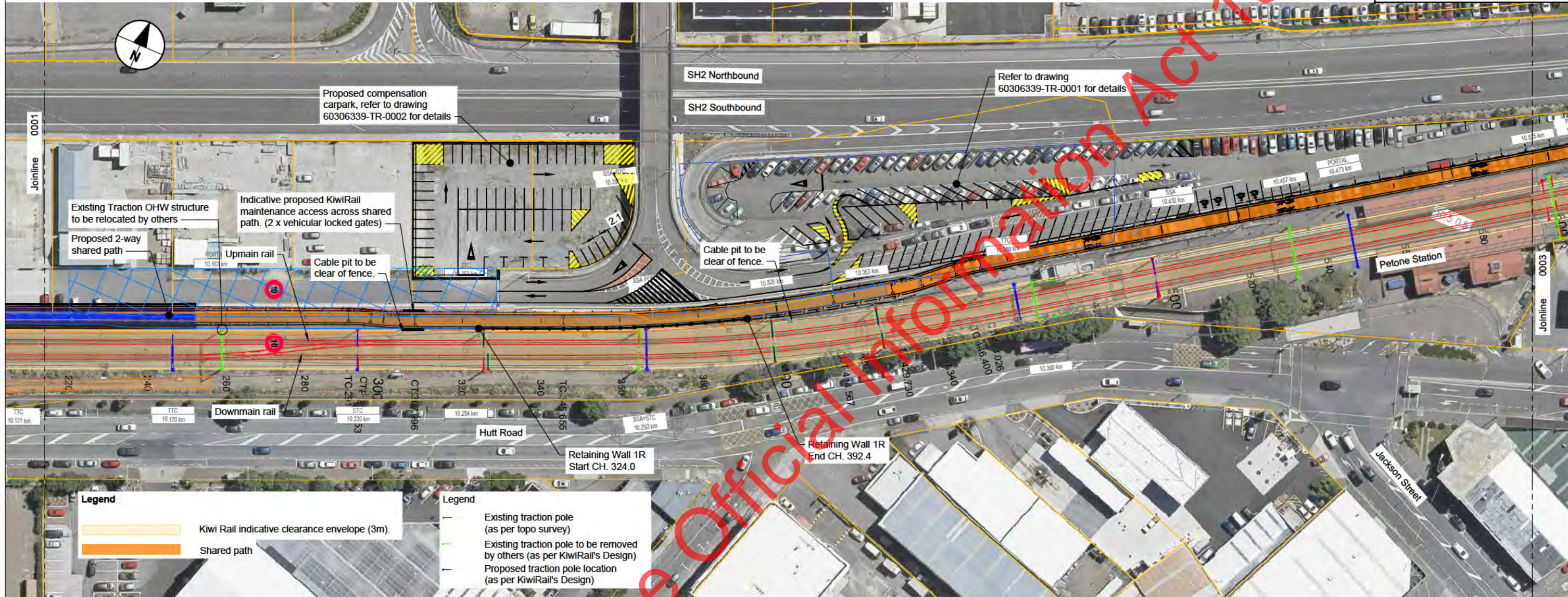
SHEET TITLE

PETONE TO MELLING
GENERAL ARRANGEMENT - PLAN
SHEET 1 OF 10

SHEET NUMBER

SK-7602

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Legend

- Kiwi Rail indicative clearance envelope (3m).
- Shared path

Legend

- Existing traction pole (as per topo survey)
- Existing traction pole to be removed by others (as per KiwiRail's Design)
- Proposed traction pole location (as per KiwiRail's Design)

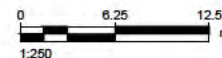
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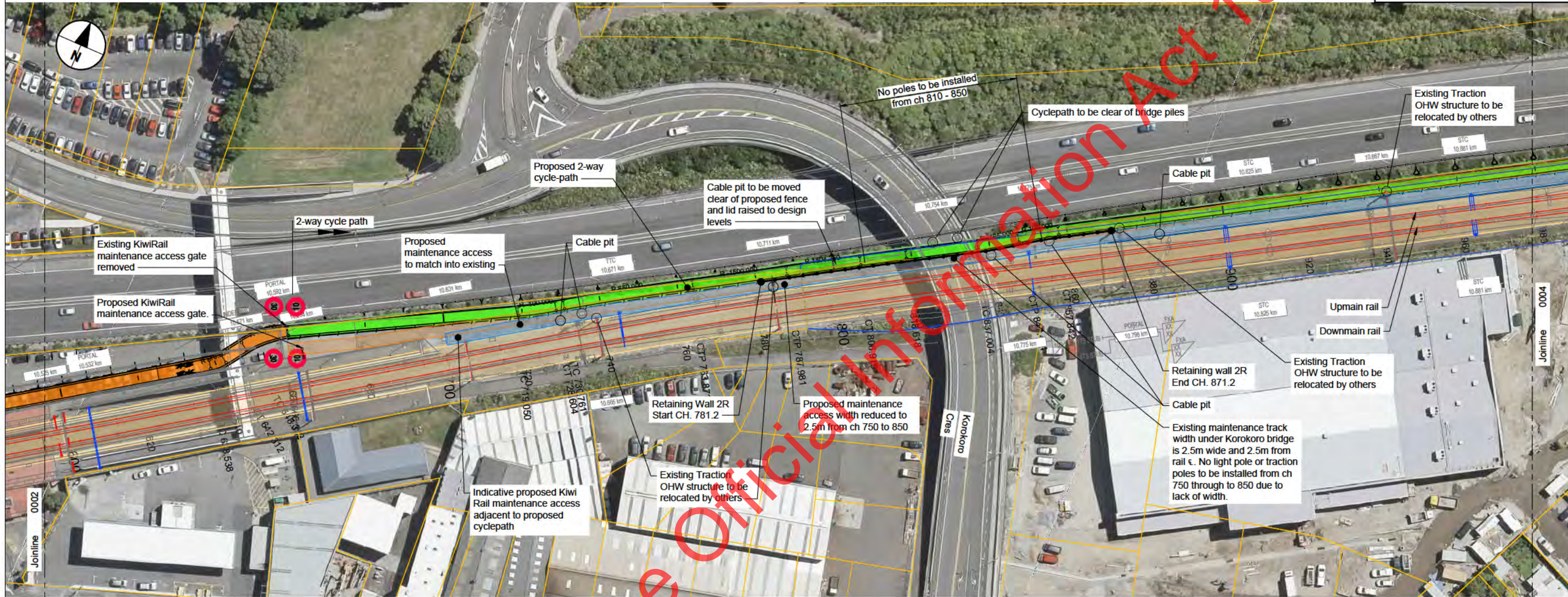
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- Legend**
- Kiwi Rail indicative clearance envelope (3m).
 - Kiwi Rail indicative proposed maintenance access (~3m)
 - Shared path
 - Cycle path

