MetroWest

Portishead Branch Line (MetroWest Phase 1)

TR040011

Applicant: North Somerset District Council
5.6, Flood Risk Assessment, Part 17 of 17
Appendices P to T
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, regulation 5(2)(e)
Planning Act 2008

Author: CH2M
Date: November 2019

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Document history

Project	Portishead Branch Line (MetroWest Phase 1) Development Consent Order Scheme
Planning Inspectorate Scheme Reference	TR040011
Volume and Application Document Reference	5, 5.6
Document title	Flood Risk Assessment, Part 17 of 17, Appendices P to T: Appendix P EA consultation response Appendix Q NSLIDB consultation response Appendix R DCO application information Appendix S Design drawing cross sections with flood levels Appendix T Flood Plans
Regulation Number	Regulation 5(2)(e)
Applicant	North Somerset District Council
Lead Author	RB at CH2M

Version	Date	Status of Version
Rev: 01	12/11/19	Application Issue

MetroWest

Portishead Branch Line (MetroWest Phase 1)

TR040011

Applicant: North Somerset District Council
5.6, Flood Risk Assessment,
Appendix P Environment Agency consultation response
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, regulation 5(2)(e)
Planning Act 2008

Author: CH2M
Date: November 2019

NetworkRail · West of England Local Enterprise Partnership · West of England Combined Authority · HM Government · Bath & North East Somerset Council · Bristol City Council · North Somerset Council · South Gloucestershire Council · travelwest

MetroWest Phase 1, Flood Risk Assessment: Consultation meeting with EA

ATTENDEES:	Dave Pring, Nigel Smith (EA) James Willcock, Jason Reading, Doug Barker (NSC)	Nick Lake, Neil Earnshaw (NR) Robert Bird (CH2M HILL)
COPY TO:	Rachel Leighfield (NR) Richard Bull (EA) Dan Alsop, Giles Oliver (NSLIDB)	Carolyn Francis, Mike Barker (CH2M HILL)

PREPARED BY: Robert Bird
DATE: 09 May 2014
PROJECT NUMBER: 490327

Introduction and summary of proposal

MetroWest Phase 1 is part of a wider rail improvement proposal in the South West, in the vicinity of Bristol. Some of the MetroWest Phase 1 works can be undertaken under Network Rail's (NR) permitted development rights and the remainder will require Development Consent Order (DCO) approval. The works requiring DCO approval include:

- Restoration of disused passenger railway line between Portishead and Pill
- Construct new station and car park at Portishead
- Reinstate Pill platform and construct associated new station building and car park
- New pedestrian and farm track crossings of railway between Portishead and Pill

Associated works (for which Network Rail can apply its permitted development rights) include:

- Upgrade of existing Portbury freight line to accommodate passenger trains
- Improvement works at Bathampton junction
- Reinstate double track at locations near Ashton Gate (currently single track)
- Widening of track west of Pill to take double track (currently single track)

Action (JW): Send Environment Agency (EA) further details of the proposed MetroWest Phase 1 works which can be undertaken under NR permitted development rights.

Data

RB has requested the EA's FRA Product 4 dataset to cover the area between Portishead and Pill (i.e. covering the DCO area). This request is outstanding.

Action (NS): RB also requested that the EA Product 4 spatial data (e.g. flood maps, defences, model node locations) are provided in GIS format as well as the usual pdf format. NS will follow this up with the EA staff providing the FRA Product 4 data.

EA modelled flood levels and flood maps in the vicinity of the DCO area are based on NAFRA results (i.e. not based on detailed modelling). The EA does not have any detailed flood models of watercourses in the vicinity of the DCO area.

Other EA data includes:

Severn Estuary tidal flood model (the EA would raise a significant fee for use of this model and simpler methods could be used instead e.g. assuming a tidal condition applied to 2D model representation of the study area)

River Avon modelled flood levels (assumed part of FRA Product 4)

Historic flood outlines (assumed part of FRA Product 4)

As built levels for new tidal flood defence at Portishead

FRA requirements and design constraints

NPPF vulnerability classification

The EA Flood Zone Map indicates parts of the disused railway between Portishead and Pill are within Flood Zone 3b.

The proposed restoration of the disused railway between Portishead and Pill would be classified as either *Essential Infrastructure* or *Less Vulnerable* National Planning Policy Framework (NPPF) development type. If the development were classified as *Essential Infrastructure* it would be required to remain operable during extreme flooding – which may not be achievable under projected climate change and sea level rise. If the development were classified as *Less Vulnerable* it would be considered by NPPF to be an inappropriate development type for Flood Zone 3b.

The EA was unable to commit to a stance on classification of the development type during the meeting, and would need to speak with the North Somerset Council (NSC) planning officer first. Require meeting/discussion (EA, NSC planner, NSC MetroWest Phase 1 project team) to agree direction.

Action (DP): Arrange for EA to speak with NSC planning officer to agree approach regarding NPPF vulnerability classification.

It may be difficult to ensure the proposed restored line remains operable during extreme floods (under projected climate change and sea level rise) as raising the level of the line is generally not an option, due to a minimum headroom requirement for the railway line under existing road bridge crossings. It may in fact be necessary to lower the line by up to approx. 300mm at some road bridge crossing locations to provide head room allowance for future electrification of the railway line. It was noted that NR is generally opposed to service disruption.

If the line cannot be designed to be safe during future extreme flooding the design should be resilient to ensure rapid re-opening following any line closure due to flooding.

Flood Risk, design constraints, opportunities

The Sequential Test for the DCO application should be a formality as the future restoration of the Portishead to Pill passenger railway is identified in NSC Core Strategy (adopted March 2013) and there are no realistic alternative locations for the railway line.

NS identified that key flood risks are from tidal flooding and tide locking of inland drainage.

The EA does not have fluvial hydraulic models within the study area (i.e. Drove Rhyne, Sandy Rhyne and Portbury Ditch). NS noted that fluvial hydraulic modelling may be required to support the FRA.

The proposed design should retain existing EA maintenance access routes to maintain watercourses. **Action (DP):** The EA will provide a map showing existing EA maintenance access tracks along the disused railway alignment.

A new tidal defence was constructed at Portishead to defend new housing from tidal flooding to a 200-year standard of protection. The EA has not yet adopted the new tidal defence as there are structural problems with the defence. The defence was designed by ARUP for Persimmons Homes. The EA can provide 'as-built' drawings. **Action (NS):** Provide as-built levels of new tidal defence to RB.

The design will follow a sequential approach with vulnerable equipment (e.g. electrical) placed in areas at lowest risk or raised (where feasible).

Tidal defence levels will be compared to projected future flood levels to assess whether tidal flooding modelling is required or not.

Existing culverts under the disused railway on Drove Rhyne (and possibly elsewhere) are in poor condition. The MetroWest Phase 1 design phase will assess which culverts need improvement. NS stated the drainage design should provide betterment e.g. through clearing blockages of existing drainage channels and culverts.

Drainage of the disused railway track will be improved by the design. The existing ballast (partly blocked with debris) will be replaced with new ballast (with a screening membrane to reduce debris accumulation). The restored railway line will therefore not increase impermeable area.

The existing railway ditches (adjacent to and parallel to the disused railway line) will be cleared of debris and vegetation to restore their function, and capacity improved if required.

The existing culverts under the disused railway will be cleared/restored/replaced as necessary to allow adequate drainage through them and ensure they are structurally sound. Since the EA consultation meeting reported here, a further consultation meeting has been held on 8th May 2014 with North Somerset Levels Internal Drainage Board (NSLIDB). NSLIDB consider the enlargement of any culvert under the disused railway to be an improvement and also noted that since the construction of the disused railway line (in approx. 1860?) local drainage catchments are likely to have changed due to, for example, the construction of the M5 motorway and the Portbury 100 road. NSLIDB recognise that it may appropriate to simplify the drainage arrangements, e.g. replacing multiple culverts with a single culvert in some locations. If culverts are enlarged as part of the design, the downstream channel capacity will be reviewed. NSLIDB consider ensuring future maintenance of drainage ditches and culverts to be a significant issue.

Railway line operation during floods - **Action (NL):** NL will advise on maximum water depth above the railway line for which the railway would still be considered operable.

The design life of the proposed railway (for future flood risk assessment under projected climate change) may be as long as 160 years. **Action (NL):** NL will advise on design life. For a design life longer than 100 years, the climate change assessment will be undertaken for 100 years acknowledging that long term climate change projections are very uncertain and for a design life longer than 100 years it is likely that any required additional mitigation measures (e.g. tidal defence upgrades) would be undertaken in the future if considered necessary. For long term (100-year) climate projections the results of applying the NPPF guidance and EA 2011 guidance will be compared.

DB stated access to Pill station during floods could be an issue (to be explored as part of the design).

DB noted that broad scale modelling indicates there is an existing surface water flooding problem at Monmouth Road, Pill, i.e. near the location of the proposed Pill station car park. It is possible that railway line drainage (not represented in the broad scale modelling) may address this. **Action (NL):** NL will review the existing railway drainage design at this location.

NSC's Sustainable drainage advice for developers (April 2014) states: *It is anticipated that Flood and Water Management Act 2010 (Schedule 3) will come into force in October 2014 and will require developers to apply for, and gain approval for sustainable drainage systems through the SuDS approval body (SAB) on new and redevelopment sites.* It is therefore likely that the Portishead and Pill stations and car parks drainage designs will require NSC SAB approval. Since the meeting NSC has provided DEFRA's *Draft National Standards for Sustainable Drainage.* NSC would refine the surface water drainage requirements when more details of the proposed stations and car parks are available (spatial extent and proposal details).

NS stated that the EA requirements for surface water drainage would be for 'betterment' for a 100-year return period 6-hour duration storm. I.e. no increase in surface water flows and volumes, and no worsening of water quality, compared to the pre-development situation (brownfield or greenfield as appropriate).

There are no specific groundwater flooding problems identified in the DCO area. Infiltration may be poor in some locations due to historic power station ash land fill. There is some landfill gassing adjacent to the DCO site. **Action (DP):** DP will provide locations of the (two) landfill sites.

Action (NS): The EA will provide the EA tidal model flood outline and levels/depths in GIS format for the 200yr and 1000yr tidal events (no model results are available allowing for projected climate change).

Timetable

The DCO is a 3 year process. NSC expects to achieve consents/approvals by the end of 2017 and opening of the railway in approx. May 2019. The FRA is expected to be submitted with the DCO application in approx. Dec 2015.

Action (DP): EA consultation response is normally within 21 days - but EA will try to provide response more quickly. **Post meeting request – please can the EA provide a consultation response on all aspects of the application (as well as the FRA consultation response).**

Action (NL): Send EA draft GRIP 1/2 drawings to the EA before Weds 7th May to assist EA in preparing consultation response.

Additional Queries

Action (RB): Send DP the list of additional questions raised by Mike Barker relating to Water Framework Directive assessment requirements, any other EA initiatives, etc.

A construction and Environmental Management Plan will be appended to the EIA.

Summary of actions

JW: Send Environment Agency (EA) further details of the proposed MetroWest Phase 1 works which can be undertaken under NR permitted development rights.

NS: RB requested that the EA Product 4 spatial data (e.g. flood maps, defences, model node locations) are provided in GIS format as well as the usual pdf format. NS will follow this up with the EA staff providing the FRA Product 4 data.

DP: Arrange for EA to speak with NSC planning officer to agree approach regarding NPPF vulnerability classification.

DP: The EA will provide a map showing existing EA maintenance access tracks along the disused railway alignment.

NS: Provide as-built levels of new tidal defence to RB.

NL: Advise on maximum water depth above the railway line for which the railway would still be considered operable.

NL: Advise on design life of proposed new railway.

NL: NL will review the existing railway drainage design near Monmouth Road, Pill.

DP: DP will provide locations of the (two) landfill sites.

NS: The EA will provide the EA tidal model flood outline and levels/depths in GIS format for the 200yr and 1000yr tidal events (no model results are available allowing for projected climate change).

NL: Send EA draft GRIP 1/2 drawings to the EA before Weds 7th May to assist EA in preparing consultation response.

DP: EA consultation response is normally within 21 days - but EA will try to provide response more quickly. **Post meeting request** – please can the EA provide a consultation response on all aspects of the application (as well as the FRA consultation response).

RB: Send DP the list of additional questions raised by Mike Barker relating to Water Framework Directive assessment requirements, any other EA initiatives, etc.

Mr Robert Bird
CH2M HILL
Burderop Park
Swindon
Wiltshire
SN4 0QD

Our ref: WX/2014/125769/01-L01
Your ref:

Date: 28 July 2014

Dear Mr Bird

PROPOSED RE-COMMISSIONING OF DISUSED RAILWAY BETWEEN PORTISHEAD AND PILL (METRO WEST PHASE 1)

I refer to our meeting on 2 May 2014 and our subsequent discussions/ correspondence regarding the above proposal.

We have now received North Somerset Council's formal acceptance of our information offer dated 19 June 2014. Accordingly, please find hereunder the Agency's response in respect of the submitted details. We would be pleased to advise further when additional information becomes available.

FLOOD RISK

This proposal must be supported by a robust flood risk assessment (FRA) that clearly articulates the flood risks to the development and its operation, both in terms of current and future risks. It is important to note that although the position of the Shoreline Management Plan is to 'hold the line' through this tidal cell, this is subject to central government funding. Accordingly, the requisite FRA must not rely on this position as a mitigation argument.

In our opinion tidal flooding of this low lying area and fluvial flooding/tide locking of the Drove Rhyne presents the main flood risks to the development. Currently, the tidal defences from Portbury Wharf to the Drove Rhyne outfall are privately owned and operated by Persimmon Homes as part of the redevelopment of Portishead Marina. As discussed, it was previously agreed through the planning process that we would operate and maintain these tidal assets however, this has not been possible due to structural problems with certain elements of the scheme i.e. the wall that forms part of the inland bund. For information, we are currently awaiting design drawings from Persimmon's consultants Arup, detailing their proposals to resolve this matter. Accordingly, it is not considered appropriate to forward the previously requested 'as built' levels, at this stage.

During our meeting Network Rail made it very clear that they will require a flood resilient railway line that remains operational during flood events. As discussed, this requirement will impact on the flood risk vulnerability classification of the proposal, which should be agreed with the Local Planning Authority. In view of Network Rail's stated requirements, and the indicated area of Flood Zone 3b (Functional Floodplain) it would appear that compliance with the National Planning Policy Framework (NPPF) will necessitate an 'Essential Infrastructure' classification. Due to the construction and operational difficulties such a designation would apparently present, further discussions between all relevant parties will be required.

The FRA will be required to quantify the tidal risks for the development's design life, which we currently understand to be 160 years. Accordingly, reference must be made to the climate change guidance in the NPPF and the latest Environment Agency guidelines dated 2011. This is an important matter that could influence the direction of mitigation works today and in the future. To assume the worst case scenario i.e. defence issues are not resolved prior to the submission of the DCO application, the FRA will need to consider this potentially higher risk and a suite of options that achieve the necessary protection to meet NPPF and Networks Rail requirements. It is advisable that North Somerset Council's transport and planning department continue to assist the Agency in the resolution of this flood risk infrastructure. We can confirm that there will be no charge for the use of our tidal model to assist your investigations, subject to a licence agreement. It would therefore be advisable to agree the extent of the model required and the scope of the modelling.

The Drove Rhyne, Portbury Ditch and Markham Brook all fall within the red line of the development boundary. The main risk will be from the Drove Rhyne as it is physically crossed by the line through a series of culverts. The catchment is steep in its upper slopes to the south of the motorway and responds quickly to intense rainfall; in addition the natural drainage has been modified heavily as a result of the motorway widening. To the north of the motorway there is little gradient and the tide is prevented from progressing inland due to our tidal flap valve. As advised, tide locking of watercourses does occur and should therefore be included, in terms of the mitigation approach for the development.

The proposal should be viewed as an opportunity to investigate and improve the Drove Rhyne culverts at the head of the Main River under the existing line, which are understood to be structurally unsound or blocked. The weight of the new railway line and the requirement to achieve flood resilience objectives could be viewed as an opportunity to improve the channel alignment by the Portbury A369. Unfortunately, we do not hold any flood level data for any of the above watercourses other than the historic flood data included in the Product 4 request. We would advise that a hydraulic modelling exercise is carried out for the Drove Rhyne, to quantify the flood risk and further inform the flood risk designation and culvert works to improve conveyance.

Please find attached a plan that shows our current access route along the Drove Rhyne for weed cutting along the left bank. Our future access to the inland bund via the B3124 is to the left of Sheepway Gate Farm.

Attenuation will be necessary to offset the new impermeable areas up to the 1 in 100 year rainfall event, with an appropriate allowance for climate change. We would expect the inclusion of sustainable drainage methods to assist in, inter alia, improving water quality. North Somerset Council should consider appropriate opportunities to improve local drainage in conjunction with the Agency and the IDB. This could be through the improvement of ditches or the main channels, which again could be identified through the modelling work.

During the meeting Network Rail explained that their business plans are to have a resilient design and that they have a policy statement outlining what this means. This is particularly relevant when considering the winter flooding on the Somerset Levels and in Dawlish. It was understood that it was an action on Network Rail to provide this information to allow further discussion/understanding however, this was not included in the meeting notes.

WATER QUALITY

As requested, please find attached a plan indicating the position of all known discharge consents and their associated outlets in the area.

Please note, careful consideration must be given to the proposal's potential impact on local water resources. Accordingly, a detailed Construction Environmental Management Plan and Operational Method Statement will be required.

BIODIVERSITY

- Water Framework Directive (WFD)

Five water bodies (WBs) have been identified as being at risk of impact as a result of the proposal, these are: the Portbury Ditch, Easton in Gordano Stream, Markham Brook, Drove Rhine and the Severn Estuary. The applicant will be expected to provide a WFD assessment illustrating the potential impacts, how these impacts could affect the water body status and to suggest appropriate avoidance/mitigation measures. Much of the assessment will be covered in the EIA, therefore it should be a relatively simple desk-based exercise to provide the additional WFD assessment. As such it is not acceptable to provide an Environmental Impact Assessment /Environmental Statement in lieu of a WFD assessment; a separate WFD assessment should be provided.

The applicant is reminded that they are responsible for illustrating that the proposed works will not cause a deterioration in, or prevent the future improvement of WFD status. If required we can provide additional advice and guidance in respect of this issue. Information on the current WFD status and factors influencing the status of the water bodies can be gained through a formal information request. Under such circumstances, it is suggested that the following information would be of particular use:

- Current WFD status of the above listed WBs
- Where there is a failure, what elements are driving this classification?

- What variables are driving elemental failure?
- What measures have been suggested/are in place for improvement?

- Protected Species Surveys

A number of protected species have been recorded in the vicinity of the proposed development, including the following; Water Vole, Great Crested Newt, European Eel, Hazel Dormouse, Grass Snake and Adder. Appropriate protected species assessments and suggested mitigation will therefore need to be incorporated into the EIA/ES.

- Protected habitats

The rivers which may be impacted by this development feed into the Severn Estuary which is designated as SSSI, SPA, SAC and Ramsar site. In addition some of the land adjacent to the development is designated as Flood Plain and Grazing Marsh. As such the applicant should consult with Natural England on the potential impacts and mitigation for these sites.

- Value of disused railway as habitat

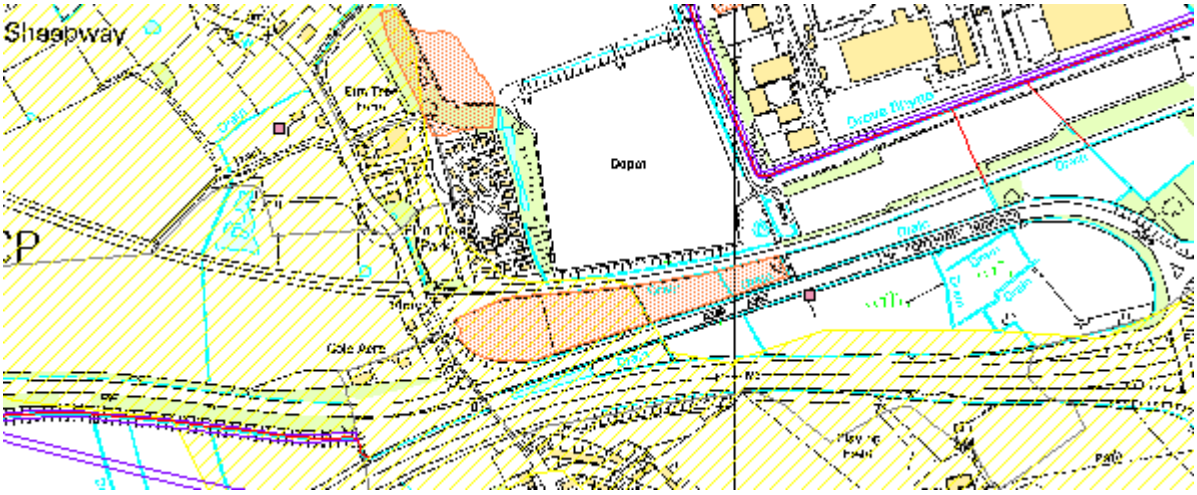
There is evidence to suggest that disused railways become important habitat and wildlife corridors for a range of animals and insects. As such, assessment of the proposed development area and compensatory habitat should be carefully considered.

WATER RESOURCES

Following an assessment of local water resources, we can advise that there are no issues regarding water resources availability along the proposed route. Additionally, there are limited abstractions in the vicinity of the site.

LANDFILL.

As discussed, our records indicate that there are two historic landfill sites within 250m of the proposed route (highlighted in orange hereunder).



The site to the north, known as Elm Tree Farm, Portbury (Ref: 0100/0052) is located at ST 4960 – 7590. The gassing status of the site is ‘unknown’.

The southern site, known as Priory Farm, Portbury (Ref: 0100/0189) is located at ST 4980 – 7560. The gassing status of the site is ‘high risk’.

Landfill gas consists of methane and carbon dioxide, which is produced as the waste in the landfill site degrades. Methane can present a risk of fire and explosion. Carbon dioxide can present a risk of asphyxiation or suffocation. The trace constituents of landfill gas can be toxic and can give rise to long and short term health risks as well as odour nuisance.

The risks associated with landfill gas will depend on the controls in place to prevent uncontrolled release of landfill gas from the landfill site. Older landfill sites may have poorer controls in place and the level of risk may be higher or uncertain due to a lack of historical records of waste inputs or control measures.

On the 22nd of June 2007 the local authority was forwarded a CD containing all the historic landfill data we hold, including the historic landfill sites within 250m of the proposed development. Accordingly, the local authority's Environmental Health and Building Control departments should be consulted in respect of this matter, in particular any requirement to assess the potential for sub-surface migration of landfill gas.

WASTE REGULATION

Excavated material arising from development works can sometimes be classified as waste. For further guidance on how waste is classified, together with best practice for its handling, transport, treatment and disposal please see our waste pages at:

http://www.environment-agency.gov.uk/business/topics/waste/default.aspx

If any waste is to be used on site, the applicant will be required to obtain the appropriate waste exemption or permit from the Agency. We are unable to specify what exactly would be required (if anything) due to the limited information provided.

If any controlled waste is to be removed off site, the site operator must ensure a registered waste carrier is used to convey the waste material off site to a suitably permitted facility. Further information is available at:

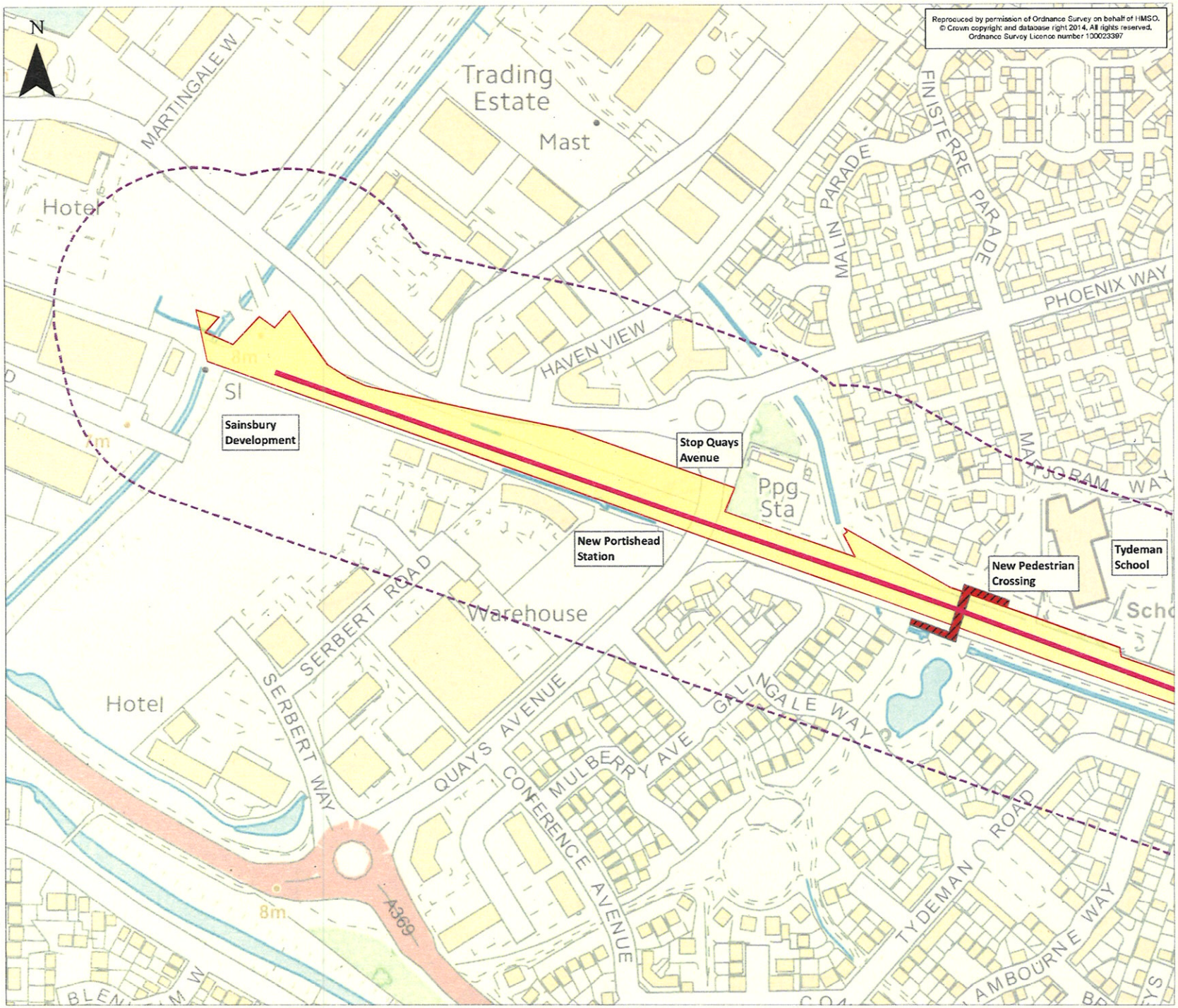
www.environment-agency.gov.uk/subjects/waste.

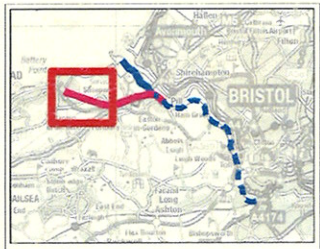
Should you wish to discuss these issues further please contact me direct.

Yours sincerely

Mr Dave Pring
Planning Specialist
Sustainable Places

Direct dial 01278 484627
Direct fax 01278 452985
Direct e-mail dave.pring@environment-agency.gov.uk





KEY

- 100m radius
- Red line boundary
- Portishead to Pill DCO Application Area
- New Pedestrian Crossing

DCO Study Boundary

- North Somerset Council

Client
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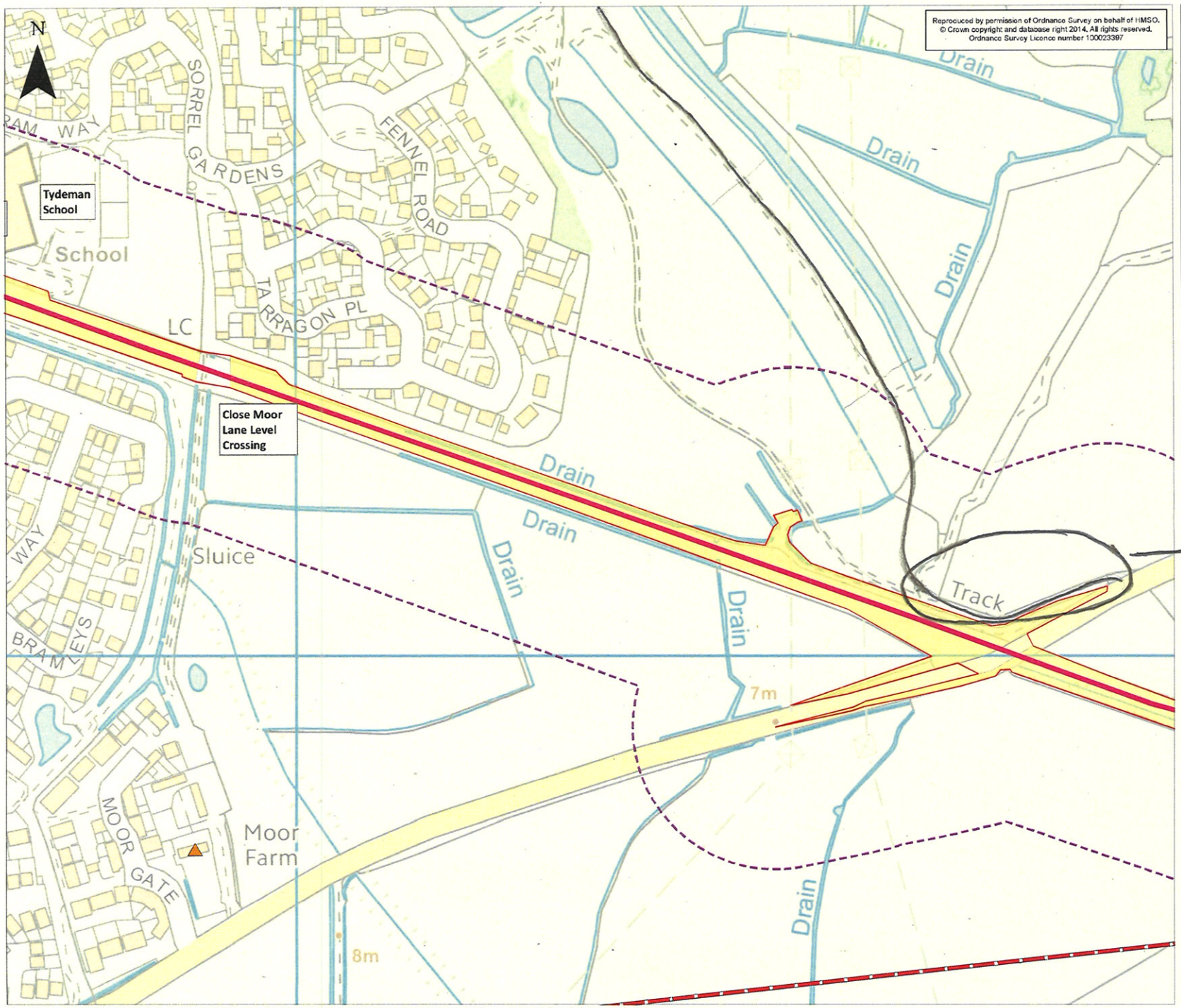
Project
METROWEST PHASE 1

Drawing :
FIGURE 2.2: PORTISHEAD TO PILL DCO APPLICATION SITE & ENVIRONMENTAL CONSTRAINTS 1 of 8

Drawn By :	Tim Hughes	Date: 30/04/2014
Checked By :	Emily Earing	Date: 30/04/2014
Approved By :	Carolyn Francis	Date: 30/04/2014

Drawing No. : 490327-008-001 - A
Revision -
Drawing Scale : 1:2,500



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Project
METROWEST PHASE 1

Drawing :
FIGURE 2,3: PORTISHEAD TO PILL DCO APPLICATION SITE & ENVIRONMENTAL CONSTRAINTS 2 of 8

Drawn By :	Tim Hughes	Date: 30/04/2014
Checked By :	Emily Earing	Date: 30/04/2014
Approved By :	Carolyn Francis	Date: 30/04/2014

Drawing No. : 490327-008-001 - B
Revision -
Drawing Scale : 1:2,500

DRG no 1 of 1

DO NOT SCALE

KEY TO SYMBOLS

Working Routes

Access Routes

Utility Information

Gas

Water

BT and Other Communications

Overhead

Underground

Electric

Overhead

Underground

Vegetation Maintenance

No Flail, WB2

H/Cut, No WC

M1, No WC

M1, W1

M3, No WC

M4, No WC

M4, W1

M4, W2

ME2, No WC

ME2, W2

ME2, W6

MS2, No WC

Mowing Dry Channels, -

X, X

NOTES

1. THE INDICATION OF A SERVICE ON THIS DRAWING IS BASED ON THE BEST AVAILABLE INFORMATION, BUT THE LOCATION CANNOT BE GUARANTEED.

2. THE INTENDED USE OF THIS DRAWING IS FOR WEEDCUT/FLAILING WORKS ONLY

Environment Agency

PROJECT

NORTH WESSEX VEGETATION MAINTENANCE UPDATE 2012

TITLE

UTILITIES INFORMATION
DROVE RHYNE
SHEET 1 of 1

Royal HaskoningDHV
Enhancing Society Together

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Peterborough PE3 8DW
44 (0) 1733 334455
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DRAWN	CHECKED	PASSED
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DATE	CLIENT REF	VALID UNTIL
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DRAWING NUMBER **1 of 1** REVISION 0

Portishead - Discharge Consents and Outlets

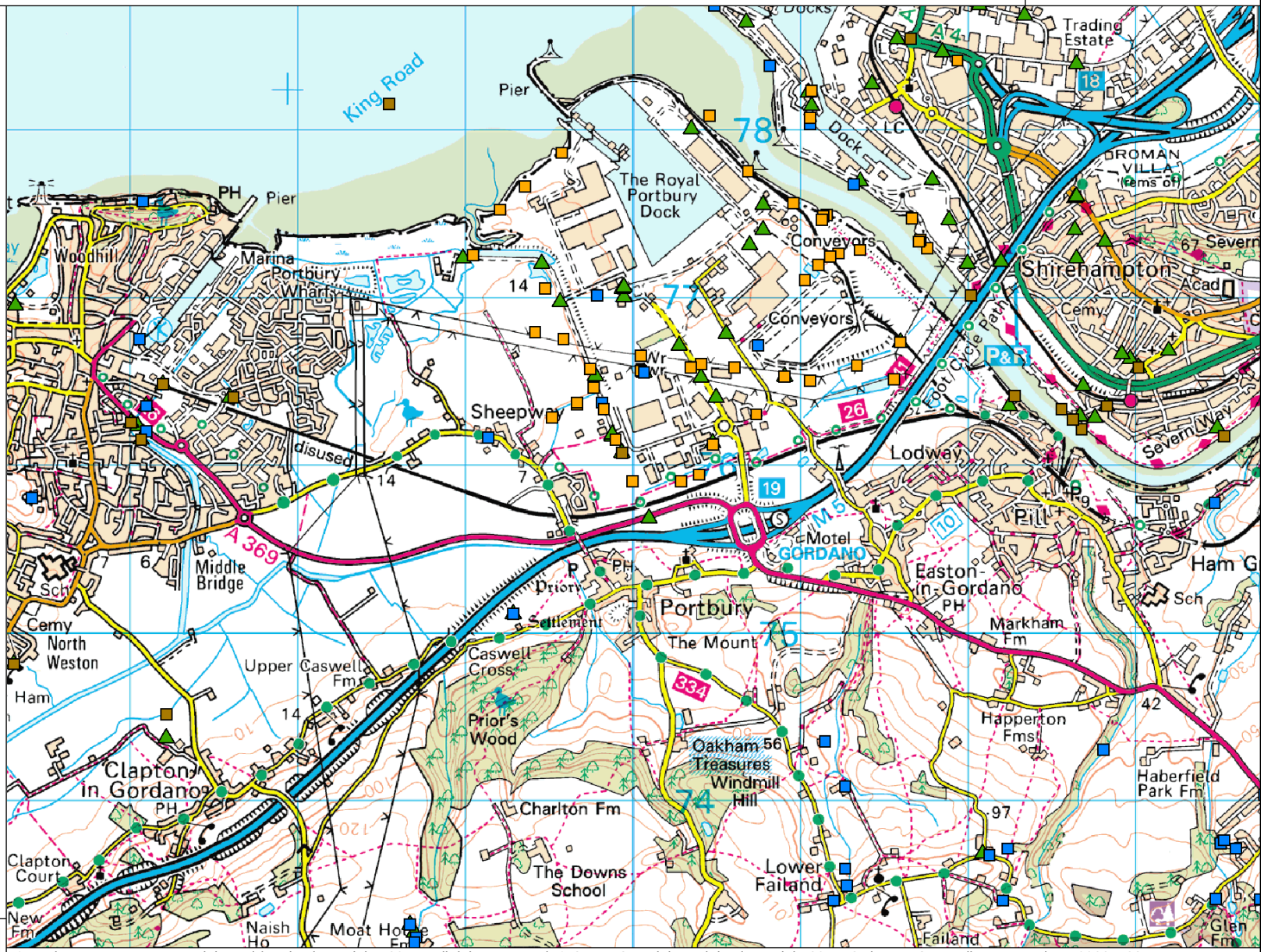
Environment Agency

Legend

WIMS Active Discharge Consents Outlets

- Agriculture
- Miscellaneous
- Sewage Outlet - not from Water Companies
- Sewage Outlet - from Water Companies
- Sewage and Trade combined
- Trade
- Waste Site

WIMS Active Discharge Consents



0 325 650 975 m.

N W E S

MetroWest Phase 1, Flood Risk Assessment: Consultation meeting with EA (revised DCO area)

ATTENDEES:	Dave Pring, Nigel Smith (EA) James Willcock, Steve Penaluna, Doug Barker, Ann-Marie Wood (NSC) Tom Meyrick (BCC)	Stuart Haskins (NR) Robert Bird (CH2M HILL)
COPY TO:	Rachel Leighfield Finch, Neil Earnshaw (NR) Matthew Sugden (BCC) Dan Alsop, Giles Oliver (NSLIDB)	Carolyn Francis, Mike Barker, Caroline Frost (CH2M HILL)

PREPARED BY:	Robert Bird
DATE:	Draft minutes finalised 23 Jan 2015 (meeting held on 10 Dec 2014)
PROJECT NUMBER:	490327

FRA requirements and design constraints

There is an outstanding risk: If parts of the proposed MetroWest scheme are within Flood Zone 3b then the DCO hearing panel will decide if the scheme is considered appropriate development (Less Vulnerable development is usually considered inappropriate for Flood Zone 3b).

Drove Rhyne – works may provide opportunity to deliver wider benefits (e.g. in consultation with IDB)

Pill Tunnel historic problem with drainage and water quality – now rectified – SH to send associated reports. Grip 2 report includes remedial measures e.g. reed beds. A drainage issue affected the other tunnel (towards junction) approx. 2 years ago – SH will provide more information.

SUDS (e.g. surface water drainage of stations and carparks) – NSC expects SUDs to meet draft standards. Will need to confirm/agree drainage strategy with NSC (also BCC and other authorities as appropriate)

Network Rail - noted that following the winter 2013/14 Somerset Levels railway closures due to flooding, lines were operational within approx. 1 day of flood levels subsiding (remedial works were not required). Depth of flooding is not usually an issue – flowing water is more problematic.

NS – important for FRA to provide understanding of likely frequency and duration of potential flooding and detail processes e.g. triggers for operational actions (e.g. flood level 100mm below top of rail – monitor, flood level at top of track – action?)

FRA should understand design changes and impact on flood risk – e.g. electrics/signal boxes to be raised above flood level

Relationship to other schemes – JW to circulate drawings/information for other schemes (Ashton Vale to Temple Meads bus scheme, Bus Rapid Transit scheme)

NS – is there information on the proposed height and footprint along the MetroWest DCO alignment? JW will provide the GRIP 2 report to the EA (this includes drawings along the whole route).

Markham Brook – current flood risk modelling is probably by J-flow (broad-scale and inaccurate)

SH – will provide NR information relating to the historic frequency of closure of the freight line – however operation of the freight line is more intermittent than the proposed passenger service and so information relating to frequency of line closures (or when route was inoperable) may be incomplete.

The only time SH recalls closure of the Portishead route due to flooding is during winter 2013/14 (Bristol Harbourside flooding event).

BCC River Avon model (joint EA and BCC CAFRA model) – BCC has additional models/results (compared to EA). TM will confirm BCC licensing arrangement before issuing CAFRA model data to CH2M HILL for use in this project.

NS referred to high tides observed in Sept (2014?) January 2014 and March 2014. These could be used to represent historic high spring tide levels. During Christmas 2013 there were high tide levels and high fluvial flows. NS will provide a map of river and tide gauge locations potentially relevant to the MetroWest study (it would be useful to also provide a summary of what is recorded at each gauge, the period of record and the reliability of data recorded). Relevant data can then be requested for this project.

Ashton Gate – Atkins modelled Ashton Gate channels for NSC. Flood levels should therefore be available in the Ashton Gate area. The Ashton gate culvert is flapped (i.e. the connection with the River Avon?).

NS – will provide information on EA assets in the Ashton Gate area (including information on condition)

NS – if the proposed works do not change ground levels, the FRA should detail how flooding affects operation of the railway.

NS will request that EA Product 4 information for the extended DCO area is also provided in GIS format (from Tracy Walton)

JW will prepare some text to justify development of the MetroWest scheme (Less Vulnerable development) within Flood Zone 3b – for presenting to the DCO hearing panel. The EA will then review / provide comments on this.

The requirement for the Sequential Test is as considered for the previous DCO area (i.e. Sequential Test is required but will be trivial).

DB – it will be important to understand the potential impacts of climate change and projected sea level rise (e.g. important if defences are currently 'close to tipping point').

Station design constraints – will include surface water management and safe access. IDB should be consulted as appropriate e.g. to ensure access to maintain channels is preserved.

NS – any works within 8m of Main River will require Flood Defence Consent.

DB and TM will provide updated local flood information to cover the extended DCO area. Information will also be provided on any known local flooding problems (i.e. areas where there may be opportunities to reduce local flood through the design).

There has been historic surface water flooding in Pill. The Pill station design should consider the potential for this to impact operability of the new station and safe access.

NSC is currently looking at passenger evacuation of tunnels along the DCO route. SH noted that this is unlikely to be a significant risk as the line would be closed before conditions arose resulting in a train being stranded. DP will confirm evacuation plan requirements with local authority emergency planning officer(s).

NS – needs to read the GRIP report to provide a clearer consultation response. The EA will provide a response by the end of the week (12th Dec 2014) and a supplementary response later (*EA response actually dated on 31st December 2015 – we assume this also includes the 'supplementary response'*).

Other projects requiring a DCO for which a WFD assessment was prepared include: National Grid Hinckley C project (registered with planning inspectorate). The project team should also discuss WFD assessment with Natural England.

DP will provide locations of discharge points and water availability along the DCO route. Any additional information required should be requested from the EA.

Summary of actions

Post meeting – Stuart Haskins actions are reassigned to Rachel Leighfield Finch

RLF to send reports associated with Pill Tunnel historic problem with drainage and water quality (now believed to be rectified). A drainage issue affected the other tunnel (towards junction) approx. 2 years ago – RLF will provide more information

JW to circulate drawings/information for other schemes (Ashton Vale to Temple Meads bus scheme, Bus Rapid Transit scheme) *Post meeting – JW has circulated this info*

JW will provide the GRIP 2 report to the EA (this includes drawings along the whole route). *Post meeting – JW has provided this info*

RLF will provide (to RB) NR information relating to the historic frequency of closure of the freight line

TM will confirm BCC licensing arrangement before issuing CAFRA model data to CH2M HILL for use in this project. *Post meeting – TM requested confirmation of client for data license. Client confirmed to be NSC and BCC. We are now awaiting issue of model data from BCC.*

NS will provide a map of river and tide gauge locations potentially relevant to the MetroWest study (it would be useful to also provide a summary of what is recorded at each gauge, the period of record and the reliability of data recorded).

NS will provide information on EA assets in the Ashton Gate area (including information on condition)

NS will request that EA Product 4 information for the extended DCO area is also provided in GIS format (from Tracy Walton, EA). *Post meeting – Tracy Walton indicated this request should be addressed to BCC due to model licensing arrangements.* ***RB*** *will pursue this with BCC.*

JW will prepare some text to justify development of the MetroWest scheme (Less Vulnerable development) within Flood Zone 3b – for presenting to the DCO hearing panel. The EA will then review / provide comments on this.

DB and TM will provide updated local flood information to cover the extended DCO area. Information will also be provided on any known local flooding problems (i.e. areas where there may be opportunities to reduce local flood through the design).

DP will confirm evacuation plan requirements with local authority emergency planning officer(s).

The EA (**DP**) will provide a response by the end of the week (12th Dec 2014) and a supplementary response later. Post meeting - *EA response was actually dated 31st December 2015 – we assume this also includes the 'supplementary response'.*

DP will provide locations of discharge points and water availability along the DCO route. *Post meeting – this information was provided in the EA consultation response (31/12/14).*

JW to provide available information on: Ashton Gate – Atkins modelled Ashton Gate channels for NSC. Flood levels should therefore be available in the Ashton Gate area. The Ashton gate culvert is flapped (i.e. the connection with the River Avon?). *Post meeting – South Bristol Link FRA reporting has now been provided.*

Mr Robert Bird
CH2M HILL
Burderop Park
Swindon
Wiltshire
SN4 0QD

Our ref: WX/2014/125769/02-L01
Your ref:

Date: 31 December 2014

Dear Mr Bird

METROWEST - PROPOSED RE-COMMISSIONING OF DISUSED RAILWAY (EXTENDED RED LINE – PILL TO ASHTON GATE AREA)

I refer to your consultation and our meeting on 10 December 2014 regarding the above.

We have now received North Somerset Council's formal acceptance of our information offer dated 4 December 2014. Accordingly, please find hereunder the Agency's response in respect of the submitted details. We would be pleased to advise further when additional information becomes available.

FLOOD RISK

Following our recent meeting it is understood that North Somerset Council, in agreement with Network Rail, wish to proceed on the basis that the proposed scheme will be classified as 'Less Vulnerable' development for flood risk management purposes. As we advised at the meeting, this particular flood risk vulnerability classification is not considered to be permissible in Flood Zone 3b (Table 3 NPPG).

Although it is evident from the flood mapping provided that sections of the route are above the current flood level, careful consideration must be given to the potential impact of climate change, particularly in respect of the possible effects on structural integrity and operational safety. As previously advised, the requisite FRA must be informed by Bristol City Council's CAFRA data, which details the latest flood levels for combined tidal and fluvial scenarios with and without climate change.

Accordingly, a detailed assessment of the route footprint and crest height will be required to determine potential flood depths/frequency, and inform the process of identifying appropriate mitigation and emergency/contingency measures, where applicable. Due to the stated 'Less Vulnerable' development classification, it is understood that the proposed service will not be required to remain operational during a flood event. Full details of the proposed works, including actual flood risk (with an allowance for climate change) confirmation of the development classification, closure trigger levels, mitigation and emergency/contingency measures must be detailed within the FRA.

As highlighted at our recent meeting, the proposal appears to be reliant on the resolution of existing issues regarding the tidal defences at Portishead. Clarification would be welcomed regarding any contingency proposals in the event of this long standing issue not being resolved within the MetroWest project timeframe.

As discussed, there are a series of culverts for the old and new Colliters Brook that are essential for draining the Ashton Vale valley. No additional loading must be applied in respect of the culverts, unless it is considered essential in terms of the viability of the proposed works. Under such circumstances, there could be opportunities to improve the culverts, which would necessitate culvert condition surveys.

The Agency would also appreciate additional detail regarding the treatment of the Drove Rhyne culverts.

For information, please see the attached maps (MWP1) which show where the CAFRA 3b flood zone is in proximity to the existing railway line.

As discussed, Agency schemes in the vicinity of the proposed works include the Ashton Vale tunnels and outfalls at Avon Chapel.

Under the provisions of the Water Resources Act 1991 and the Land Drainage Byelaws, the prior written consent of the Agency is required for any proposed works or structures in, under, over or within 8 metres of the bank top of the River Avon.

BIODIVERSITY

Water Framework Directive (WFD)

As previously advised, the applicant will be expected to provide a WFD assessment detailing the proposal's potential impacts, how these impacts could affect any relevant water body status and suggest appropriate avoidance/mitigation measures. Much of the assessment will be covered in the EIA, therefore it should be a relatively simple desk-based exercise to provide the additional WFD assessment. As such it is not acceptable to provide an Environmental Impact Assessment /Environmental Statement in lieu of a WFD assessment; a separate WFD assessment should be provided.

The applicant is reminded that they are responsible for demonstrating that the proposed works will not cause a deterioration in, or prevent the future improvement of WFD status. If required, we can provide additional advice and guidance in respect of this issue.

Protected Species Surveys

A number of protected species have been recorded in the vicinity of the proposed development, including the following; Otters, Water Voles, Great Crested Newts, Hedgehogs, Badgers, Dormice, Lesser Horseshoe Bats etc. Appropriate protected species surveys/assessments and suggested mitigation will therefore need to be incorporated into the EIA/ES.

Invasive Species

The presence of any invasive species along the route must be established and, if found, appropriate method statements provided, detailing how these will be dealt with to avoid a breach of the Wildlife and Countryside Act. For information, our records indicate the potential presence of, inter alia, the following species; Marsh Frog, Floating Pennywort, Winter Heliotrope, Japanese Knotweed, Giant Knotweed and Rhododendron.

Designated Sites

An appropriate assessment of the proposals potential impact on a range of designated sites must be provided. These include;

Markham Brook LWS
Severn Estuary SSSI, SAC, SPA, Ramsar
River Avon LWS (part of)
Ham Green SSSI (geological)
Avon Gorge – River Avon LWS
Avon Gorge Woodlands SAC, SSSI
Avon Gorge & Leigh Woods LWS
Portbury Wharf Nature Reserve LWS
Fields between A396 and M5 Motorway Portbury LWS
Fields between railway line and A369 Portbury LWS
Field east of M5 Motorway Lodway LWS
Field east of Court House LWS
Drove Rhyne and adjacent fields LWS

Natural England should be consulted in respect of any sites with a National/International designation. Ecological Surveys will also need to be carried out and appropriate mitigation/compensation implemented.

WATER QUALITY

As requested, please find attached the mapped positions of all known discharge consents and their associated outlets in the area of the extended route. Should you require details in respect of specific consents, please contact the Agency's customer enquiries section:

wessexenquiries@environment-agency.gov.uk

Please note, careful consideration must be given to the proposal's potential impact on local water resources. Accordingly, a detailed Construction Environmental Management Plan and Operational Method Statement will be required.

All relevant works must comply with the Agency's Pollution Prevention Guidance documents, particularly PPG1, PPG2, PPG5 and PPG6, which may be accessed through the following link:

https://www.gov.uk/government/collections/pollution-prevention-guidance-ppg

WATER RESOURCES

Following an assessment of local water resources, we can advise that the availability of water for abstraction across the four Q values is classified as ‘good’ for the whole route, with all four Q values showing as green (water available for licensing). There is one waterbody however where availability becomes restricted (see attached map WRRES).

It must be noted that if it is intended to abstract more than 20 cubic metres of water per day from a surface water source (e.g. stream or drain) or from underground strata (via borehole or well) an abstraction licence will be required from the Agency under the provisions of the Water Resources Act 1991. There is no guarantee that a licence will be granted as this is dependent on available water resources and existing protected rights.

CONTAMINATION

National Planning Policy Framework (NPPF) paragraph 109 states that the planning system should contribute to and enhance the natural and local environment by:

Preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of water pollution; and

Remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate

Government policy also states that planning policies and decisions should ensure that adequate site investigation information, prepared by a competent person, is presented (NPPF paragraph 121).

Accordingly, the Agency must advise that an appropriate remediation strategy is provided that includes the following components to deal with the risks associated with contamination of the site:

- A preliminary risk assessment which has identified:

  all previous uses

  potential contaminants associated with those uses

  a conceptual model of the site indicating sources, pathways and receptors

  potentially unacceptable risks arising from contamination at the site.

- A site investigation scheme, based on the above, to provide information for a detailed assessment of the risk to all receptors that may be affected, including those off site.

- The results of the site investigation and the detailed risk assessment referred to above and, based on these, an options appraisal and remediation strategy giving full details of the remediation measures required and how they are to be undertaken.

- A verification plan providing details of the data that will be collected in order to demonstrate that the works set out in the remediation strategy are complete and identifying any requirements for longer-term monitoring of pollutant linkages, maintenance and arrangements for contingency action.

These comments are relevant to the proposed route in its entirety.

Further information regarding this matter may be accessed through the following link:

https://www.gov.uk/government/collections/land-contamination-technical-guidance

WASTE REGULATION

As previously advised, excavated material arising from development works can sometimes be classified as waste. For further guidance on how waste is classified, together with best practice for its handling, transport, treatment and disposal please see our waste pages at:

http://www.environment-agency.gov.uk/business/topics/waste/default.aspx

If any waste is to be used on site, the applicant will be required to obtain the appropriate waste exemption or permit from the Agency. We are unable to specify what exactly would be required (if anything) due to the limited information provided.

If any controlled waste is to be removed off site, the site operator must ensure a registered waste carrier is used to convey the waste material off site to a suitably permitted facility. Further information is available at:

www.environment-agency.gov.uk/subjects/waste.

LANDFILL.

Our records indicate that there are no known landfill sites within 250m of the extended section of the proposed route.

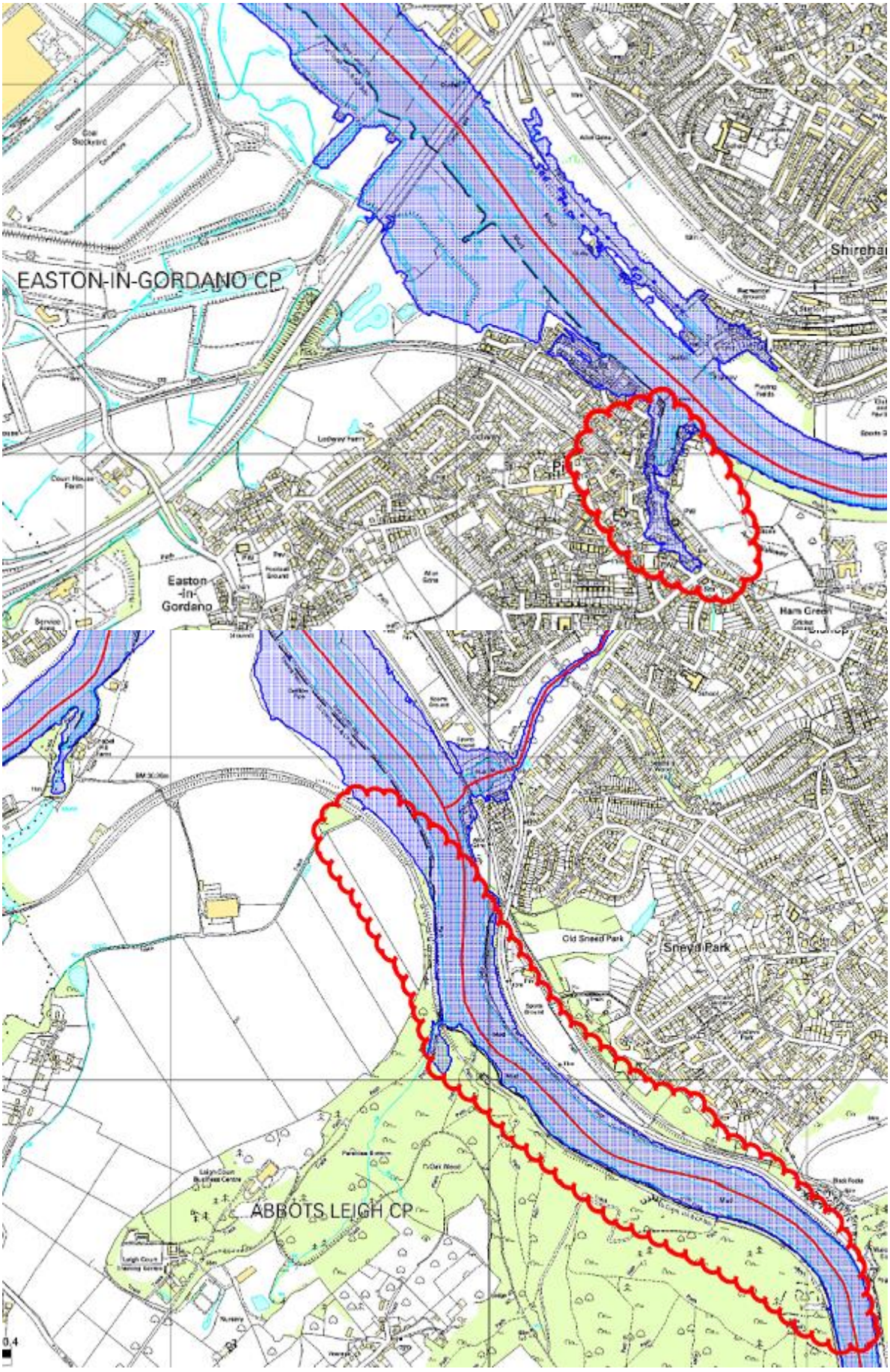
Should you wish to discuss these issues further please contact me direct.

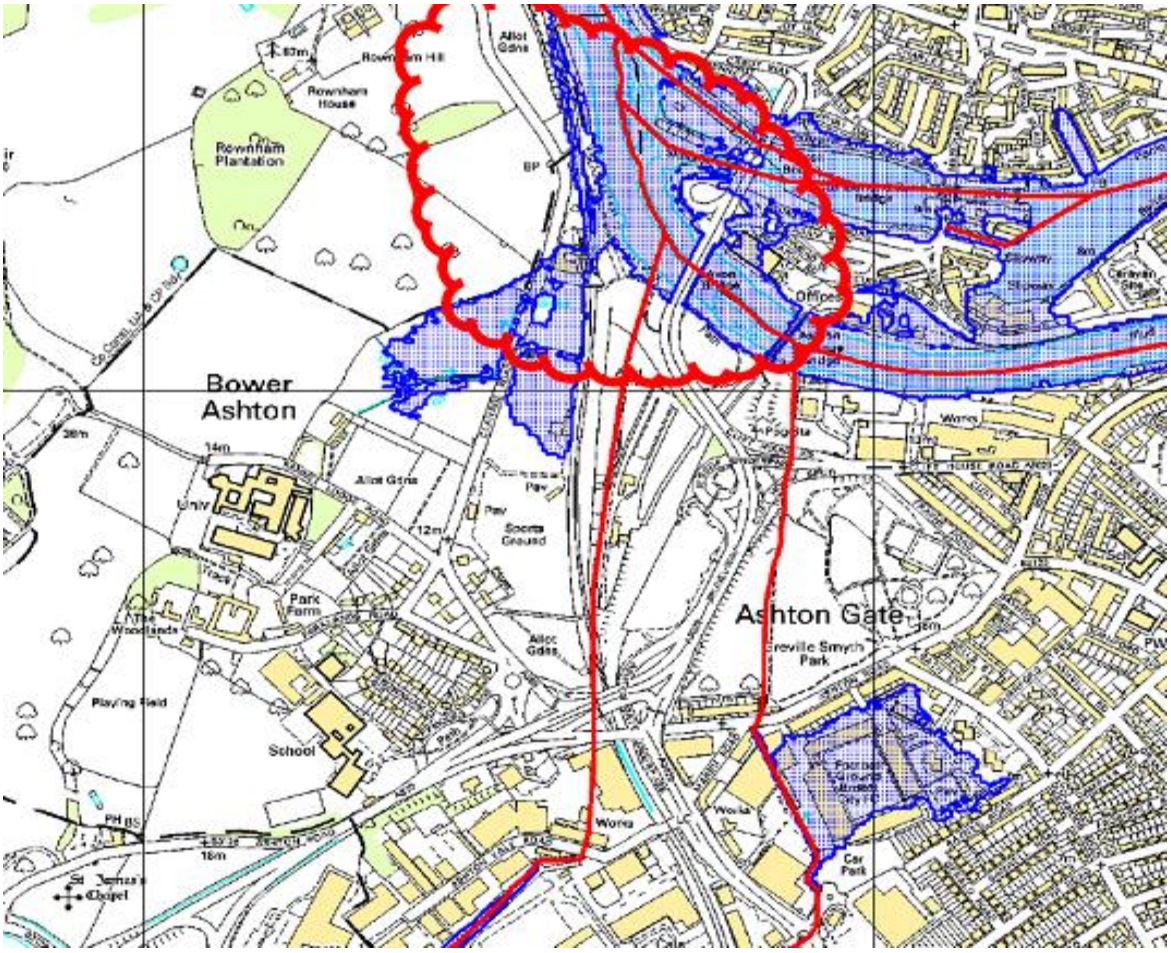
This letter should be read in conjunction with the Agency's letter dated 28 July 2014

Yours sincerely

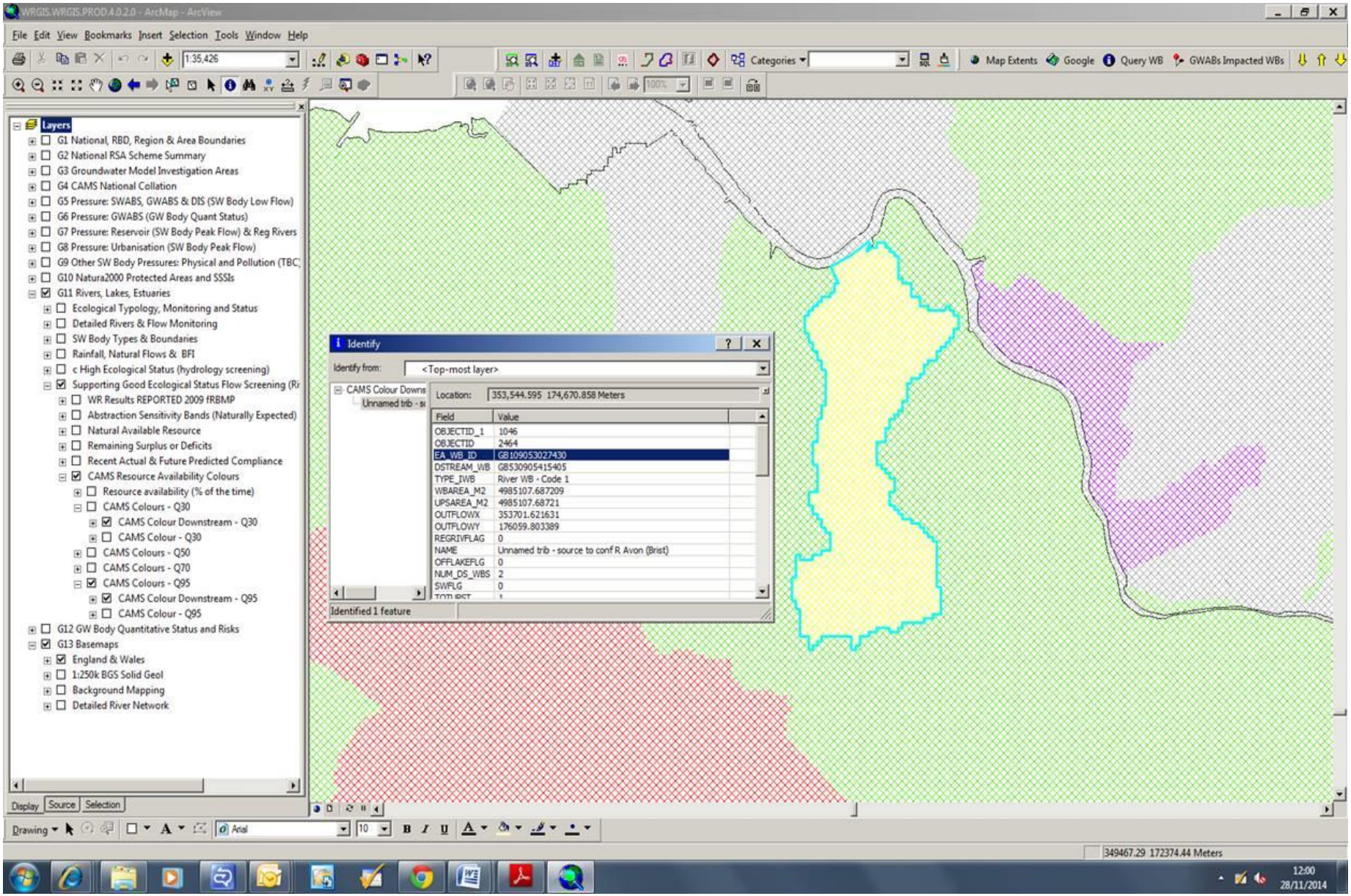
Mr Dave Pring
Sustainable Places - Planning Specialist

Direct dial 01278 484627
Direct fax 01278 452985
Direct e-mail dave.pring@environment-agency.gov.uk


EASTON-IN-GORDANO CP
Easton
-in-
Gordano
Old Sneed Park
Sneyd Park
ABBOTS LEIGH CP


Bower
Ashton
Ashton Gate
Rownham Plantation
Rownham House
Rownham Hill
Allot Gdns
Park Farm
The Woodlands
Playing Field
School
Sports Ground
Greville Smyth Park
Car Park
Works
Offices
St James's Chapel
PH
14m
12m
18m

Water Resources



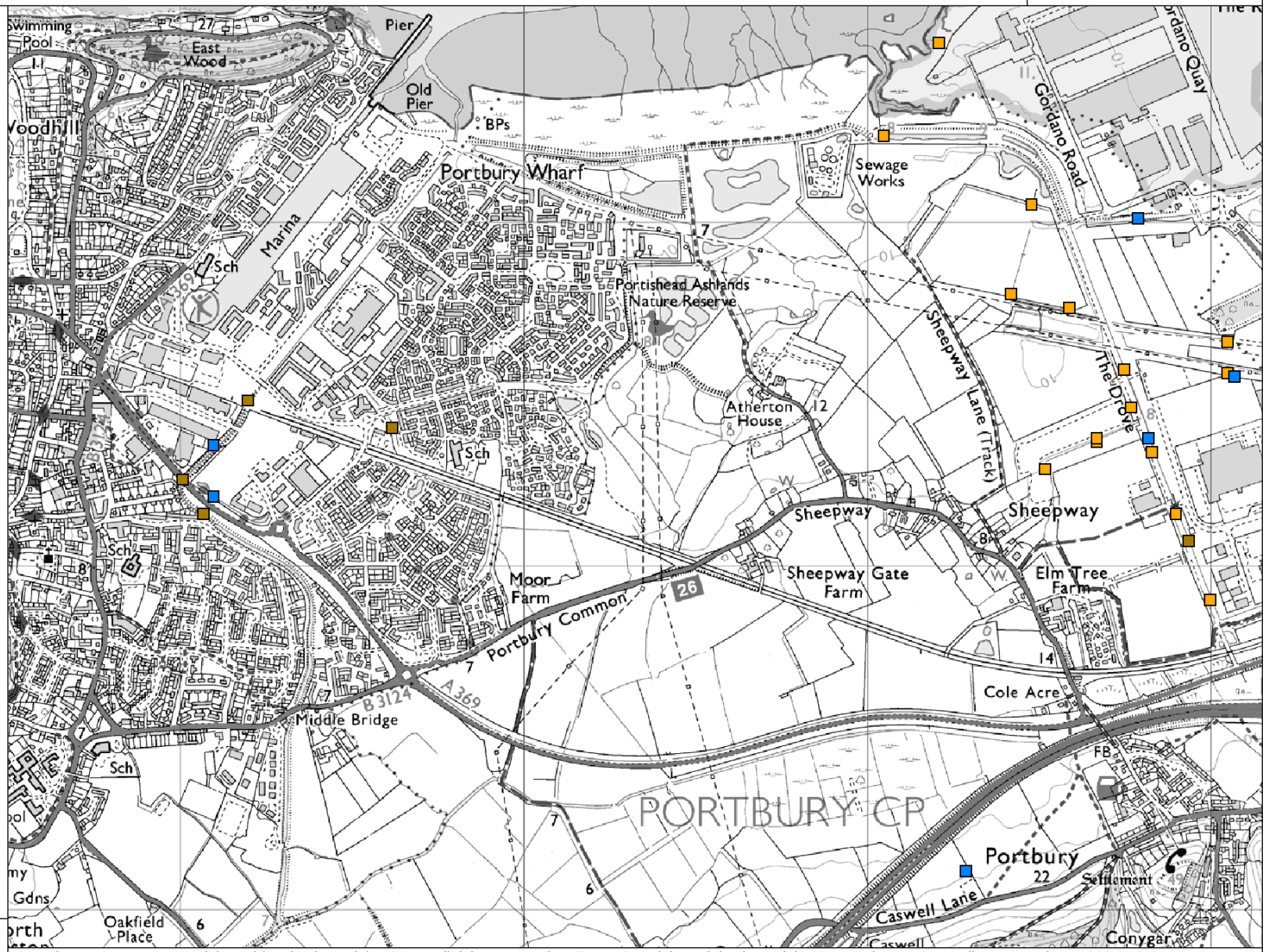
Portishead to Pill DCO Scheme. Discharge Consent Outlets 1 of 5

Environment Agency

Legend

WIMS Active Discharge Consents Outlets

- Agriculture
- Miscellaneous
- Sewage Outlet - not from Water Companies
- Sewage Outlet - from Water Companies
- Sewage and Trade combined
- Trade
- Waste Site



0 160 320 480 m.

N W E S

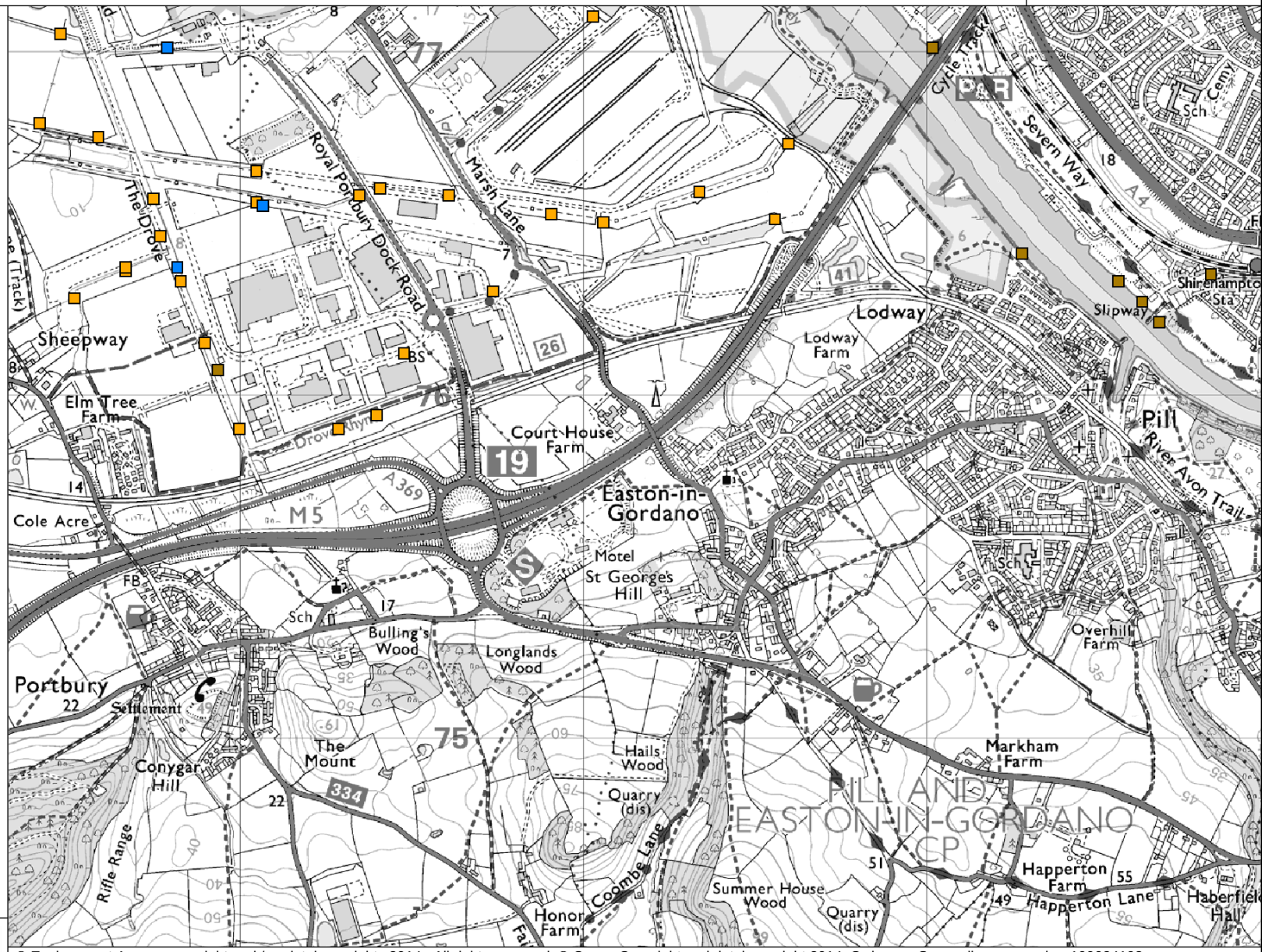
Portishead to Pill DCO Scheme. Discharge Consent Outlets 2 of 5

Environment Agency

Legend

WIMS Active Discharge Consents Outlets

- Agriculture
- Miscellaneous
- Sewage Outlet - not from Water Companies
- Sewage Outlet - from Water Companies
- Sewage and Trade combined
- Trade
- Waste Site



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N W E S

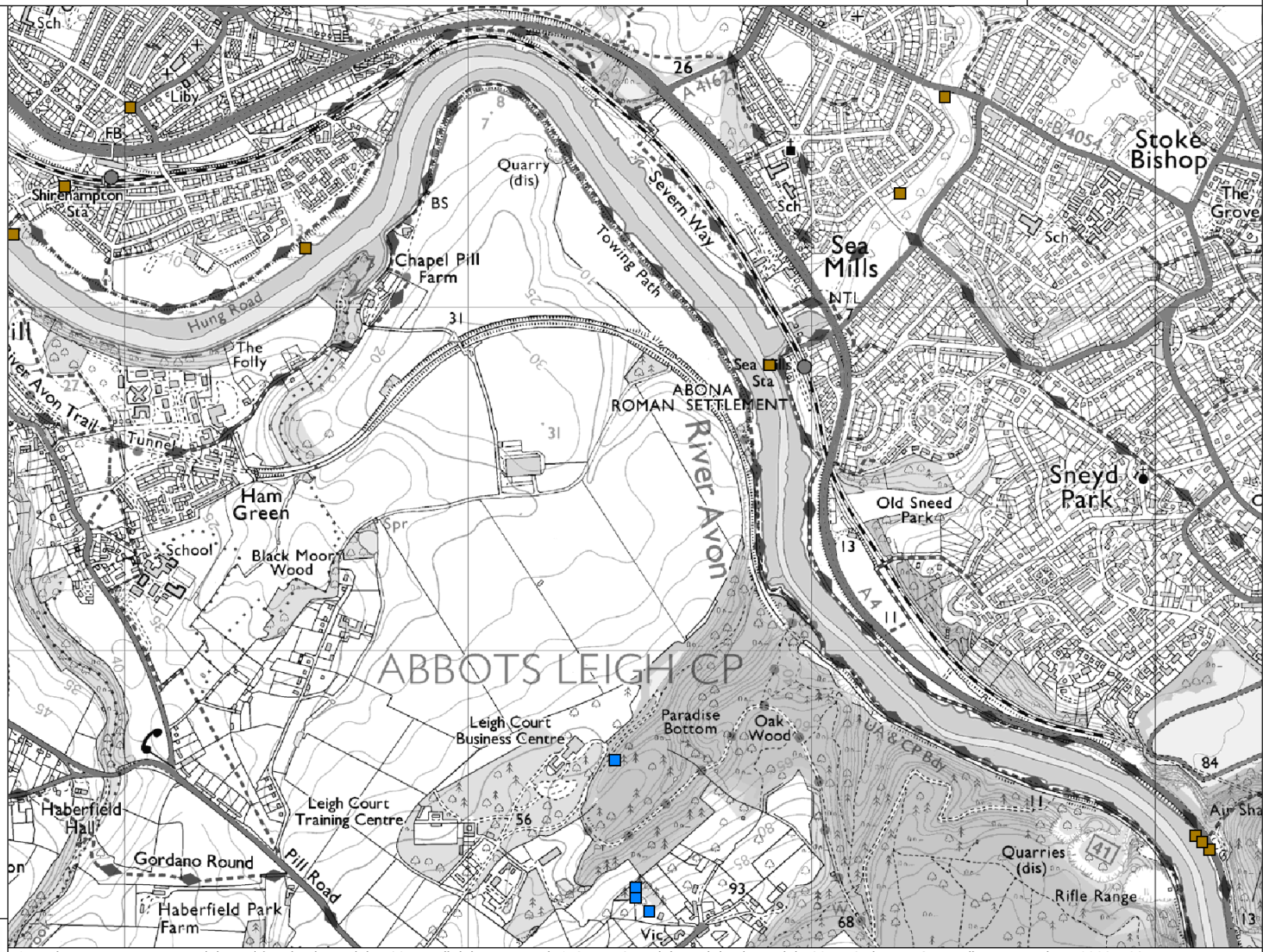
Portishead to Pill DCO Scheme. Discharge Consent Outlets 3 of 5

Environment Agency

Legend

WIMS Active Discharge Consents Outlets

- Agriculture
- Miscellaneous
- Sewage Outlet - not from Water Companies
- Sewage Outlet - from Water Companies
- Sewage and Trade combined
- Trade
- Waste Site



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N W E S

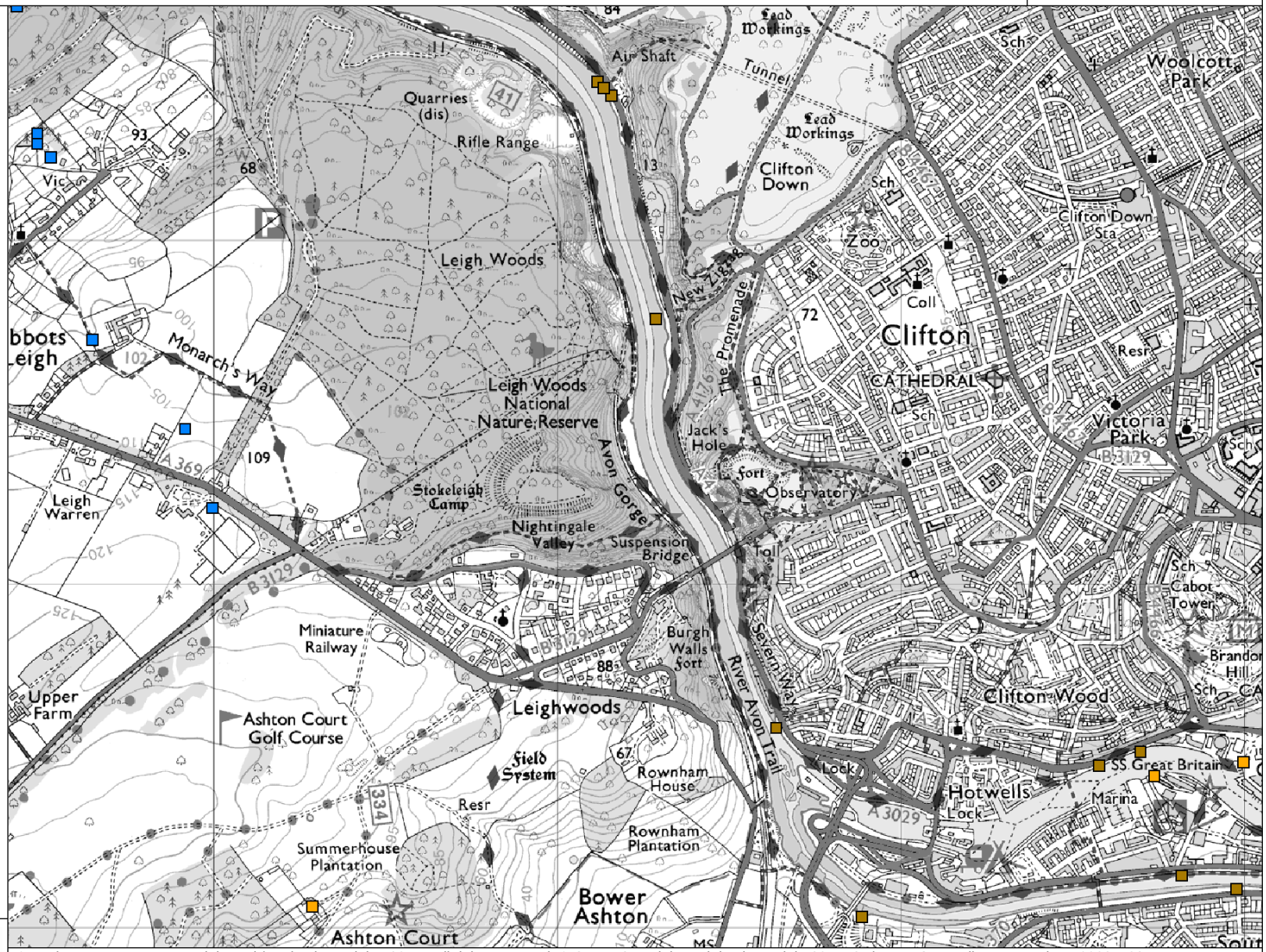
Portishead to Pill DCO Scheme. Discharge Consent Outlets 4 of 5

Environment Agency

Legend

WIMS Active Discharge Consents Outlets

- Agriculture
- Miscellaneous
- Sewage Outlet - not from Water Companies
- Sewage Outlet - from Water Companies
- Sewage and Trade combined
- Trade
- Waste Site



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N W E S

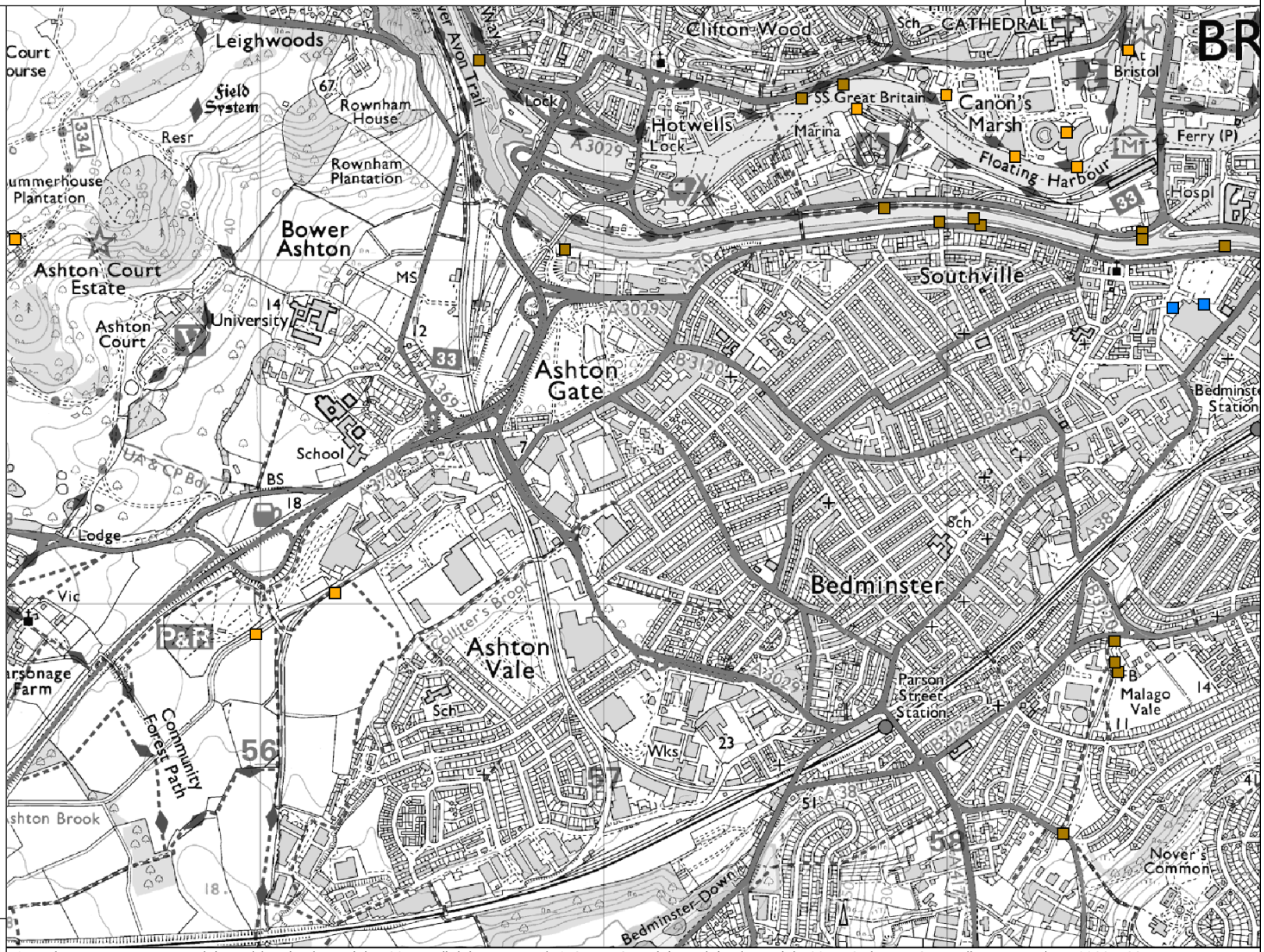
Portishead to Pill DCO Scheme. Discharge Consent Outlets 5 of 5

Environment Agency

Legend

WIMS Active Discharge Consents Outlets

- Agriculture
- Miscellaneous
- Sewage Outlet - not from Water Companies
- Sewage Outlet - from Water Companies
- Sewage and Trade combined
- Trade
- Waste Site



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N W E S

MetroWest Phase 1

Meeting with Environment Agency

18 May 2016

Attendees:

Dave Pring, Environment Agency (**DP**)
Deborah Steadman – Environment Agency (**DS**)
Doug Barker – NSC (**DB**)
Lucy Nicholson – NSC (**LN**)

MetroWest Team:
James Willcock – NSC (**JW**)
Rob Bird – CH2M (**RB**)
Carolyn Francis – CH2M (**CFF**)
Aime White – Network Rail Infrastructure Limited (**AW**)
Sarah Holmes – Bond Dickinson (**SCH**)
Duncan Tilney – Bond Dickinson (**DET**)
Richard Guyatt – Bond Dickinson (**RG**)

1. INTRODUCTORY COMMENTS

1.1 JW said the project was finding it difficult to find the correct flood risk vulnerability categorisation for its scheme. DET explained that the reduced detail in the NPPF compared to PPS25 did not help. The approach for using a matrix identifying principles with general application was not designed to deal with a classification of a project like MetroWest. The project is struggling to find its place. There is no criteria based policy to assess it. It is hoped that the EA can assist in advising on categorisation and indicate the process that needs to be followed.

1.2 RG explained the background to the scheme – essentially it is replacing existing infrastructure and nothing new is really being built. The railway has been in situ for 150 years and most of it is already operational railway.

1.3 DP said he had briefly reviewed the draft FRA, which RG said was very much a first draft which had not yet received the project team's comments.

2. CLASSIFICATION

2.1 DP said that the project cannot be classified as less vulnerable as part of it is in Flood Zone 3b. RB confirmed that the modelling output shows the most significant source of flood risk is the tidal River Avon. The railway would experience flooding approximately once every 20 to 50 years on average for the present day scenario and more frequently in the future due to projected sea level rise.

2.2 DP asked for clarification as to whether during a flood event the railway would remain operational – initial discussions with Network Rail had indicated that this was the case but now it appeared that this would not necessarily apply.

2.3 AW said that the services on the railway would stop if flood waters reached the top of the rail head level. Services would not run if a driver could not see the top of the rails.

2.4 RB explained that in the modelling there was potential for an impact from the tidal River Avon once every 5 to10 years on average for the pre-development present day scenario and once every 20 to 50 years on average for the post-development present day scenario. Fluvial flood risk from Drove Rhyne and Easton-in-Gordano Stream is considered insignificant (less than once every 1000 years on average).

2.5 Impacts from the fluvial Avon tributaries (Colliter's Brook and Longmoor/Ashton Brook) are still being assessed but it looks like there may be a flooding of the railway from these watercourses approximately every 100 to 1000 years for the present day scenario and every 50 to 75 years for the future (2135) scenario.

2.6 Projected climate change impacts have been assessed for a long horizon (120 year horizon in accordance with development design life). Whilst the assessed climate change impacts are significant due to projected sea level rise during this 120 year period, the impacts for a shorter horizon (e.g. 60 years) would be less.

2.7 DS confirmed that climate change needed to be taken into account in modelling. RB acknowledged this but noted that within that period it is likely there would be a strategic scheme to mitigate the impacts of climate change on flood risk within Bristol, e.g. a River Avon tidal defence structure.

2.8 DP said that the railway has to be classified as essential infrastructure or water compatible to be developed in Flood Zone 3b. As water compatible classification is unlikely to be accepted for a railway development by the examination panel, the classification should be essential infrastructure.

2.9 Essential infrastructure is required to be operational during a flood. AW confirmed the railway will remain operation during floods whilst the top of rail remains above water (i.e. visible by train drivers). For larger events, railway operation would cease. Details of operations during flooding (e.g. triggers and responses) will be specified in a flood risk management plan. DP accepted this approach is reasonable as it is not feasible to protect the line from extreme flooding and instead the emphasis should be on managing flood risk to ensure service users remain safe during floods. Maintaining operations until an extreme flood event then can form part of the flood risk management plan and remains in the spirit of the NPS. Climate change may then need to be factored in and this may be that the classification of an event as an extreme event will happen more frequently. It was agreed that a requirement should be included in the DCO necessitating a flood risk management plan.

2.10 RG suggested that this could be supported by a Statement of Common Ground between NSC (in both capacities as developer and regulator), EA and NRIL, ideally presented to PINS with the DCO application and with a draft management plan attached backing up the requirement. The requirement would be a pre-commencement requirement as the management plan may need to change slightly as a result of pre-construction and detailed design.

2.11 RG said that NRIL would need to be content with the proposal and NW could not bind NRIL on the topic at this meeting. AW said that NR had their own weather and climate resilience team and she will liaise with them as well as her colleagues who will know about the mitigation plans, if any, in relation to local areas such as the Somerset Levels. She thought the Operation & Maintenance team would be responsible for the day-to-day operation of any flood risk management plan.

3. FLOOD RISK ASSESSMENT

3.1 RB explained that the modelling had been created in discussion with the Environment Agency. Those discussions had given CH2M a greater understanding of the issues and the scope of the modelling is within the consultation outcomes with EA.

3.2 The modelling identifies two areas where the railway may displace potential floodplain storage. These are where the railway crosses the tidal River Avon Flood Zone 3b at Bower Ashton and the fluvial Easton-in-Gordano Stream Flood Zone 3b.

3.3 However, the design results in a net gain in floodplain storage (approx. 1850m^3 for the 200-year return period flood) in the tidal River Avon floodplain near Bower Ashton as although the railway will be slightly higher, a small bund will be removed with the net result that there is slightly more water on the western side of the railway. Floodplain compensation would therefore not be required here. Instead, a slight increase in local flood risk will need to be agreed with affected land owner(s). Discussion with landowners has not yet taken place.