- Legend**
- Existing traction pole (as per topo survey)
 - Existing traction pole to be removed by others (as per KiwiRail's Design)
 - Proposed traction pole location (as per KiwiRail's Design)

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DETAILED DESIGN

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PROJECT MANAGEMENT INITIALS

Section 9(2)(a)

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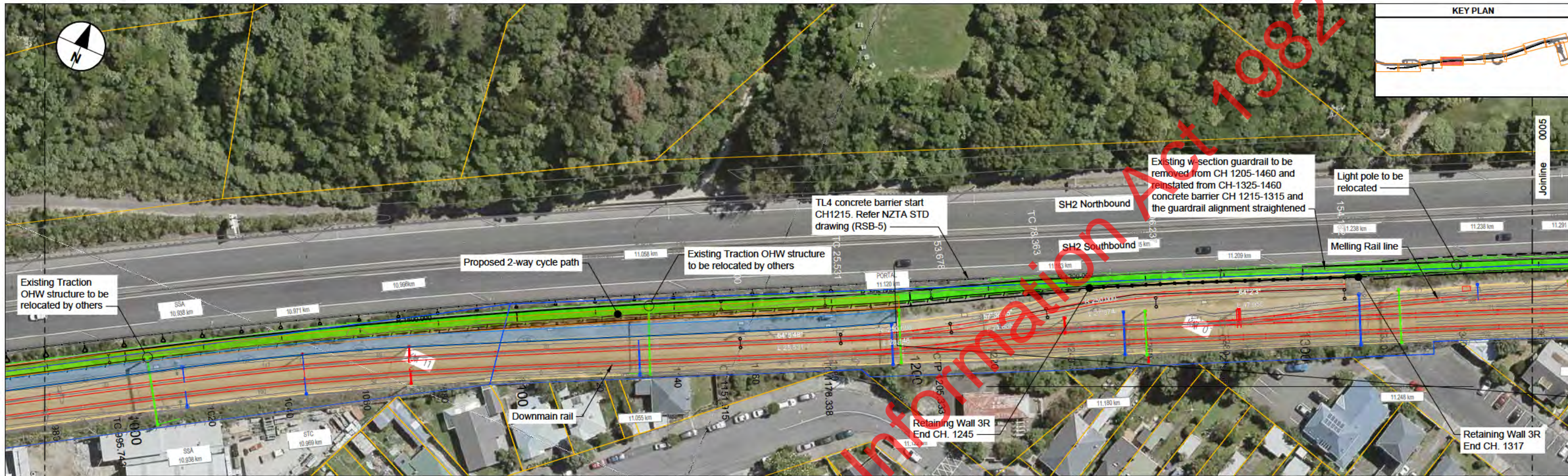
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SHEET TITLE
PETONE TO MELLING
GENERAL ARRANGEMENT - PLAN
SHEET 3 OF 10

SHEET NUMBER
SK-7604

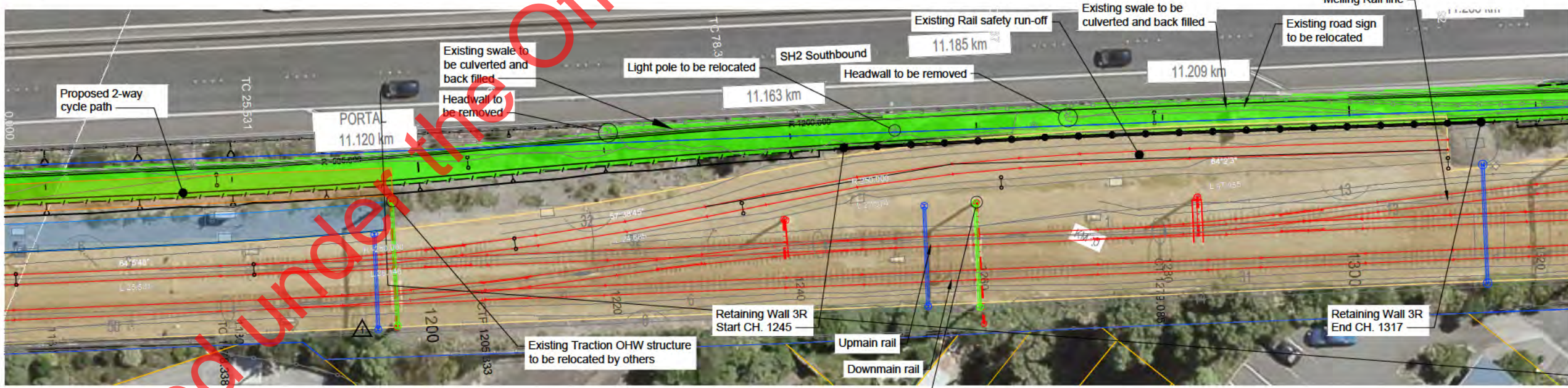


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 - Shared path
 - Cycle path

- Legend**
- Existing traction pole (as per topo survey)
 - Existing traction pole to be removed by others (as per KiwiRail's Design)
 - Proposed traction pole location (as per KiwiRail's Design)



Plan - Rail Safety Turnout

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 P2M DETAILED DESIGN
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 NZ TRANSPORT AGENCY

PROJECT MANAGEMENT INITIALS

Section 9(2)(a)

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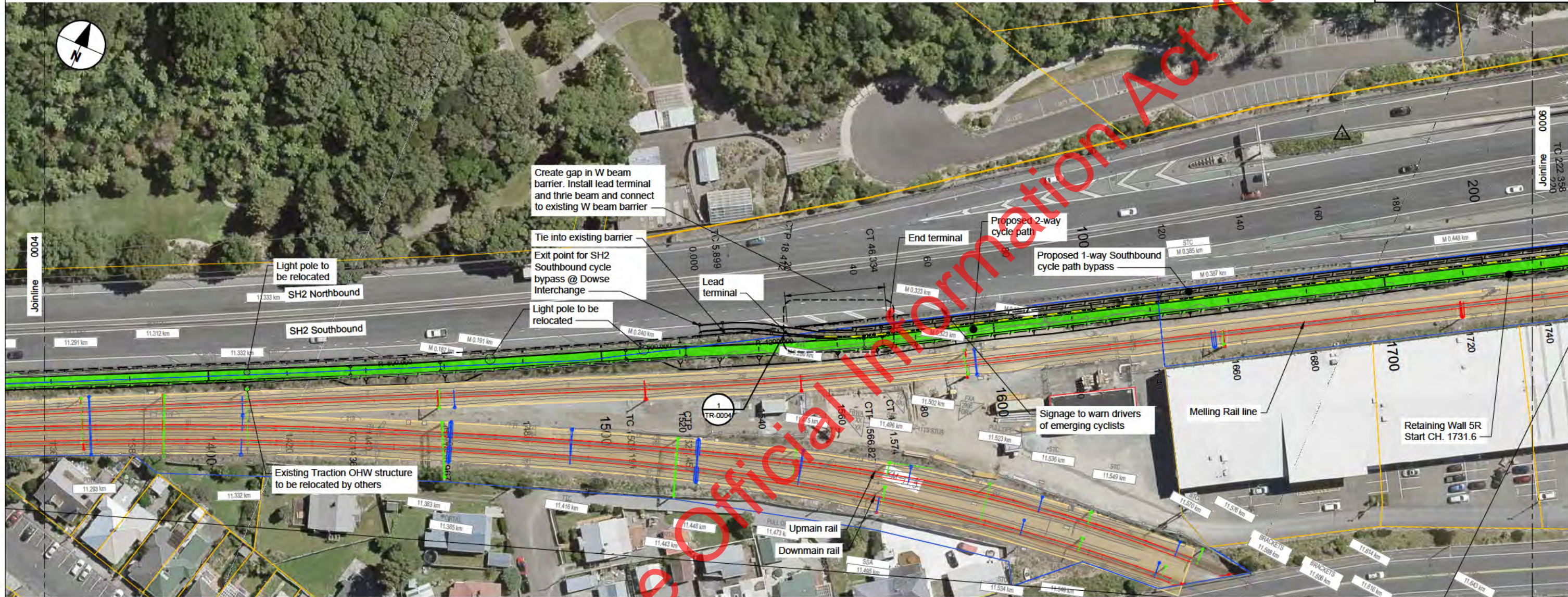
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PROJECT NUMBER
60306339