3.4 The volume of displaced potential Easton-in-Gordano Stream floodplain storage is small (less than 150m^3 for the 1000-year return period flood). A conservative estimate of upstream impact here is approximately 0.9mm for the 30-year flood and 4.3mm for the 1000-year flood. DS agreed this is only a minor impact and mitigation would not be required provided the FRA includes evidence that this slight increase in flood risk is accepted by the affected land owner(s).

3.5 Another area to consider was the Clanage Road proposed compound area (in the tidal River Avon Flood Zone 3b near Bower Ashton).

3.6 JW raised the permanent access and temporary compound at Clanage Road. Post-construction it would be a maintenance access and emergency access point only. There could be a small ramp up to the railway but the impact on overall flood storage would be insignificant (compared to the gain in floodplain storage of 1850m3 at this location referred to above). It was possible that the design could include a permeable surface of either compressed ballast or grasscrete. NSC wished to understand whether EA would find such use of this area as an acceptable one despite the flood classification and assuming there were no net loss of floodplain storage.

3.7 DS said that we would need to demonstrate that there was no net loss of floodplain storage and justify why the access had to be there – could there be any alternative sites and why is it essential that access needs to be effected in this location. Details of when it might be used and how it may be used would also assist as well as any mitigation that could be offered.

3.8 AW asked if use of the site for storage during construction could be contemplated. DS thought this would only be in the short term and more details would be needed from NRIL/NSC to justify this. The use of the compound could be included in the flood risk management plan. The basis of the flooding was tidal and there should be plenty of warning allowed for clearing of the site.

4. THE PERSIMMON BUND AT PORTISHEAD

4.1 DB explained that it appeared that a way forward had been agreed with Persimmon and this should be a clear timetable as to when the works to the bund will be carried out. He hoped that this would be prior to the DCO being submitted for consideration. He is waiting to hear what colleagues have to say on the issue but it is expected that the issues that are holding up adoption can be wrapped up soon.

5. ASHTON VALE ROAD

5.1 JW explained the process of consultation, which EA had been involved in, relating to a potential new access road at Ashton Vale. The affected landowners were not positive but clear options are emerging out of the consultation, but it is likely that compulsory powers are going to be necessary. Whilst an option culverting the Longmoor Brook was included, it was largely done so out of completeness and there are clear difficulties moving forward with that design.

5.2 RG explained the issues about the potential buffer zone being required by EA. If the road is forced south it will enter a zone which was formerly used as a landfill and will lead to considerable additional construction difficulties and expenses. He asked whether, as the scheme would be a road running parallel to the brook, it might be possible to reduce the access requirements and instead cone off part of the road when access was required.

5.3 DP said that his asset performance colleagues would need to be consulted. He advised that details be provided to him as soon as possible so that the conversations with the asset performance team can commence.

6. NEXT STEPS

6.1 It was agreed that the EA should wait for the next iteration of the FRA before formally reviewing it.

6.2 RB hoped to have a reasonably complete version available for consideration by the end of June and hopefully this could be with EA at the end of June/early July for a detailed review.

6.3 CH2M will provide the detail for modelling at the same time. DS explained that this may take a couple of months to check through, although review of the FRA would take less time.

6.4 RG confirmed the project's intention to continue dialogue with EA on an informal basis and, whilst acknowledging Section 42 consultations would take place, he hoped that a close ongoing dialogue with EA would be possible so that a few issues were left by Section 42 and none by examination.

6.5 Work can also commence on a draft of:

6.5.1 requirement;

6.5.2 an initial draft flood risk management plan;

6.5.3 Statement of Common Ground.

6.6 Network Rail need to consider the proposed requirement and the acceptability of a flood risk management plan.

6.7 It was anticipated that a further meeting should be put in the diary for mid-September. It would be helpful to have the EA's comments on the FRA before that meeting which would mean that the EA would need the modelling and FRA in good time before the September meeting.

6.8 The process for environmental permits also needs to be considered. DS suggested that CFF contact her and she can provide details of who to discuss the permitting regime with at EA. AW said that it appeared that a few of the exceptions to the permitting regime would apply given the proximity of the Avon Gorge and the environmental protections that apply.

6.9 SCH will provide an overview of the regime and a list of other consents will need to be prepared in readiness for the September meeting.

6.10 SCH will also provide initial draft wording for dealing with the sequential test and exception test for consideration.

7. DISTRIBUTION

All attendees
Andrew Linfoot, CH2M
Steve Penaluna, NSC
Colin Field, Network Rail
Monica Peto, Eversheds
Rob Snell - Arup

Richard Guyatt
18 May 2016
Bond Dickinson

MetroWest Phase 1, Flood Risk Assessment: Consultation meeting with EA.

Held at CH2M Bristol office, 19th October 2016

ATTENDEES:	Dave Pring, Deborah Steadman (EA) James Willcock, Jennifer Devereux (NSC)	Robert Bird, Carolyn Francis (CH2M)
COPY TO:	Steve Penaluna, Lucy Nicholson (NSC) Tom Meyrick (BCC) Aime White (NR)	Andrew Linfoot, Mike Barker (CH2M)

PREPARED BY:	Robert Bird
DATE:	4 November 2016
PROJECT NUMBER:	674946

Purpose

Review EA's comments on MetroWest Phase 1 draft FRA and modelling, and agree requirements to address these comments.

EA comments on draft FRA and requirements to address these comments

Items in the EA FRA and modelling review response letter are listed in italic font below. These are followed by associated meeting notes/actions. It was noted that a separate meeting will be required with the EA model review team to agree how best to address the model review comments.

DP will arrange the model review meeting.

Model review

1) *With the exception of the representation of buildings in the CAFRA model the approach for each of the fluvial models is acceptable for an FRA – the majority of our comments relate to the standard of documentation of the modelling and hydrology. The data supply also needs improvement with some essential files missing and other superseded files included.*

Discuss representation of buildings with EA coastal model review team (in separate meeting). Review team to specify any data still outstanding.

2) *With regard to updating the flood map, the Easton and Drove Rhyne models are not suitable for changing our flood map as they use soft bed as the base of their sections and include pluvial flooding.*

It will only be necessary to update the modelling with hard bed levels applied if the FRA conclusions rely on reclassification of Flood Zones. Post meeting – this does not seem to be the case – i.e. model update not considered to be required (subject to EA agreement).

3) *With reference to the coastal model, we need more assurance that the model is large enough around the Royal Portbury Dock. This should be tested by extending the model inputs at that location.*

Discuss with EA coastal model review team (in separate meeting).

4) *There are also some missing files and reports, which we will need to see before accepting the models.*

The EA will provide contact details for EA model review team to confirm what information is missing. CH2M will then provide any missing information ahead of the separate meeting with the EA model review team.

FRA comments

5) *There are 3rd party impacts as a result of this scheme, increasing flood levels to some areas around Portishead and Bower Ashton. There has not been enough done to address this impact and we will need to see more information on the effects of this increase. In particular what are the receptors here – are there any additional houses flooded or are there any properties flooded to a greater depth? Who owns this land? Are there any opportunities to prevent this increase? If not, agreement will need to be sought from the affected landowners and this may be unacceptable.*

Where increased flood risk cannot be mitigated, impacted land owners will need to understand and accept the change in flood risk. The proposed development must not result in increased flood depths in properties or additional flooded properties. This also applies to landowners for whom there will be a benefit.

For the present day scenario, the MetroWest Phase 1 alignment between Portishead and Pill is currently outside of the 1000 year return period coastal flood extent. An adaptive approach to mitigating changes in future coastal flood risk due to (typically increased) proposed railway levels can be considered if this is supported by additional model results i.e. design could mitigate change in flood risk for a shorter 60 year climate change horizon (compared to scheme design life of 120 year horizon) and demonstrate by modelling that further mitigation could be provided in the future if required by e.g., increasing culverts sizes through the railway.

Modelling indicates the proposed replacement of the cattle creep underpass with culverts will result in a slight increase in flood levels on the Port's land during an extreme tidal flood in Easton-in-Gordano Stream. The land owner will be consulted with the aim of the land owner understanding and accepting this (slight) additional flood risk.

6) *We welcome the proposed assessment and improvement where necessary of all culverts, but is there any opportunity to improve flood risk by increasing capacity? This has not been explored in the FRA.*

Where required, the scheme aims to replace culverts 'like for like' i.e. no impact on flood risk. However, the scheme will restore the railway drainage ditches which are currently in a poor state (significant vegetation/blockage). This will act to reduce flood risk in the vicinity of the railway.

7) *Appendix L lists more areas in flood zone 3 than are listed in Table 4.6 (Section 4.2.5)?*

CH2M will reconcile these differences.

8) *Please provide more information on the proposed resilience measures.*

Network Rail currently addresses railway flood risk / railway flooding as part of its operations elsewhere. Network Rail will provide details of flood risk resilience measures to be applied for the MetroWest scheme e.g. railway resilience to flooding and service recovery after flooding.

9) *Please confirm that a 10m maintenance strip will be maintained adjacent to all main rivers?*

This would generally be the case. However, the railway alignment is fixed and this constraint may result in less than 10m access strip in some locations, e.g. along the River Avon, to be checked by Network Rail and their designers. It was suggested that the EA, NSC and NSLIDB should review the designs and identify/address any access/maintenance concerns.

10) *Sections 8.1.2 and 8.1.4 - Please provide more evidence to support the argument for no compensation, such as drawings and a volume calculation for the 1 in 100 year fluvial event and consider the receptors that may be impacted.*

Relevant calculations and sketches will be provided to the EA and (later) in the FRA.

11) *8.1.3 – Please provide more information on the proposals over the Portbury Ditch.*

When drawings are available these will be provided to the EA and included in the FRA.

12) *We cannot rely on any future strategic flood risk scheme, as the delivery of any such scheme would depend on many factors out of our control. Your proposals must therefore have a robust contingency plan. Currently you are relying heavily on an operational flood plan, but there are no details regarding your proposals in the FRA. The railway line will flood frequently, so more information on how you will address the safety of passengers is required.*

Network rail has started to prepare a flood plan. The flood plan can be based on existing processes for other routes. The flood plan will be appended to the FRA.

NSC and BCC emergency planners will need to review and accept the flood plan. The EA would not have an approval role for the flood plan but would need to see that it is in place, and that it has been approved. The flood plan should make use of the EA flood warning service.

JD will liaise with AW to progress the flood plan. Ideally the flood plan will be completed before Christmas 2016.

13) *No information on the location of the maintenance compound has yet been provided.*

Details of Clanage Road (and other) maintenance /access compound design and usage will be provided in the FRA.

There should be no temporary works in Flood Zone 3b (but OK in Flood Zone 3a).

14) *Finally, please could you provide a table to compare the existing and proposed rail levels against the modelled flood levels at regular intervals, where the railway crosses areas of floodplain? By cross referencing those areas on drawings to clearly show the areas under discussion, it will enable a clear assessment of the flood risk impact.*

Flood levels will be added to long section design drawings.

Next steps

CH2M will circulate meeting minutes.

CH2M will provide a summary table of EA comments on the draft FRA and their resolution.

AOB

AW provided an email list of queries to the EA related to environmental permits. The list is provided at the end of this note. DP to direct the questions to appropriate EA staff.

Summary of actions

DP: DP will arrange the model review meeting (to be attended by EA model review team).

DP: Provide contact details for EA model review team to confirm what model review information is missing. CH2M will then provide any missing information ahead of the separate meeting with the EA model review team.

RB: Additional modelling to demonstrate design could mitigate change in flood risk for a shorter 60 year climate change horizon (compared to scheme design life of 120 year horizon) and demonstrate that further mitigation could be provided in the future if required by e.g., increasing culverts sizes through the railway.

JW with help from CF/RB: Consult the Ports and landowners affected by proposed change in flood risk in the Clanage Road / Bower Ashton area (including those who benefit from proposed change in flood risk) with the aim of the land owner understanding and accepting change in flood risk. RB to provide flood map(s) so that JW can identify affected land owners.

RB: Reconcile differences in FRA Appendix L and Table 4.6, for next FRA draft.

AW: Network Rail will provide details of flood risk resilience measures to be applied for the MetroWest scheme e.g. railway resilience to flooding and service recovery after flooding.

JD: EA, NSC and NSLIDB should review the designs and identify/address any access/maintenance concerns. Arrange two separate meetings attended by CH2M, ARUP, NR design teams and (i) EA and NSC, (ii) NSLIDB.

RB: Provide more evidence to support the argument for no compensation. Relevant calculations and sketches will be provided to the EA and (later) in the FRA.

RB: provide more information on the proposals over the Portbury Ditch. When drawings are available these will be provided to the EA and included in the FRA.

JD: Liaise with AW to progress the flood plan. Ideally the flood plan will be completed before Christmas 2016.

RB: Details of Clanage Road (and other) maintenance /access compound design and usage will be provided in the FRA.

RB: Flood levels will be added to long section design drawings and appended to the FRA.

DP: AW provided an email list of queries to the EA related to environmental permits. The list is provided at the end of this note. DP to direct the questions to appropriate EA staff.

RB: Prepare and circulate meeting minutes.

RB: Provide a summary table of EA comments on the draft FRA and their resolution.

Additional Queries for the EA relating to the Environmental Permitting Regulations

We would like guidance from the EA on the application of the new Environmental Permitting Regulations in relation to works required for the Portishead Branch line. Is it possible to get some generic approvals from the EA in areas where the Main Rivers (particularly the River Avon) flow close to the track. For example, would the following works be exempted or excluded from permitting?

- Track bed work including excavation of existing track bed and replacing with new, including up to a ~2m shift off current alignment.
- If any culverts within NR land are found to be damaged or in poor condition during construction we can replace them 'like for like' in size without seeking prior authorisation from the EA.
- Any track bed or track works can be undertaken above Main River culverts, provided the excavations remain within the track bed.
- Works to Pill Viaduct, above a Main River culvert. This may include scaffolding to be kept up for more than one day for re-pointing etc. which may temporarily inhibit access to the ground above the culvert (the EA exemption currently covers scaffolding provided it is removed daily).
- A Main River culvert runs beneath Ashton Gate Level Crossing (LC), and there are a number of other Main River culverts in this area. We would like to be able to remove equipment associated with the LC including concrete, signalling equipment etc will may require minor excavation and levelling above the culvert.
- De-vegetation
- Re-building/improvements to retaining walls (particularly within the Gorge)
- Re-building or significant alterations to Quarry Underbridge no. 2 (River Avon bank is within 8m)
- Improving track bed drainage
- Alterations to earthworks including re-grading of slopes, rock-picking etc.
- Placing welfare cabins within flood plains, particularly throughout the Gorge as there is very limited space and NR's H&S standards require welfare every 1km.

MetroWest Phase 1 (MW1)
Environment Agency meeting draft notes

14:00, 27th February, Jacobs, Bristol

Attendees	**Apologies:**
James Willcock (JW), MetroWest Phase 1 Jenny Devereux (JD), MetroWest Phase 1 Jake Faucitt (JF), Network Rail Robert Bird (RB), Jacobs Dave Pring (DP) Environment Agency Deborah Steadman (DS) Environment Agency	

No	Item	Action	Date
1.	A discussion was had on the flooding impact at Portishead. The EA asked what the impact the FRA would show at a lower design life than 120 yrs. 100 year is the usual lifetime used for a more vulnerable development, with 60 years used for less vulnerable developments. MW1 will undertake an assessment for an 80 and 100yr scenario. It will probably be two weeks until we have anything to send over.		
2.	JW suggested that we use 60yrs as our central case scenario and that the 80yrs and 100yrs scenarios could be sensitivity tests. JW/RB to justify the use of a 60 year lifetime in the FRA. SBL and AVTM FRA's were based on a 60yr scenario and this was agreed by the EA.		
3.	RB confirmed that the FRA wouldn't be ready to share with the EA for 2 months.		
4.	JF to share flow rates and location for out falling into Markham brook with DS.		
5.	JF to provide RB a permeability value for ballast.		
6.	Draft flood risk permits should be sent to DS and other permits to DP.		
7.			

MetroWest Phase 1 (MW1)
Environment Agency meeting draft notes

14:00, 30th July, Jacobs, Bristol

Attendees	**Apologies:**
Jenny Devereux (JD), MetroWest Phase 1 Richard Matthews (RM), MetroWest Phase 1 Daniel Brutto (DB), Network Rail Carolyn Francis (CF), Jacobs Robert Bird (RB), Jacobs Dave Pring (DP), Environment Agency Deborah Steadman (DS), Environment Agency Diamond McGill (DM), Environment Agency	

No	Item	Action	Date
	Flood Risk Assessment		
1.	The EA have high level comments and will send through more detailed comments on the FRA later	DP	
2.	The EA need more detail in the FRA on the impacts of raising the railway line. Sections 6 and 9 of the FRA says that impact is negligible and also that there is no impact, so language needs to be tightened up and explanations of any impacts provided. Statements like 'where possible' need to replaced with clearer language about what will and won't happen.	RB	20.08.18
3.	Is the scheme reducing maintenance access to main rivers at all? We don't think so, but RB will check and detail it in the FRA.	RB	20.08.18
4.	More explanation is required on the flood difference plots. The EA need a commentary on which properties are affected and the number this is needed before they feedback their comments at the end of August.	RB	20.08.18
5.	More explanation is required in the flood difference plots to explain why the grey areas have no impact. RB explained the reason is because of the model tolerance. Detail on this needs to be in the FRA.	RB	20.08.18
6.	DM asked for maps in the FRA to show the difference the scheme causes to flood extents for both the fluvial and tidal scenario. This could be GIS maps. These will be circulated before the EA send their formal feedback	RB	20.08.18

No	Item	Action	Date
7.	DM asked if the drainage from the railway is out falling into Colliter's and Longmoor brook as the emergency flood relief culvert does not have much capacity left in a flood event. JD/RM explained the line was changing very little in this area so it shouldn't change track drainage. However they would check with Network Rail about the red cess formation that looks to be at a higher level.	DB	20.08.18
8.	The FRA needs to explain that the fluvial model plots were done using the CAFRA model.	RB	31.08.18
9.	More explanation is required of the grey areas in the flood difference plots at Ashton Vale and the Green area.	RB	20.08.18
10.	More explanation is need in the FRA for the changes in flood levels at Portishead.	RB	31.08.18
11.	DS was happy with the explanation justifying the 100-year design life although there are a couple of policy points they need to check. DS also said to include the 60yr flood difference plots for Portishead that show the flood levels not reaching the railway.	DS RB	31.08.18
12.	RB presented the flood difference plots for infilling Cattle Creep and widening the Easton in Gordano culvert. This causes some flooding on the Port's perimeter track, but benefit's elsewhere. The EA said that we should get should a formal response from the port that they are happy with this.	JD/ RM	31.08.18
13.	JD explained that infilling Cattle Creep was now no longer the preferred option due to various engineering complications. However, the engineering design for replacing the bridge deck of cattle creep was not progressed enough to discount the infill option. Due to this the ES will present both scenario's.		
14.	RB will check what the highest flood level is at Cattle Creep to discount needing to model the bridge deck replacement options.	RB	31.08.18
15.	The EA requested more information on the discharge rates of track/ station drainage into Markham Brook to make sure it is acceptable. The EA will also need discharge rates for any track/ highway drainage that outfalls into any main river or a watercourse that connects to a main river. Without this the scheme could end up with a pre-commencement condition that gives the maximum outfall rate into these watercourses.	DB/RB	20.08.18
	Landowner Consultation		
16.	DS said that once RB has produced the details showing exactly which properties are affected by the scheme and the evidence to show that the grey areas on the flood plots are insignificant then we only need to write to the yellow areas on the flood plots (there is no need to inform property owners with a reduction in flood risk).	RB/ JD	31.08.18
	Flood modelling review		

No	Item	Action	Date
17.	The EA have given their modellers until the 31st to review the model. Their feedback that needs to be passed back to DM to go with her feedback, so we should receive feedback about the 7th September.	DP/DM	07.09.18
	Flood Compensation Bower Ashton		
18.	DM/ DS said a diagram was required to go with RB explanation of why flood compensation is not required. RB also needs to check if there are any hydraulic links and that nothing is cut off. If RB can provide this then the EA thinks that flood compensation is probably not required.	RB	31.08.18
19.	DP explained that if Essential Infrastructure is in Flood Zone 3 or 3B then it needs to demonstrate in a 1 in 20yr flood event it can stay operational. RB explained that the line would have to close in this flood event and there was little that could be done because of the historic alignment of the line. DP said the EA would not object to the scheme on this basis. JD to speak to Womble Bond Dickinson, as DP said that this was a hot topic at inquiries currently and we would need an explanation for the inspector.	JD	07.08.18
20.	The EA said to explain detriments in flood risk and where we can't do compensation e.g. Marsh Lane	RB	31.08.18
21.	The FRA should note conversations with the EA to show where things have been agreed.	RB	31.08.18
22.	The Ashland's flood bund at Portishead is still to be adopted by the EA. The FRA should note this is an ongoing issue.	RB	31.08.18
23.	**Water Framework Directive**		
24.	DP said that he was happy overall with the Water Framework Directive.		
25.	DP said ref table 3 is there any chance for improvement on Culvert replacement, DB to check. However, the replacement of the culvert is likely to improve conveyance as many are currently silted up.	DB	31.08.18
26.	DP said that evidence is required to show that ground water hasn't changed.	CF	31.08.18
27.	Water Quality has been scoped out of the WFD, but there are some area's that should be scoped in e.g. run off and run in.	CF	31.08.18
28.	DP will send over his more detailed comments.	DP	
	Operational Flood Plan		
29.	DB explained that NRIL had produced an outline plan for reacting to flood events based on NRIL's overarching current plans for the Network. This will be submitted with the DCO. The plan needs signing off before it is circulated and will need input from the FRA. A detailed one will be produced later.	DB	20.08.18
30.	DM said that if the operational flood plan used flood alerts to be aware that tunnels may not be covered by this. Tunnels are above the flood Zone levels so it should be fine.		

No	Item	Action	Date
31.	Detail of plans for reacting to flood events during construction will be included in the contractors CEMP. The contractors CEMP will be a requirement of the DCO.		
32.	When available the Master CEMP will be shared with the EA.	JD	31.08.18
	Materials Storage		
33.	JD to share with the EA the final construction strategy so DP can see the areas where there will be Ballast Storage. He will then be able to advise on the best permitting route for old ballast storage.	JD	20.08.18
	Protective Provisions and Requirements		
34.	DP to send over the EA's draft text for Protective Provisions to put into the DCO. He said this will be standard text that they will want in all DCO's. JD to share with WBD.	JD	07.08.18
35.	JD explained that the requirements were a few weeks away from being able to share. However we will send them over when they are.	JD	20.08.18

Ms Jennifer Devereux
North Somerset Council
Town Hall
Walliscote Grove Road
Weston-super-Mare
BS23 1UJ

Our ref: WX/2016/129249/04-L02
Your ref:

Date: 18 September 2018

Dear Ms Devereux

METRO WEST – FLOOD RISK MODELLING AND FRA REVIEW

Thank you for your consultation regarding the above.

A detailed assessment of the submitted modelling data is attached however, a general overview of the Agency's position is provided hereunder:

The Agency must advise that further work is required in respect of the CAFRA, Drove Rhyne and Easton in Gordano modelling, with many of the previously highlighted issues remaining unaddressed or unanswered. This is particularly the case regarding the Drove Rhyne and Easton in Gordano models, where the models and reports have not been amended. The only apparent change is that some outputs, which were missing in 2016, have now been submitted.

With regard to the CAFRA model, the tidal 1000 year event has used different base model versions for the pre and post development scenarios. The Agency therefore requires updates to remove all changes made to the model inputs, which do not represent real planned changes. This is because the models used for comparison of pre and post development scenarios should be identical, apart from the addition of the proposals. Introducing other changes to the model is not acceptable as it is not possible to know whether it is the proposals or the other model changes that are causing the difference.

In terms of the coastal model only, while there are still minor issues, which remain unchanged from the previous consultation, the model can be considered sufficient for this specific purpose. The Agency's preference however, is for the outstanding issues to be addressed.

Assuming all these points can be resolved, the Agency has the following comments regarding the FRA, many of which have not been addressed since the last consultation:

- In accordance with the National Planning Policy Framework, any development designated as 'Essential Infrastructure' should remain operational during a flood event, over its lifetime. However, the Agency has accepted that an approved railway will flood in an extreme flood event, subject to the adoption of an agreed flood management plan, including details of flood warnings and evacuation procedures. Unfortunately, the submitted details clearly show that, with the inclusion of the nationally prescribed allowance for the predicted impact of climate change, there will be a section of the line which will flood more frequently than the 1 in 2 year (50% AEP) event. In table 4.2 it is indicated that during a 1 in 2 year (50% AEP) event, the post development flood level will be 0.93 m, which is a very significant depth. The Agency does not consider the 1 in 2 year (50% AEP) event to be an extreme flood event. Therefore, additional work will be required to ensure the line remains operational up to a 1 in 20 year (5% AEP) event, with the aforementioned allowance for the predicted impact of climate change, without increasing flood risk elsewhere.

- There are noted third party impacts resulting from the proposed scheme, increasing flood levels to some areas around Portishead and Bower Ashton. Insufficient work has been undertaken to address this impact and therefore, the Agency will require more information on the effects of this increase. In particular, details of the receptors i.e. are there any additional houses at risk or are there any properties flooded to a greater depth? Additionally: How is the extent of flooding increasing? Who owns the land? Are there any opportunities to prevent the increase? If not, agreement will need to be sought from the affected landowners, which may prove problematic. It should be noted the Agency will require plans clearly showing the real increase or decrease of flood levels, including all differences of less than 20mm. It is suggested that this is shown on colour coded plans which differentiate the increases in flood heights over the area, in addition to spot levels labelled at vulnerable locations, including properties, showing the exact increase in mm at that location. This is required because the model tolerances argument is not valid in this case, as this is a relative comparison of change in level between two models with the same input data. Therefore, any changes in levels shown by the model will be caused by the proposed works. The Agency will additionally require maps showing any difference in flood extents caused by the proposals.

- While the Agency welcomes the proposed assessment and improvement (where necessary) of all culverts, it is now understood this does not include any main river culverts. This must be stated in the FRA, together with a statement that there will be no additional loading onto or additional drainage into any main river culverts, in accordance with the Agency's response dated 10th December 2014. Currently, paragraphs 8.1.23 and 9.2.2 contradict the "no change" discussed at the meeting on 30th July 2018. If any Main River culverts were to be considered for improvement or replacement, the FRA should show that the plans maximise opportunities for flood risk benefits, in consultation with the Agency. Where culverts are to be replaced, sections 8.1.1, 8.1.24 and 9.2.1, have not demonstrated that opportunities to reduce flood risk, though the replacement and refurbishment of culverts, have been considered.

Cont/d..

- Appendix L lists more areas in flood zone 3 than are listed in Table 4.6 (Section 4.2.5). The Agency will therefore require this variance to be corrected or justified.

- Please provide more information on the proposed resistance/resilience measures and the level of protection to be afforded against given return periods.

- Please state in the FRA that a 10m maintenance strip will be maintained adjacent to all main rivers, as confirmed at the meeting on 30th July 2018.

- Please provide more evidence to support the argument for no floodplain compensation and consider the receptors that may be impacted.

- It needs to be shown that the floodplain compensation in Bower Ashton can be provided on a level for level basis and is hydraulically linked to the area of lost storage. It should be noted that section 8.1.4, which is repeatedly referred to in relation to this issue, is not related to flood plain compensation in Bower Ashton.

- Further information is required in respect of the proposed works over the Portbury Ditch. Are any changes proposed in respect of the height or size of the structure? In what return period would you expect the pedestrian access to flood?

- As previously advised, it is not possible to rely on any future strategic flood risk scheme, as the delivery of any such scheme would depend on numerous factors outside the Agency's control. Accordingly, the proposals must have a robust contingency plan. The submission appears to rely heavily on an operational flood plan however, relevant details have not been included in the FRA. As advised, the Agency has accepted the railway will flood however, as previously stated "*This position would obviously be dependent on an agreed flood management plan, including details of flood warnings and evacuation procedures, to ensure, inter alia, the development and its users would remain safe for the agreed lifetime period"*

- Please provide details of the plan for drainage near to the Markham Brook. There must not be any additional water conveyed to the Markham Brook Pumping Station, which does not have sufficient capacity to accept additional flows. If additional flows were proposed, the Agency must be consulted regarding requisite improvements to the Pumping Station.

- Please provide a table to compare the existing and proposed rail levels against the modelled flood levels at regular intervals, where the railway crosses areas of floodplain.

- It is stated that a post development scenario is not required for the Drove Ryne, because the effect of raising the railway by up to 200mm is considered insignificant. However, the model report shows that the sensitivity test was only run with an increase of 150mm, not 200mm. Additionally, it does not clearly show what "insignificant" is considered to mean. Does this mean no change?

Cont/d..

A run should be undertaken on a selection of return periods for a 200mm increase of the railway and a post development difference plan shown.

- As a general note, the FRA does not appear to be well structured and, in addition, contains numerous repetitions and contradictions. This makes it very difficult to establish an accurate assessment of flood risk and has, as a result, significantly increased the review period.

Should you wish to discuss the above issues further please contact the undersigned direct.

Yours sincerely

Dave Pring
Planning Specialist

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Direct fax 01278 452985
Direct e-mail nwx.sp@environment-agency.gov.uk

End

Jennifer Devereux
North Somerset Council
Town Hall
Walliscote Grove Road
Weston-super-Mare
BS23 1UJ

Our ref: WX/2016/129249/05-L01
Your ref:

Date: 24 April 2019

Dear Ms Devereux

METROWEST PHASE 1 - REVISED DRAFT WATER RESOURCES, ECOLOGY AND GEOLOGY CHAPTERS, WATER FRAMEWORK DIRECTIVE COMPLIANCE SCREENING REPORT, FLOOD RISK ASSESSMENT AND MASTER CEMP (SEPT 2018).

Thank you for your consultation regarding the above.

Please find hereunder the Agency's response in respect of the submitted documentation:

Flood risk modelling and Flood Risk Assessment (FRA)

A detailed assessment of the submitted modelling data has been undertaken. The Environment Agency is now satisfied the models are fit for the purpose of assessing the flood risk.

The Environment Agency has the following comments regarding the submitted FRA:

- In accordance with the National Planning Policy Framework, any development designated as 'Essential Infrastructure' should remain operational during a flood event, over its lifetime. However, the Agency has accepted that an approved railway will flood in an extreme flood event, subject to the adoption of an agreed flood management plan, including details of flood warnings and evacuation procedures. As previously discussed, the submitted details clearly show that, with the inclusion of the nationally prescribed allowance for the predicted impact of climate change, there will be a section of the line which will flood more frequently than the 1 in 2 year (50% AEP) event. Table 4.2 indicates that during a 1 in 2 year (50% AEP) event, the post development flood level will be 0.93 m, which is a very significant depth. The Agency must advise that it does not consider the 1 in 2 year (50% AEP) event to be an extreme flood event. It is noted the applicant does not consider it possible to reduce the identified flood risk. Additionally, it is noted Network Rail are considered capable of managing flooding of the track. Therefore, on the understanding Network Rail has a full appreciation of the risk, the Agency must advise that this issue remains a matter of concern, which will be the subject of future representations during the examination process.

- The Agency has reviewed the updated submission in respect of third party flooding impacts, which show the proposed scheme would result in an increase in flood risk. Accordingly, the Agency will require full details of the investigations which have been undertaken, with the objective of preventing the identified increase in flood risk. The submission must clearly show that it is not possible, in engineering terms rather than financial terms, to reduce this flood risk, while still implementing the scheme. If this is the case, engagement with and agreement from all affected landowners must be achieved before the scheme is approved. Even if this is achieved, increasing flood risk to third parties is still contrary to the National Planning Policy Framework (NPPF). If it is proven the increase in flood risk to third parties is unavoidable, the Agency must again advise that this matter will be the subject of future representations and careful consideration during the examination process.

- The Agency must request further evidence to support the applicant's argument for not providing floodplain compensation. Any evidence submitted must include a careful consideration of any receptors that may be adversely affected, including third parties. The Agency would advise that any mitigation of the increase in flood risk to third parties through appropriate floodplain storage, should be delivered on a level for level and hydraulically linked basis. This would apply to every aspect of the proposed scheme that would result in a reduction in floodplain storage, even if the effects are too small to be recorded through modelling. This is particularly noticeable at Bower Ashton, where it is stated the proposed works would result in an increase in flood water stored in the floodplain, but does not clearly set out if this is through appropriate floodplain compensation, which would be provided on a level for level and hydraulically linked basis.

- As previously stated, the Agency welcomes the assessment and improvement (where necessary) of culverts. However, the FRA still lacks clarity in respect of the proposed treatment of each of the main river culverts which would be crossed by the proposed scheme. Accordingly, the Agency requires a clear position statement detailing the proposals for each Main River culvert. If none of the culverts are to be replaced, this must be stated in the FRA, together with a statement that there would be no additional loading on or additional drainage into any main river culverts, in accordance with the Agency's response dated 10th December 2014. If any Main River culverts are to be improved or replaced, the FRA must show that the plans maximise opportunities for flood risk benefits, in consultation with the Agency.

- While the Agency appreciates access to Main River culverts will not be compromised, it remains concerned to ensure that the existing access to all sections of Main River is maintained and improved, where possible. Therefore, the Agency will require confirmation in the FRA that there will not be any works within the Main River maintenance strip, as confirmed at the meeting on 30th July 2018.

- The Agency have no objection to the Emergency Plan however, further engagement with the Agency could potentially assist in the use of the Flood Alert/Warning system more effectively.

- The FRA does not contain sufficient detail regarding the proposed construction of the stations and associated infrastructure, including car parks, to enable the Agency to undertake any assessment. Accordingly, additional detail is required.

- As a general note, the FRA does not appear to be well structured and, in addition, contains numerous repetitions and contradictions. This makes it very difficult to establish an accurate assessment of flood risk and has, as a result, significantly increased the review period and has made it more difficult to determine the safety of the proposal.

Please note that Flood Zone 3 represents the undefended 1% AEP (1 in 100 year) event, not a defended event.

Groundwater and Contaminated Land

The Agency has reviewed two documents that make reference to groundwater and land contamination issues. The first document is entitled 'CHAPTER 17 - Water Resources, Drainage and Flood Risk'. Within this document there is a brief summary of concerns previously raised by the Agency regarding the mobilisation of contaminants and the need to undertake appropriate assessments. In response the document states:

"*The identification and assessment of likely significant effects arising from the mobilisation of historic contamination is presented in Chapter 10 Sections 10.4 and 10.6 Geology, Hydrogeology, Ground Conditions and Contaminated Land.*"

Accordingly, the Agency must advise that it is unable to comment further in respect of this particular issue, until the up to date version of Chapter 10 has been forwarded for its consideration.

The second document forwarded for review is entitled 'APPENDIX 17.2 - Water Framework Directive Compliance Screening'. There are three paragraphs of particular concern to the Agency (paragraphs: 2.2.3, 2.2.4 and 2.2.5). It is noted the first two paragraphs appear to contend the impact to the receptors that they concern, will be 'neutral'. It is not clear what neutral means in the context of the impacts discussed and the proposed scheme.

The main portion of paragraph 2.2.3 states that:

"*where contaminated ballast occurs along the railway (mostly between Portishead and Pill Junction and in the vicinity of Ashton Gate), superficial deposits appear to be dominated by silts and clays which being relatively impermeable, will limit infiltration to underlying groundwater. With these ground conditions and the implementation of measures to protect water resource during construction as set out in the Master CEMP and implemented through the contractor's CEMP the magnitude of the impact is considered to be negligible upon groundwater quality.*"

This statement does not appear to be grounded in any understanding, nor does there appear to be any demonstration of an understanding of the levels of contamination present, alongside a detailed understanding of the potential pathways for those contaminants to impact upon the environment. Based on the little information available, the Agency must contest the assertion made in this section of the document, which essentially appears to be that there is no risk. The applicant would need to demonstrate the rationale for this assertion, with detailed data, appropriate risk assessments and a conceptual model.

Paragraph 2.2.4 states:

"*impacts upon groundwater quality during operation of the railway line are considered to be negligible due to the small quantities of pollutants produced, the localised nature of any contaminants and the presence of the ballast which will aid in the removal contaminants. The groundwater receptors are of medium and high value therefore the impact upon groundwater quality from track drainage is anticipated to be of neutral significance of effect.*"

Once again the insistence that there is no risk to groundwater, this time in relation to the operation of the railway line, is not accepted by the Agency on the basis of the information available. This paragraph raises a number of questions i.e. why are the impacts of the railway line considered negligible? and, how will the ballast aid the removal of contaminants? The last sentence of the above paragraph also needs to be explained i.e. if "*the groundwater receptors are of medium and high value"*, why is it contended *"the impact upon groundwater quality from track drainage is anticipated to be of neutral significance of effect"* – what does this apparently contradictory statement mean?

Paragraph 2.2.5 states that groundwater has been scoped out of the study. This appears to be due to the fact it has been established the study area does not include a groundwater Source Protection Zone (SPZ) and because: "*significance of risk of the DCO Scheme to groundwater as being neutral during the construction phase and neutral during the operational phase*". This is a matter of particular concern to the Agency, principally because it has not been consulted in respect of the information upon which the assertion has been made. Additionally, it is not known what a 'neutral' risk to groundwater in this context actually means. The Agency must advise that the absence of a SPZ does not mean that groundwater is of no resource value in its own right, now or in the future, or that it can be disregarded as a pathway to surface water.

For information/guidance, the Agency's position document pertaining to development risks in areas that may be sensitive to groundwater pollution '*The Environment Agency's approach to groundwater protection*' may be accessed through the following link:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/692989/Envirnment-Agency-approach-to-groundwater-protection.pdf

Pollution Prevention

The Agency would welcome the opportunity to review the latest CEMP, which supersedes the submitted Master CEMP (Sept 2018). This will ensure the Agency is satisfied in respect of the extent of plans/strategies/reports etc required, prior to works commencing.

With reference to paragraph 2.9.13, the Agency must advise that it needs to be contacted when any form of environmental incident occurs. The term 'reportable spillages' is a little subjective and therefore requires clarification, notwithstanding the Network Rail and Environment Agency Operating Agreement (env/AS/02A).

Ecology

Notwithstanding the proposed limitation on operating hours, has consideration been given to fencing or other measures, to prevent otters and other mammals (badgers, deer) getting onto the line?

Cont/d..

Should you wish to discuss this matter further please contact the undersigned direct.

Yours sincerely

Dave Pring
Planning Specialist

Direct e-mail nwx.sp@environment-agency.gov.uk

End

Meeting Note

Client:	North Somerset District Council				
Matter:	MetroWest Phase 1: FRA for the Portishead Branch Line DCO Scheme			Matter no:	381278.1
Attending:	James Willcock (NSC), Richard Guyatt (WBD), Tom Ewings (WBD), Sarah Holmes (WBD), Richard Matthews (NSC), Carolyn Francis (Jacobs), Robert Bird (Jacobs), Dave Pring (EA), Diamond McGill (EA), Stuart Oxley (EA), Michelle Scogings (NR), Niall Spencer (NR)				
Name:	Tom Ewings	Location:	Bristol	Date:	17 May 2019
Start time:	2pm	Units:			

Key Actions

1. **Carolyn Francis** to provide more information w/c 20th May on the track bed investigation report and send to Stuart Oxley at EA.
2. **Carolyn Francis** to 'tidy up' the CEMP and issue w/c 20th May to Dave Pring at EA.
3. **James Willcock** to issue Construction Strategy to Dave Pring at EA.
4. **Robert Bird** and colleagues to prioritise further modelling including testing compensation options (Caravan Club, BCC land, etc.) and revise the FRA as necessary.

1. Introduction

1.1 **James Willcock** opened the meeting by explaining that the project team has been surprised by the EA's response on the issue of flooding, suggesting a lack of proportionality given that the railway was constructed 150 years ago and the proposed works at Bower Ashton are very modest.

1.2 **Dave Pring** said that the frequency and scale of flooding in this area means it is a real concern, with flood events more regular than every two years. **Robert Bird** confirmed that these events will see flood depths of approximately 0.9 metres in the former Clifton Bridge Station area.

1.3 **Diamond McGill** explained that the EA has to treat this as a new development in the same way it would for a housing scheme. The EA is concerned that there is a significant depth of flooding and the track would potentially flood more than once a year, based on the 100 year design life modelling output.

1.4 **James Willcock** said that the design life for recently delivered major highway schemes has been 60 years, and MetroWest is more comparable to those. EA has clearly accepted those before, in respect of permitting.

1.5 **Dave Pring** explained if there are changes to existing infrastructure – as we are doing – then it still needs to be subject to policy.

1.6 **James Willcock** said that at Bower Ashton, which is in Flood Zone 3a all MW1 is doing is raising track height by roughly 150mm to 200mm.

1.7 **Diamond McGill** explained that their position is dictated by their statutory role and what is expressed in policy. The EA will need to explain to PINS what the modelling shows. She noted that the track is going to be used for different purposes under the MW1 scheme, with passenger trains returning to the line, so the protection for passengers and the need for a robust service pattern suggest the issue is significant.

1.8 **Dave Pring** stated that the points the EA is making are nothing new, though they have only been able to provide more detailed responses, following recent receipt of the modelling from **Robert Bird**.

2. Design life and flood events

2.1 **Michelle Scogings** said that during any franchising process the base assumption is that a rail asset is there to stay, given the capital cost of doing the work, so the design life issue does not really sit with how the Office of Rail and Road or Network Rail would value the asset.

2.2 **Niall Spencer** added that during flood events the track would not necessarily close as there are interim measures such as speed restrictions that could be in place until the water has dispersed below the top of rail height.

2.3 **Richard Guyatt** said that the parties may have to agree a Statement of Common Ground and then just flag up where our differences are. In respect of design life it may actually be best if Jacobs just set out the 60 year and 100 year design life scenarios, and then leave the Secretary of State to make a decision on the evidence. **Dave Pring** acknowledged this suggestion as a potential way forward.

2.4 **Richard Guyatt** highlighted that the National Policy Statement for National Networks ("NPS NN") paragraph 5.102 appears to give some flexibility to an approach to projects where there is existing infrastructure.

3. Third Party Risk and Modelling

3.1 **Robert Bird** ran through the modelling based on the 100 year design life, in regard to third party flood risk. He explained that there are a small number of problem areas including the former police dog training centre on Clanage Road and properties on the opposite side of the Portway (between the suspension bridge and Hotwells). The flooding effects are small, save for a 74mm increase at the former police dog training centre.

3.2 **Diamond McGill** commented that the EA has found it very difficult to interpret the Flood Risk Assessment ("FRA") with the number of appendices. However, the key point is even where there is a very small increase to third party flood risk, the EA still need to flag it as it is contrary to the NPPF.

3.3 **Diamond McGill** asked whether flood plain compensation at Bower Ashton would solve the problem? **Dave Pring** emphasised that**,** if MW1 has not assessed the potential for compensation/mitigation, it should be undertaken, as the Panel will ask about it. The onus is on the applicant to prove what solutions are viable and why solutions have to be discounted. If the cost is too high, that is the case MW1 will have to make to the Panel.

3.4 **Diamond McGill** also requested that modelling of compensation options needs to be presented on a hydraulically linked basis. This has not been shown so far. **Robert Bird** felt this modelling could be done but the complex hydraulics means the compensation may not solve the problem. **Diamond McGill** said MW1 still need to do the analysis and present the findings.

3.5 **Robert Bird** stated that the hydraulic modelling does not include details such as property flood threshold levels. **Richard Guyatt** noted that this means the houses on the other side of the Portway, for example, have not been assessed in light of the fact they are raised up.

3.6 **Diamond McGill** said MW1 should be notifying the third parties who are going to face a negative flood impact from the scheme. She has worked on another Network Rail scheme – Barnard's Lock (which didn't go ahead in the end) – and there was no detriment, though it was open land either side and there were no impacts on buildings.

4. Flood plain compensation

4.1 **Diamond McGill** said EA would always expect to see hydraulically linked compensation modelling but this has not yet been presented to them. **Robert Bird** noted that the need for compensation is arising because the railway is taking up more space, and the fact it operates as a hydraulic control. Further simulations can be undertaken to assess compensation options.

4.3 **Diamond McGill** explained that it will not just be a matter of digging a large hole – there must be a clear hydraulic link so the specific water we're talking about goes to that place.

4.4 **Richard Guyatt** noted the existence of two disused platforms at Clifton Bridge Station, the removal of which may provide some of the required volume for flood mitigation.

5. Culverts

5.1 **Diamond McGill** said there is a contradiction in the FRA about what happens where there is a culvert at a main river (Portbury Ditch, Drove Rhyne, Colliter's Brook and Longmoor Brook). Diamond believed MW1 is changing the weight over the two Bristol culverts.

5.2 **James Willcock** said there is no increase in load here. Diamond asked for a clear statement to this effect in the FRA. EA must not see any increase in structural loading over main river culverts.

5.3 **Diamond McGill** needs the FRA to give clear confirmation that no works are being undertaken in the 10 metre maintenance strip which the EA uses but which also has a flood plain role. **Michelle Scogings** said Network Rail can ensure their tender documents include a requirement not to encroach into this area.

5.4 **Richard Guyatt** explained that MW1 would need powers under the Order to temporarily close the towpath, which could impact on EA's ability to access the River Avon. Diamond noted EA's maintenance staff use the towpath. The EA needs notification of any activities which might hinder their access.

6. New stations

6.1 **Diamond McGill** said the FRA focuses on the new track. There is very little information on the flood impact of the stations and car parks. EA need a lot more information here – the impact of the buildings and car park etc. should be assessed to the same extent as if they were the only development being undertaken.

6.2 **Diamond McGill** felt the FRA is not well-structured. There are 125 pages of main report, then folders up to 'T' each of which contains sub-folders.

7. Brown water and contaminated land

7.1 **Stuart Oxley** said more information is required about contamination of land and he couldn't find any detail on the results of ground investigation sampling.

7.2 **Carolyn Francis** explained that the main contamination risk concerns the removal of the old ballast which contains organic matter (which NR consider as contamination) as well as pollutants. This is covered in the ES and CEMP. The contamination risk for the operational phase was scoped out by PINS.

7.3 **Stuart Oxley** is not expecting huge discharge on the disused line, and most likely low levels elsewhere, but he can't just accept MW1 saying it is scoped out. EA needs evidence to show

why. He also had concerns about historic contamination and this has not been addressed. Carolyn Francis requested clarification on Stuart Oxley's concerns about what he meant by historic contamination as much of the historic land uses in Portishead have been cleaned up during redevelopment.

7.4 **Dave Pring** did not recall what was discussed when they were consulted at the scoping phase, but cannot recall any discussion of this split between risk during the construction and operational phases. **James Willcock** said the EA will need to take the matter up with PINS if they feel something was scoped out without them having sufficient opportunity to comment.

7.5 **Michelle Scogings** said that Network Rail can provide **Stuart Oxley** with details of how they treat potentially contaminated material. NR would have strong stipulations for in their tender documents.

7.6 **Sarah Holmes** said the risks only appear in the construction phase as the contaminants are at risk of mobilisation. During the operational phase nothing is changing/ being done any differently to any other rail line which Network Rail would manage and be regulated on. At this stage the focus is on significant environmental impacts so there is no need to report insignificant risks.

7.7 **Stuart Oxley** was surprised by the lack of detail he has received. He just needs a "coherent narrative" on this to back up the conclusions on why operational contamination is scoped out.

7.8 **Carolyn Francis** will provide more information on the track bed investigation report and send to EA.

8. Pollution prevention

Dave Pring said the EA would like to review the CEMP. **Carolyn Francis** explained that a version was sent to them in the autumn and not much has changed with it since then. She is tidying the document up and should be able to send it next week.

9. Ecology

9.1 **Dave Pring** reported that the EA's ecologist is generally happy with what they've been presented with.

9.2 **Carolyn Francis** noted that ecology is an important issue (particularly in the Avon Gorge) and Jacobs have been in extensive consultation with Natural England. On the specific comment about fencing, the strategy is to replace the fencing along the railway for security reasons. This fencing does not extend underground, so will not stop animals such as badgers borrowing underneath.

10. Emergency Plan

Diamond McGill said that the EA may be able to assist with use of the flood warning system. Much of this sort of practical mitigation is to be dealt with at the permitting stage (i.e. when applying for flood risk permits).

11. Construction strategy

Michelle Scogings explained that at this stage the document is high level purely in order to support the DCO. EA would still like to see it. James Willcock will issue a copy.

12. AOB

12.1 **Dave Pring** asked about current timescales for submission of the application. James Willcock confirmed the target is end of July.

12.2 **Richard Guyatt** asked if EA would like the draft DCO at this stage. WBD can provide a document tracked against the most recent version the EA received. Richard Guyatt noted that

we are not looking to disapply any EA processes. We will be disapplying North Somerset Levels IDB byelaws.

12.3 **Diamond McGill** asked whether EA can expect more revisions of the FRA. There is work to do, the EA's input has been useful, and MW1 will need to undertake further work on the FRA.

Close of meeting

Ms Jennifer Devereux
North Somerset Council
Town Hall
Walliscote Grove Road
Weston-super-Mare
BS23 1UJ

Our ref: WX/2016/129249/05-L02
Your ref:

Date: 19 June 2019

Dear Ms Devereux

METROWEST PHASE 1 – MEETING NOTES FROM 17 MAY 2019

Thank you for forwarding the meeting notes in respect of the above.

We are essentially satisfied the notes provide an overall accurate account of the meeting.

Notwithstanding the above, the following observations should be noted and recorded with the meeting notes for clarification purposes:

3.6 – The Barnard's Lock scheme was a very different proposal, which was considered relevant to the conversation at the time however, it is not a good comparison to MetroWest, as it related to essential works to an existing line.

However, if it were to be used, the point Diamond was attempting to convey is that the Environment Agency took the stand of **no detriment to properties** anywhere, but that we could consider detriment up to 0.05m to open land, as the scheme changed the flood dynamics, meaning that there was betterment to some areas and detriment to others. Therefore, it was impossible to avoid detriment altogether and still implement the proposal. However, the key point is that this was only considered for open land, no properties were impacted. As far as we are aware, the scheme did not progress to the stage where the owner of the open land (which would have been impacted) was consulted as an alternative solution was found.

4.1 – For every development, which results in additional material in the floodplain, hydraulically linked floodplain compensation must be provided. This would usually not require modelling however, with regard to MetroWest, it is contended that floodplain compensation is not required, even though there are areas where the flood risk to properties is increased. Therefore, modelling is required to demonstrate the identified increase in flood risk to properties would not be alleviated by providing hydraulically linked floodplain compensation, as claimed. This is contrary to our normal planning requirements however, we are prepared to adopt a pragmatic approach regarding this issue and consider this solution in the case of MetroWest.

5.3 – The Environment Agency understands there will be works within the 10 metre maintenance strip. The clear statement needs to show that Agency access will not be restricted in the long term and that we will be closely consulted on access restrictions for temporary works, potentially with some special measures put in place to allow continued access for Agency staff where possible. Any works which impact on the normal processes of the floodplain, should have already been incorporated into the modelling.

Cont/d..

7. – This section is entitled ‘Brown water and contaminated land’. This should read ‘Groundwater and contaminated land’

7.3 – This states “Stuart Oxley is not expecting huge discharge on the disused line, and most likely low levels elsewhere”. We do not recall Stuart referring to discharges in this manner. Accordingly, it is not known what this comment refers to.

7.3 - states “Carolyn Francis requested clarification on Stuart Oxley’s concerns about what he meant by historic contamination, as much of the historic land uses in Portishead have been cleaned up during redevelopment.” For clarification, we do not view this as an action for the Agency. We would expect the developer to present information about the contaminative status of the application area, not simply the track bed.

We would reiterate that our observations, both verbal and written, have been entirely consistent throughout the consultation process and have always been intended to be constructive. We have endeavoured to ensure the project’s compliance with central government planning policy and related regulatory processes pertinent to the Agency. Accordingly, we have advised that any deficiencies in terms of process and/or evidence, could potentially compromise any DCO application submitted for examination.

Should you wish to discuss the above comments, please contact me direct.

Yours sincerely

Dave Pring
Planning Specialist

Direct dial 02030 250153
Direct fax 01278 452985
Direct e-mail nwx.sp@environment-agency.gov.uk

End

Draft Meeting Note

Matter no: 381278.1

Client: North Somerset District Council

Matter: MetroWest Phase 1

Attending: Robert Bird (Jacobs), Carolyn Francis (Jacobs), Dave Pring (EA), Diamond McGill (EA), Stuart Oxley (EA), Dan Brutto (NR), Richard Guyatt (WBD), Tom Ewings (WBD), James Willcock (NSC), Jennifer Devereux (NSC), Michelle Scogings (NR), Niall Spencer (NR), Gilles Moullec (NR), Chris Stratton (EA)

Name: Tom Ewings (WBD) Location: Bristol Date: 26 July 2019

Start time: 10.00 Units:

Agenda

1. Flood mitigation technical note
2. Construction methodology for retaining the Track at Bower Ashton at its current level
3. Ground Investigation appendix to Environmental Statement
4. Storage of old ballast at compounds

Actions

1. **Niall Spencer** and **Jennifer Devereux** to liaise to arrange a further meeting to deal with the technical detail and feed in the issues which will restrict the design and methodology.
2. **Jennifer Devereux** to forward on details to the Environment Agency of where the proposed compounds will be and give an estimate of the volume of material likely to be stored in the compounds (though noting the project team do not have the detail down to exactly where the piles of ballast will be stored).

1. Flood mitigation technical note

1.1 **Robert Bird** explained the recent work Jacobs have undertaken on flooding. He said the modelling showed raising the track, which was included in the original design, resulted in flooding on third party land in the 2115 modelling allowing for climate change.

1.2 Since then Jacobs have undertaken further conceptual modelling to see where flood compensation is viable – see Figure 3.1 in the Jacobs Technical Note of flooding. The areas considered broadly divided into two: Compensation 1 which is areas to west of railway; and Compensation 2 which is areas to the east of the railway.

1.3 **Robert Bird** further explained that the study of the compensation options is that it is not possible to fully mitigate the flooding impacts on third party land if the track height is raised. Therefore Jacobs have considered the option of retaining the same level and footprint of track, whilst keeping the ramp at Clanage Road - which can be compensated for. Robert referred to Figures

5.1 onwards in the Technical Note on flooding, which assess the flooding impacts in the scenario of retained track level and footprint. It also details the available options which achieve full mitigation of the Clanage Road ramp.

1.4 **Robert Bird** said Jacobs did identify a problem with the previous model, whereby it had been affected by a limitation of model creating 'noise' in the results. The modelling has been modified to address this and the result is that impacts on the properties on the Portway are no longer present.

1.5 **James Willcock** noted that the main compensation we're looking at now is shown in Figure 5.6 of the Technical Note on flooding (Compensation v5).

1.6 **Robert Bird** referred to an email he issued earlier in the morning explaining the impacts on track flooding of keeping the track at the same level. The benefit of the previous design with the raised track was reduced flooding of the track. In the 2015 baseline, when keeping the track height as it is now, there is flooding every 5-10 years. In 2075 the flooding events become more frequent - every 1-2 years.

1.7 **Diamond McGill** said it is positive to hear that the MW1 project team has looked to address the third party land flooding impacts.

1.8 **Dave Pring** said the EA have not had time to review Jacobs' Technical Note on flooding and had suggested delaying the meeting for this reason. His priority is to talk through the recently presented report to understand what EA need to be reviewing. He would be interested to hear what NR have to say now that the proposal is to keep the track height the same, given the increased risk of flooding compared to the previous design which raised the track.

1.9 **Michelle Scogings** responded to Dave Pring's query, saying NR are still looking into the detail but will be considering the operational aspects of retaining to the existing track height. This would include discussion with key industry partners (likely to include ORR and DfT). This work may take some time but it is understood that it is important. Network Rail advised only a very high level review had currently been undertaken.

1.10 **Gilles Moullec** said he has been looking into the feasibility of the redesign to the existing track level. NR has been guided by Jacobs so far in terms of getting a viable design, but are not getting into the detail. This will be done once this new scope is formally remitted.

1.11 **Michelle Scogings** said NR will need to engage with other parties (detailed in 1.9) throughout the design process from commencement to completion and seek their views before it can be finalised. Michelle Scogings said NR are in the same position as the EA – they still need time to fully consider the Jacobs Technical Note and reach conclusions on the best way forward.

2. Construction methodology for retaining the track at Bower Ashton at its current level

2.1 **Michelle Scogings** is happy to talk about the high level principles, though NR does not have a design for the track yet. NR is currently taking input from those with knowledge of practical railway delivery – Gilles in particular has been working on the high level practical methodology. This will be understood once the design is commenced and a more definite position given.

2.2 **Gilles Moullec** explained that NR can work towards a design to maintain existing track levels and footprints. However, the need to achieve ‘tie-ins’ to existing track, and to comply with modern standards, means that the levels won’t be identical from a design perspective. The levels will be further influenced by construction tolerances, which again, may result in further deviations from existing levels, however, it will be very close.

2.3 **Gilles Moullec** explained that in working up the design NR is trying to be as 'neutral' as possible (in terms of impacts on track height and footprint) but cannot be sure until the detailed design is finalised.

2.4 **Michelle Scogings** said there are other construction methodology issues to consider; one of these being how ballast is stored and moved. However, the design work is taking the lead and once this is pinned down the methodology can also be finalised. Michelle summarised by saying at the moment NR are working at a high level and Network Rail understand the end-state (subject to relevant approvals) – the challenge is the works (design/methodology) to get to this position.

2.5 **Dan Brutto** asked whether the EA officers can provide feedback on what they want to see/ don't want to see in terms of storage of ballast/other track material at or close to the line. Network Rail would propose to agree this prior to the commencement of the design and methodology works.in combination with any comments on digging on or close to the line within the flood zones and over Main Rivers. It would also be helpful to receive a steer on whether Longmoor and Colliter's Brooks are regarded as tidal Main Rivers or not.

2.6 **Dave Pring** said EA can include this information in the response, though noted that he had previously requested the latest iteration of the CEMP but is not sure what stage this is now at.

2.7 **Jennifer Devereux** explained that the CEMP is still being revised, but the revisions are mainly to do with the sharing of responsibilities. The main detail is in the flood plan but this needs to be reissues to the EA given the new method with track height being kept the same.

2.8 **Carolyn Francis** said the pollution prevention measures have not changed in the CEMP since it was last issued to EA in March, so the existing draft can be used by the EA for the purposes of this discussion. The other document to consider is the Surface Water Drainage Strategy, which includes temporary drainage at Clanage Road Construction Compound.

2.9 **Diamond McGill** said that when it comes to storing material, there may be a requirement to have permits issued by the EA. The EA's basic position is that no material is to be stored in the flood plain. If this is absolutely necessary/unavoidable, the material should be stored more than 16 metres away from any main river.

2.10 **James Willcock** said the Clanage Road compound is in the flood plain and ballast will need to be stored here, which could create a problem. The ballast would be stored in bags so that it could be removed easily. Network Rail advised this was not "business as usual" and will need some consideration in respect of methodology (specifically if ballast has to be stored in bags)

2.11 **Gilles Moullec** said he has started work on considering the methodology which does look into the ballast, but is limited to how NR can handle the material at the track side. Gilles suggested organising a meeting in the future to address any concerns once the methodology has been more fully developed, but NR need to know the restrictions from EA to help shape the design.

ACTION – **Niall Spencer** and **Jennifer Devereux** to liaise to arrange a further meeting to deal with the technical detail and feed in the issues which will restrict the design and methodology.

3. Other FRA Matters

3.1 **Jennifer Devereux** explained that Jacobs will be updating the FRA with further comments which Dave Pring and Diamond McGill provided during and following the last meeting.

3.2 Mitigation will also be provided in the vicinity of the Easton in Gordano Stream. Details will be provided shortly but the works required are relatively minor.

4. Ground investigation appendix to Environmental Statement

4.1 **Carolyn Francis** explained that a new appendix has been produced for the Environmental Statement, as a summary report with annexes. Jacobs have brought together the geology, site history and contamination detail. The appendix identifies data gaps to deal with in detailed design. Carolyn noted that it is also important to read this alongside the DCO - a Requirement will be added into the DCO to say that development cannot commence until there is a written scheme to deal with contamination.

4.2 **Carolyn Francis** pointed to the executive summary to the new appendix which notes several sources of contamination. Most are considered to be low risk, though further investigation is required. Most of the effects are likely to be mitigated through good construction practice. The Avon Road underbridge, temporary storage of ballast, storage of old ballast at construction sites for longer periods (up to two years) perhaps near the disused line – all of these will require further working with the Environment Agency to secure any required consents.

4.3 **Carolyn Francis** also mentioned an existing sewer under the proposed footprint for Portishead station/platform which needs to be considered during piling operations. There is also a disused MoD oil pipeline in the site of the proposed car park B. We have not found a purge certificate for that pipeline, so we will assume it is still live so works in that area will need to be sensitive to the pollution risk. Also, at the Avon Road Bridge, asbestos has been identified so the project team will need to comply with the relevant regulations to manage this appropriately.

5. Storage of removed ballast at compounds along the dis-used line

5.1 **Dave Pring** queried the details regarding the proposed storage of ballast, asking whether this has been issued to the Environment Agency for comment. Dave asked whether the MW1 team wants EA guidance on these issues. The short notice for this call means EA did not have a colleague from Waste Management involved to provide input.

5.2 **Carolyn Francis** said the old ballast is to be stored at the Portbury Hundred and Lodway compounds, and possibly along the rail corridor. Some will be contaminated and perhaps will be stored for over a year. The project team would certainly wish to discuss the permitting requirements in more detail with the Environment Agency.

5.3 **Dave Pring** asked for these additional details to be forwarded to the Environment Agency. Without this detail they cannot provide useful guidance.

ACTION – **Jennifer Devereux** to forward on details to the Environment Agency of where the compounds are and give an estimate of the volume of material (though noting the project team do not have the detailon the design of the stockpiles such as area, location and height of the stockpiles).

5.4 **Chris Stratton** said the volumes of materials would most likely exceed the exempt quantities, and the storage duration of over a year would be an issue too. He also pointed out that the Environment Agency would also want to see assurances over the safe transporting of contaminated material.

5.5 **Stuart Oxley** said he has had a quick look through the Technical Note on land contamination from Jacobs (at a high level). One thing he noticed was that the risks are considered to be low, but the Environment Agency would want more confidence from further investigation to confirm this. The data is a huge improvement on what he has seen before, but the Environment Agency need to see more justification from site investigation and desk study.

5.6 **Stuart Oxley** also noted that in respect of one site (Avon Road Underbridge) the report says further investigation is not deemed necessary, but Stuart could not see why. He agreed to cover this in his written response.

6. Other matters

6.1 **Diamond McGill** said where the project involves working over main river culverts, it will need to be sure not to increase the loading and risk of damage to that culvert.

6.2 **Stuart Oxley** said his remit is protected waters but not human health. On the latter he advised the project team to liaise with Bristol City Council. **Jennifer Devereux** said the report will go to both Bristol City Council and North Somerset Council to respond on the public health aspect. **26th July 2019**

From: Pring, Dave <dave.pring@environment-agency.gov.uk>
Sent: Wednesday, August 14, 2019 5:30 PM
To: Jennifer Devereux <Jennifer.Devereux@n-somerset.gov.uk>; James Willcock <James.Willcock@n-somerset.gov.uk>
Subject: MetroWest - Flood Risk Assessment – River Avon flood risk: Off-site impacts and mitigation Technical Note

Hi Jenny,

Please find hereunder our comments in respect of the submitted Technical Note:

We will need to complete a review of the modelling, before we are able to accept the findings of the Technical Note. However, as stated during our recent telecon, we are very supportive of the focus on ensuring there is no increase in flood risk to third parties, by maintaining the line at existing levels. If the model review is satisfactory, we will accept the compensation V5 being provided for the ramp, on the grounds that it would appropriately mitigate the increase in flood risk.

We have noted that leaving the railway line at its current level will result in regular flooding, particularly when the predicted impact of climate change is considered. As previously advised, we will continue to highlight the resulting low resilience to flooding, in accordance with our statutory duties.

We would reiterate that no material should be stored within the designated floodplain. If this is absolutely necessary/unavoidable, the material should be stored more than 16 metres away from any statutory main river. Any storage of materials within the designated floodplain, which is not deemed to be specifically regulated through the DCO or a Local Planning Authority planning permission, will require a Flood Risk Activity Permit from the Agency.

The storage of materials, within the designated floodplain or otherwise, may additionally be subject to the requirements of a formal waste permit from the Agency. Further information regarding waste regulation matters will be forwarded upon receipt of details regarding the proposed storage locations.

We have requested a copy of the latest iteration of the CEMP on numerous occasions however, this has not been forthcoming. Accordingly, the pollution prevention measures and related procedures, proposed in respect of the storage of potentially contaminated materials, is not known.

Our response to the Land Contamination Summary Report will be forwarded at the earliest opportunity.

Regards

Dave

Dave Pring
Planning Specialist
Sustainable Places
Wessex Area

Internal Phone: 50153
External Phone: 02030250153
Fax: 01278 452985
E-mail: nwx.sp@environment-agency.gov.uk

Environment Agency, Rivers House, East Quay, Bridgwater, Somerset, TA6 4YS

MetroWest

Portishead Branch Line (MetroWest Phase 1)

TR040011

Applicant: North Somerset District Council
5.6, Flood Risk Assessment,
Appendix Q North Somerset Levels Internal Drainage Board consultation response
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, regulation 5(2)(e)
Planning Act 2008

Author: CH2M
Date: November 2019

NetworkRail · West of England Local Enterprise Partnership · West of England Combined Authority · HM Government · Bath & North East Somerset Council · Bristol City Council · North Somerset Council · South Gloucestershire Council · travelwest

Dan Alsop - Chartered Engineer

RAYMOND HOUSE 29 BROAD STREET LYME REGIS DORSET DT7 3QE

tel: 01 297 444502 W 07 712 010 264 M

Email: alsop-engineer@o2.co.uk

Mr Robert Bird
CH2M Hill
Burderop Park
Swindon
SN1 4JA

25th November 2014

cc Mr Giles Oliver, Engineer, North Somerset Levels IDB
cc Mrs Ailsa Colbourne, Clerk, North Somerset Levels IDB

Dear Robert,

METROWEST PHASE 1
NORTH SOMERSET LEVELS IDB

I am writing on behalf of the IDB as a follow up to our meeting on 8th May.

Information on the Local Drainage System
I enclose copies of your plans marked up with what information I am able to supply. This is based on various inspections but not on rigorous surveys. Accordingly, although to the best of my knowledge it cannot be guaranteed as accurate.

Please also note:

Any levels are in metres AOD

More information may be available, please ask if you have a specific inquiry.

I will check the flow paths of the watercourses I have not yet marked with this information, but hope to gather this information shortly.

We may be able to assist with landowner information, although this is subject to confidentiality constraints.

The IDB's principal concerns are as follows:

Culverts
You will note that I have marked the 7 (or 8?) culverts know to us under the length of railway of interest to the IDB, ie West of Royal Portbury Dock Road. The Board will wish to be assured that these will be put into proper working order as part of the scheme. As discussed at the meeting, owing to the major infrastructure changes in this area over the last 40 or so years, the size of the existing culverts may no longer be appropriate for the watercourses they serve, and could be either over or undersize, or indeed completely redundant. I understand that detailed inspections

have been undertaken as part of the appraisal and we would be pleased to receive a note of their respective sizes, levels and general condition.

Should any culverts require reconstructing on structural grounds, it would be prudent to consult the Board at an early stage. Apart from the sizing issue, adequate access for periodic maintenance, whether by the railway operator or adjacent riparian interests, is crucial. This is an ongoing issue for us with Network Rail owing to the administrative and physical barriers which constraint the clearance work.

Possible Footbridge
On sheet 1 you will see have identified a potential clash. The watercourse which runs parallel to and south of the railway is an important local drain and is routinely cleaned out by the IDB using mechanised plant . The Board's access route is marked in red so the bridge would need to clear this. At present it would also be impossible to form a footpath from the bridge towards the station because just upstream of the culvert under the railway the gap between the housing and the watercourse is very narrow. However both issues could be solved by extending the railway culvert all the way to a point East of the footbridge.

Formalities
The Board operates under the provisions of various pieces of Land Drainage legislation and in particular publishes byelaws, a copy of which may be accessed on the Board's website http://www.nslidb.org.uk The main point to note is that almost any works within 9 metres of a watercourse within the Board's area (I have marked the Board's boundary on the plans) will require formal written consent prior to the commencement of construction. Clearly in cases such as these it is advisable to agree the proposals well in advance of this in order to minimise the possibility of delays.

Yours sincerely,

Dan Alsop

Dan Alsop, BSC CEng MICE
Northern Area Engineer

Encs:

6 sheets of A3 drawings

PORTBURY DITCH (EA)

OUTFALL (CUT)

CULVERT. (PRIVATE)

SCREEN (IDB)

HIGHWAY CULVERT - NSC

N

MARTINGALE W

DITCH

PORTBURY

Trading Estate

Mast

Hotel

HAVEN VIEW

MALIN PARADE

FINISTERRE ROAD

IDB BOUNDARY (APPROX)

PHOENIX WAY

IDB

THE CUT (IDB)

MARJORAM WAY

Sainsbury Development

Stop Quays Avenue

FOUL (NW)

Ppg Sta

New Portishead Station

New Pedestrian Crossing

Tydeman School

Warehouse

POSSIBLE CLASH

SERBERT ROAD

SERBERT WAY

QUAYS AVENUE

CONFERENCE AVENUE

MULBERRY AVE

GALLINGALE WAY

TYDEMAN ROAD

AMBOURNE WAY

OUTFALL TO PORTBURY DITCH

(ENLARGED) STORAGE POND (SAINSBURYS)

Hotel

S/W SEWER (NW)

POND FILLED

8m

A369

SW SEWERS (NW)

STORAGE POND (NSC)

CULVERT UNDER RAILWAY (NSC?)

CULVERTS PROVIDED BY DEVELOPERS.

OUTFALL FROM STORAGE POND (NSC).

THE CUT (IDB) - ACCESS ROUTE FOR MECHAISED PLANT SHOWN RED

KEY

- 100m radius
- Red line boundary
- Portishead to Pill DCO Application Area
- New Pedestrian Crossing

DCO Study Boundary

- North Somerset Council

0 50 100 Metres

Client
North Somerset Council,
Town Hall,
Walliscote Grove Road,
Weston-super-Mare
BS23 1UJ

CH2M HILL
Geospatial
Burderop Park, Swindon, SN4 0QD
Tel: +44 (0)1793 812479 Fax: +44 (0)1793 812089
www.ch2m.com

Project :
METROWEST PHASE 1

Drawing :
FIGURE 2.2: PORTISHEAD TO PILL DCO APPLICATION SITE & ENVIRONMENTAL CONSTRAINTS 1 of 8

Drawn By :	Tim Hughes	Date: 30/04/2014
Checked By :	Emily Earing	Date: 30/04/2014
Approved By :	Carolyn Francis	Date: 30/04/2014

Drawing No. : 490327-008-001 - A

Revision -

Drawing Scale : 1:2,500

NOTES

[redacted]

JULY 2014

(1)

STORAGE PONDS – DISCHARGE TO MOAT

N

RAM WAY

SORREL GARDENS

FENNEL ROAD

TARRAGON PL

Tydeman School

School

LC

Close Moor Lane Level Crossing

Drain

MOAT DRAINS TO TIDAL OUTFALL

Drain

INNER TIDAL DEFENCE

THE MOAT

AWT OUTFALL

(HIGH GROUND)

CULVERT

Drain

Drain

(LOW)

Track

CUTTING

UP

(LOW)

CUTTING

UP

(LOW)

(OVERGROWN)

7m

CULVERT (NSC?).

CULVERT (NSC ?)

THE CUT (CHOKED)

Sluice

IDB MACHINE ACCESS

WAY

BRAMLEYS

MOOR GATE

Moor Farm

IDB

TO SANDY RHYNE

Drain

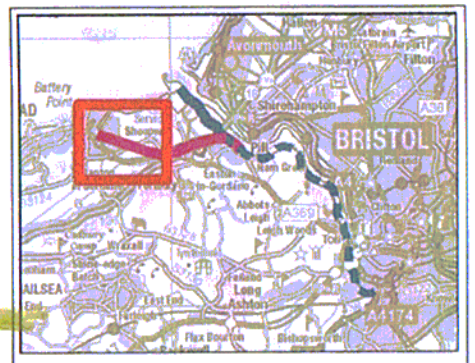
(HEDGE NO DITCH)

OLD (TIDAL ?) BANK

8m

THE CUT (IDB) TO THIS POINT

STORAGE POND (NSC)



KEY

- 100m radius
- Red line boundary
- Portishead to Pill DCO Application Area
- Oil Pipeline
- Listed Building

DCO Study Boundary

- North Somerset Council

0 50 100
Metres

Client
North Somerset Council
Town Hall,
Walliscote Grove Road,
Weston-super-Mare
BS23 1UJ

CH2M HILL
Geospatial
Burderop Park, Swindon, SN4 0QD
Tel: +44 (0)1793 812479 Fax: +44 (0)1793 812089
www.ch2m.com

Project :
METROWEST PHASE 1

Drawing :
FIGURE 2,3: PORTISHEAD TO PILL DCO APPLICATION SITE & ENVIRONMENTAL CONSTRAINTS 2 of 8

Drawn By :	Tim Hughes	Date: 30/04/2014
Checked By :	Emily Earing	Date: 30/04/2014
Approved By :	Carolyn Francis	Date: 30/04/2014

Drawing No. : NOTES Revision
490327-008-001 - B -
Drawing Scale : 1:2,500 JULY 2014

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(2)

N

SHEEPWAY

Rose Cottage

IDB

Sheepway Gate Farm

Shipway Farm

Sheepway

AREA S OF ROAD DRAINS UNDER RAILWAY TO SANDY RHYNE

RAILWAY CULVERTS (NSC?)

Drain

Disused Railway

RAILWAY CULVERT

CULVERT UNDER HIGHWAY (NSC)

THE PORTBURY HUNDRED

7m

SANDY RHYNE (EA)

OUTFALL TO SANDY RHYNE

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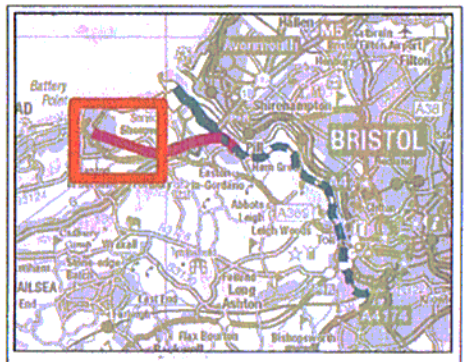

KEY

- 100m radius
- Red line boundary
- Portishead to Pill DCO Application Area
- Oil Pipeline
- Listed Building

DCO Study Boundary

- North Somerset Council
- IDB BOUNDARY (APPROX)

0 50 100
Metres

Client
North Somerset Council
Town Hall,
Walliscote Grove Road,
Weston-super-Mare
BS23 1UJ

CH2M HILL
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Burderop Park, Swindon, SN4 0QD
Tel: +44 (0)1793 812479 Fax: +44 (0)1793 812089
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Project :
METROWEST PHASE 1

Drawing :
FIGURE 2.4: PORTISHEAD TO PILL DCO APPLICATION SITE & ENVIRONMENTAL CONSTRAINTS 3 of 8

Drawn By :	Tim Hughes	Date: 30/04/2014
Checked By :	Emily Earing	Date: 30/04/2014
Approved By :	Carolyn Francis	Date: 30/04/2014

Drawing No. : 490327-008-001 - C
Revision -
Drawing Scale : 1:2,500
JULY 2014

NOTE [redacted]

(3)

↗ DRAINS TO DROVE RHYNE

N

8m

W

Drain

Track

Elm Tree Farm

Track

Elm Tree Park

DROVE RHYNE (EA)

The Drove

SEE DWG (D) (SHEET 5)

Depot (RAISED)

(ACCESS TO THE DROVE FROM A369 NO LONGER IN USE)

PLANTATION WITH MOAT

RAILWAY CULVERT

CYCLEPATH

BARRIER.

(Track)

RAILWAY CULVERT

14m

STATION ROAD

AVON WILDLIFE TRUST RESERVE (LOW)

Drain

A369

A369

(HIGH GROUND)

CULVERT (N/S)

7m

Cole Acre

?

Drain

M5 M5

7m

PORTBURY HUNDRED

FB

OUTLET (FROM FLOW CONTROL ?)

MOTORWAY S/WATER STORAGE TANK WITH OUTLET CONTROL

SANDY RHYNE (EA)
SUMMER WL 4·80 AOD
WINTER WL ≈ 4·50 AOD

BOX CULVERT (HIGHWAYS AG)

MS S/WATER PIPELINE (ROUTE UNKNOWN)

UPLAND STREAM

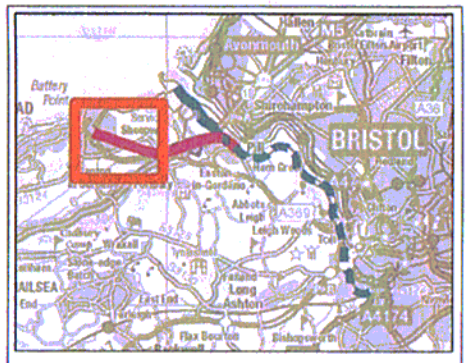
PRIORY ROAD

STATION

(HIGHER GROUND)

(ALL LEVELS AOD)

PORTBURY PUMPING STATION (FOUL) (WESSEX)



KEY

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- Red line boundary
- Portishead to Pill DCO Application Area
- Oil Pipeline
- Listed Building

DCO Study Boundary

- Network Rail
- North Somerset Council

0 50 100
Metres

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BS23 1UJ

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Project :
METROWEST PHASE 1

Drawing :
FIGURE 2.5: PORTISHEAD TO PILL DCO APPLICATION SITE & ENVIRONMENTAL CONSTRAINTS 4 of 8

Drawn By :	Tim Hughes	Date: 30/04/2014
Checked By :	Emily Earing	Date: 30/04/2014
Approved By :	Carolyn Francis	Date: 30/04/2014

Drawing No. : 490327-008-001 - D
Revision : -
Drawing Scale : 1:2,500

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(4)

N

Warehouse

PORTBURY WAY

BRADLEY ROAD

ROYAL PORTBURY DOCK ROAD

9m

Drain

Track

Drove Rhyne (ENVIRONMENT AGENCY MAIN RIVER)

WL HELD ~3.0m AT OUTFALL

The Drove

Track

CULVERT UNDER ROAD FREE DISCHARGE TO DROVE RHYNE

RAILWAY CULVERT ?

Drain

WESSEX FOUL P/STN

THE PORTBURY HUNDRED

A369

Drain

Drain

Drain

Drain

9m

Junction 19

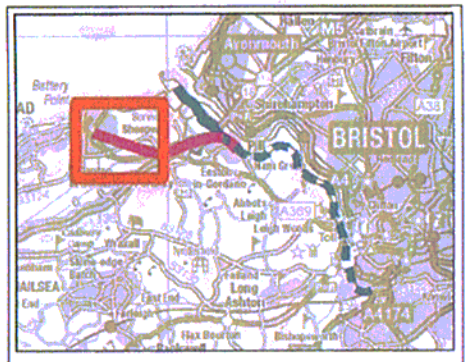
M5

TO TIDAL EXCLUSION SLUICE & WATER LEVEL CONTROL STRUCTURE

FIXED WEIR ?

BARRIER

IDB BOUNDARY



KEY

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- Red line boundary
- Portishead to Pill DCO Application Area
- Oil Pipeline

DCO Study Boundary

- Network Rail

0 50 100
Metres

Client
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Weston-super-Mare
BS23 1UJ

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Project :
METROWEST PHASE 1

Drawing :
FIGURE 2.6: PORTISHEAD TO PILL DCO APPLICATION SITE & ENVIRONMENTAL CONSTRAINTS 5 of 8

Drawn By :	Tim Hughes	Date: 30/04/2014
Checked By :	Emily Earing	Date: 30/04/2014
Approved By :	Carolyn Francis	Date: 30/04/2014

Drawing No. : 490327-008-001 - E
NOTES [redacted]
Revision -
Drawing Scale : 1:2,500
JULY 2014

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N

OR WAY

DA NO WAY

Drain

8m

lss

Warehouse

Mast

Railway (disused)

Drain

Court House Farm

IDB BOUNDARY

7m

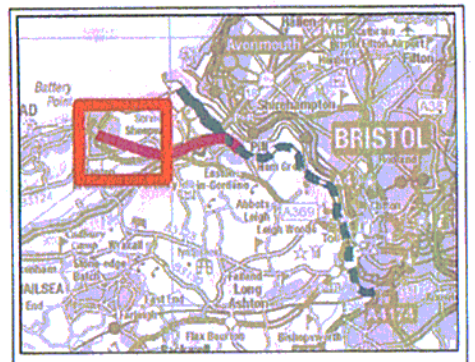
Drain

Mast

lss

BEECHWOOD ROAD

CHURCH RO



KEY

- 100m radius
- Red line boundary
- Portishead to Pill DCO Application Area
- Listed Building

DCO Study Boundary

- Network Rail

0 50 100
Metres

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Project :
METROWEST PHASE 1

Drawing :
FIGURE 2.7: PORTISHEAD TO PILL DCO APPLICATION SITE & ENVIRONMENTAL CONSTRAINTS 6 of 8

Drawn By :	Tim Hughes	Date: 30/04/2014
Checked By :	Emily Earing	Date: 30/04/2014
Approved By :	Carolyn Francis	Date: 30/04/2014

Drawing No. : 490327-008-001 - F NOTES [redacted] Revision -

Drawing Scale : 1:2,500 JULY 2014

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6

MetroWest Phase 1 (MW1)
Draft LPA Water, FRA and Drainage meeting notes

12:30, 24th October 2017, Town Hall, W-s-M

Attendees	**Apologies:**
Jenny Devereux (JD), MetroWest Phase 1 Carolyn Francis (CF), CH2M Robert Bird (RB), CH2M Magda Fabsiak (MF), CH2M Alex Hawtin (AH), BCC Matthew Sugden (MS), BCC Lucy Nicholson (LN), NSC Simon Bunn (SB), North Somerset Level IDB Dan Alsop (DA), North Somerset Level IDB Giles Oliver (GO), North Somerset Level IDB	

No	Issue	Action By	Date
1.	JD did a brief run through of the scheme.		
2.	The Highways drainage design for the scheme needs more detail for LN and the IDB to comment on it. Highways would need discharge locations and discharge rates so that they can comment on whether the Highway Drainage is adequate or needs to be upgraded. The IDB would expect discharge rates of the additional highway drainage into their watercourses to confirm capacity.		
3.	LN said that NSC require an outline drainage strategy with planning applications. LN and MS will provide standard comments on what NSC expect from an outline drainage design and send over.	LN/ MS	
4.	JD discussed this with project team members after the meeting and an outline drainage strategy is being produced, but needs to be completed.		
5.	Bristol City Council (BCC) are updating their surface water model this is due to be complete at Christmas. There are a few areas of high risk to surface water flooding in Bristol. The Ashton area is at high risk of surface water flooding. The initial local modelling only included the larger culverts. The Ashton area is pumped and it is not known how this was dealt with in the model.		
6.	BCC should be engaged early when we have the detailed drainage design.	JD	
	Portbury Wharf Nature Reserve and Portishead		

No	Issue	Action By	Date
7.	An attenuation pond was built for the nearby housing development in the open land to the east. It is not clear if the containment bund that Persimmon were due to build has been built – the assumption is that it has not been built. The IDB do not recollect seeing it on site. Without it a 1 in 100 year flood event would reach the railway. RB thinks the risk to the railway embankment is low, but we should see if Persimmon will build it. LN to look at this issue in more detail and send over a plan. DA thinks the drainage in this area may have to be changed if the bund is built.	LN	
8.	The NSC drainage team would not allow trees to be planted in the Nature Reserve as one of its purposes is for flood attenuation.		
9.	The car parking at Sheepway is currently used by the IDB when inspecting their assets. When it was designed it was for heavy machinery and low loaders for them to maintain drains. JD will speak with NR and the project team about accommodating their continued access. IDB would prefer to have separate space from NR.	JD	13.11.17
10.	JD to send LN and DA direct links to the Sheepway Design.	JD	06.11.17
11.	The highway drainage at Portishead may need upgrading to get discharge into The Cut - this will need investigating at detailed design stage. The IDB will need consulting on increased discharged into The Cut from Car Park A to make sure it has capacity. The Cut drains to the Portbury Ditch, which is managed by EA, so the EA will also be concerned about new discharges to The Cut. IDB cannot access The Cut due to tree growth, so when construct the footbridge they would like to see the ditched clearer and access reinstated.		
12.	The IDB raised that the Pond south of the railway by the proposed Trinity Bridge is still not adopted.		
13.	JD explained that the Highways and Car Parks for the scheme will be adopted after construction by NSC.		
14.	The IDB require the northern access to The Cut to be maintained as far as the culvert inlet. The IDB will want to see detailed drawings for Trinity Bridge to make sure they can fit their equipment in.		
	Dis-used line		
15.	JD explained that the culverts underneath the railway would either be cleared or replaced like for like except the Easton-in-Gordano culvert, which is being increased in size to take the additional run off from Cattle Creep U/b (further east), which is being infilled. CH2M to model the proposed design on flood risk.		

No	Issue	Action By	Date
16.	When the haul road is constructed the IDB have requested a temporary drainage design for it and to know what materials it will be made out of. The haul road would need to take account of current drainage features. In the PEIR Water Chapter three culverts are mentioned, but the IDB think there are more than 3 culverts that would be affected and will have a look. Culverts not on watercourses are maintained by IDB and in a poor condition. We need to bear in mind the inter-connectively of drains in this area. A number of the ditches drain to the south (not the north).		
17.	The IDB have requested that the railway drainage does not interfere with IDB drains, but it should link into them.		
18.	The IDB requested that run-off from all compounds should be checked to see if drainage and discharge to watercourses is required. This is usually covered in the Construction Environmental Management Plan. The design standards for temporary drainage should be the same as permanent drainage.		
19.	It was asked who would be responsible for the permanent compound drainage. JD said that she thought this would be Network Rail as they will own the permanent compounds.		
	Pill		
20.	At Pill the highway drainage is not designed to take large flows and there is already a problem with flooding. We need to know if the surface water can infiltrate, and if not need to discharge to the highway drainage. The project needs to demonstrate that there is capacity in the highway drainage to accept these additional flows. It may be necessary to upgrade the highway drainage.		
	Clanage Road		
21.	This site in in FZ3 and we need to be aware of the planning history and previous refusals. MS- said there would need to be flood mitigation for the Clanage Road compound. JD said that the project team had discussed the use of this site during construction and operation with the EA. He also mentioned there was an existing highway drainage problem on Clanage Road and drainage under the Clanage Road site in culvert to the River Avon which blocks up with silt causing flooding in the deer park.		
	Licences		
22.	Bristol have a 6 week turn around period for issuing land drainage consent for ordinary watercourses. £50 charge. All the information is on their website. We do not think we have BCC watercourses to deal with on this project.		
23.	NSC have a similar process on their website for land drainage consent for Ordinary watercourses. Consents takes 8 weeks minimum. Need 8m within the banks for Ordinary watercourses not in IDB area.		

No	Issue	Action By	Date
24.	The IDB require construction ready detail for consent. They have a list of bylaws, which are all listed on their webpage. The IDB usually make a plan of all the elements of a scheme that may require consent. There is a £50 charge for each consent with a charge for extra officer input. Consents required for additional flows, storage or fencing, temporary works. IDB can offer a letter of intent.		
	AOB		
25.	There are sewage tanking issues around the Wessex Water pumping station at The Drove. Need to improve land drainage locally. Increased drainage on the M5 crawler lane discharges to Drove Rhyne, which has capacity. The culvert is reported to be heavily silted, so there is room for improvement.		
26.	De-silting the culvert by the pumping station would be seen as an improvement.		
27.	It was requested that we re-engage with the IDB, NSC and BCC when the Flood Risk Assessment is completed.		
28.			

TECHNICAL MEMORANDUM

MetroWest Phase 1: Portbury Wharf Attenuation pond flood storage levels

PREPARED FOR:	North Somerset Council
PREPARED BY:	Nick Holder
DATE:	April 19, 2018
PROJECT NUMBER:	674946
REVISION NO.:	0
APPROVED BY:	Robert Bird

Introduction

As part of the MetroWest Phase 1 Flood Risk Assessment, there is the need to evaluate the levels of the Portbury Wharf Attenuation pond in relation to the levels of the proposed railway line works.

Back ground

The Portbury Wharf Attenuation pond is s a two stage attenuation pond serving the properties in the development to the west. It is designed to limit discharge to the open watercourse along its north-eastern tip.

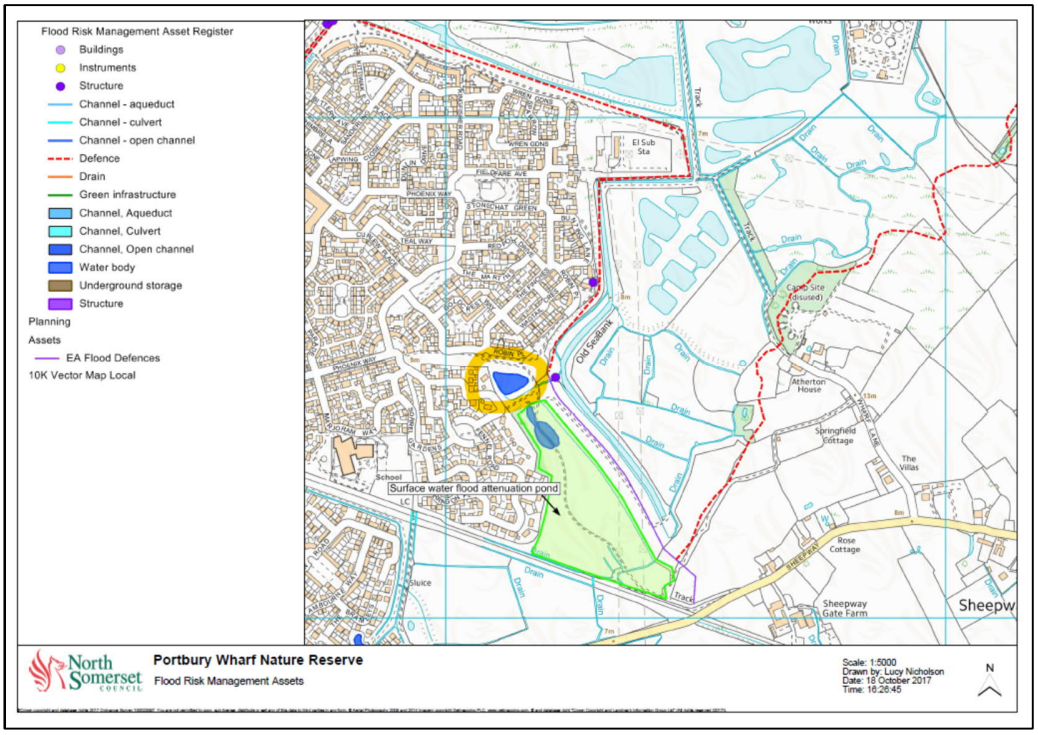


Figure 1: Portbury Wharf Attenuation Pond (smaller pond circled, wider storage area in green)

A small primary storage area to the north can overtop as required into the larger secondary area to the south. Both are controlled by an outfall control structure in the north east of the pond, controlling discharge to the water course.

The proposed works to be undertaken for the MetroWest project include works to the railway line directly south of the attenuation pond as defined by project design drawings W1097B-ARP-DRG-ETR-000230 and W1097B-ARP-DRG-ETR-000231. It is therefore necessary to determine water levels in the attenuation area during design floods and to understand whether the MetroWest proposals affect the available flood storage capacity.