SHEET TITLE
PETONE TO MELLING
GENERAL ARRANGEMENT - PLAN
SHEET 4 OF 10

SHEET NUMBER
SK-7605

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Legend

- Kiwi Rail indicative clearance envelope (3m).
- Shared path
- Cycle path
- Existing safety barrier retained with new termination
- Existing safety barrier replaced along new alignment with new termination
- Delineator post between cycle routes

Legend

- Existing traction pole (as per topo survey)
- Existing traction pole to be removed by others (as per KiwiRail's Design)
- Proposed traction pole location (as per KiwiRail's Design)

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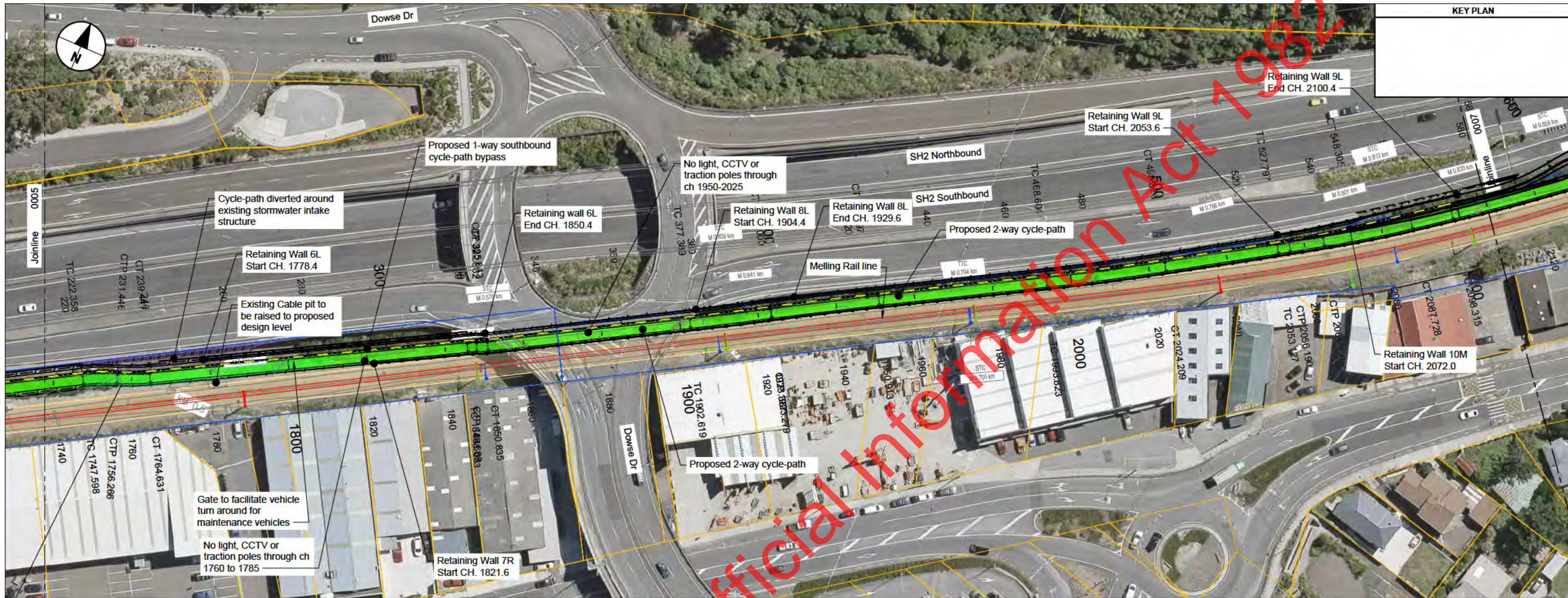
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NZ TRANSPORT AGENCY

PROJECT MANAGEMENT INITIALS		
Section 9(2)(a)		
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ISSUE/REVISION		
NO	DATE	DESCRIPTION
A	15.11.19	FOR INFORMATION ONLY
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PROJECT NUMBER
60306339
SHEET TITLE
PETONE TO MELLING
GENERAL ARRANGEMENT - PLAN
SHEET 5 OF 10
SHEET NUMBER
SK-7606





Legend

- Kiwi Rail indicative clearance envelope (3m).
- Cycle path
- Existing safety barrier retained with new termination
- Existing safety barrier replaced along new alignment with new termination
- Delineator post between cycle routes

Legend

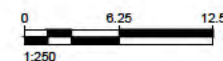
- Existing traction pole (as per topo survey)
- Existing traction pole to be removed by others (as per KiwiRail's Design)
- Proposed traction pole location (as per KiwiRail's Design)