Calculation

Two scenarios have been evaluated, considering the 1:100yr rainfall event. One scenario considers free flow out of the control structure, whilst the other scenario considers a tide locking event, restricting the flow out of the attenuation pond.

Previous calculations[1] have defined the required storage volumes for these events as 4699m^3 and 22898m^3, for the free flow and tide locked scenarios respectively. This reflects the restriction on discharge during the tide locked event.

To determine the levels associated with these storage volumes, a GIS process has been used as outlined below:

I. Create shapefile delineating the boundary of the storage areas.
II. Import LiDAR DTM (2m resolution DTM, Survey Open Data, Environment Agency 2018)
III. Clip DTM to shapefile boundary
IV. Define range of plane heights between minimum and maximum elevations in DTM
V. Using the “surface volume” tool, determine the volume between surface and plane for the entire range of plane heights

Using the steps above, a range of elevations (plane heights) and volumes can be determined.

Results

Figure 4 (at end of this technical note) shows an extract from drawing W1097B-ARP-DRG-ETR-000231. It shows the proposed works on the railway adjacent to the storage area. The proposed MetroWest works are mostly above the calculated flood storage levels. This extract shows that during a tide locked event, proposed works at one of the adjacent sections (Chainage 17500m), would have a very marginal impact on flood storage capacity, as the flood storage level just reaches the lowest level of proposed works at this location. However, the tide locked flood event requires the simultaneous occurrence of both a high tide and a 1:100yr rainfall event, and is considered to have a return period significantly greater than 100 years. For the event assuming free flow through the outfall, the proposed MetroWest works would have no impact on flood storage capacity.

[1] Portishead Quays Consortium July 2001. The Ashlands Surface Water Drainage Strategy (Ove ARUP and partners Ltd)

Table 1 shows the results of this assessment. Highlighted rows show the levels associated most closely with the assessed volumes of 4699m^3 and 22898m^3. It can be seen from these results that for the given volumes, the corresponding storage levels would be 6.65mAOD and 7.145mAOD. The extents associated with these levels can be seen in Figures 2 and 3.

Figure 4 (at end of this technical note) shows an extract from drawing W1097B-ARP-DRG-ETR-000231. It shows the proposed works on the railway adjacent to the storage area. The proposed MetroWest works are mostly above the calculated flood storage levels. This extract shows that during a tide locked event, proposed works at one of the adjacent sections (Chainage 17500m), would have a very marginal impact on flood storage capacity, as the flood storage level just reaches the lowest level of proposed works at this location. However, the tide locked flood event requires the simultaneous occurrence of both a high tide and a 1:100yr rainfall event, and is considered to have a return period significantly greater than 100 years. For the event assuming free flow through the outfall, the proposed MetroWest works would have no impact on flood storage capacity.

Table 1: Surface volume results

Plane_Height	Area_2D	Volume
5.75	245	30
6	872	129
6.25	3693	677
6.5	12044	2322
6.6	17399	3794
6.65	19936	4732
6.7	22178	5787
6.75	24431	6953
7	46220	15361
7.1	54204	20452
7.145	55892	22934
7.15	56036	23214
7.25	58054	28933

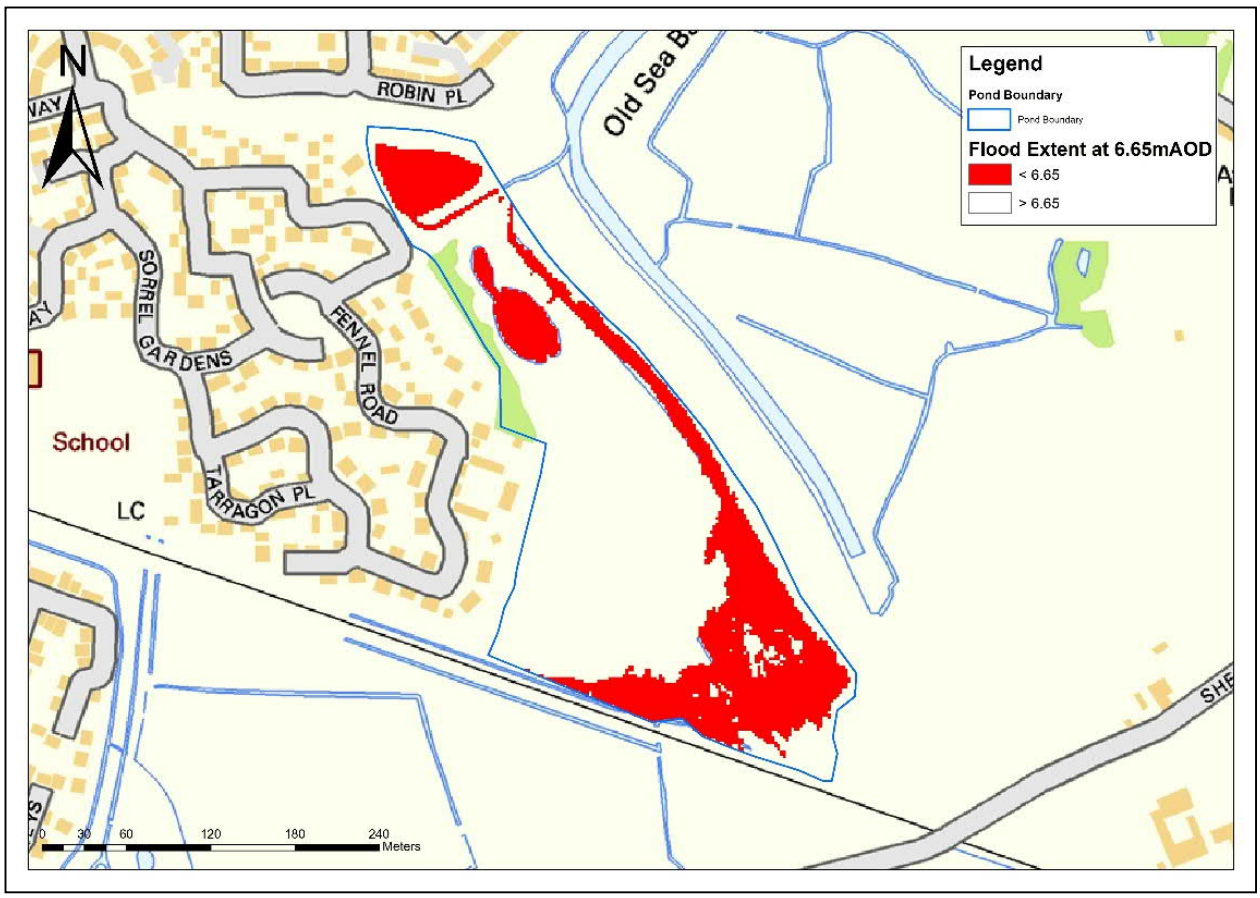


Figure 2: Flood extent at 6.65mAOD representing the storage of 4699m^3

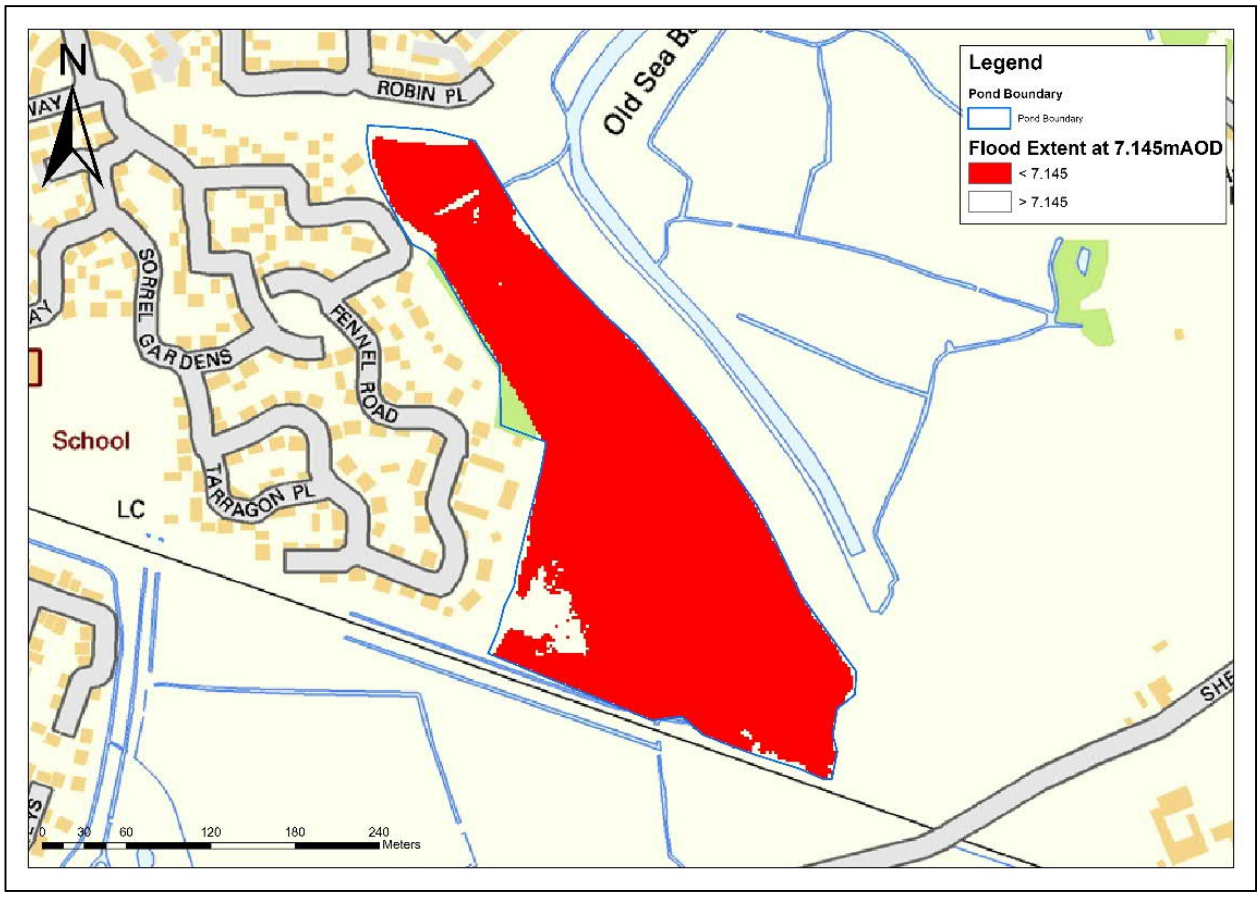


Figure 3: Flood extent at 7.145mAOD representing the storage of 22898m^3

Conclusions

The methodology applied in this note defines a flood extent and level for a given volume of storage, as defined previously in calculations[2].

The results indicate that during a free flow 1:100yr event, the proposed works would not have an impact on the storage area. They also indicate that during a 1:100yr tide locked event, part of the proposed works along this reach would marginally impact the storage area. However, the tide locked flood event requires the simultaneous occurrence of both a high tide and a 1:100yr rainfall event, and is considered to have a return period significantly greater than 100 years.

The impact of the proposed MetroWest works on available flood storage capacity is therefore considered insignificant.

[2] Portishead Quays Consortium July 2001. The Ashlands Surface Water Drainage Strategy (Ove ARUP and partners Ltd)

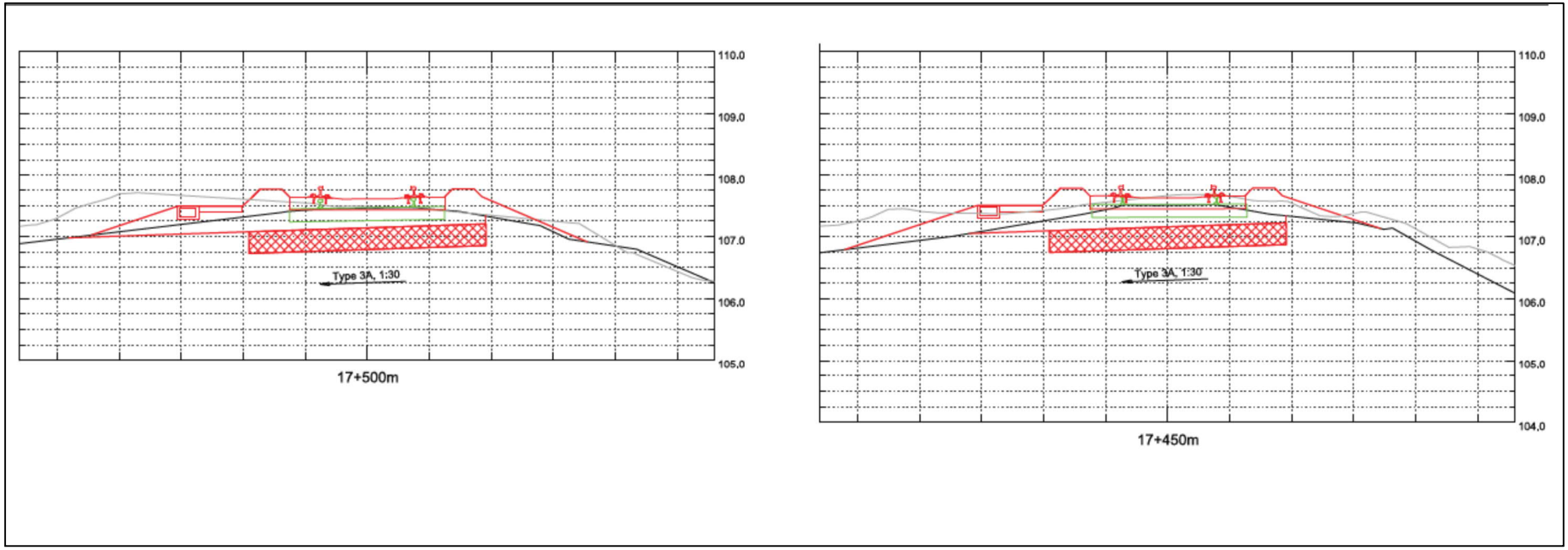


Figure 4: Extract of proposed cross sections from project drawing W1097B-ARP-DRG-ETR-000231
Red line – proposed
Green line – existing
Black line – topographic survey levels
Grey line – LiDAR levels (topographic survey levels preferred)

MetroWest Phase 1 (MW1)
NSLIDB meeting draft notes

09:00, 8th February, Town Hall, W-s-M

Attendees	**Apologies:**
Richard Matthews Jenny Devereux (JD), MetroWest Phase 1 Lucy Nicholson (LN) NSC drainage team Dan Allsop (DA) IDB engineer Giles Oliver (GO) IDB engineer Steve Yates (SY) Ardent Magda Fabisiak (MF) Jacobs Andrew Linfoot (AL) Jacobs Jake Faucitt (JF) Network Rail Dave Jacobs	

No	Item	Action	Date
1.	JD/RM to send the IDB the Minor Civils drawings with shading and showing the proposed and existing fence lines. The IDB currently have about a 4m width for clearing the cut with a slight overhang.	JD/RM	
2.	The IDB wanted to understand better how they would clear the cut around trinity bridge. One possibility was to culver the small un-culverted bits in this area. However a site visit showed there were some issues with this such as utilities.		
3.	The IDB said that they clear the Cut in Portishead every 6 months with a 13 tonne excavator. During construction this won't be possible. A solution needs to be considered. One possibility is that the IDB clear the Cut before construction and then the contractor does it during the 18 month construction period. There also needs to be emergency cover 24/7.		
4.	The watercourses on Portbury Wharf will probably need clearing out just before construction and then after. RM/JD to speak to John Flannigan about this and the current route of access. The IDB said they are currently cleared once a year and have emergency access.	JD/RM	
5.	The IDB will mark up on a plan where the low loader at Sheepway parks and the direction the Rhine maintenance vehicle goes. Ownership and car parking could be a land issue. For example shared access keys for maintenance.	IDB	
6.	It was explained the ditches for track drainage will be cleared and most culverts under the railway replaced. The IDB asked the head walls were on the land boundary for maintenance purposes. This means NR would need an access right to maintain the culverts.		
7.	JD to speak to the EA about their flood defence at Portbury Wharf and where it is.		

No	Item	Action	Date
8.	The IDB's ditches will need safeguarding in compounds during construction such as south of the railway at sheepway.		
9.	The IDB will provide a generic speck for the pipe size they usually require. The pipe size will need specifying when consent is sort by us.	IDB	
10.	The watercourse east of Sheepway may be in the wrong locations and may need maintain by us during construction.		
11.	SY/JF to check that all the track drainage sits with NSC's/ NR's land boundary.	SY/ JF	
12.	By the Drove the pipe north of the railway may be dug out and culverted that goes into the Portbury Ditch. South of the railway the IDB may take over the ditch if the access is put in order.		
13.	Shadow/draft licences are to be submitted with the DCO these require quite a lot of info. Consent will be needed for watercourses affected by the scheme and maintenance affected. This also includes NSC ordinary watercourses such as the one to the east of Marsh Lane.		
14.	A conf-call is required with Simon from the IDB to discuss what they have done on other DCO's such as the Grid C connection and what he is expecting to see from the IDB's planning side. LN also to attend.	JD/RM	
15.	The IDB would like to see the Drainage Strategies, Flood Risk Assessment and Water Framework Directive when completed. A follow up meeting will be held with the IDB when these are complete.		
16.	JD/RM to send the IDB key NR, NSC and Jacobs contacts.	JD/RM	
17.			

MetroWest Phase 1 (MW1)
North Somerset Levels Internal Drainage Board meeting draft notes

10:00, 1 June 2018, IDB offices, Hewish

Attendees	**Apologies:**
Richard Matthews (RM), North Somerset Council Dan Alsop (DA) IDB Giles Oliver (GO) IDB David Crossman (DC) IDB Simon Bunn (SB) IDB Jake Faucitt (JF) Network Rail Dave Bellamy (DB) Jacobs Imri Reshef (IR) Jacobs	

No	Item	Action	Date
1.	The meeting was structured as follows: • IDB comments on GRIP 3 minor civils; • Introducing Drainage Strategy		
2.	**Sheepway / Portbury Wharf area** • IDB do not have a contract to clear ditches here. This is currently being managed by North Somerset Council Streets and Open Spaces Team. • In the past, when IDB maintained the ditches they would use tracked vehicles that would travel from Sheepway road via a bridleway route using the grass verge on the side of the surfaced bridleway. The IDB requested that the same width of verge is available for their tracked vehicles in case they are awarded a contract to clear the ditches in the future. • During construction, the IDB suggested that the temporary bridleway route is wide enough for tracked vehicles to maintain the ditches. • From time to time NR or a contractor clearing the ditches may need to park a low loader in the public parking area owned. It is unlikely there will be a clash between these occasional uses, but it is important that both NSC Streets and Open Spaces team and NR liaise with each other about these activities. • **Post meeting note:** the North Somerset Council Streets and Open Spaces team have reviewed the plans and are happy with what is proposed for vehicular access on a temporary and permanent basis to maintain the ditches on Portbury Wharf Nature Reserve (apx 5m wide including verges).		

No	Item	Action	Date
3.	**Galingale Way – Trinity Footbridge location** • **To the east of the pond at Galingale Way** the IDB have approximately 4m space between a post and wire fence and the top of the ditch within which they operate to clear the ditch; • The MetroWest Phase 1 project will not change the existing situation at this location. The existing post and wire fence will remain in situ and will not be replaced. • The IDB are not satisfied with their current arrangements and see the MetroWest Phase 1 project as an opportunity to improve their access as they would like to have a 6-9m width to operate with alongside the drainage ditch. The IDB requested that the existing situation is improved and that the fence be removed and 2m of vegetation be cut back. • **Post meeting note:** This is not a MetroWest Phase 1 project issue as we are not making changes in this area. The vegetation immediately behind the post and wire is required for its ecological value so cannot be cleared as requested. • **To the west of the Galingale Way pond**, the IDB confirmed that the footprint of the proposed footbridge would not compromise their access to the drainage ditches. • The IDB requested that the proposed surfaced path to the footbridge and the proposed surfaced area at the base of the footbridge be designed in a way that did not impede vehicular access (e.g. no raised kerbs). They used wheeled vehicles at this location.		
4.	**Network fenceline ditch crossings** • Where NR identify a trespass risk due to the fenceline crossing an IDB ditch, the clearances beneath the fenceline will be reduced to prevent this risk through provision of bagwork surrounding a short section of pipe. Required diameter has not been specified but, unless a more detailed requirement is provided by IDB/NSC, will be assumed to be provided as a best fit depending on the width of the ditch. •		

No	Item	Action	Date
5.	**Drainage from Portishead Rail Station** • Agreed that the rail drainage can outfall at this location (channel east of pumping station). Headwall to be provided at level to be determined by NR. • Agreed that this may be raised above the invert of the channel due to the channel's depth. The channel is currently lined with in-situ concrete. No requirement provided for tying the headwall into the concrete other that for NR to provide local in-situ repairs to "make good" any areas damaged by construction. • NR will own the drainage all the way to the ditch. • The ditch invert is apx. 3m • The drainage will cross over an existing culvert and high voltage cables. The existing culvert is 3-4m deep and 1500mm in diameter.		
6.	**Culverts beneath railway** • JF explained that the NR fenceline will be kinked in at the location of culvert headwalls to allow IDB access right up to the culvert, while also allowing NR to retain the headwall on NR on their land. • IDB agreed with this approach. • Opportunity to keep existing culvert at Portishead – noted that the IDB view was that the culvert is of robust concrete construction and may not require replacement. This is something which NR could potentially pursue but more information is required on the design/form of the existing structure. IDB said they do not have access to this. • Do NSC have any information on this culvert?	RM	
7.	**IDB culvert replacement parallel to railway north of Portbury 100** • Noted that IDB are potentially culverting a drain which runs parallel to the north side of the track at Portbury Hundred. If IDB install this drain before construction of the fence line this may impact constructability given that there will likely be a requirement to provide an offset between the pipe and the fence posts. • IDB should install the pipe before MW1 and done in a way that allows the fence line to be installed as shown. Otherwise there is a risk that the design will have to be amended at a later date.		
8.	**Wessex Water pumping station at Portbury 100** • This pumping station is sometimes flooded and excess water is pumped over the disused railway. • JF stated that this would be resolved when the project clears existing drainage ditches and replaces the culvert beneath the railway.		

No	Item	Action	Date
9.	**Overview of Draft Drainage Strategy** • IDB will review drawings and plans that had been provided to them earlier in the week, and issue any comments. • Jacobs went through each of the plans and proposals in the draft drainage strategy. • IDB concluded that at this stage they could see no issues with the drainage proposals, except to note that they did not believe check dams were necessary in the drainage alongside the main car park boulevard in Portishead.	IDB	

MetroWest

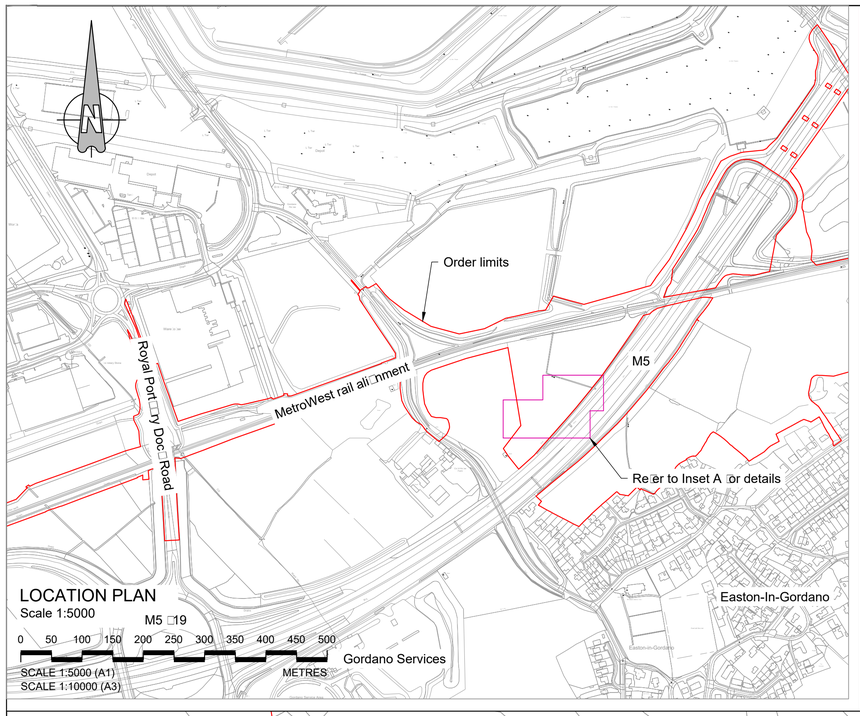
Portishead Branch Line (MetroWest Phase 1)

TR040011

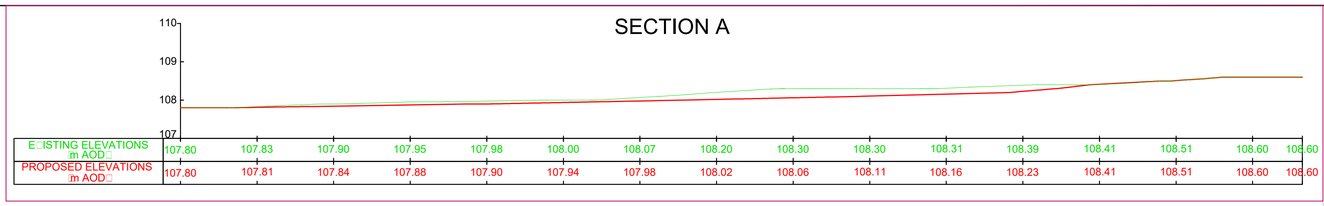
Applicant: North Somerset District Council
5.6, Flood Risk Assessment,
Appendix R DCO application information
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, regulation 5(2)(e)
Planning Act 2008

Author: CH2M
Date: November 2019

NetworkRail · West of England Local Enterprise Partnership · West of England Combined Authority · HM Government · Bath & North East Somerset Council · Bristol City Council · North Somerset Council · South Gloucestershire Council · travelwest



SECTION A



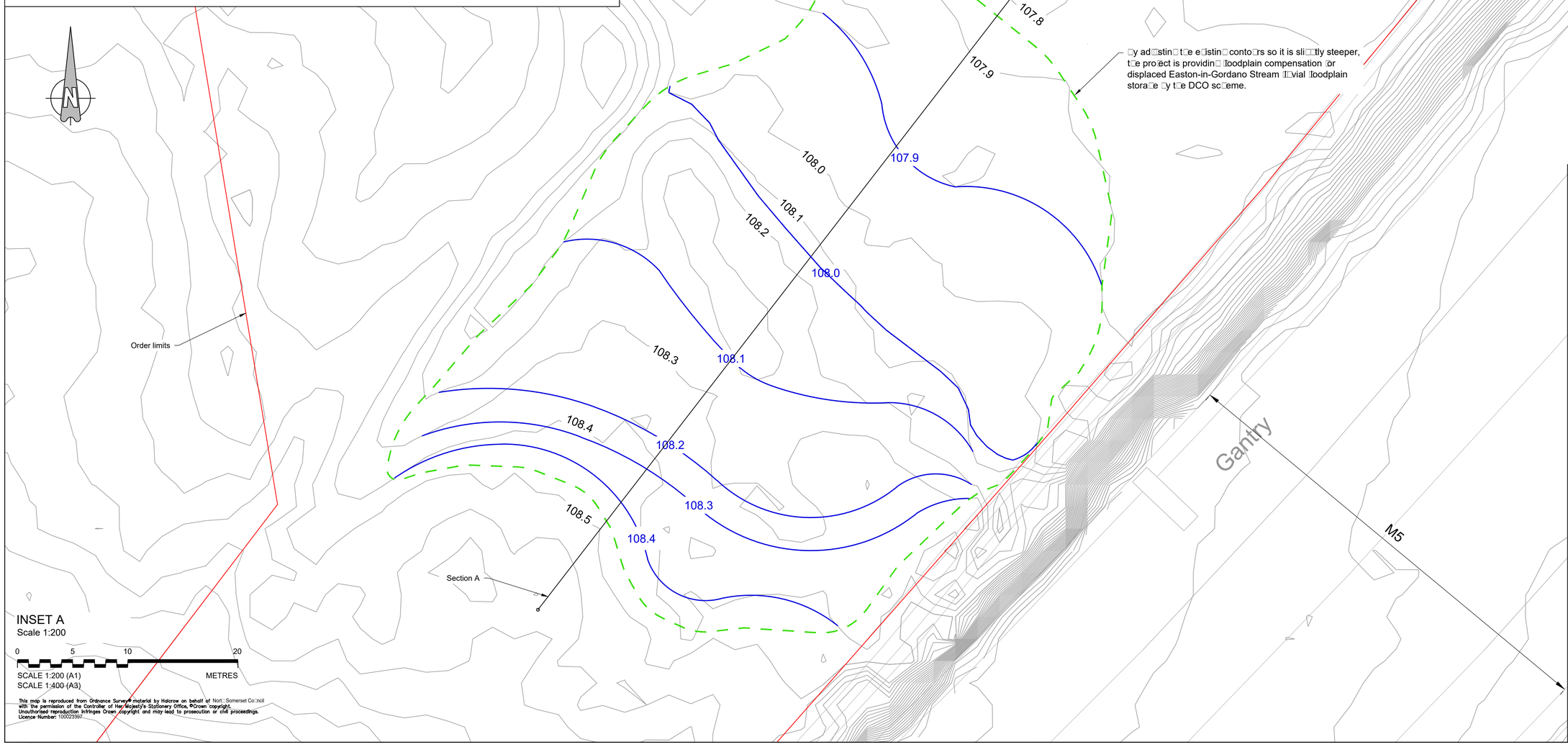
E□ISTING ELEVATIONS □m AOD□	107.80	107.83	107.90	107.95	107.98	108.00	108.07	108.20	108.30	108.30	108.31	108.39	108.41	108.51	108.60	108.60
PROPOSED ELEVATIONS □m AOD□	107.80	107.81	107.84	107.88	107.90	107.94	107.98	108.02	108.06	108.11	108.16	108.23	108.41	108.51	108.60	108.60

NOTES

1. All dimensions are in metres □nless noted ot□erwise
2. Elevations are s□own at +100m d□e to Networ□Rail re□□irements.

□EY:

- 108.4 — Proposed conto□r
- Appro□imate e□tent o□stream compensation e□cavation
- 108.4 — E□istin□ conto□r



DO NOT SCALE. This drawing is to be read in conjunction with all relevant Architects, Engineers and Specialist Manufacturer's drawings and specifications. If in doubt please consult the Engineer.

Rev	□y	C□□d	Approvd	Date	Description
A	ADS	ADL	ADL	20.09.2019	Location plan added

travelwest

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Pro□ect

PORTISHEAD □RANCH LINE
(METROWEST PHASE 1)

Drawin□

EASTON-IN-GORDANO
FLOOD MITIGATION PLAN

Drawn □y:	OHP	Date: 07□08□2019
C□ec□ed □y:	ADL	Date: 07□08□2019
Approved □y:	ADL	Date: 07□08□2019

Drawin□ No.	Revision
467470.□□.04.20-S□20	A

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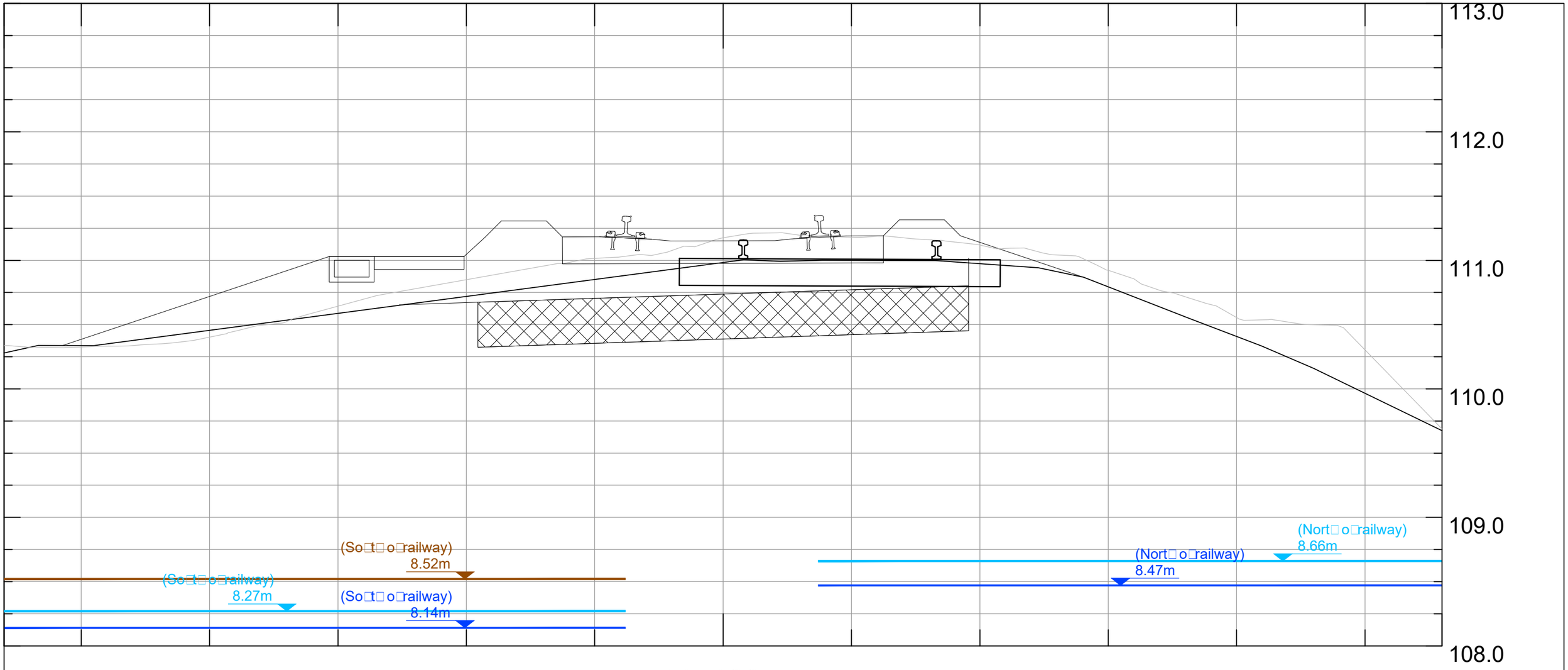
MetroWest

Portishead Branch Line (MetroWest Phase 1)

TR040011

Applicant: North Somerset District Council
5.6, Flood Risk Assessment,
Appendix S Design drawing cross sections with flood levels
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, regulation 5(2)(e)
Planning Act 2008

Author: CH2M
Date: November 2019



14+100m

LEGEND

Tidal events ret□rn periods (post development):

0.000m — 200yr 2115

0.000m — 1000yr 2115

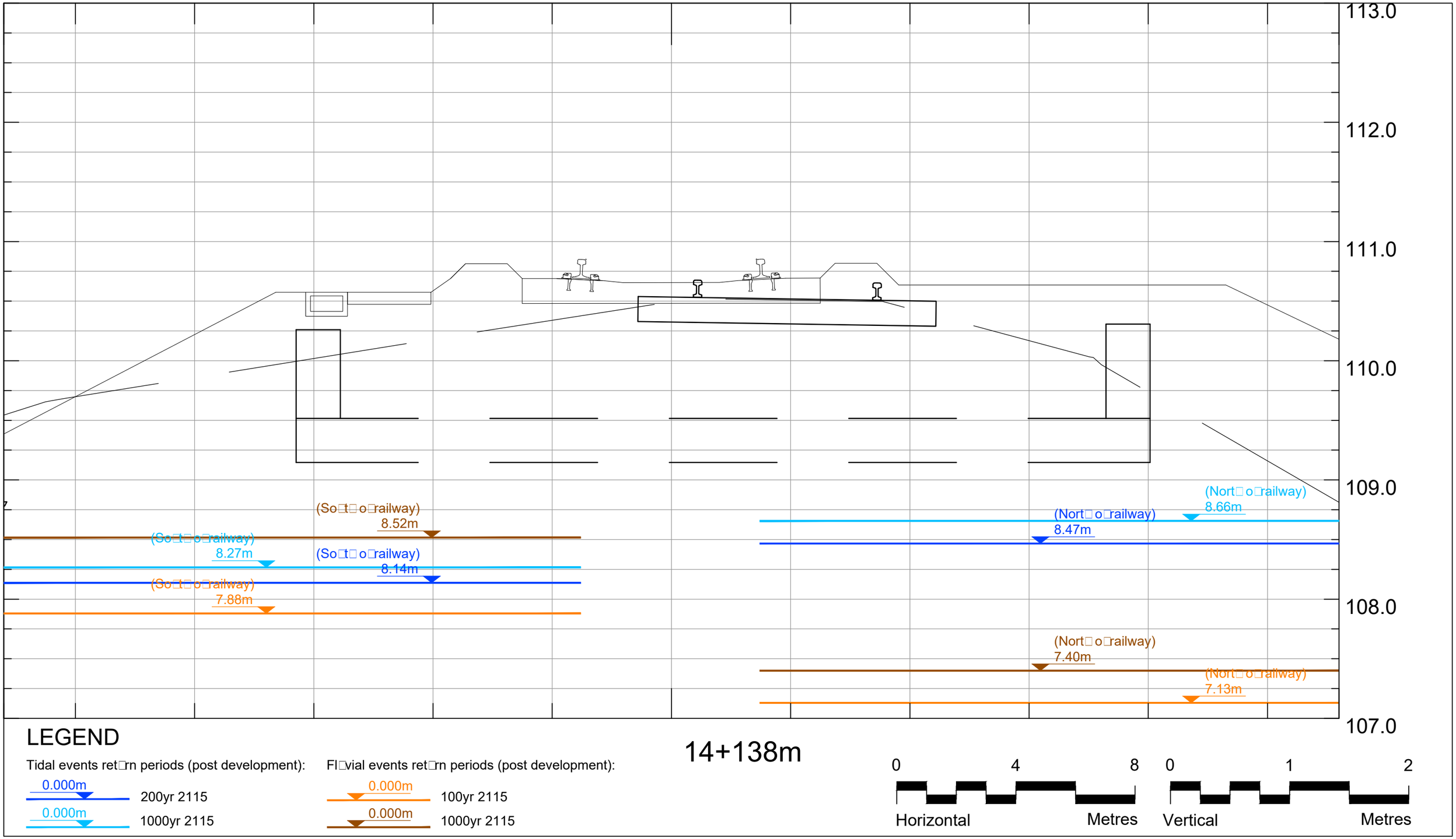
Fl□vial events ret□rn periods (post development):

0.000m — 100yr 2115

0.000m — 1000yr 2115

0 4 8 Horizontal Metres

0 1 2 Vertical Metres



LEGEND

Tidal events ret□rn periods (post development):

0.000m — 200yr 2115

0.000m — 1000yr 2115

Fl□vial events ret□rn periods (post development):

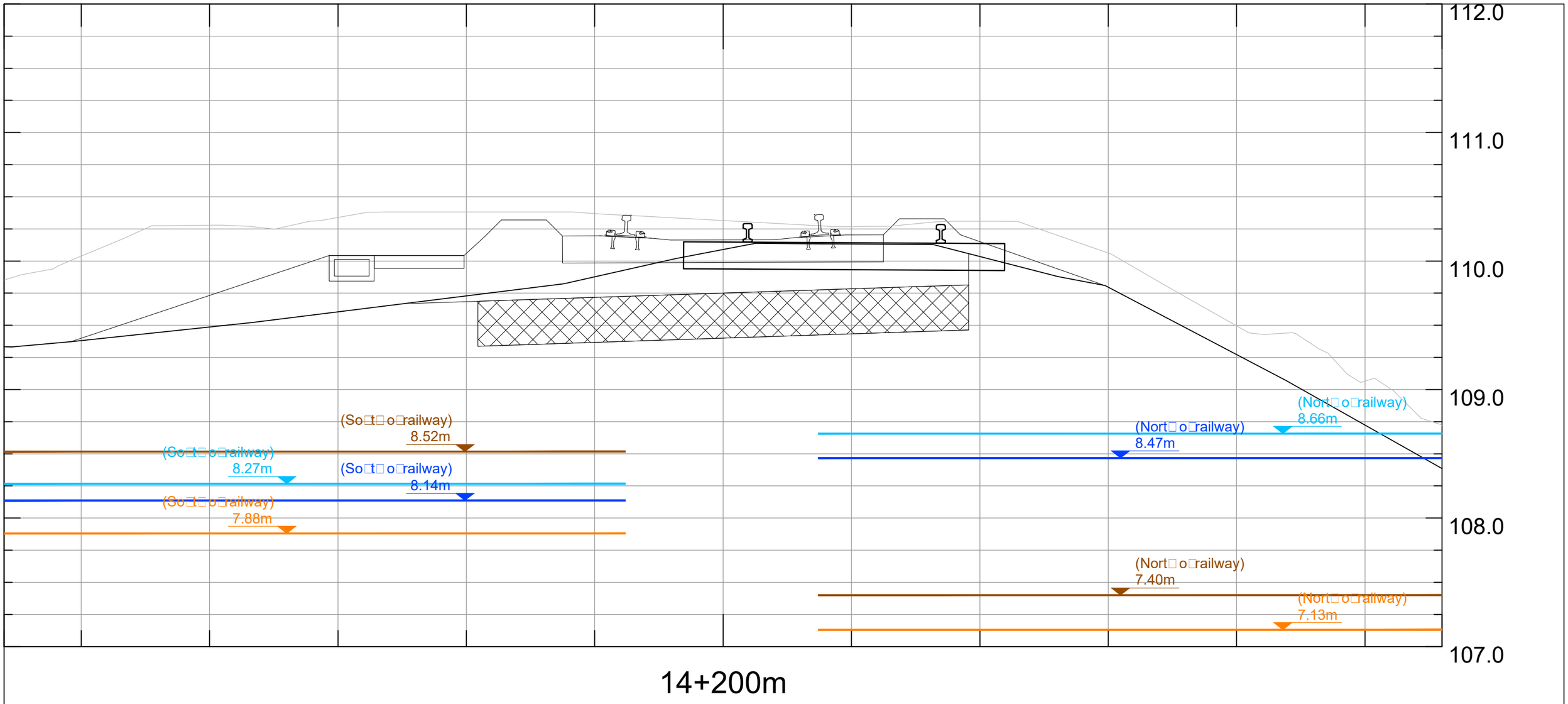
0.000m — 100yr 2115

0.000m — 1000yr 2115

14+138m

0 4 8 Horizontal Metres

0 1 2 Vertical Metres



LEGEND

Tidal events ret□rn periods (post development):

0.000m — 200yr 2115

0.000m — 1000yr 2115

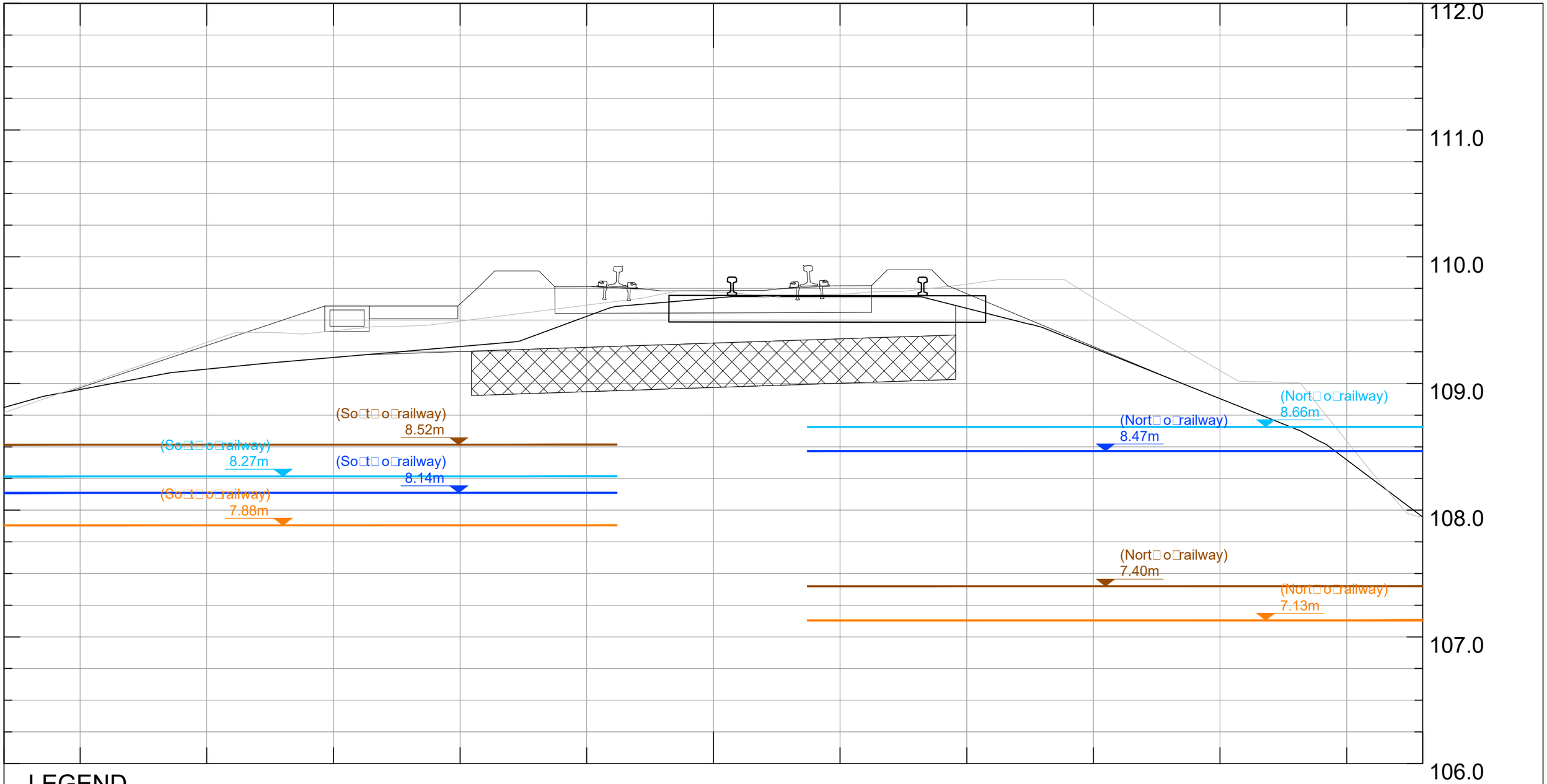
Fl□vial events ret□rn periods (post development):