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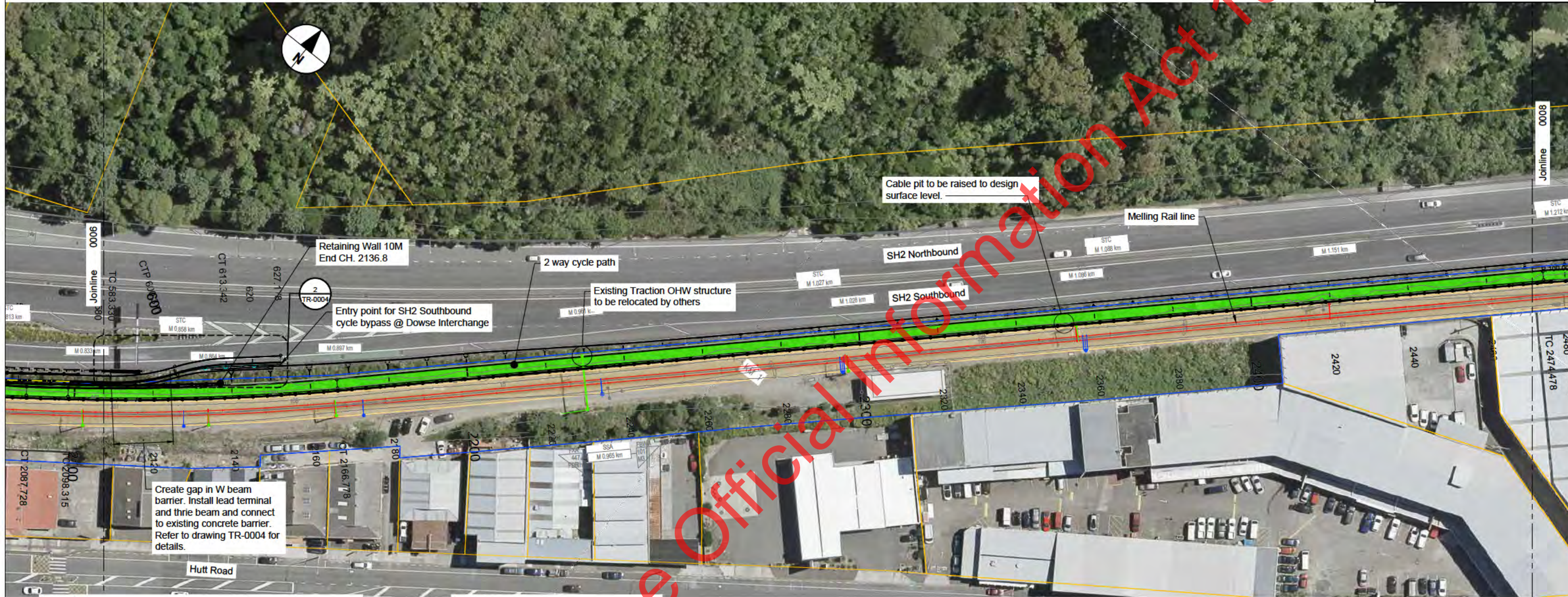
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- Legend**
- Kiwi Rail indicative clearance envelope (3m).
 - Cycle path
 - Existing safety barrier retained with new termination
 - Existing safety barrier replaced along new alignment with new termination
 - Delineator post between cycle routes

- Legend**
- Existing traction pole (as per topo survey)
 - Existing traction pole to be removed by others (as per KiwiRail's Design)
 - Proposed traction pole location (as per KiwiRail's Design)

Create gap in W beam barrier. Install lead terminal and thrie beam and connect to existing concrete barrier. Refer to drawing TR-0004 for details.

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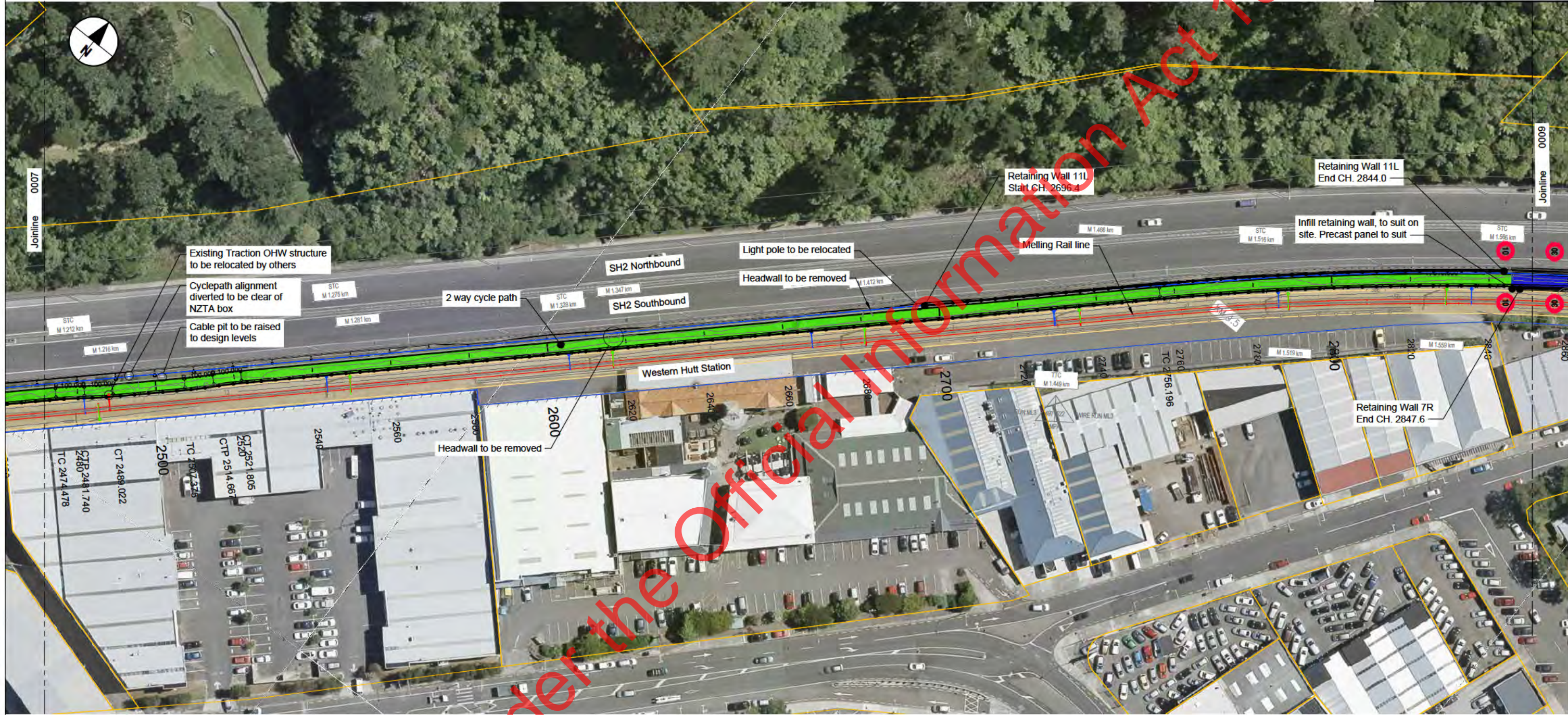
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Legend

- Kiwi Rail indicative clearance envelope (3m).
- Cycle path

Legend

- Existing traction pole (as per topo survey)
- Existing traction pole to be removed by others (as per KiwiRail's Design)
- Proposed traction pole location (as per KiwiRail's Design)

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PROJECT NUMBER

60306339

SHEET TITLE

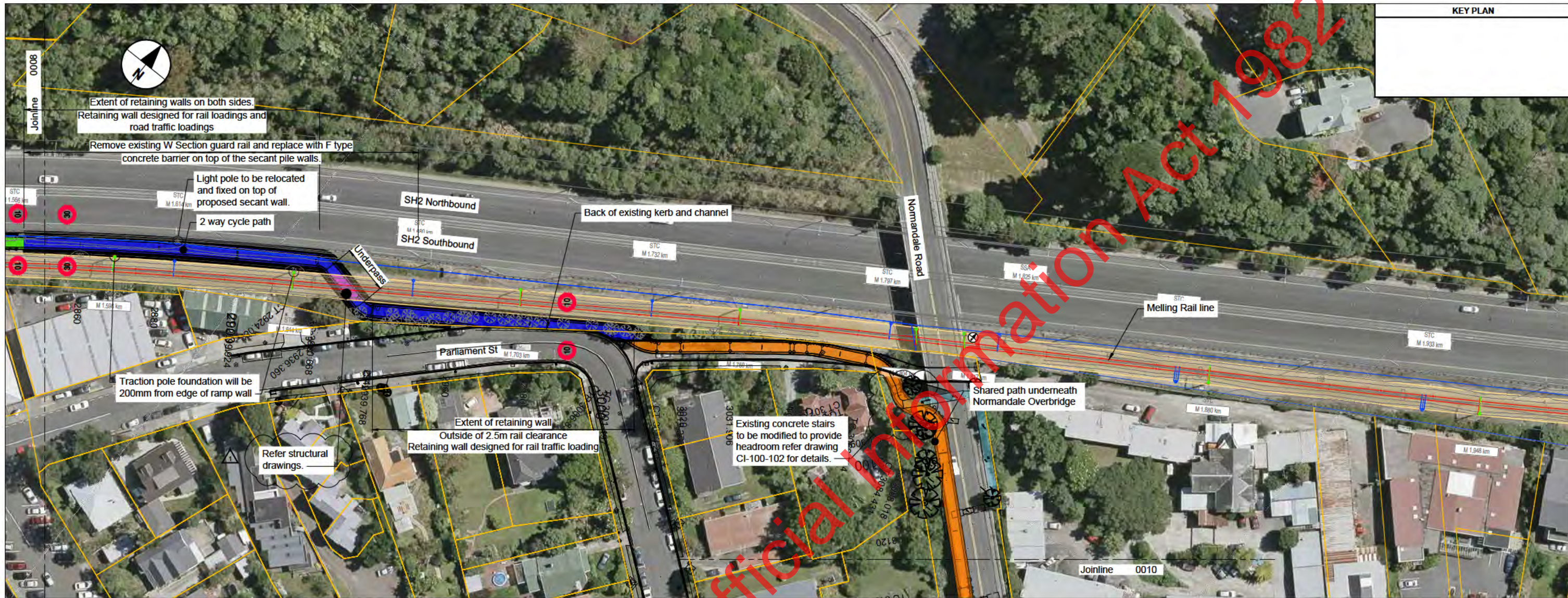
PETONE TO MELLING
GENERAL ARRANGEMENT - PLAN
SHEET 8 OF 10

SHEET NUMBER

SK-7609



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Legend

- Kiwi Rail indicative clearance envelope (3m).
- Shared path

Legend

- Existing traction pole (as per topo survey)
- Existing traction pole to be removed by others (as per KiwiRail's Design)
- Proposed traction pole location (as per KiwiRail's Design)

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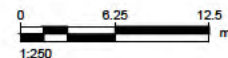
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P2M DETAILED DESIGN



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PROJECT NUMBER

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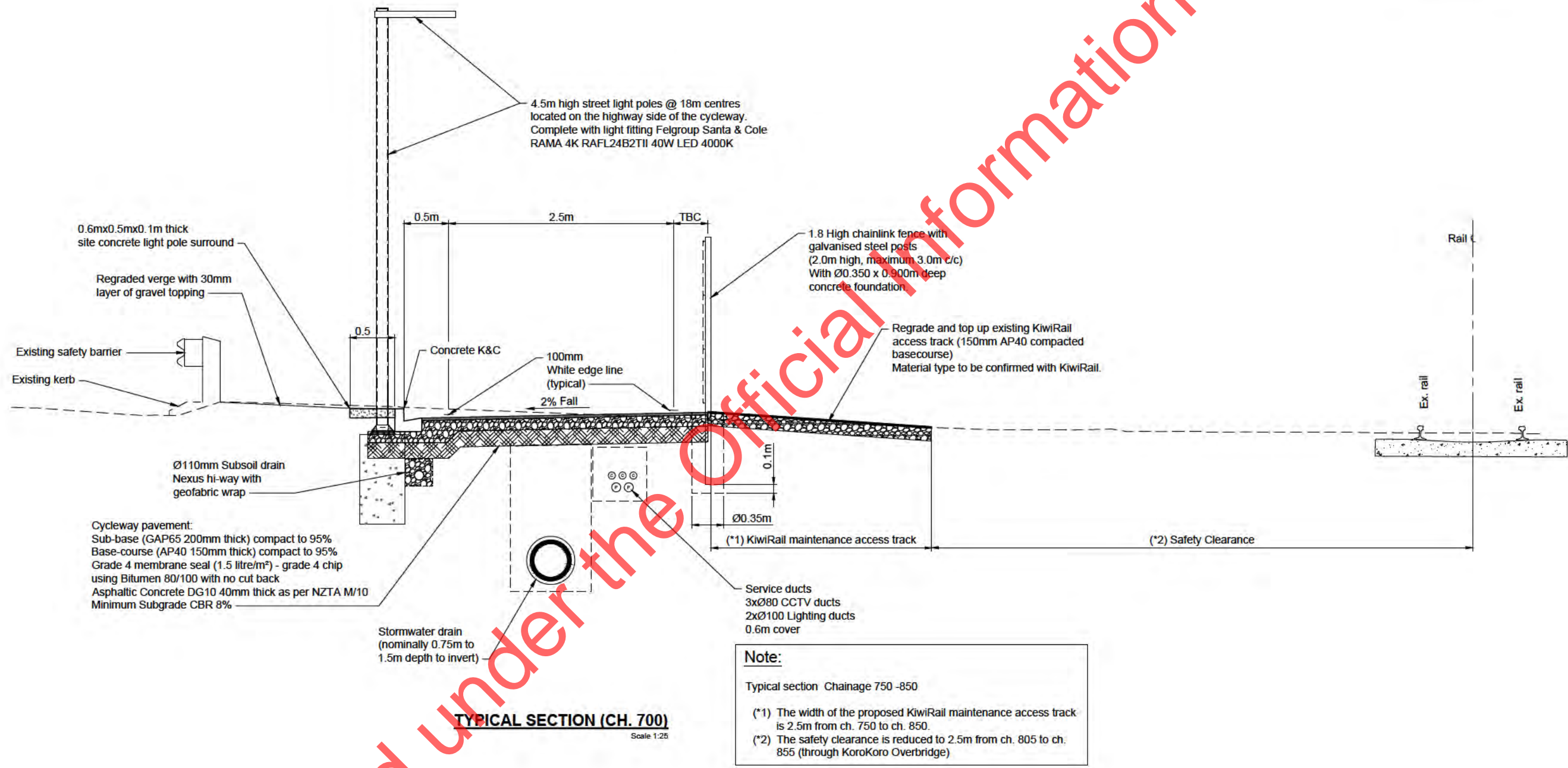
SHEET TITLE