0.000m — 100yr 2115

0.000m — 1000yr 2115

0 4 8 Horizontal Metres

0 1 2 Vertical Metres



LEGEND

14+250m

Tidal events ret□rn periods (post development):

0.000m — 200yr 2115

0.000m — 1000yr 2115

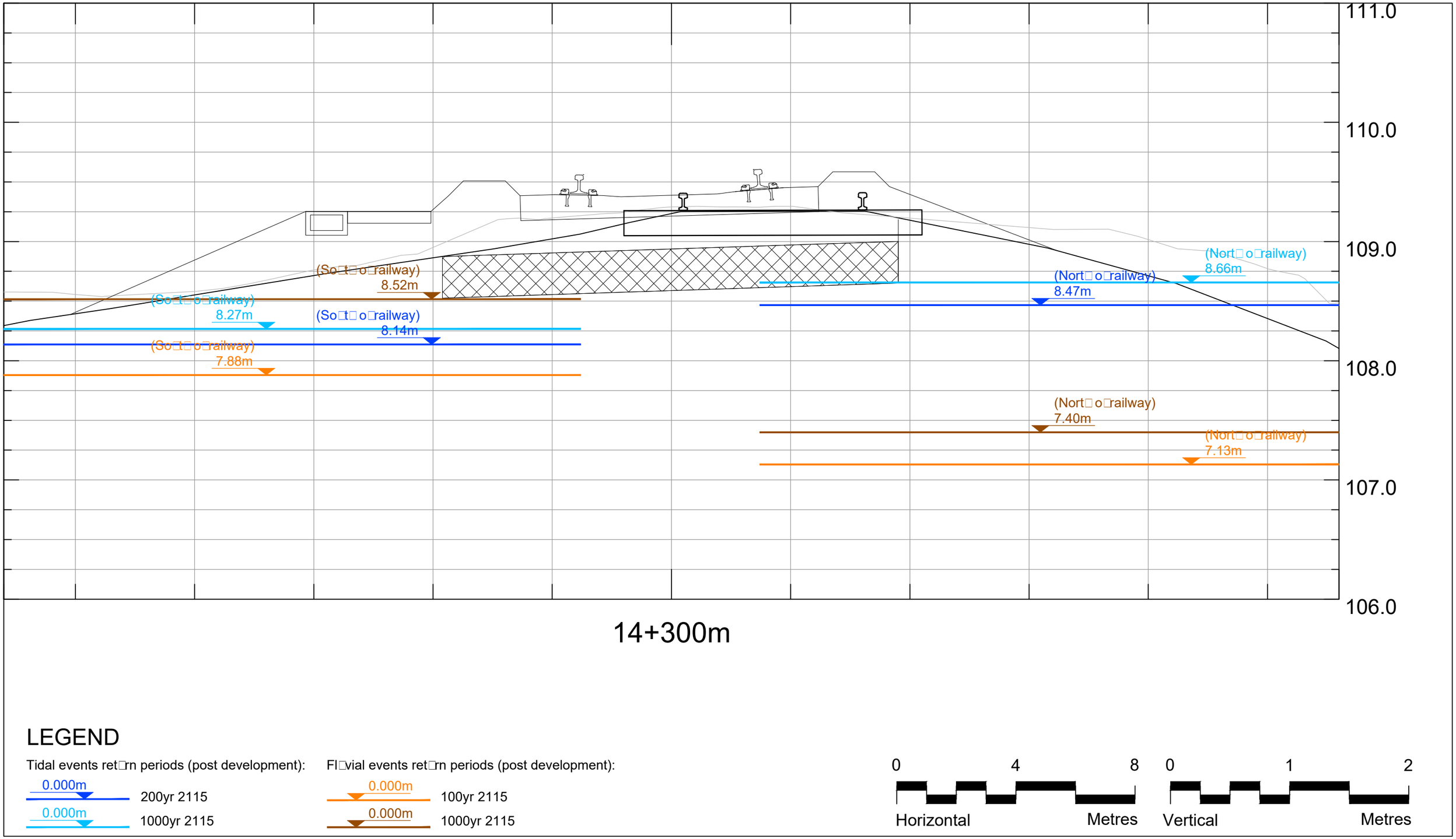
Fl□vial events ret□rn periods (post development):

0.000m — 100yr 2115

0.000m — 1000yr 2115

0 4 8 Horizontal Metres

0 1 2 Vertical Metres



LEGEND

Tidal events ret□rn periods (post development):

0.000m — 200yr 2115

0.000m — 1000yr 2115

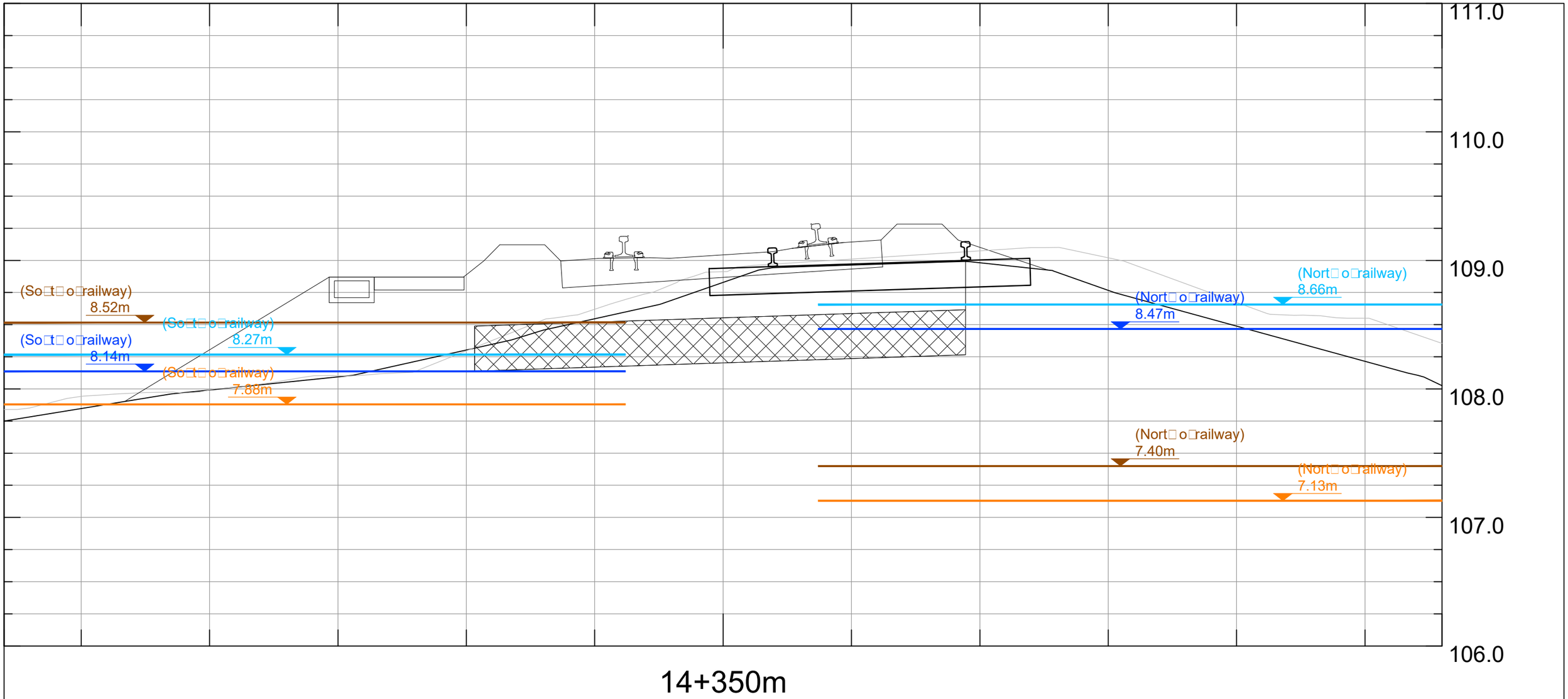
Fl□vial events ret□rn periods (post development):

0.000m — 100yr 2115

0.000m — 1000yr 2115

0 4 8 Horizontal Metres

0 1 2 Vertical Metres



LEGEND

Tidal events ret□rn periods (post development):

0.000m — 200yr 2115

0.000m — 1000yr 2115

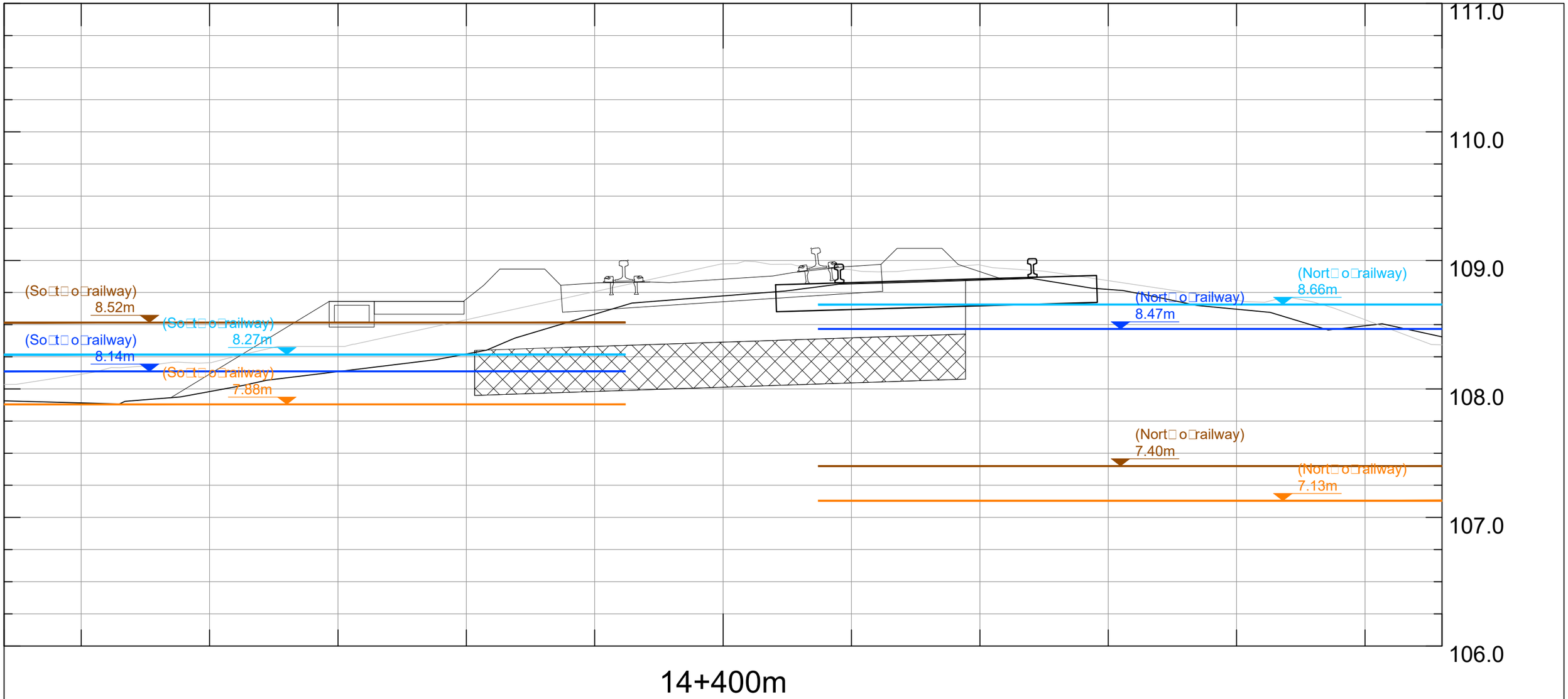
Fl□vial events ret□rn periods (post development):

0.000m — 100yr 2115

0.000m — 1000yr 2115

0 4 8 Horizontal Metres

0 1 2 Vertical Metres



LEGEND

Tidal events ret□rn periods (post development):

0.000m — 200yr 2115

0.000m — 1000yr 2115

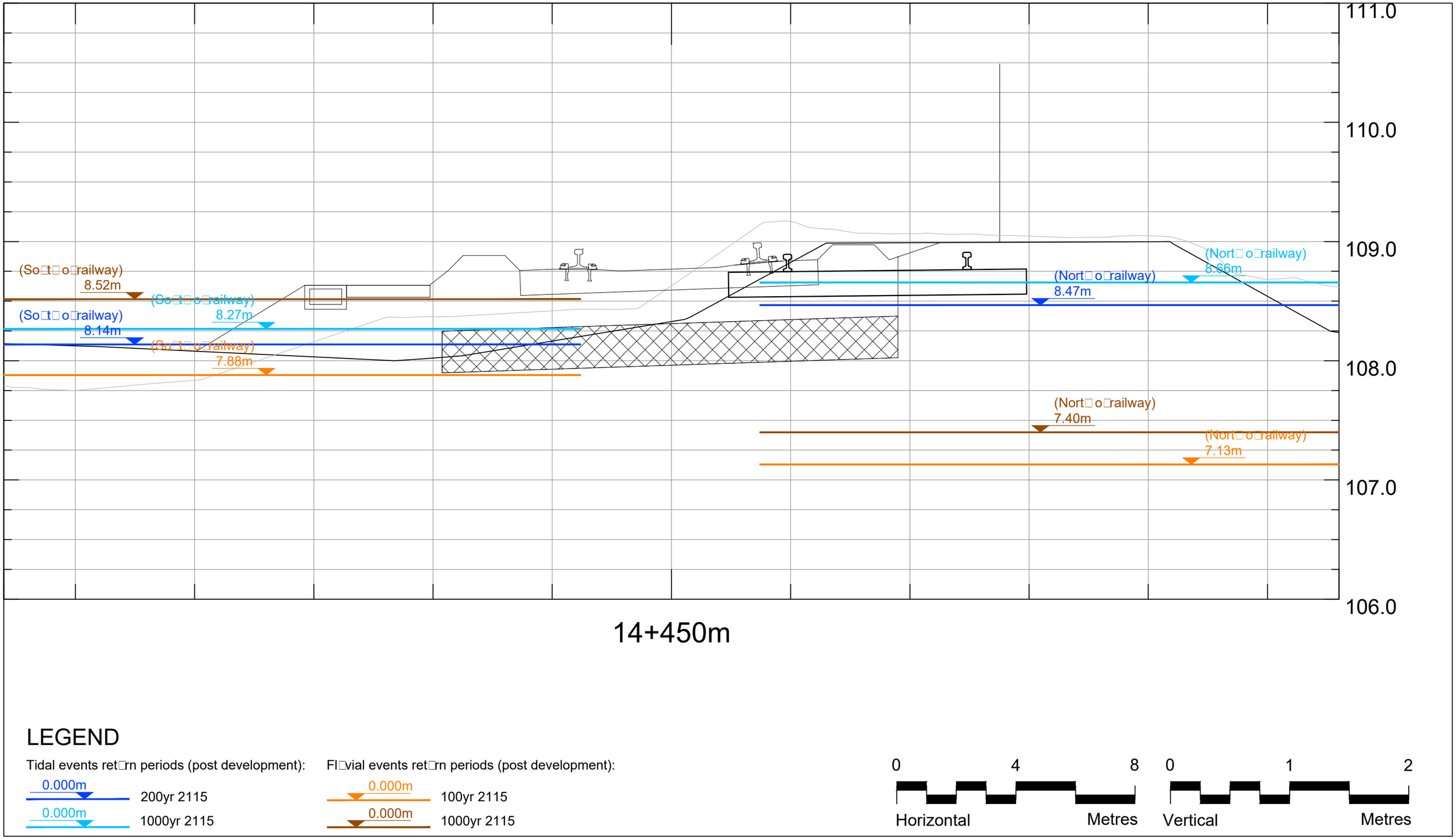
Fl□vial events ret□rn periods (post development):

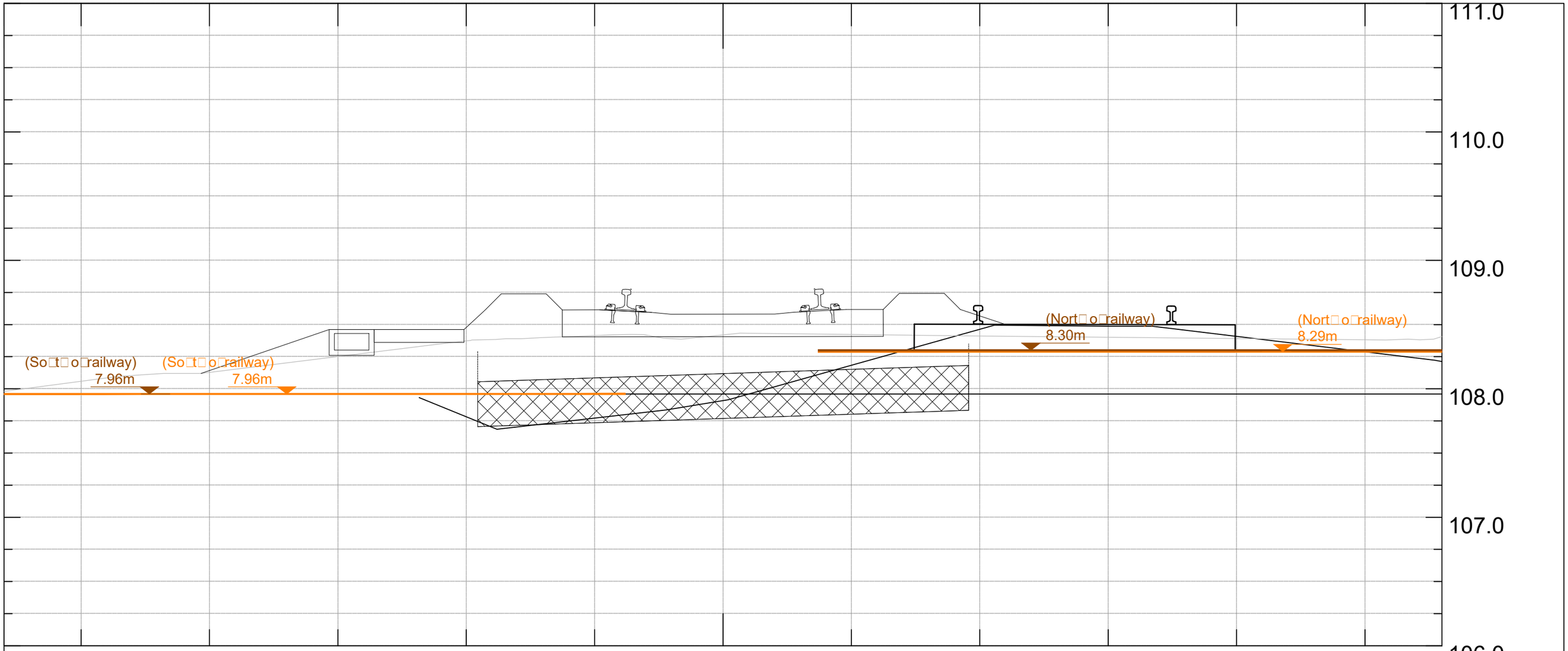
0.000m — 100yr 2115

0.000m — 1000yr 2115

0 4 8 Horizontal Metres

0 1 2 Vertical Metres


111.0
110.0
109.0
108.0
107.0
106.0
(So□t□o□railway)
8.52m
(So□t□o□railway)
8.27m
(So□t□o□railway)
8.14m
(So□t□o□railway)
7.88m
(Nort□o□railway)
8.66m
(Nort□o□railway)
8.47m
(Nort□o□railway)
7.40m
(Nort□o□railway)
7.13m
14+450m
LEGEND
Tidal events ret□rn periods (post development):
0.000m
200yr 2115
0.000m
1000yr 2115
Fl□vial events ret□rn periods (post development):
0.000m
100yr 2115
0.000m
1000yr 2115
0
4
8
Horizontal
Metres
0
1
2
Vertical
Metres



14+550m

LEGEND

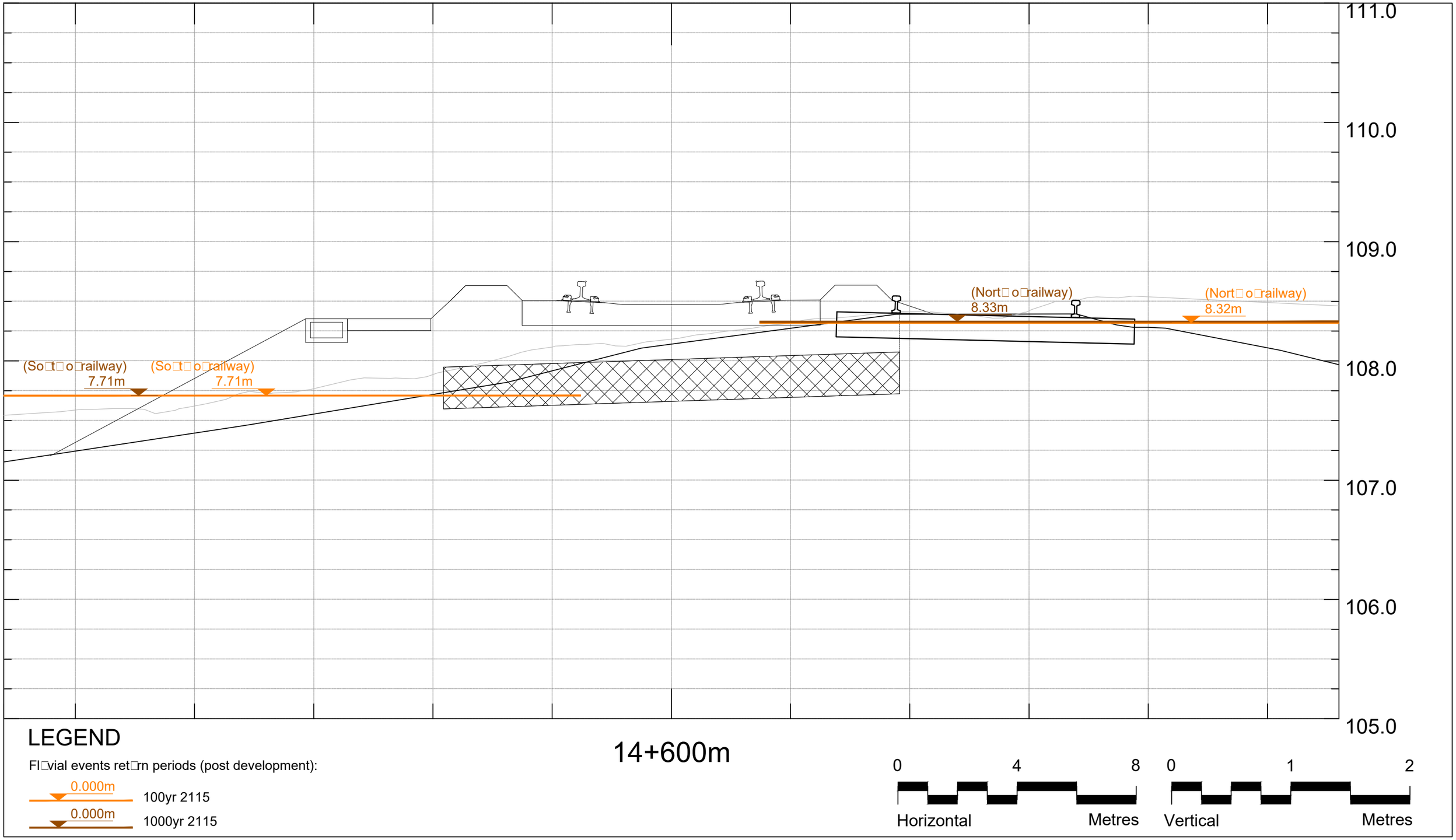
Fl□vial events ret□rn periods (post development):

0.000m — 100yr 2115

0.000m — 1000yr 2115

0 4 8 Horizontal Metres

0 1 2 Vertical Metres



LEGEND

Fl□vial events ret□rn periods (post development):

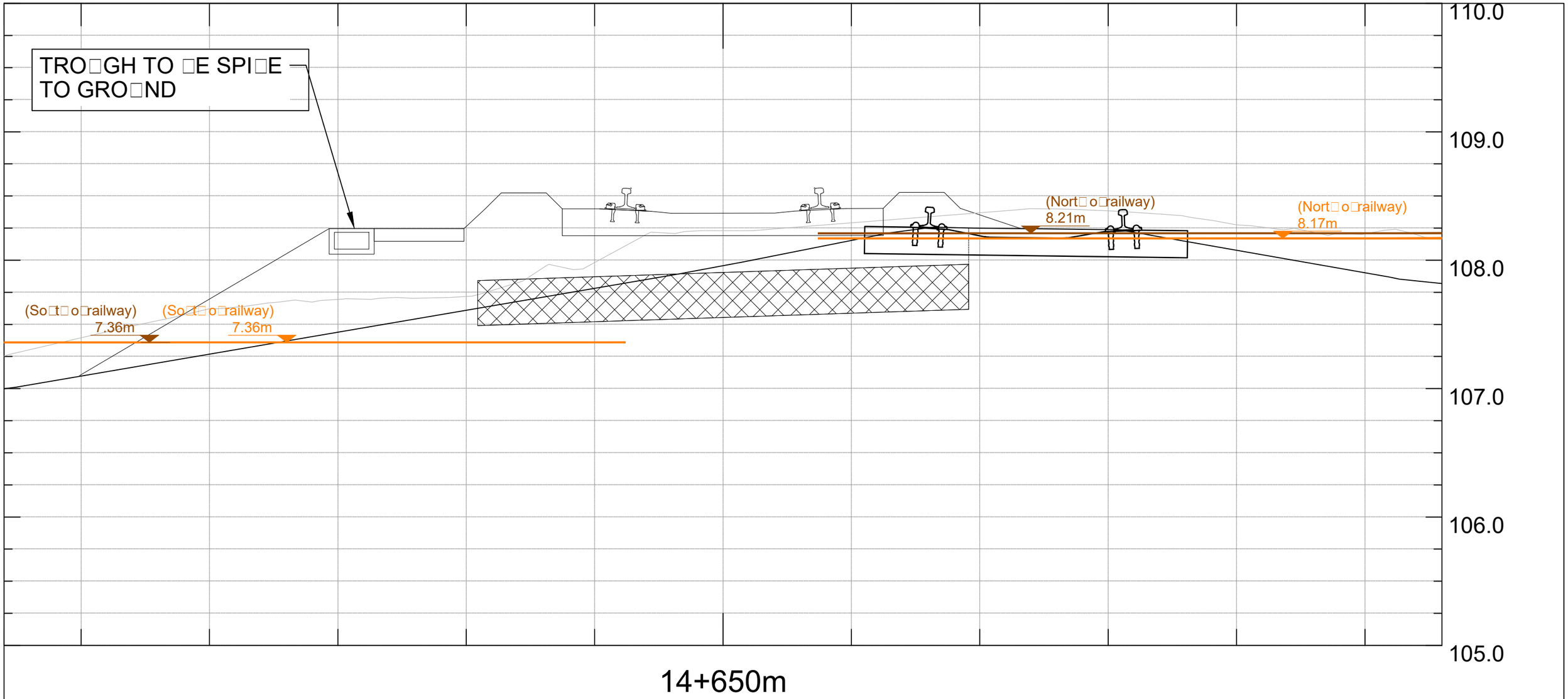
0.000m 100yr 2115

0.000m 1000yr 2115

14+600m

0 4 8 Horizontal Metres

0 1 2 Vertical Metres



LEGEND

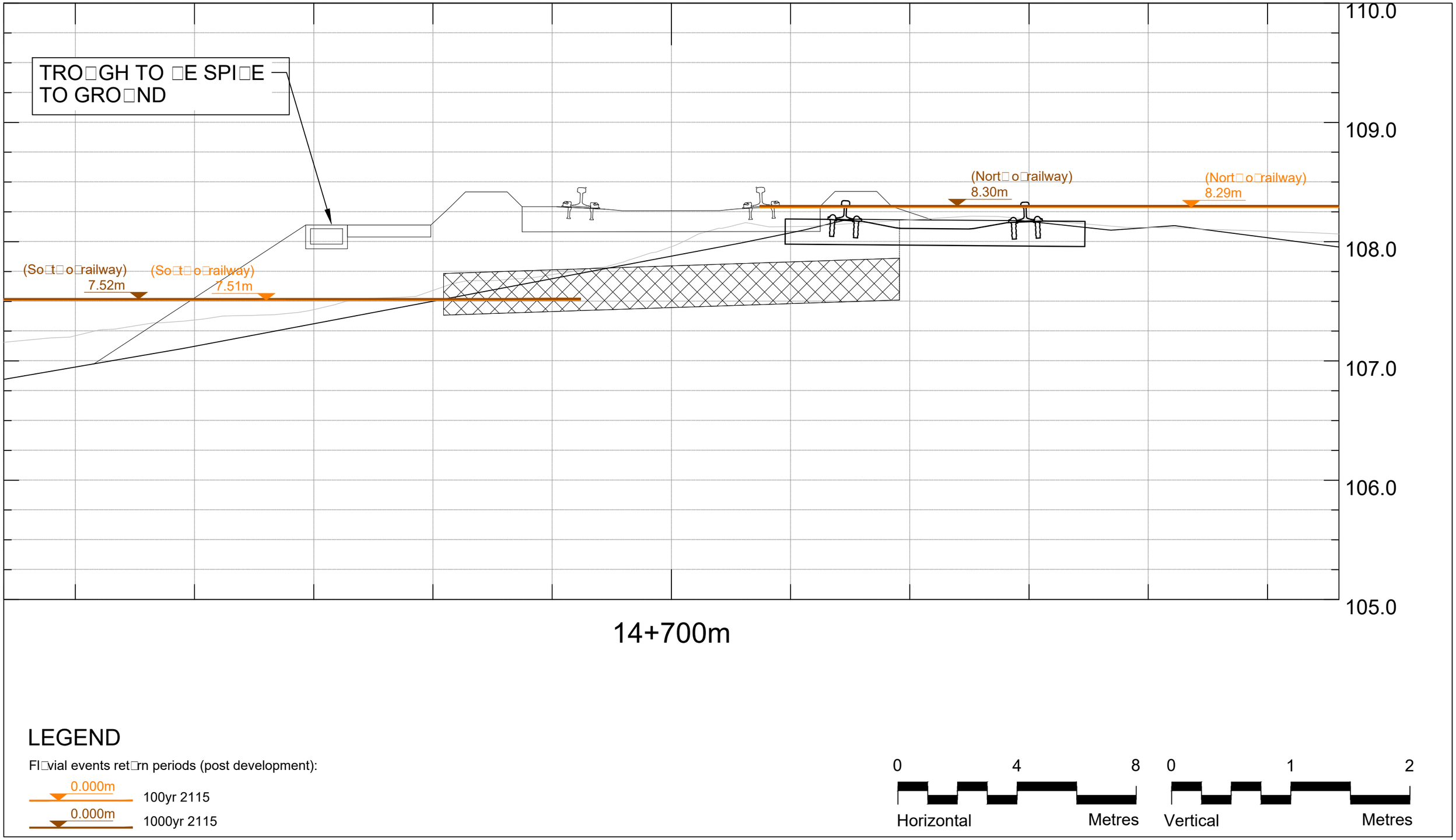
Fl□vial events ret□rn periods (post development):

0.000m — 100yr 2115

0.000m — 1000yr 2115

0 4 8 Horizontal Metres

0 1 2 Vertical Metres



LEGEND

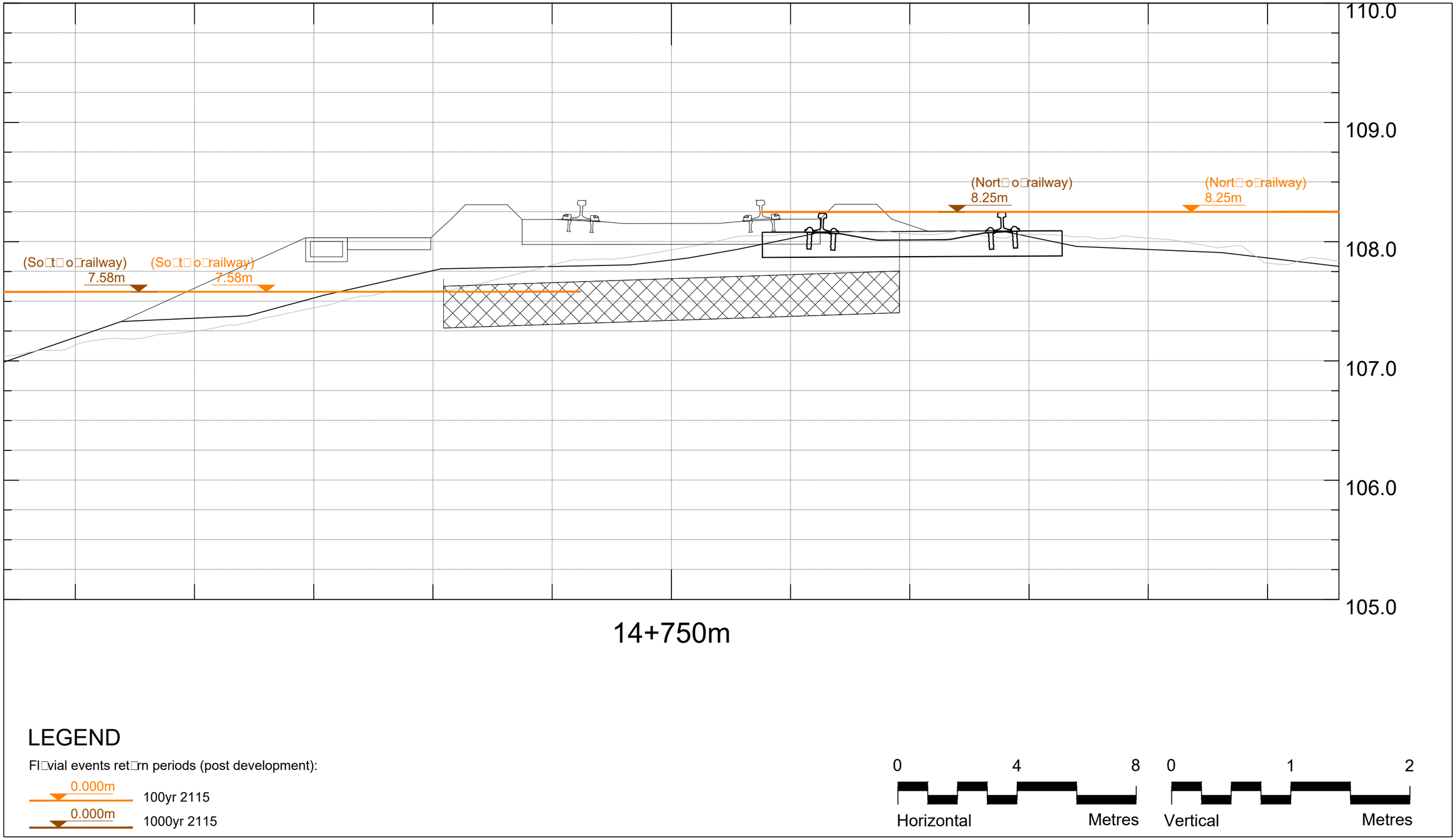
Fl□vial events ret□rn periods (post development):

0.000m — 100yr 2115

0.000m — 1000yr 2115

0 4 8 Horizontal Metres

0 1 2 Vertical Metres



LEGEND

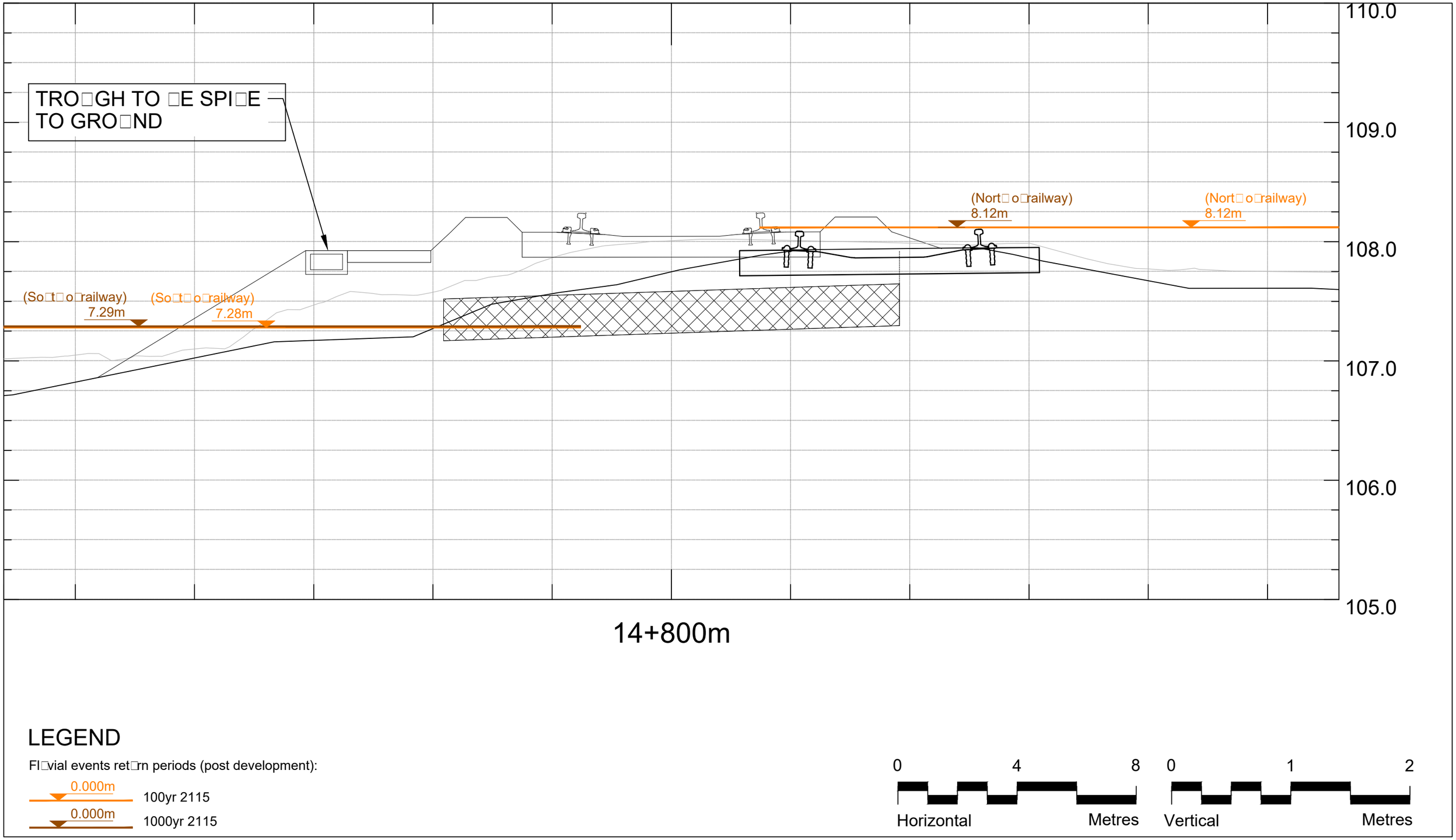
Fl□vial events ret□rn periods (post development):

0.000m — 100yr 2115

0.000m — 1000yr 2115

0 4 8 Horizontal Metres

0 1 2 Vertical Metres



LEGEND

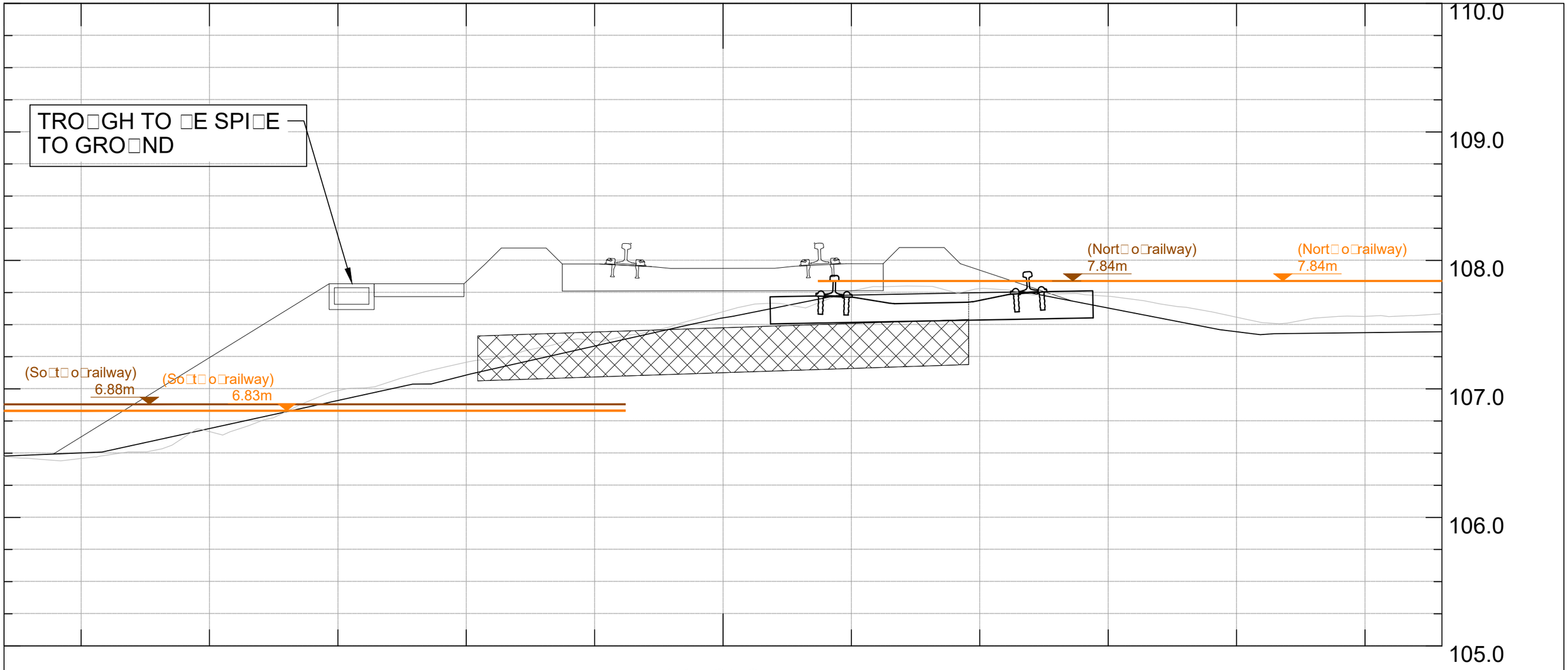
Fl□vial events ret□rn periods (post development):

0.000m — 100yr 2115

0.000m — 1000yr 2115

0 4 8
Horizontal Metres

0 1 2
Vertical Metres



14+850m

LEGEND

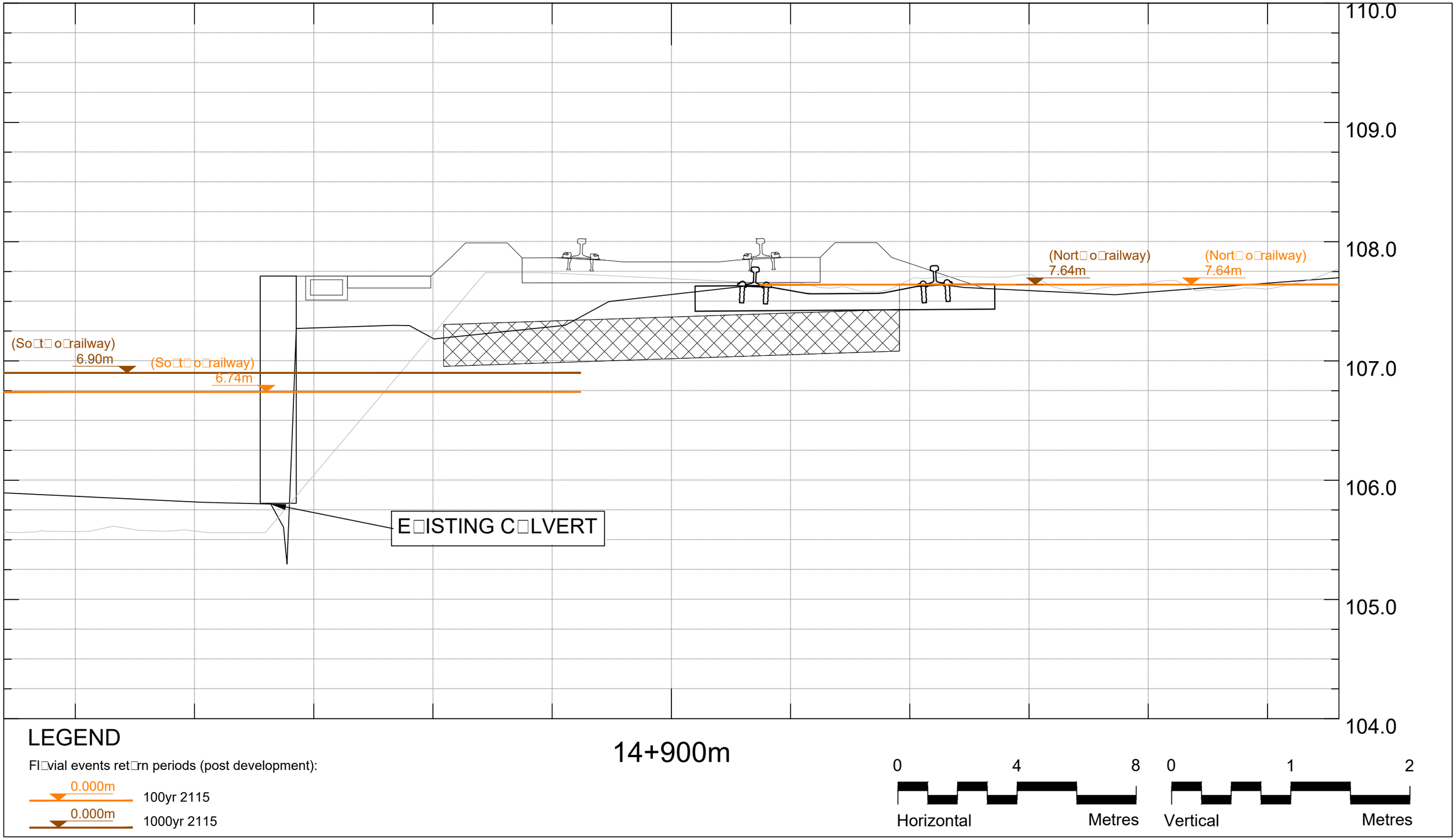
Fl□vial events ret□rn periods (post development):