PETONE TO MELLING
GENERAL ARRANGEMENT - PLAN
SHEET 9 OF 10

SHEET NUMBER

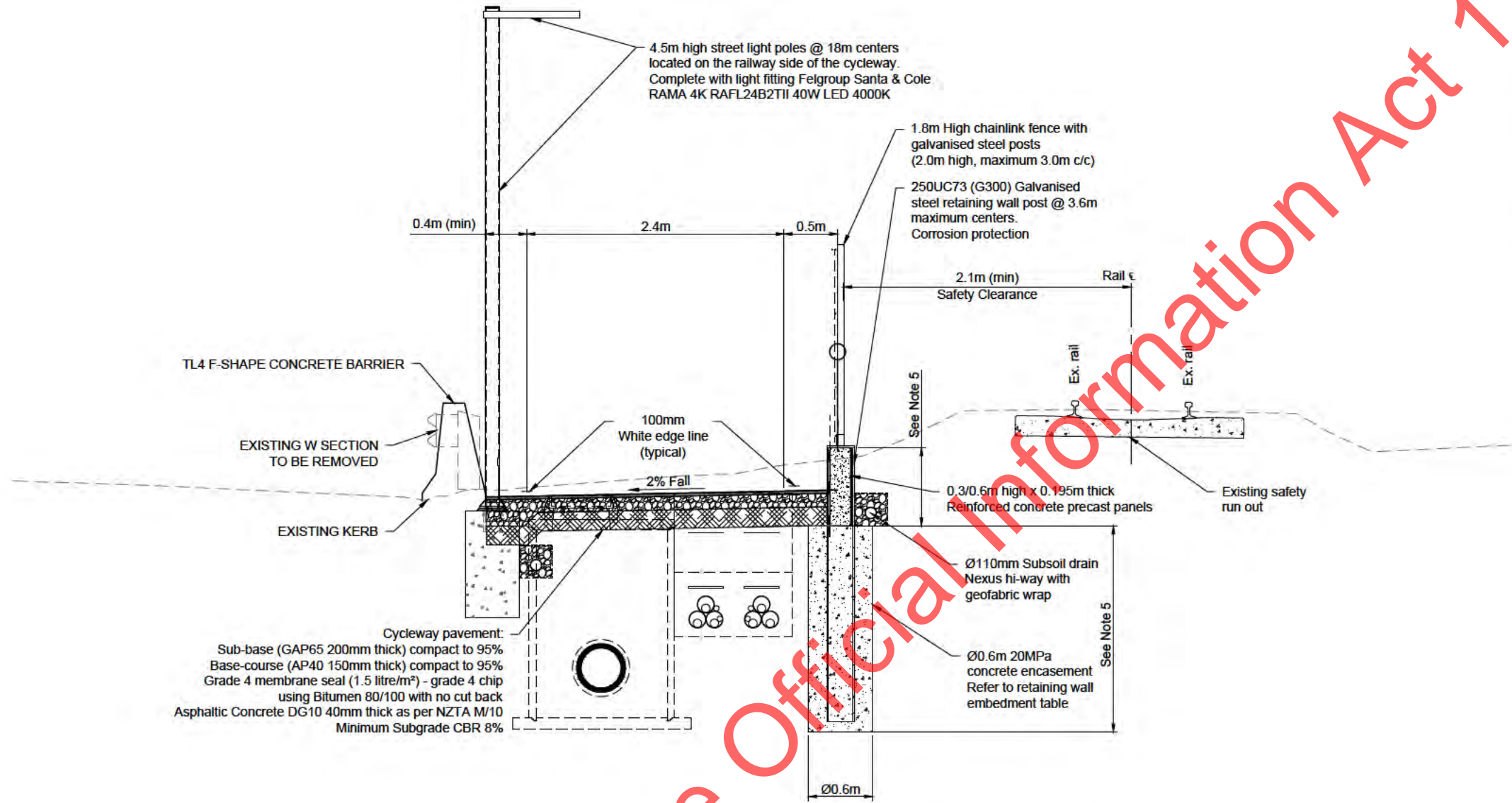
CI-0009

- Note:**
- Where access into KiwiRail corridor is to be provided pavement to be increased over approximately 10m length
 Sub-base (GAP65 200mm thick) compact to 95%
 Base-course (AP40 150mm thick) compact to 95%
 Grade 4 membrane seal (1.5 litre/m²) - grade 4 chip using Bitumen 80/100 with no cut back
 Asphaltic Concrete DG10 40mm thick as per NZTA M/10
 - Subsoil drainage to connect to nearest SW manhole
 - All fencing adjacent the rail corridor, to be erected with air breaks and earthing connections in accordance with KiwiRail requirements.



Note:
 Typical section Chainage 750 -850
 (*1) The width of the proposed KiwiRail maintenance access track is 2.5m from ch. 750 to ch. 850.
 (*2) The safety clearance is reduced to 2.5m from ch. 805 to ch. 855 (through KoroKoro Overbridge)

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TYPICAL SECTION (CH. 1270)
Scale 1:25

- Note:**
- Where access into KiwiRail corridor is to be provided pavement to be increased over approximately 10m length Sub-base (GAP65 200mm thick) compact to 95% Base-course (AP40 150mm thick) compact to 95% Grade 4 membrane seal (1.5 litre/m²) - grade 4 chip using Bitumen 80/100 with no cut back Asphaltic Concrete DG10 40mm thick as per NZTA M/10
 - Subsoil drainage to connect to nearest SW manhole
 - All fencing adjacent the rail corridor, to be erected with air breaks and earthing connections in accordance with KiwiRail requirements.
 - Fence mounting details, refer to drawing sheet ST-0031.
 - Retaining wall details, refer to drawing sheets ST-0030 to ST-0035 and ST-0037.

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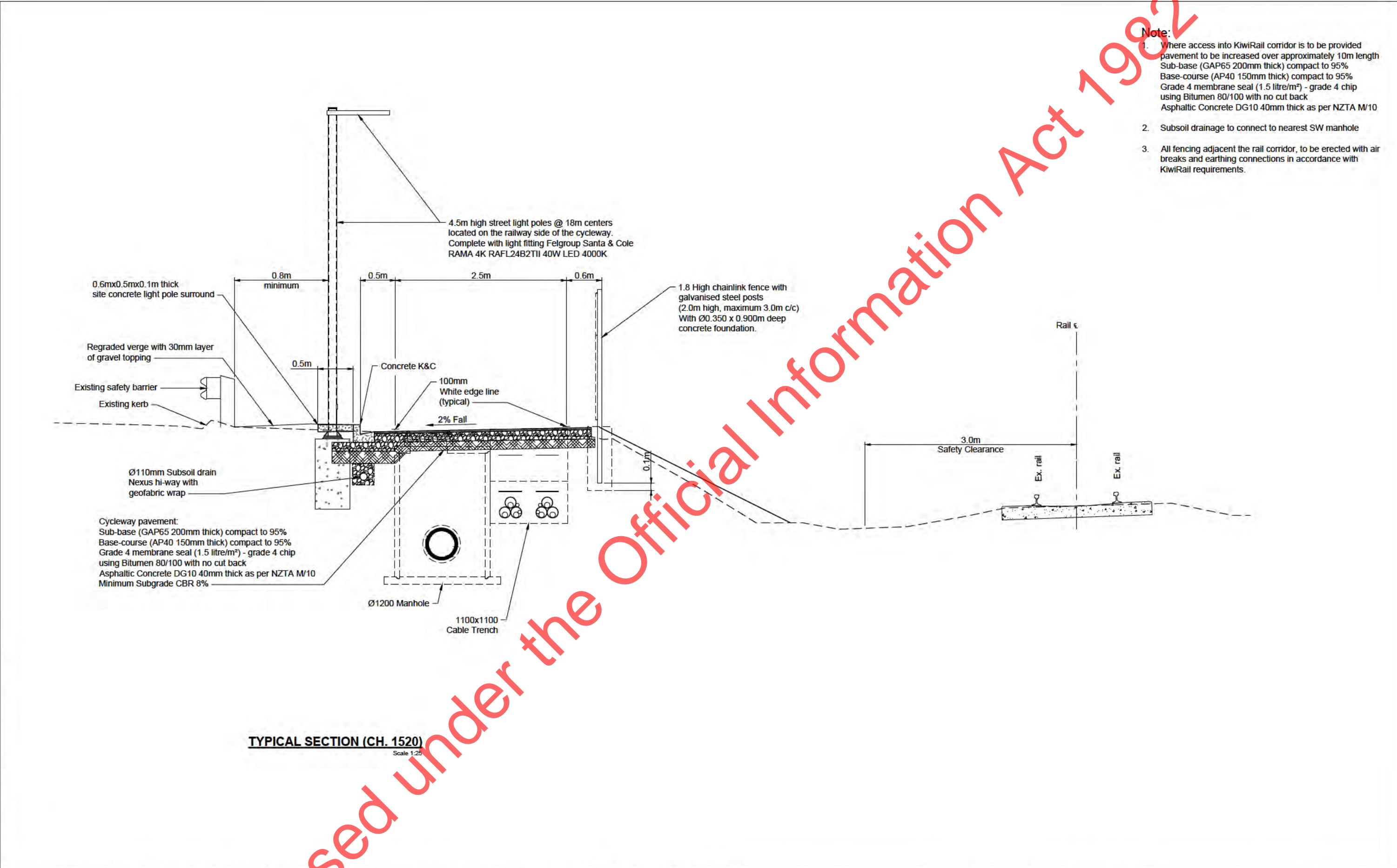
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CLIENT: WAKA KOTAHI NZ TRANSPORT AGENCY

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PROJECT NUMBER: 60306339
SHEET TITLE: PETONE TO MELLING TYPICAL CROSS SECTION CH. 1270
SHEET NUMBER: SK-7622



- Note:**
- Where access into KiwiRail corridor is to be provided pavement to be increased over approximately 10m length
Sub-base (GAP65 200mm thick) compact to 95%
Base-course (AP40 150mm thick) compact to 95%
Grade 4 membrane seal (1.5 litre/m²) - grade 4 chip
using Bitumen 80/100 with no cut back
Asphaltic Concrete DG10 40mm thick as per NZTA M/10
 - Subsoil drainage to connect to nearest SW manhole
 - All fencing adjacent the rail corridor, to be erected with air breaks and earthing connections in accordance with KiwiRail requirements.

TYPICAL SECTION (CH. 1520)

Scale 1:25

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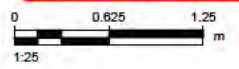


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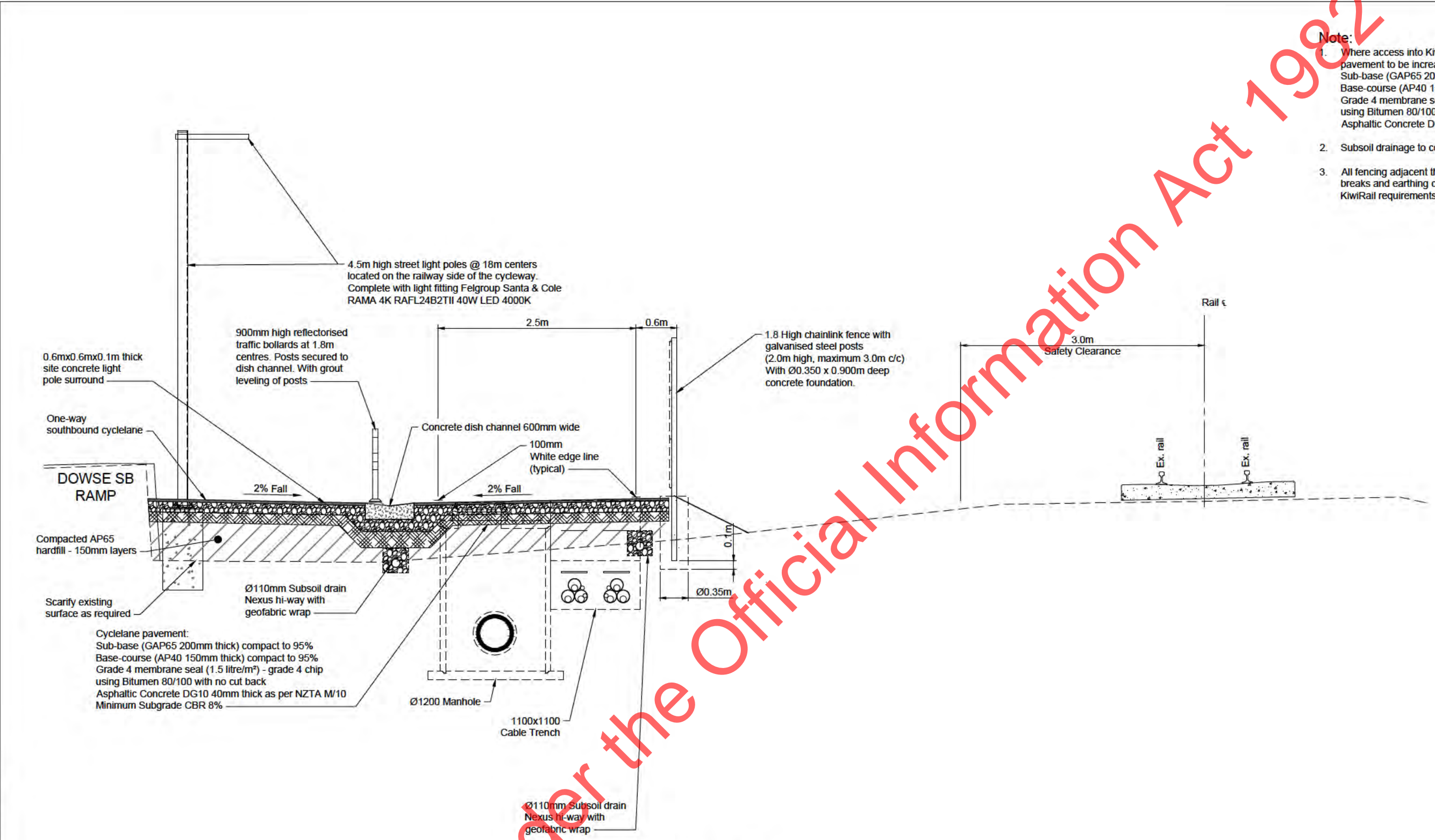
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A	15.11.10	FOR INFORMATION ONLY

PROJECT NUMBER
60306339

SHEET TITLE
PETONE TO MELLING
TYPICAL CROSS SECTIONS
SHEET 3 OF 5

SHEET NUMBER
SK-7623



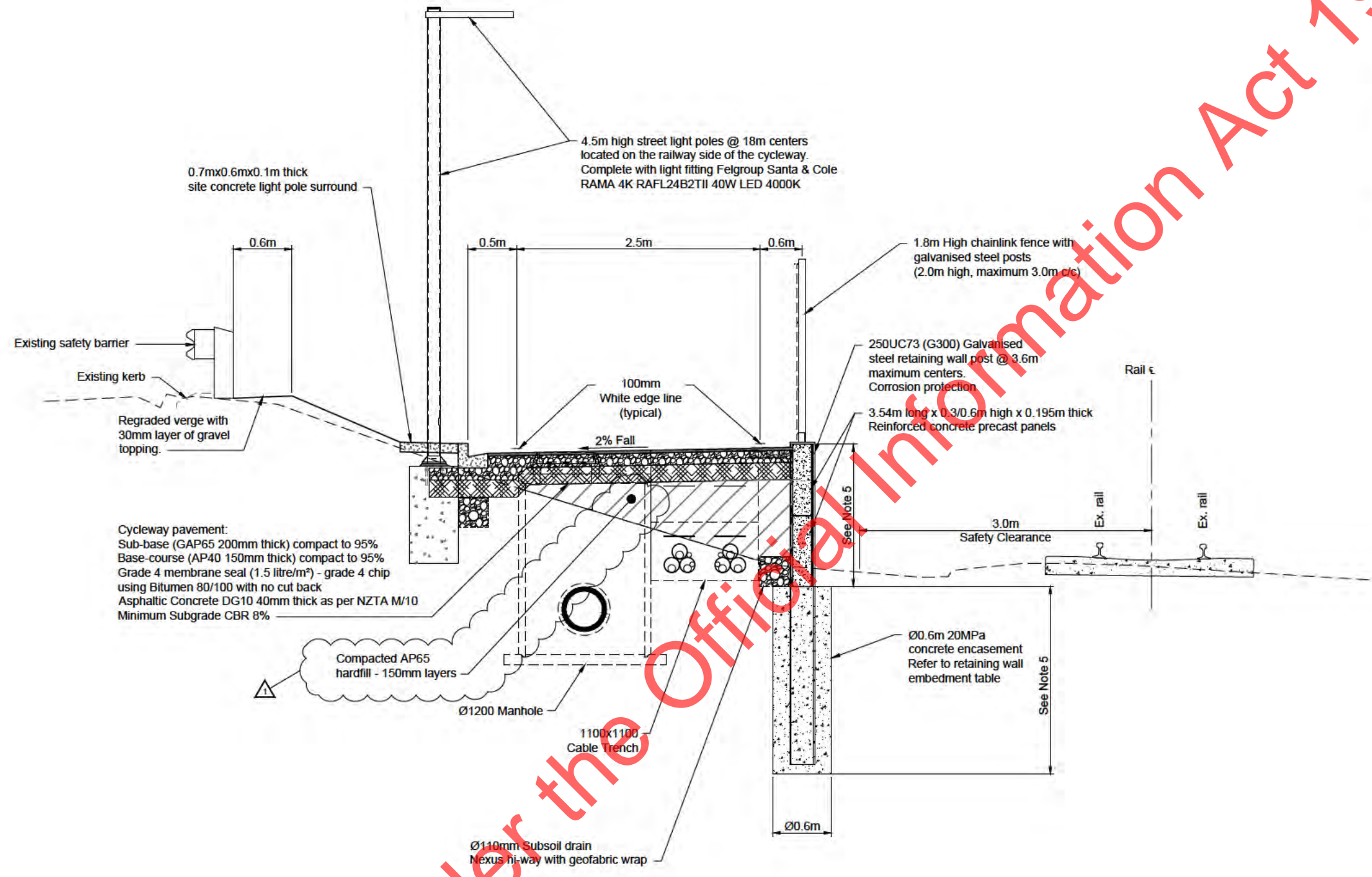
- Note:**
- Where access into KiwiRail corridor is to be provided pavement to be increased over approximately 10m length Sub-base (GAP65 200mm thick) compact to 95% Base-course (AP40 150mm thick) compact to 95% Grade 4 membrane seal (1.5 litre/m²) - grade 4 chip using Bitumen 80/100 with no cut back Asphaltic Concrete DG10 40mm thick as per NZTA M/10
 - Subsoil drainage to connect to nearest SW manhole
 - All fencing adjacent the rail corridor, to be erected with air breaks and earthing connections in accordance with KiwiRail requirements.

TYPICAL SECTION (CH. 1700)
 Scale 1:25

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TYPICAL SECTION (CH. 2220)
Scale 1:25

- Note:**
- Where access into KiwiRail corridor is to be provided pavement to be increased over approximately 10m length
Sub-base (GAP65 200mm thick) compact to 95%
Base-course (AP40 150mm thick) compact to 95%
Grade 4 membrane seal (1.5 litre/m²) - grade 4 chip using Bitumen 80/100 with no cut back
Asphaltic Concrete DG10 40mm thick as per NZTA M/10
 - Subsoil drainage to connect to nearest SW manhole
 - All fencing adjacent the rail corridor, to be erected with air breaks and earthing connections in accordance with KiwiRail requirements.
 - Fence mounting details, refer to drawing sheet ST-0031.
 - Retaining wall details, refer to drawing sheets ST-0030 to ST-0035 and ST-0037.

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