0.000m — 100yr 2115

0.000m — 1000yr 2115

0 4 8
Horizontal Metres

0 1 2
Vertical Metres



LEGEND

Fl□vial events ret□rn periods (post development):

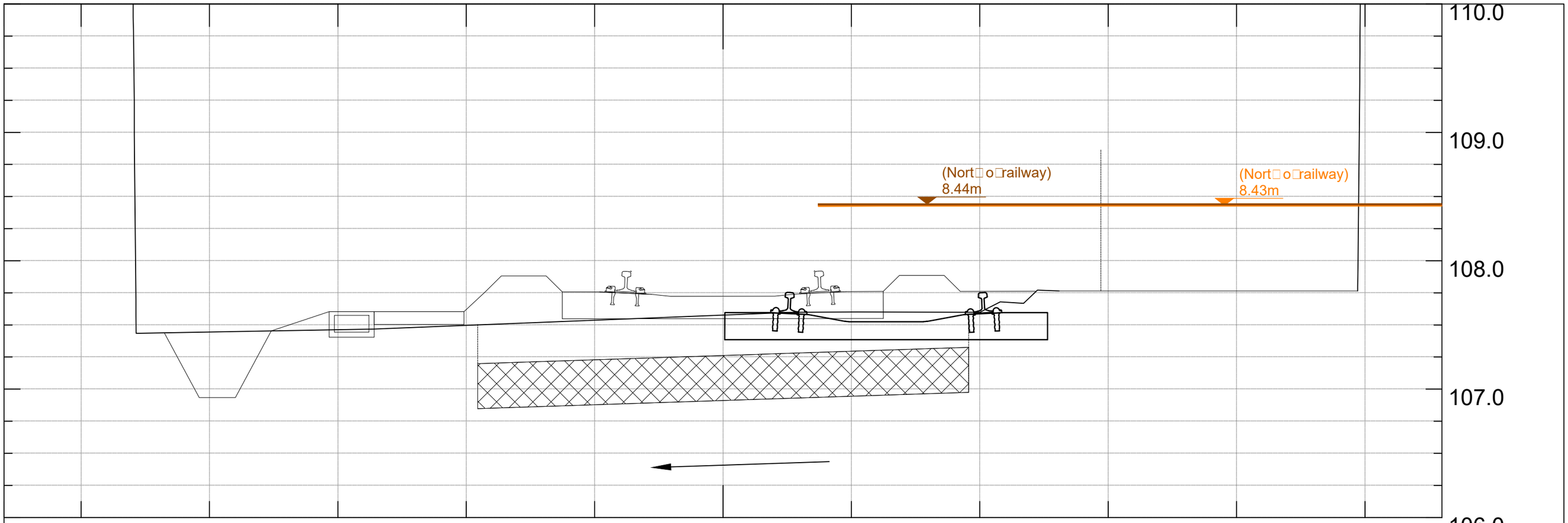
0.000m 100yr 2115

0.000m 1000yr 2115

14+900m

0 4 8 Horizontal Metres

0 1 2 Vertical Metres



14+930m

LEGEND

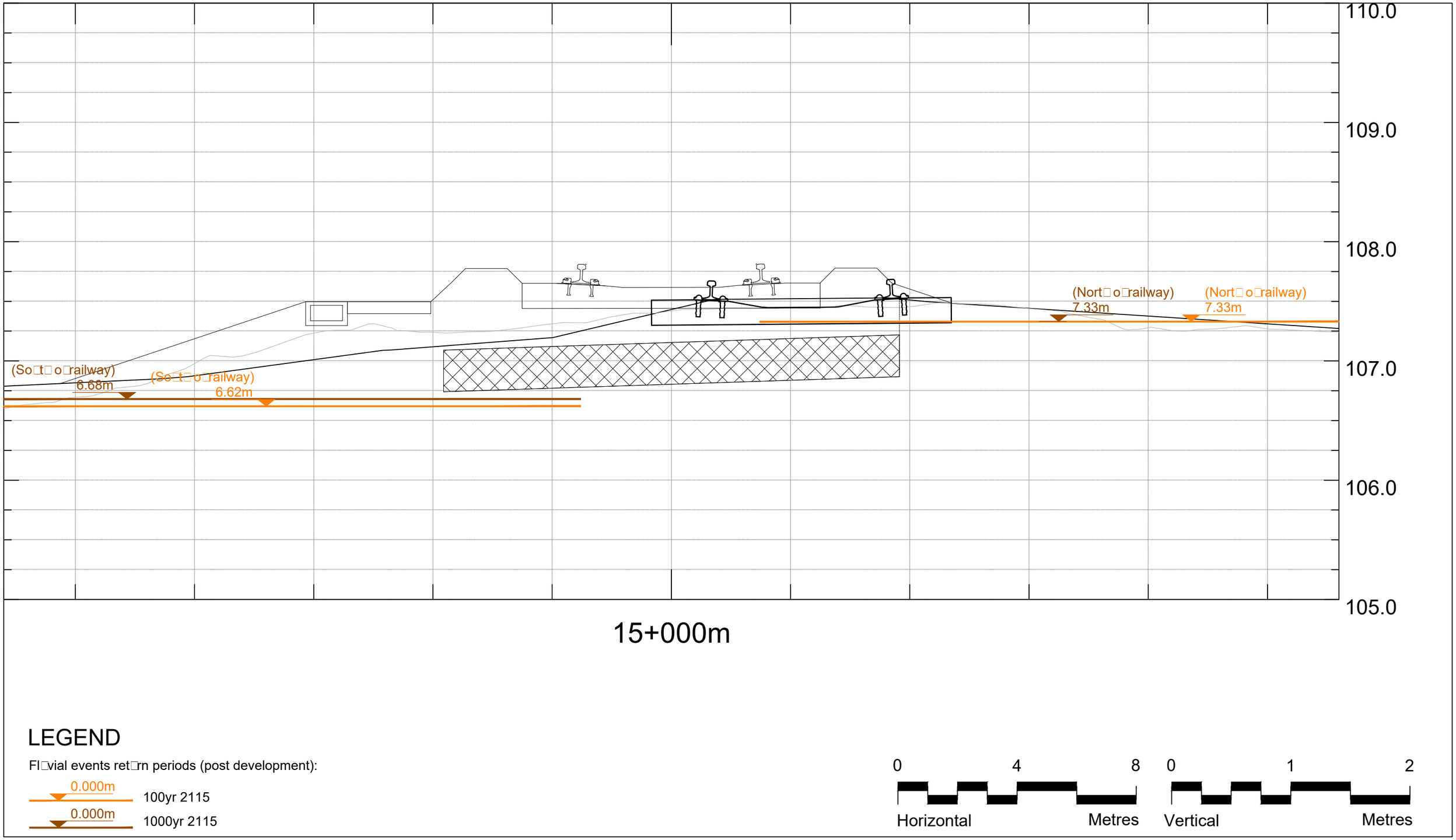
Fl□vial events ret□rn periods (post development):

0.000m — 100yr 2115

0.000m — 1000yr 2115

0 4 8
Horizontal Metres

0 1 2
Vertical Metres



LEGEND

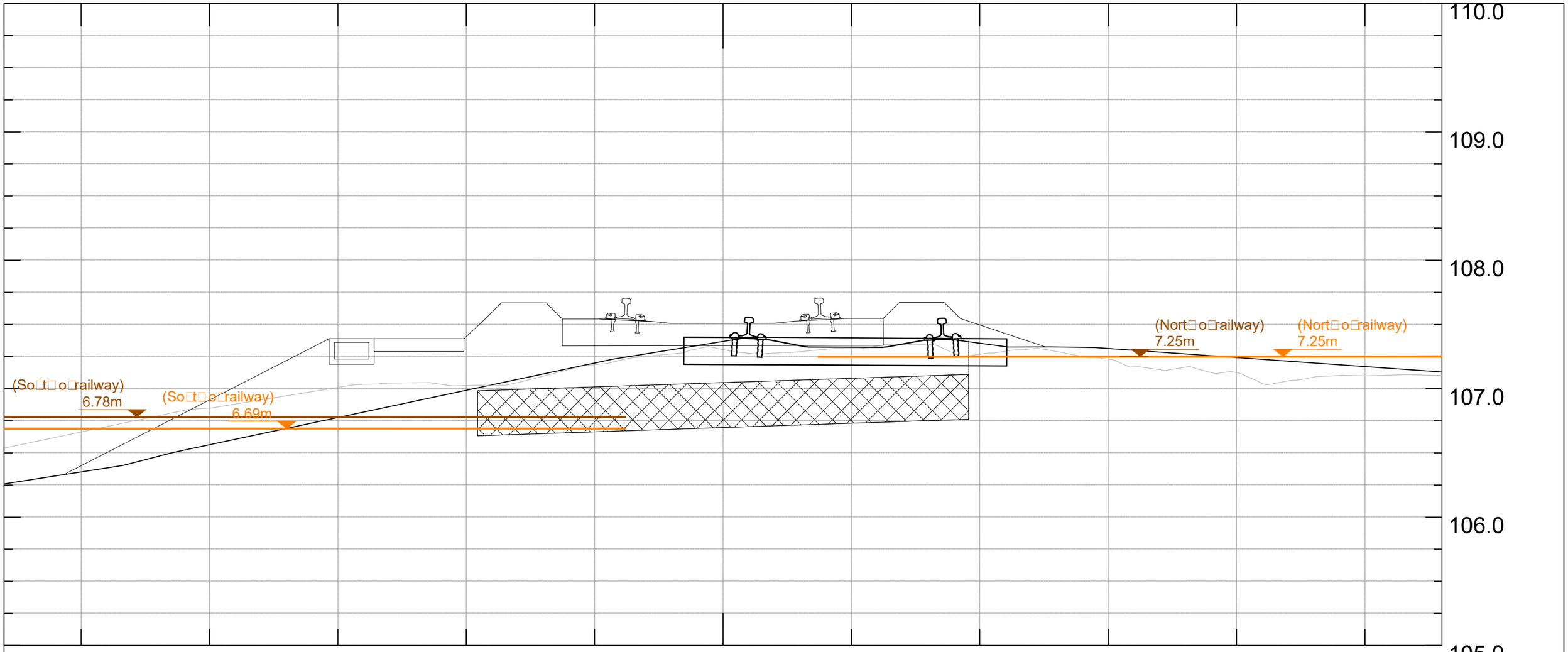
Fl□vial events ret□rn periods (post development):

0.000m — 100yr 2115

0.000m — 1000yr 2115

0 4 8 Horizontal Metres

0 1 2 Vertical Metres



LEGEND

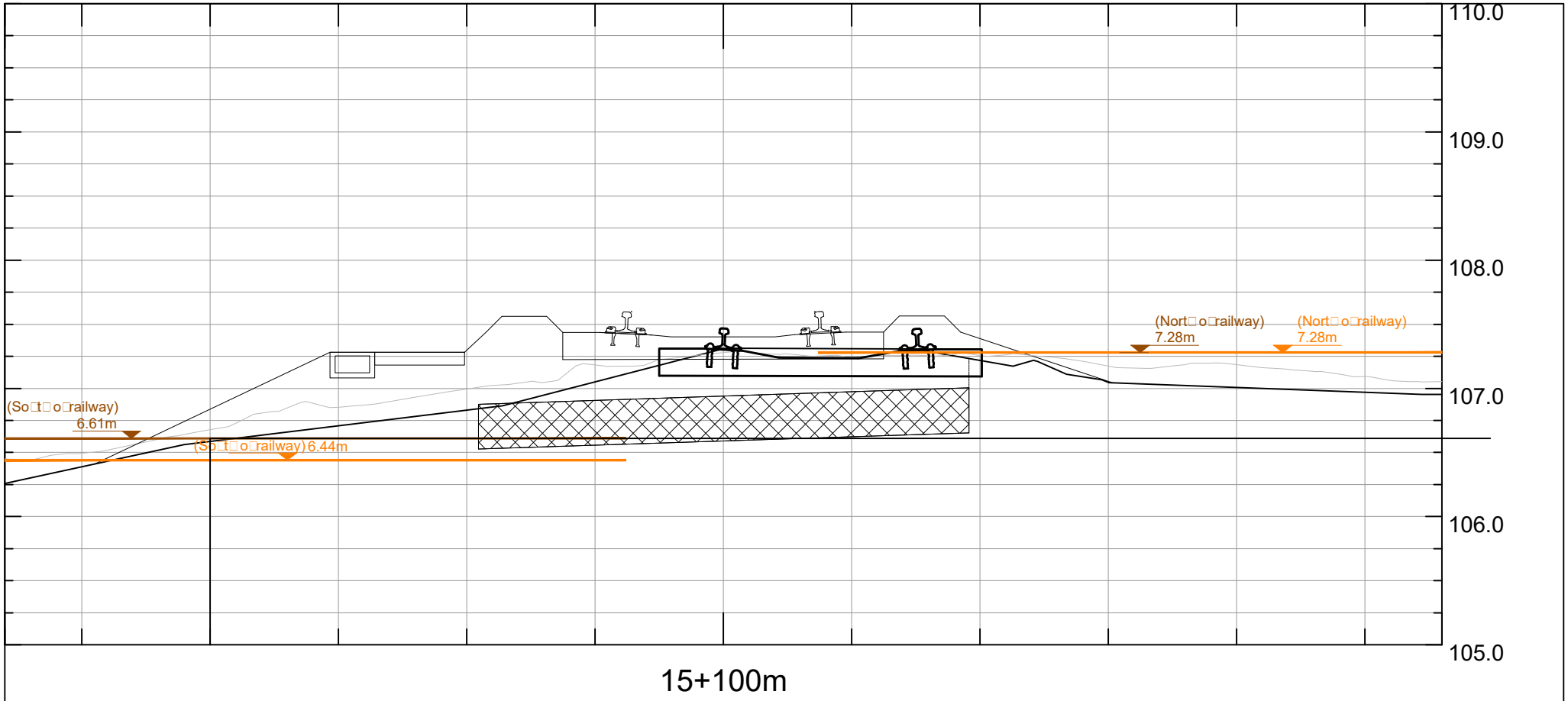
Fl□vial events ret□rn periods (post development):

0.000m — 100yr 2115

0.000m — 1000yr 2115

0 4 8
Horizontal Metres

0 1 2
Vertical Metres



15+100m

LEGEND

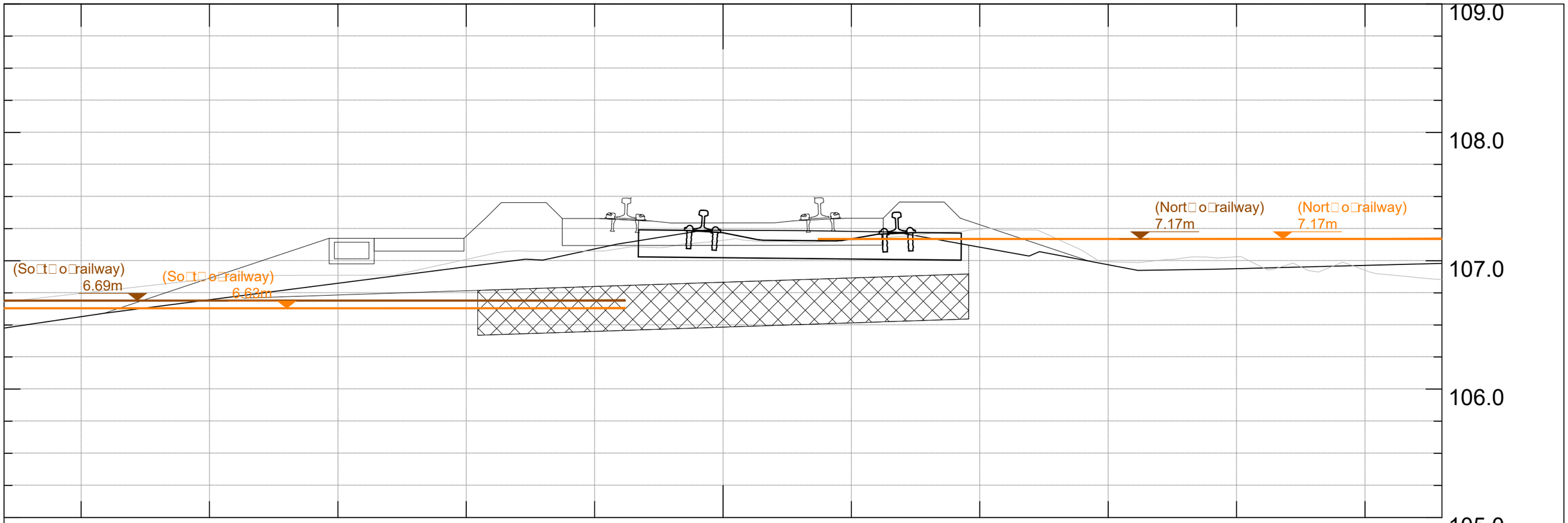
Fl□vial events ret□rn periods (post development):

0.000m — 100yr 2115

0.000m — 1000yr 2115

0 4 8 Horizontal Metres

0 1 2 Vertical Metres



15+150m

LEGEND

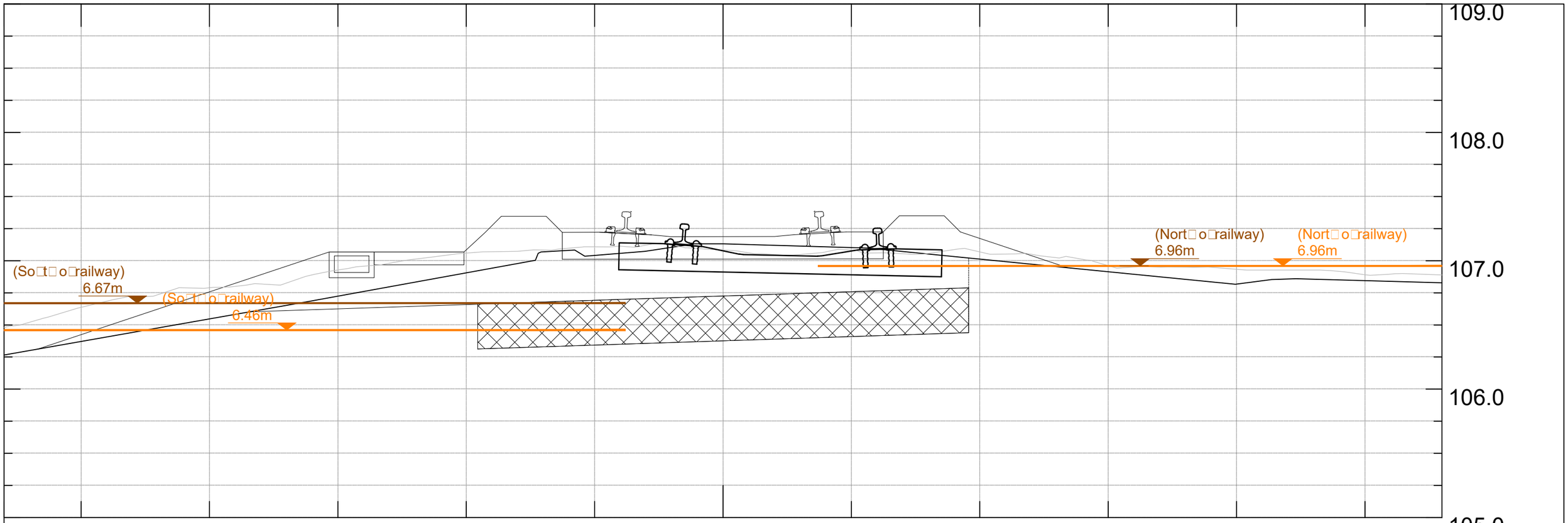
Fl□vial events ret□rn periods (post development):

0.000m — 100yr 2115

0.000m — 1000yr 2115

0 4 8 Horizontal Metres

0 1 2 Vertical Metres



LEGEND

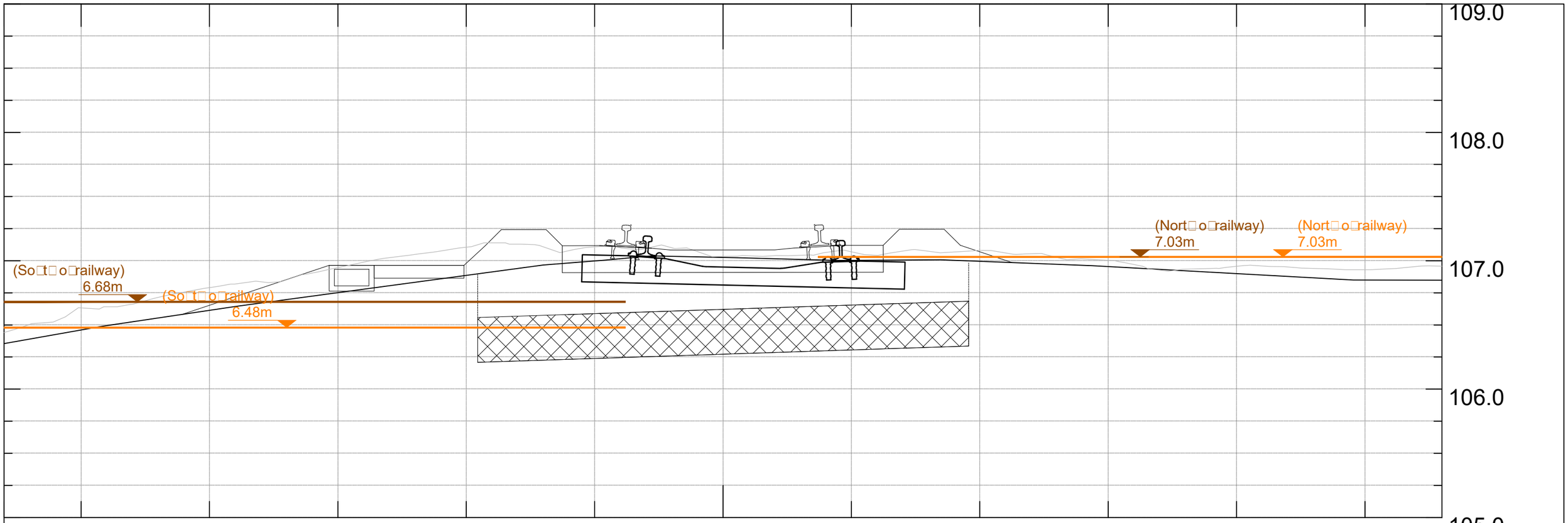
Fl□vial events ret□rn periods (post development):

0.000m — 100yr 2115

0.000m — 1000yr 2115

0 4 8 Horizontal Metres

0 1 2 Vertical Metres



15+250m

LEGEND

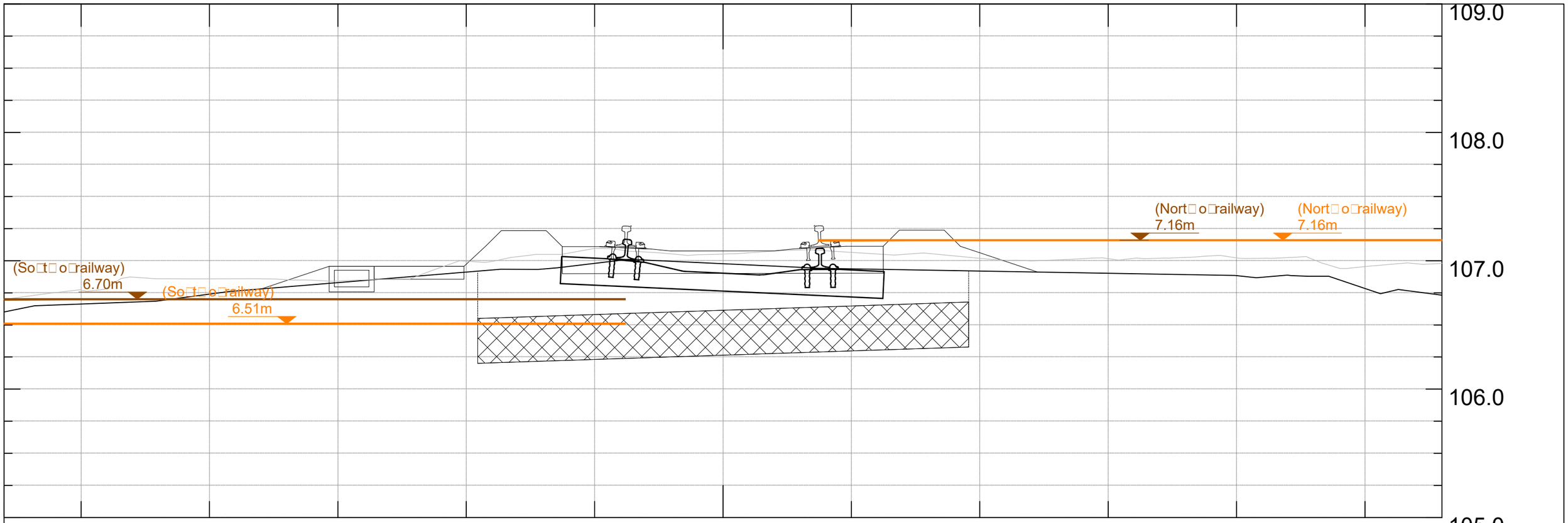
Fl□vial events ret□rn periods (post development):

0.000m — 100yr 2115

0.000m — 1000yr 2115

0 4 8 Horizontal Metres

0 1 2 Vertical Metres



LEGEND

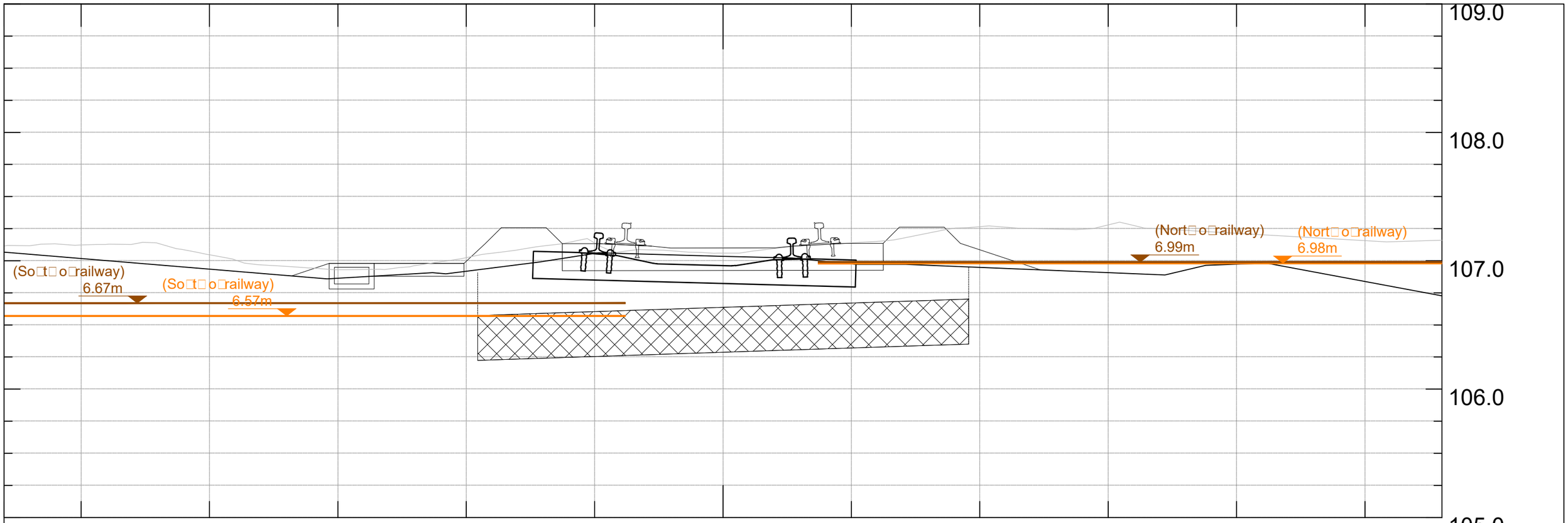
Fl□vial events ret□rn periods (post development):

0.000m — 100yr 2115

0.000m — 1000yr 2115

0 4 8
Horizontal Metres

0 1 2
Vertical Metres



15+350m

LEGEND

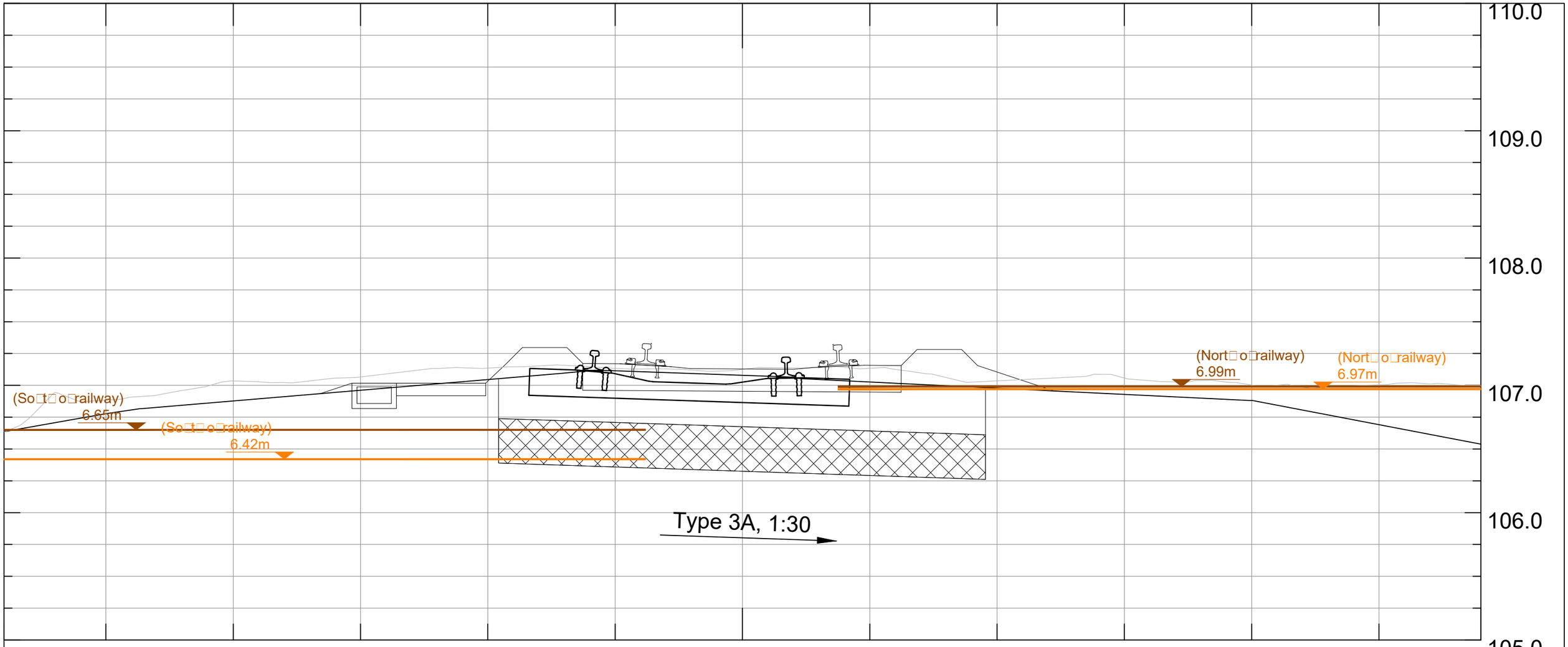
Fl□vial events ret□rn periods (post development):

0.000m — 100yr 2115

0.000m — 1000yr 2115

0 4 8 Horizontal Metres

0 1 2 Vertical Metres



15+400m

LEGEND

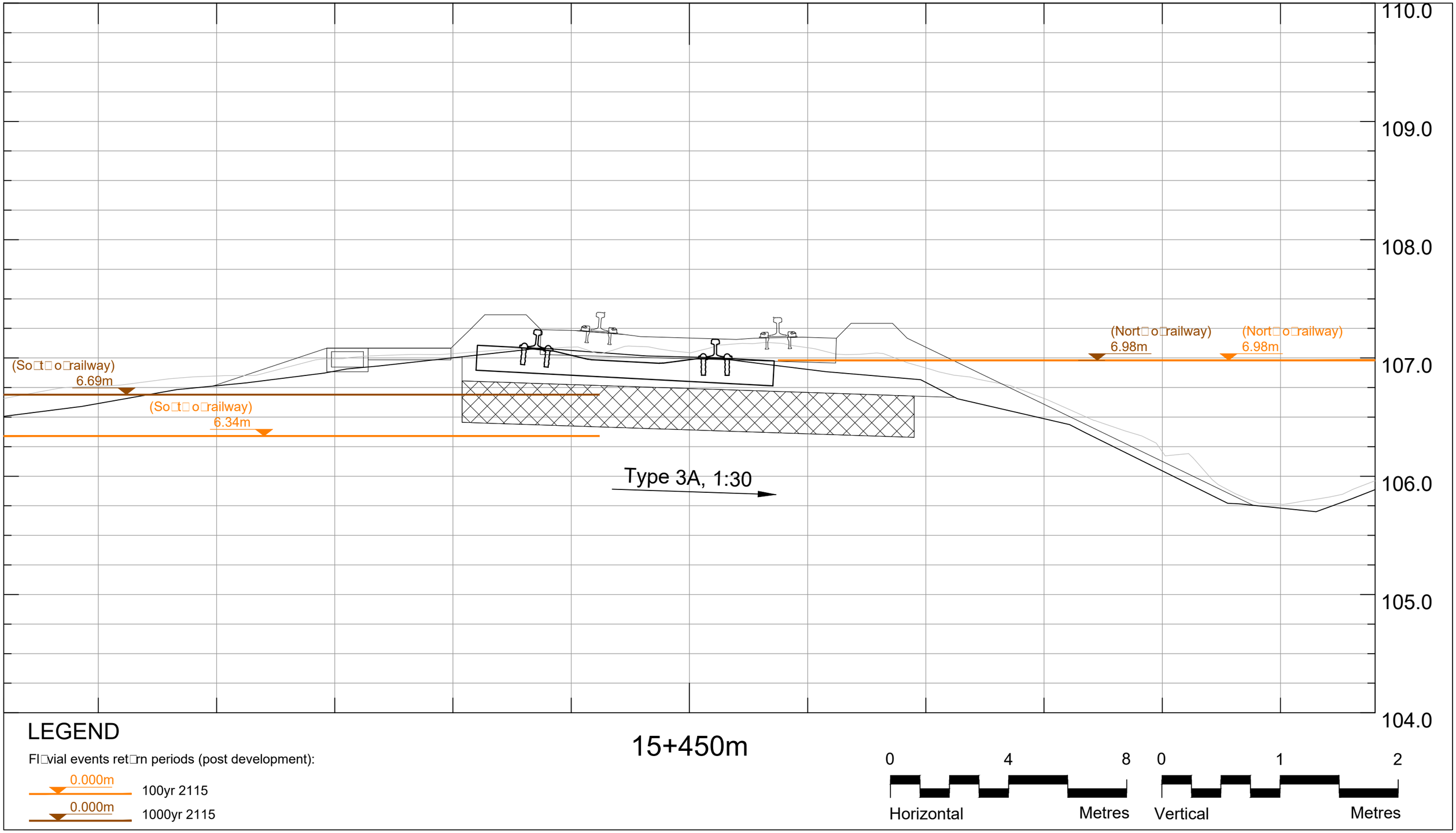
Fl□vial events ret□rn periods (post development):

0.000m — 100yr 2115

0.000m — 1000yr 2115

0 4 8
Horizontal Metres

0 1 2
Vertical Metres



LEGEND

Fl□vial events ret□rn periods (post development):

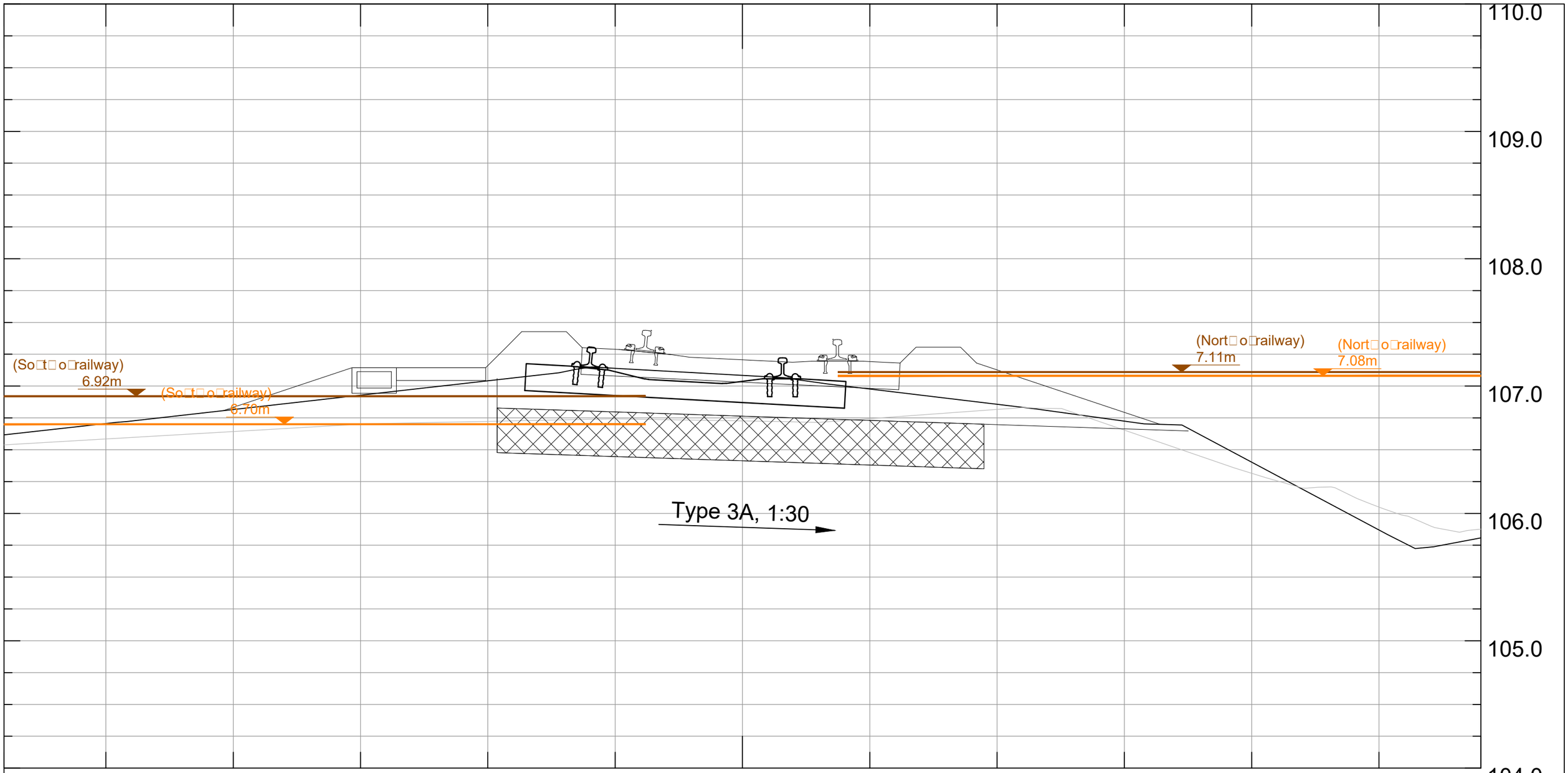
0.000m — 100yr 2115

0.000m — 1000yr 2115

15+450m

0 4 8 Horizontal Metres

0 1 2 Vertical Metres



LEGEND

Fl□vial events ret□rn periods (post development):

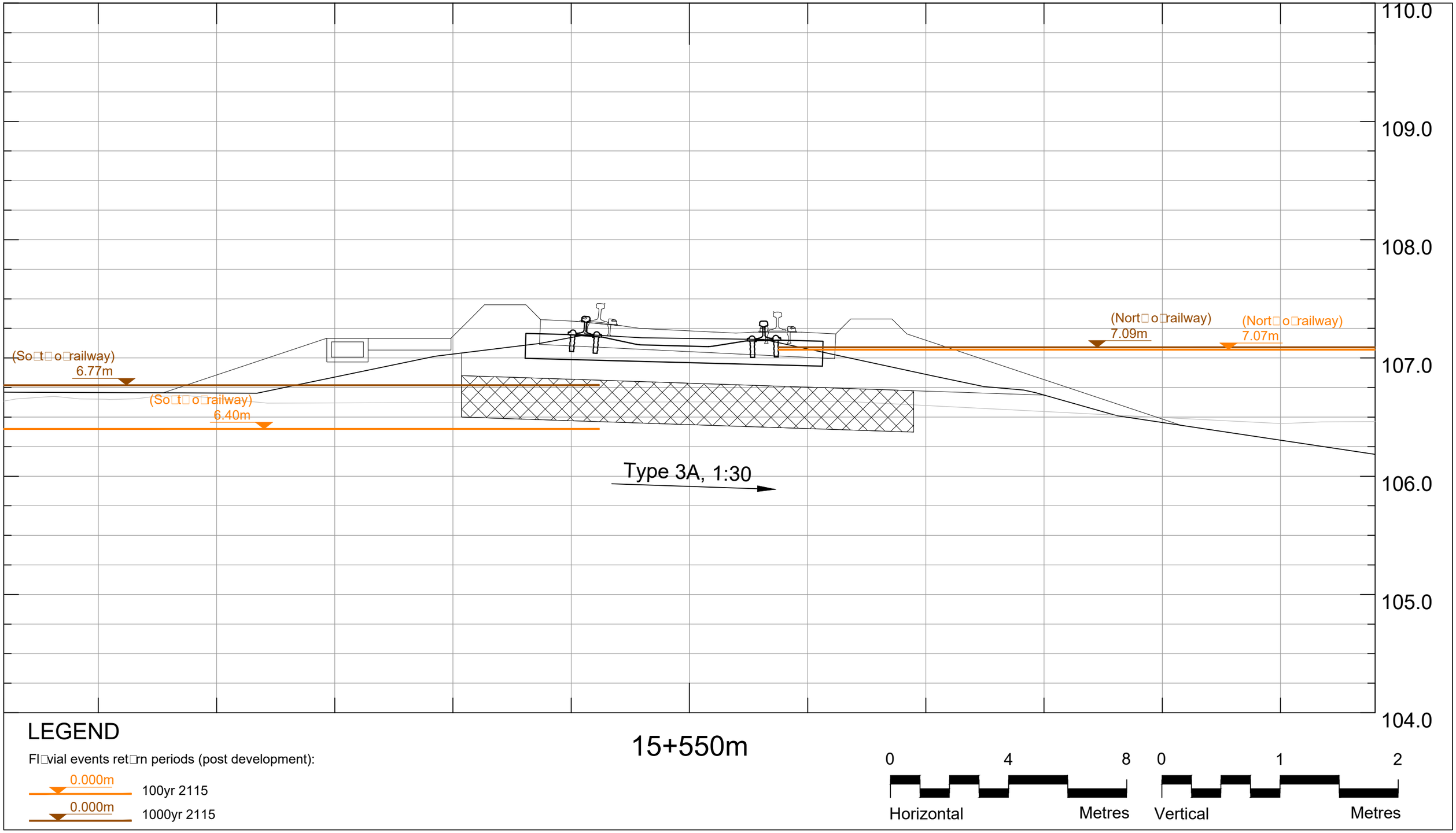
0.000m — 100yr 2115

0.000m — 1000yr 2115

15+500m

0 4 8 Horizontal Metres

0 1 2 Vertical Metres



LEGEND

Fl□vial events ret□rn periods (post development):

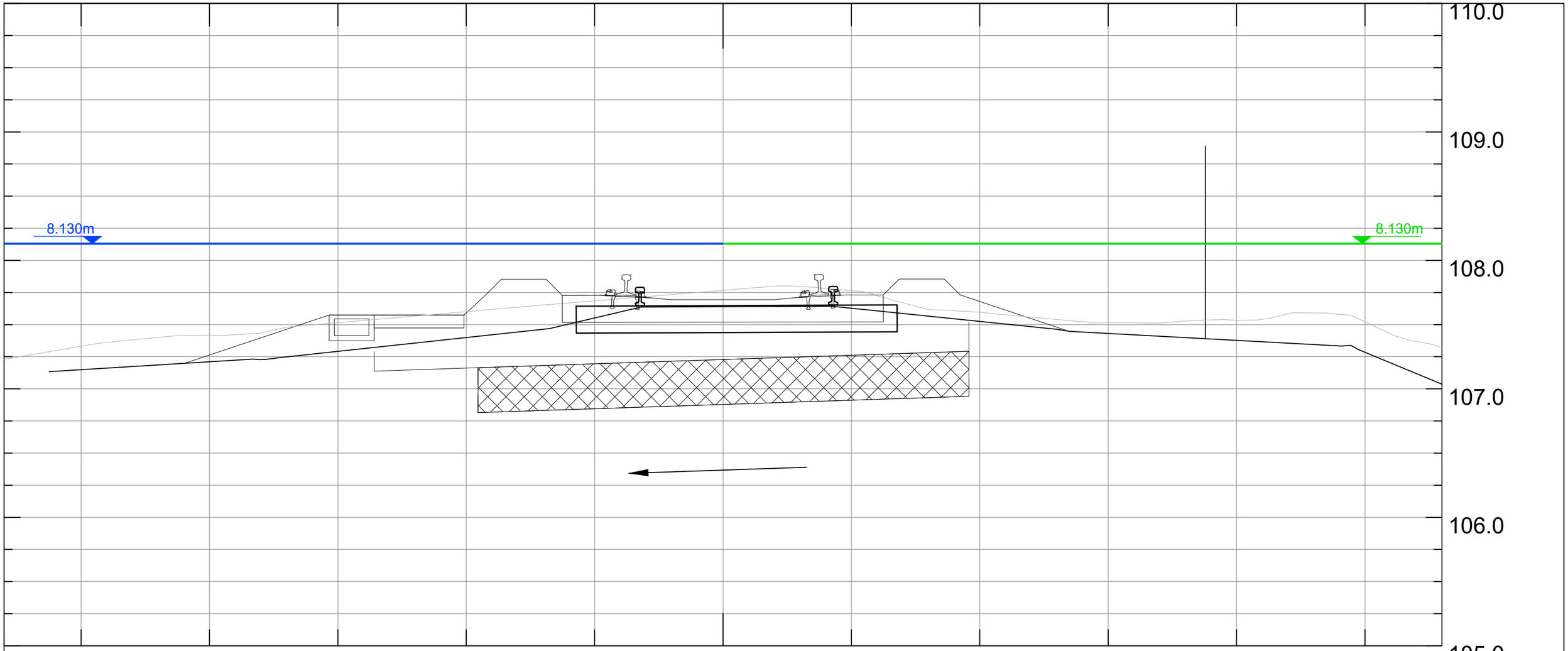
0.000m — 100yr 2115

0.000m — 1000yr 2115

15+550m

0 4 8 Horizontal Metres

0 1 2 Vertical Metres



LEGEND

Flood levels (post development) - Seaward Side:

0.000m 1000yr 2115

Flood levels (post development) - Landward Side:

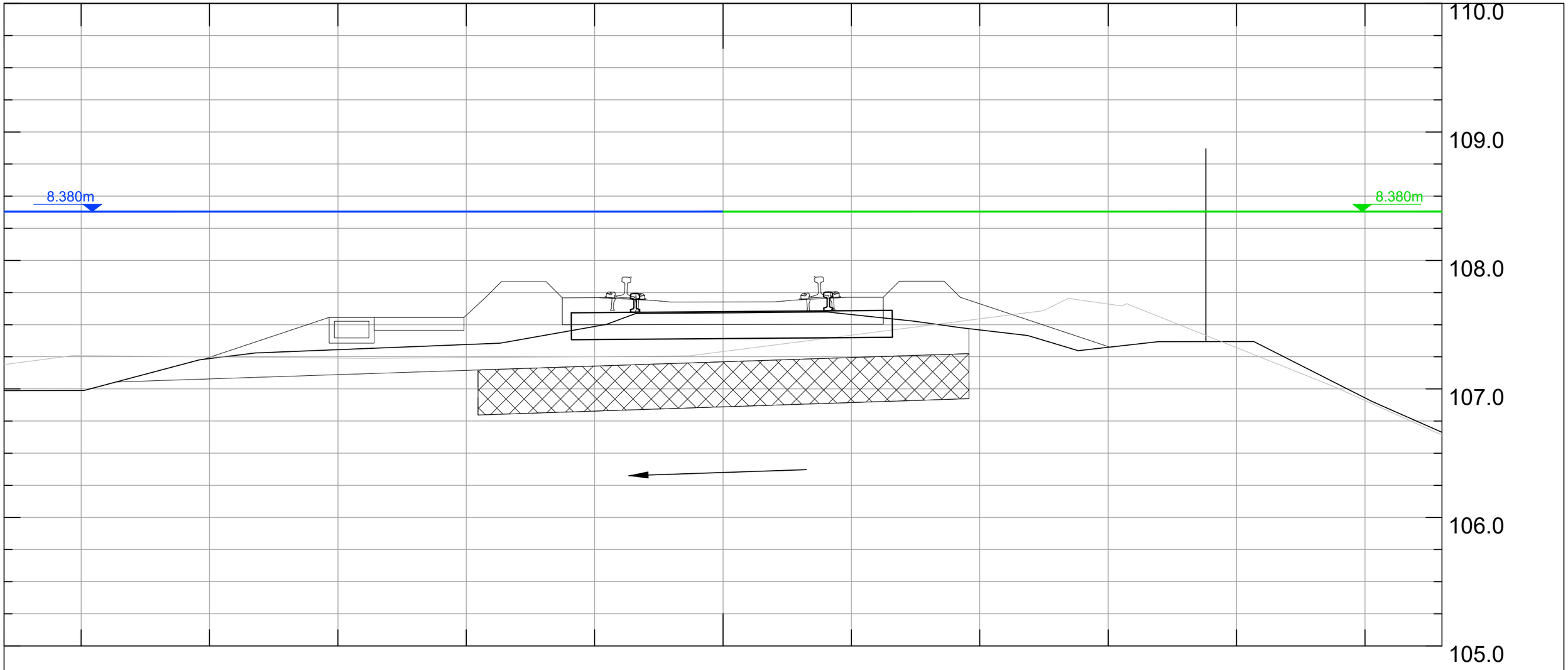
0.000m 1000yr 2115

0 4 8

Horizontal Metres

0 1 2

Vertical Metres



LEGEND

Flood levels (post development) - Seaward Side:

0.000m 1000yr 2115

Flood levels (post development) - Landward Side:

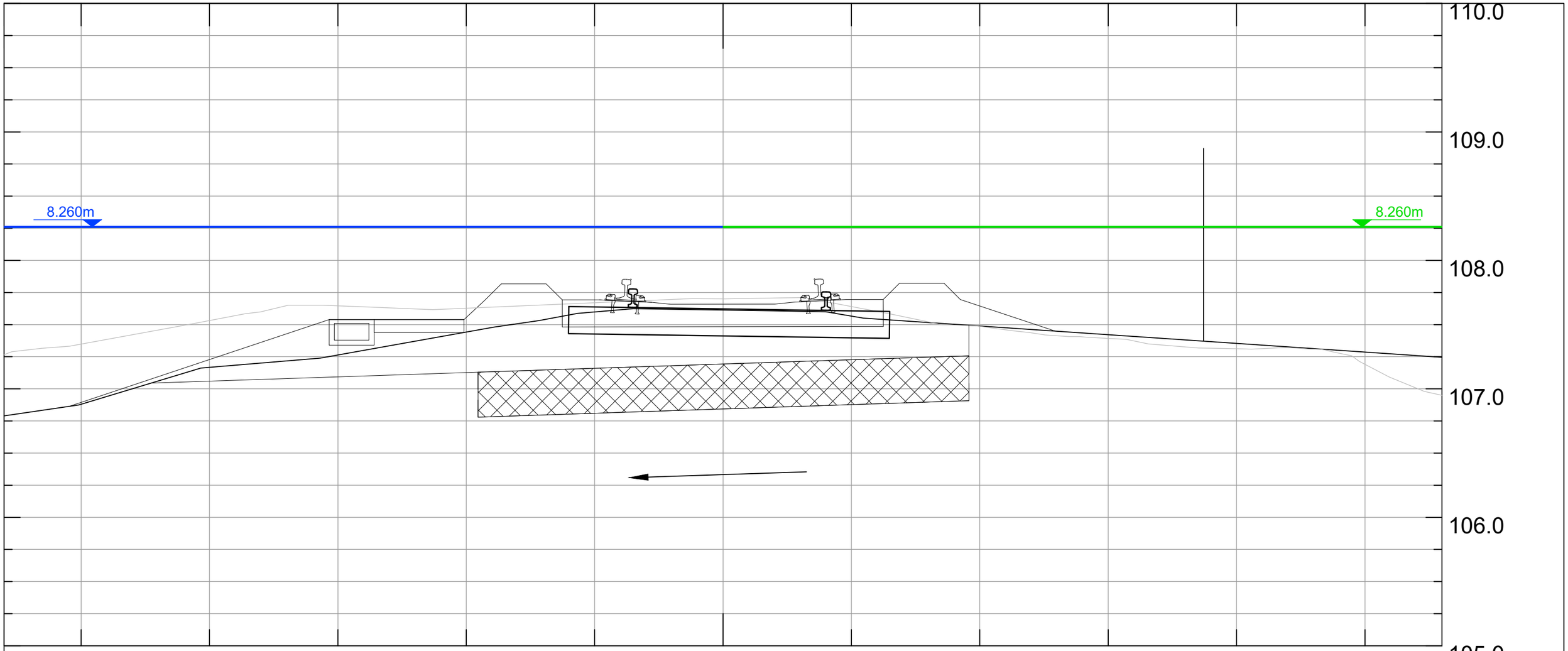
0.000m 1000yr 2115

0 4 8

Horizontal Metres

0 1 2

Vertical Metres



17+350m

LEGEND

Flood levels (post development) - Seaward Side:

0.000m 1000yr 2115

Flood levels (post development) - Landward Side:

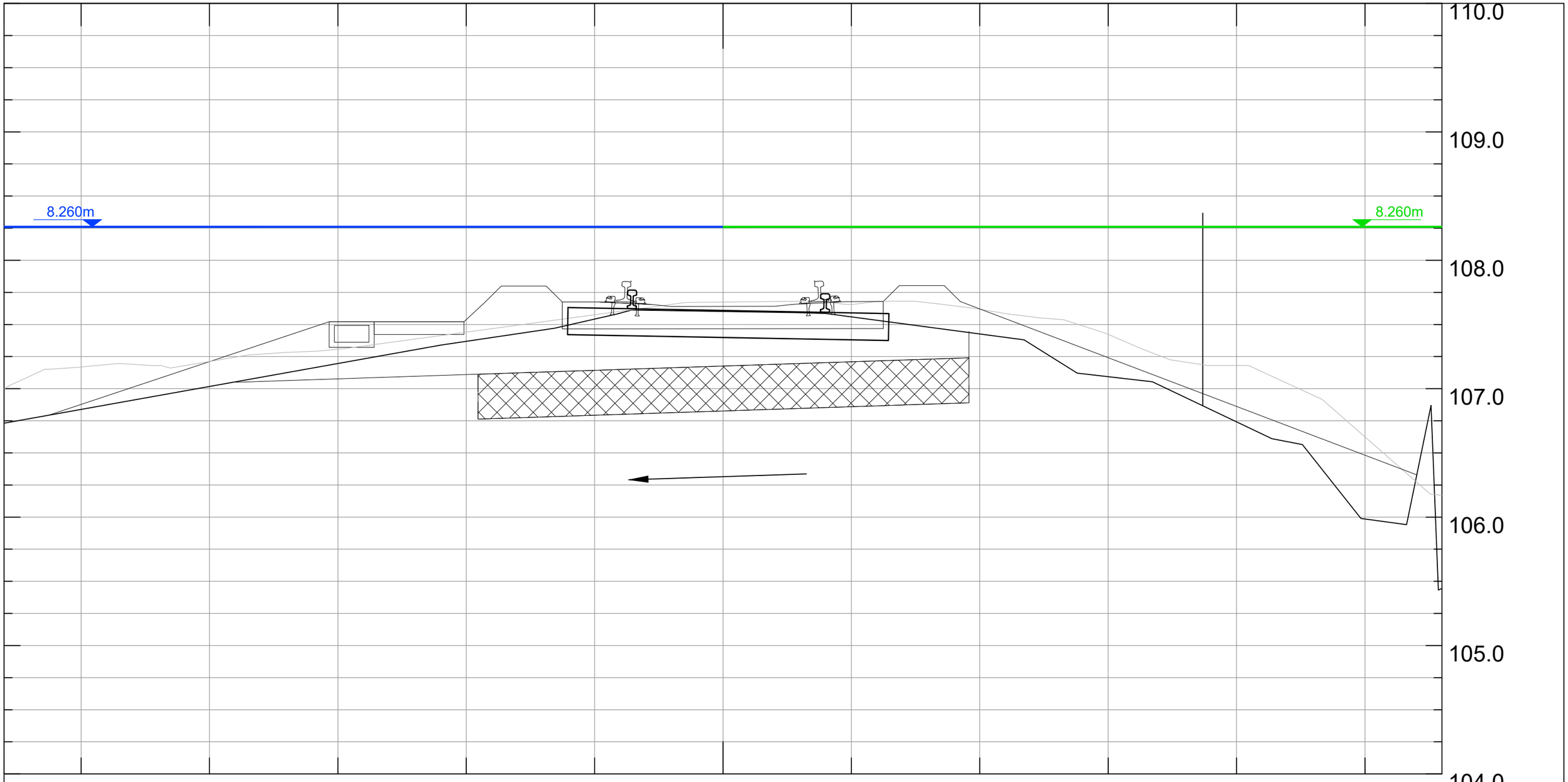
0.000m 1000yr 2115

0 4 8

Horizontal Metres

0 1 2

Vertical Metres



LEGEND

Flood levels (post development) - Seaward Side:

0.000m 1000yr 2115

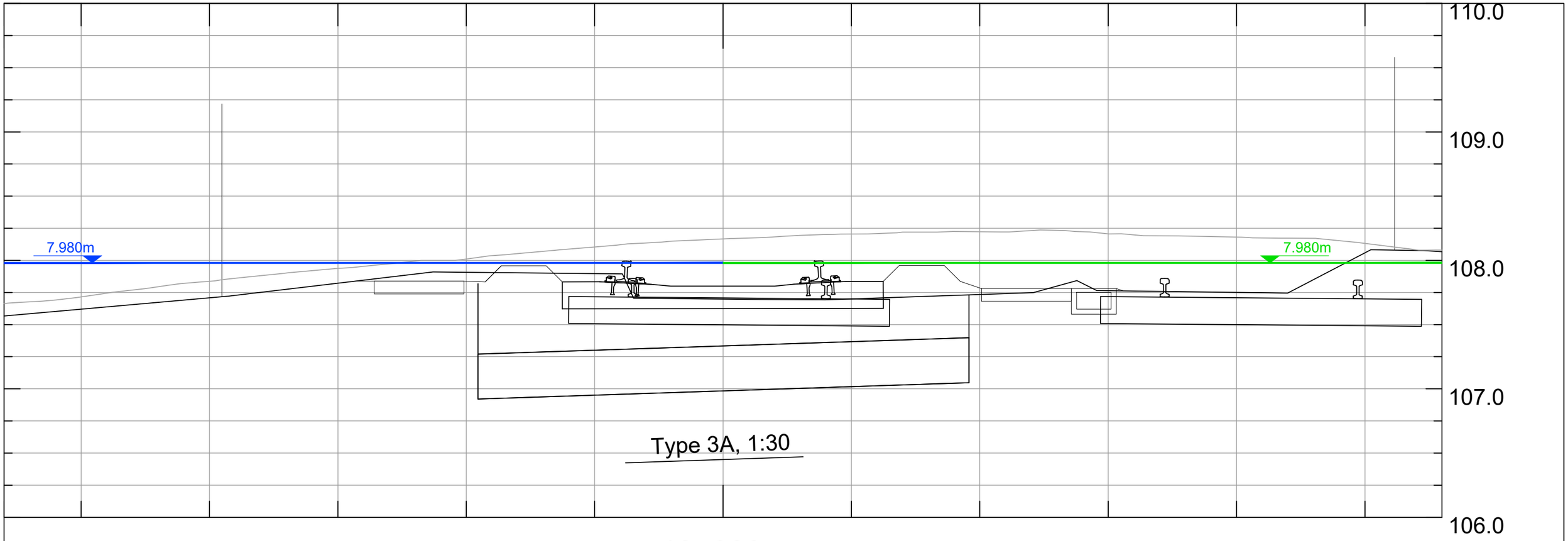
Flood levels (post development) - Landward Side:

0.000m 1000yr 2115

17+400m

0 4 8 Horizontal Metres

0 1 2 Vertical Metres



Type 3A, 1:30

18+000m

LEGEND

Flood levels (post development) - Seaward Side:

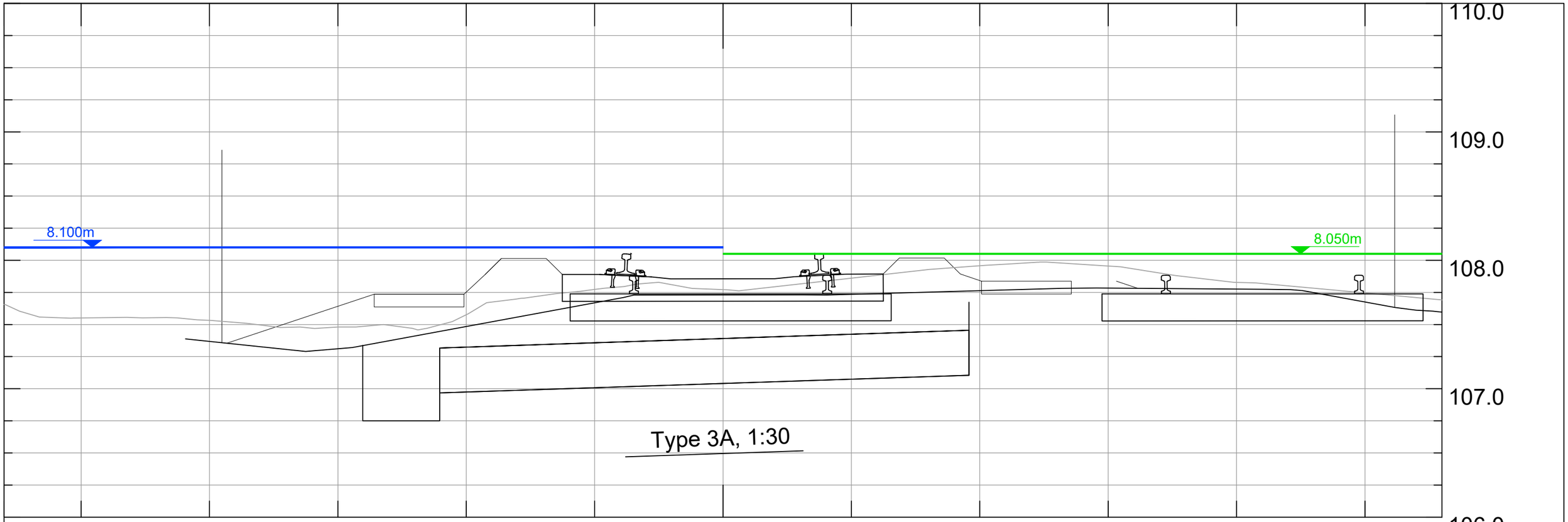
0.000m 1000yr 2115

Flood levels (post development) - Landward Side:

0.000m 1000yr 2115

0 4 8
Horizontal Metres

0 1 2
Vertical Metres



Type 3A, 1:30

18+050m

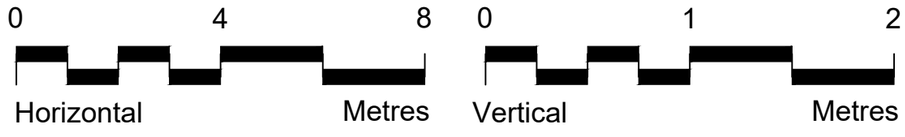
LEGEND

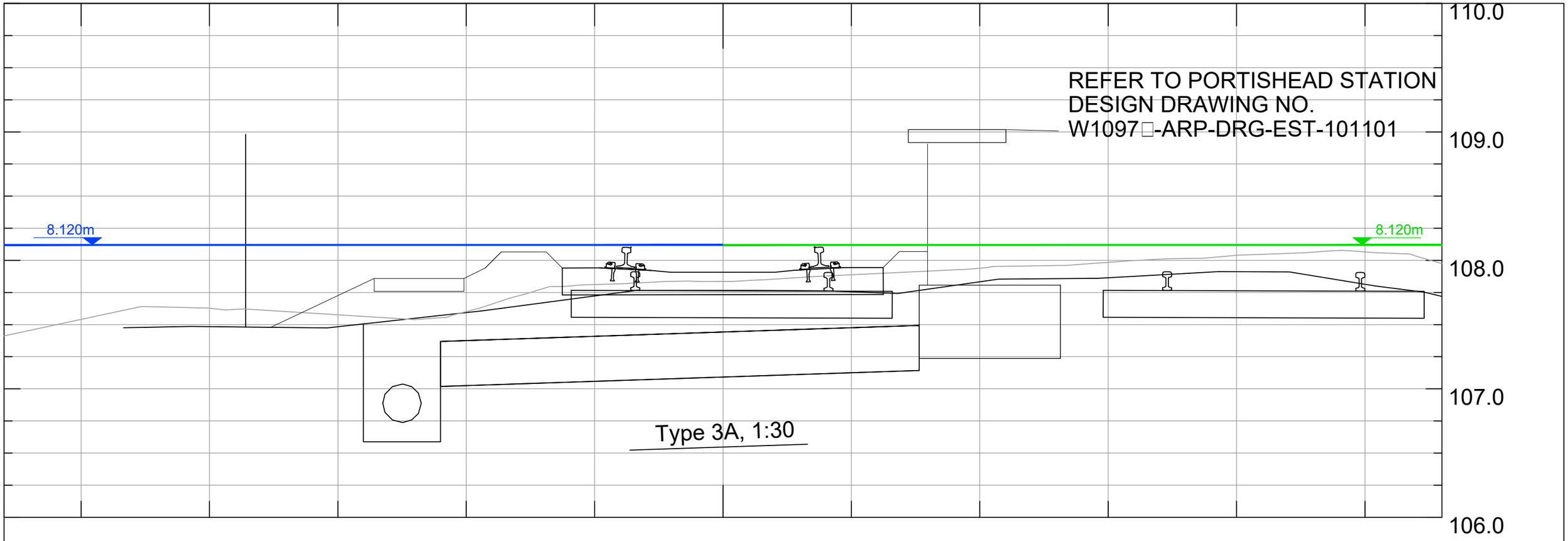
Flood levels (post development) - Seaward Side:

0.000m 1000yr 2115

Flood levels (post development) - Landward Side:

0.000m 1000yr 2115





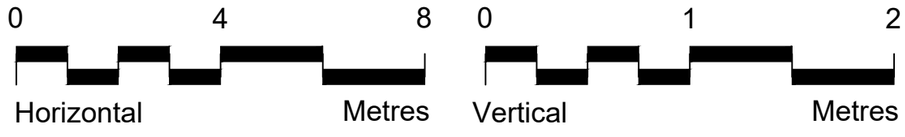
LEGEND

Flood levels (post development) - Seaward Side:

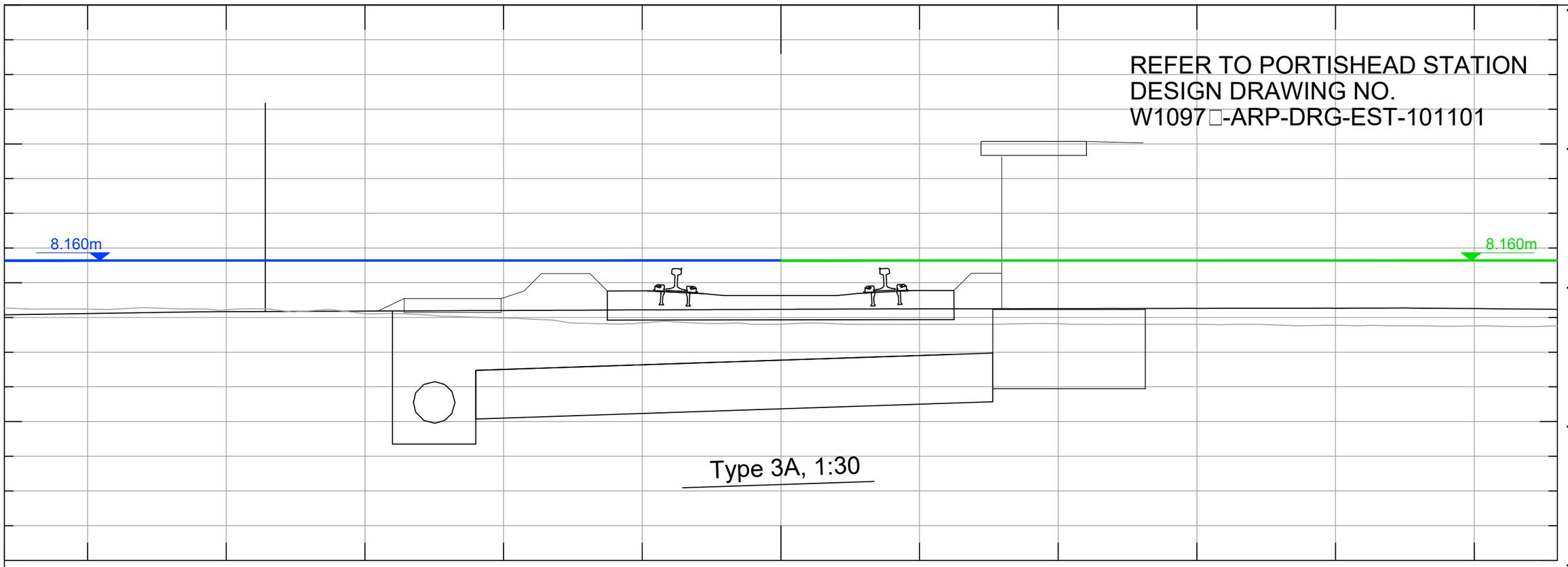
0.000m 1000yr 2115

Flood levels (post development) - Landward Side:

0.000m 1000yr 2115



REFER TO PORTISHEAD STATION
DESIGN DRAWING NO.
W1097□-ARP-DRG-EST-101101



Type 3A, 1:30

18+200m

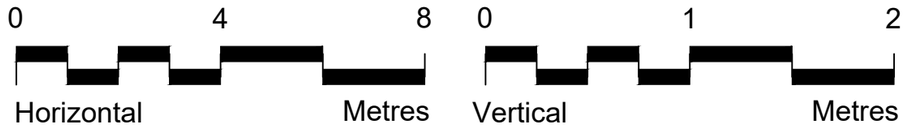
LEGEND

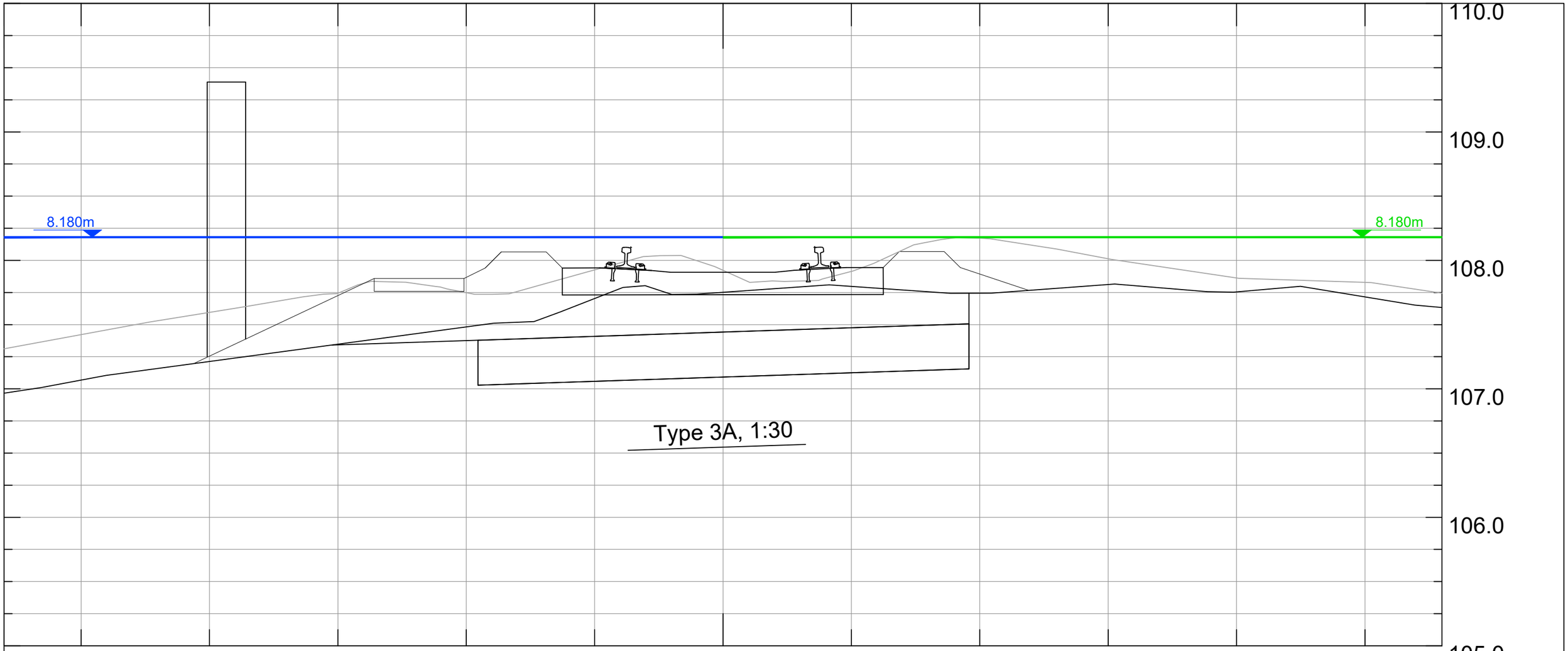
Flood levels (post development) - Seaward Side:

0.000m 1000yr 2115

Flood levels (post development) - Landward Side:

0.000m 1000yr 2115





LEGEND

Flood levels (post development) - Seaward Side:

0.000m 1000yr 2115

Flood levels (post development) - Landward Side:

0.000m 1000yr 2115

0 4 8
Horizontal Metres

0 1 2
Vertical Metres

MetroWest

Portishead Branch Line (MetroWest Phase 1)

TR040011

Applicant: North Somerset District Council
5.6, Flood Risk Assessment,
Appendix T Flood Plans
The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009, regulation 5(2)(e)
Planning Act 2008

Author: CH2M
Date: November 2019

NetworkRail · West of England Local Enterprise Partnership · West of England Combined Authority · HM Government · Bath & North East Somerset Council · Bristol City Council · North Somerset Council · South Gloucestershire Council · travelwest

MetroWest Phase 1: Outline Flood Plan for the Operations Phase

1. Introduction

1.1 Project Background

The project known as MetroWest Phase 1 comprises the delivery of infrastructure and passenger train operations to provide:

- a half hourly service for the Severn Beach line (hourly for St. Andrews Road station and Severn Beach station);
- a half hourly service for Keynsham and Oldfield Park stations on the Bath Spa to Bristol line; and
- an hourly or 'hourly service plus' service for a reopened Portishead Branch Line with new/reopened stations at Portishead and Pill (and also serving existing stations at Parson Street, Bedminster and Bristol Temple Meads).

1.2 Scope and Purpose

The Portishead Branch Line scheme is presently the subject of a Development Consent Order (DCO) application (the DCO Scheme). As part of the DCO submission package, a Master Construction Environmental Management Plan (CEMP) has been prepared which pertains to the construction stage of the scheme. The Master CEMP outlines the need for the construction contractor to produce Flood Plans for each relevant Stage (as defined by the DCO) of the project for approval by the relevant local authority prior to the commencement of the construction phase. Hence, consideration of the implications of flood planning during the construction stage of the scheme lies outside the scope of this document.

If the DCO for the Portishead Branch Line is approved and once the project is constructed, the DCO Scheme has the potential to be impacted by extreme weather events such as flooding during its period of operation. This Outline Flood Plan has been developed to support the DCO application. It provides an indication of the key issues required for consideration, and the general approach that will be taken, for flooding issues when the scheme is operational.

Network Rail (NR) manages flood risk at a route level, producing Extreme Weather Plans (Standard Maintenance Procedure NR/L3/TRK/1010) which incorporate flood responses across the route network. Once the DCO Scheme reaches the operational stage any relevant flood response issues pertaining to the line will fall under the auspices of the route-wide plan and any subsequent updates applied to it. Network Rail's route-wide Extreme Weather Plan will identify the likelihood of occurrence of flooding on the line; will demonstrate how

Network Rail will respond to and monitor flooding events; and demonstrate how the DCO Scheme will be returned to operational status following the subsidence of flooding.

The purpose of the route-wide Extreme Weather Plan (including flooding) which will incorporate the operational scheme will be to ensure the safety of rail traffic passengers, personnel and infrastructure where flooding presents a danger. In addition it will advise all concerned of the actions to be taken in the event of a Flood Warning being received from the Environment Agency (EA). This Outline Flood Plan shall be read in conjunction with the Standard Maintenance Procedure NR/L3/TRK/1010, Issue 02 August 2008 *Management of responses to extreme weather conditions at structures, earthworks and other key locations* (formally NR/L3/MTC/TK0167). The Outline Flood Plan draws heavily upon the contents of this document to present an illustration of the provisions that will apply as part of Network Rail's strategic approach to flood risk management along the future line of the DCO Scheme once it has reached the operational phases.

2. Flooding

2.1 Flood Risks

2.1.1 Generic Flood Risks To Rail Infrastructure

Fast flowing rivers, particularly under flood conditions, can present a hazard to railway bridges that traverse them and railway embankments adjacent to them. There have been several notable incidents where fast flowing rivers have scoured away the river bed beneath the foundations of bridges which has resulted in their collapse. As a result of the obvious dangers that scour presents, all railway bridges over water will have a scour risk assessment completed prior to commissioning. Any structures identified as being at significant risk will require special precautions to be taken.

In particular locations, during flood conditions river levels rise to an extent where the openings of bridges and culverts run at full bore. This in itself can give rise to dangers. Particularly at risk is a metal bridge deck that may be displaced by the force of water itself or debris carried downstream. When enclosed culverts run at full bore, the water can be put under pressure and hydraulic capacity can be reached. This can lead to water backing up, causing further flooding upstream with attendant dangers. Flooding can also be caused by the release of water from reservoirs and by tidal changes.

Where flooding does occur, it is important to recognise that parts of the railway and infrastructure not normally thought to be at risk may become so. It is essential that these dangers are recognised, and where appropriate, action should be taken to maintain the safety of the line. It is also important to note the condition and course of rivers, streams etc, under normal conditions. Changes of flow rates and alterations in water course, either by natural means or manmade, can lead to problems. Debris build up may also cause blockages and lead

to additional forces on the structure. Timber and metal superstructures are particularly at risk of being displaced from their bearings. This Outline Flood Plan describes how NR will approach developing response requirements in conditions of heavy rainfall or high tide and the action to be taken in response to receipt of a flood warning once the scheme is incorporated into the wider operational rail network.

This Outline Flood Plan relates to structures and sections of track which have been identified by the Flood Risk Assessment (FRA) for the DCO Scheme as being exposed to particular risks of flooding. A brief precis of the key issues identified within the FRA is presented below. This information will be developed more fully as part of the final updated route-wide Extreme Weather Plan which will apply to the DCO Scheme upon commissioning.

2.1.2 MetroWest Phase I Flood Risk

The DCO Scheme is considered to pass the NPPF Sequential Test as the DCO Scheme is identified in NSC Core Strategy, Adopted April 2012 and there are no other feasible locations for the DCO Scheme. The current resilience of the rail asset to flooding has been assessed as part of the assessments undertaken within the project FRA.

The FRA identified that the most significant flood risk to the DCO Scheme is River Avon tidal flood risk in the vicinity of Bower Ashton. For the present day (2015) scenario, modelling undertaken for the FRA indicates the proposed railway would flood once every 5 to 10 years on average near Bower Ashton, due to high tide/surge conditions.

For the future scenarios, due to projected future sea level rise, the railway will flood on average approximately once a year by 2075 and more than once every year on average in 2115 near Bower Ashton. Whilst it is anticipated that there would be a strategic River Avon flood defence scheme in place by that time, due to the extensive increase in flood risk across Bristol, the adopted Extreme Weather Plan will detail flood warning procedures and actions to manage flood risks to the DCO Scheme and its users/personnel.

Coastal flood risk between Portishead and Pill is not regarded as significant for the present day (2015) and future (2075) scenarios as modelling undertaken for the FRA indicates flooding of the DCO Scheme occurs less than once every 1000 years on average. Modelling indicates that for the future (2115) scenario the DCO Scheme will experience coastal flooding once every 200 to 1000 years on average.

Portishead station and carpark are in the defended floodplain and the impact of flooding on access and egress is considered insignificant for the present day (2015) and future (2075) scenarios. For the future (2115) scenario, Portishead station and carparks are predicted to flood once every 200 to 1000 years on average. Pill station, carpark and adjacent roads are

several metres higher than River Avon flood levels and so access/egress is considered safe from River Avon tidal flooding.

The FRA indicates that fluvial flooding in the Longmoor and Colliter's Brooks would result in flooding of the railway in the vicinity of the railway crossing of Longmoor Brook approximately once every 100 to 1000 years on average for the present day (2015) and every 50 to 75 years in 2075 and 2115.

Further to the above the Environment Agency's surface water flood map indicates that there may be relatively small and localised areas in the vicinity of the DCO Scheme that could be vulnerable to surface water flooding during rainstorms.

The surface water drainage of the railway and stations/carparks has been designed in consultation with the EA, North Somerset Levels Internal Drainage Board (NSLIDB), North Somerset District Council (NSDC) and Bristol City Council (BCC), as appropriate, to ensure the DCO Scheme does not increase surface water flood risk elsewhere. The ground conditions at Portishead and Pill stations and carparks are not suitable for sustainable drainage systems (SuDS) based on infiltration, but the drainage designs include underground tanks where appropriate to maintain current discharges to outfalls.

A breach of the Sea Commissioner's Bank coastal flood defence during a tidal flood event would not affect the DCO Scheme for the present day (2015) scenario. The potential for a breach to impact the DCO Scheme increases for the future (2115) scenario, due to projected future sea level rise. The final Extreme Weather Plan which will be applicable to the operational DCO Scheme will specify operational procedures during high tide and surge levels (i.e. levels for which a breach would impact the railway services). This may include, for example, precautionary closure of the railway during (rare) high tide and surge level conditions.

The inland flood bund coastal flood defence (FRA, Appendix M) provided as part of a recent residential development has an unresolved structural issue. The EA requires this to be resolved before adopting and maintaining the structure. The EA is in discussion with the developer to resolve this outstanding issue. There is likely to be a strategic response to manage future increased coastal flood risk between Portishead and Pill and the inland bund is likely to remain a component of the strategic coastal flood risk management infrastructure in the future.

Significant culverts under the railway will continue to be managed by the NR, EA, NSLIDB, NSDC and BCC as appropriate to their ownership and responsibilities to minimise the risk of blocked culverts resulting in increased flooding locally during a flood event. Access will be maintained for third parties to maintain their assets as part of the DCO Scheme.

The detail provided below within this Outline Flood Plan indicates the approach to managing flooding issues that NR will adopt within the Extreme Weather Plan which will apply to the DCO Scheme in order to manage the potential impacts of flood on scheme infrastructure.

2.2 Flood Warnings

Where there is a likelihood of flooding, warnings are issued by fax from the regional offices of the EA and electronically through the Flood Warning Database. Flood warnings are communicated to Network Rail Control by the EA. It will be the responsibility of the NR Control to advise their staff of warnings issued as necessary.

2.2.1Coding of Flood Warning

The National Coded Flood Warning Service provides a means whereby warnings of flooding can be transmitted with an indication of estimated severity. There are four types of flood warning in the Service. Each level of severity is associated with flooding forecast for a certain type of area and flood risk, as follows:

- Flood Alert;
  - Fast flowing and bank full rivers
  - Flooding on fields and minor roads
  - Surface water flooding
  - Spray/wave overtopping
  - Overland flow from rivers/watercourses
  - Flooding from ordinary watercourses
  - Potential property flooding

- Flood Warning (Including Updates);
  - Risk to life and property
  - Underground stations and lines vulnerable
  - Damage to defences
  - Risk to main road and railways
  - Significant wave/spray overtopping
  - Access Roads vulnerable
  - Severe floodplain inundation

- Severe Flood Warning;
  - Large numbers of people/property affected
  - Major incident/flood plan triggered
  - High risk to life
  - Civil disruption (traffic etc)
  - Major breaches of flood defences

- Warning no longer in force Flood water receding;
    - Fall in water level with damage and destruction to be cleared up where flooding has occurred

2.2.3 General Flood Alert

When a General Flood Alert is issued by the EA that covers a wide geographic area i.e. not river specific, NR Control shall advise the Maintenance Delivery Unit (MDU) within the affected area that a general alert is in operation. The MDU shall immediately advise teams working within the area and instruct them to monitor the water levels of any rivers contained within the Flood Plan that lies within their vicinity of work. If they believe water levels are rising significantly they must report this back to the Section Manager who will then decide whether mitigation measures contained within the Flood Plan should be put in place before a formal Flood Warning has been issued by the EA. Records will be kept of all flood warnings. The records will note the time the warning was given, from whom, to whom, content of message, action taken and time all clear given. The MDU personnel, Incident Support Controller (ISC) and NR Control shall ensure that flood logs are kept and maintained.

2.2.4 Procedure Following Receipt of EA Flood Warnings

Figure 1 provides a general illustration of the process to be followed once a flood warning is issued by the EA.

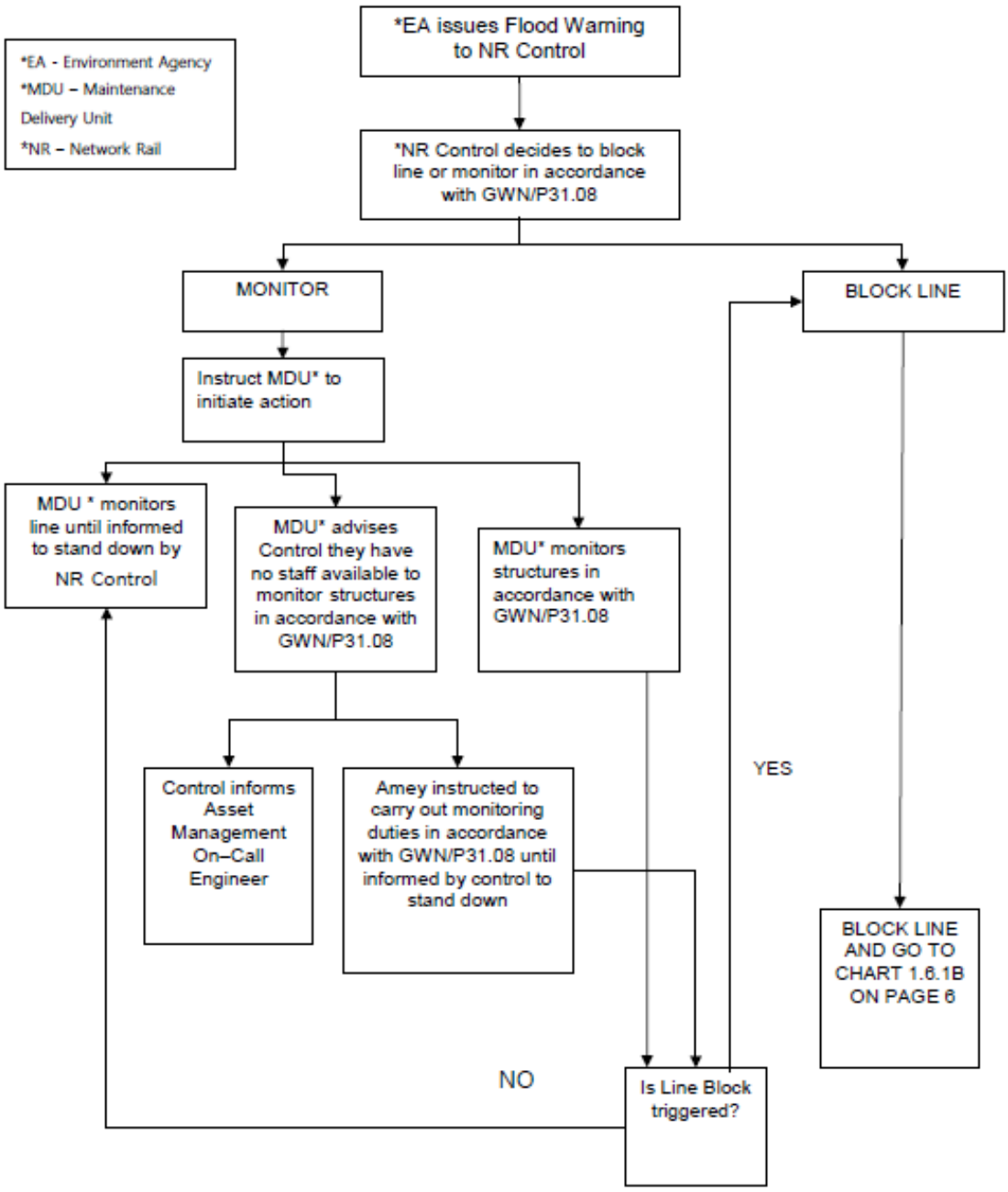


Figure 1. A flow diagram of the process to be followed once a flood warning is given in an area impacting the operational scheme. Reference to further charts and pages refer to contents of NR/L3/TRK/1010.

Following a major flood event that closes a line, the process outlined within Figure 2 will be followed. Where a line block is in place for in excess of 12 hours the Structures Route Asset Maintainer (RAM) may decide that inspections and underwater examinations may need to be undertaken on structures that are not included in this document before they are opened to traffic.

Flood Alert: The MDU On-Call Manager or Minor Works Contractor (MWC) shall arrange to advise their local staff as necessary. The MDU or MWC shall make preparatory arrangements for patrolling of lines at risk and particular structures or sites at risk as identified within the Flood Risk Assessment.

Flood Warning: The MDU On-Call Manager shall arrange to advise their local staff as necessary. In some cases certain lines on the Route will have to be closed to traffic under this warning. The MDU or MWC shall make preparatory arrangements for patrolling of lines at risk and particular structures or sites at risk identified within the Flood Risk Assessment.

Severe Flood Warning: The MDU On-Call Manager or MWC shall arrange to advise their local staff as necessary. As a minimum, the MDU or MWC will arrange for patrolmen to go to the affected Sections of line and to remain on patrol until recalled. For particular areas identified as at risk within the FRA decisions and line closures will be made in accordance with the Hazard Warning Guidance Notes (see Section 2.2.6), and in line with the information sheets for individual areas of flooding risk identified within the FRA.

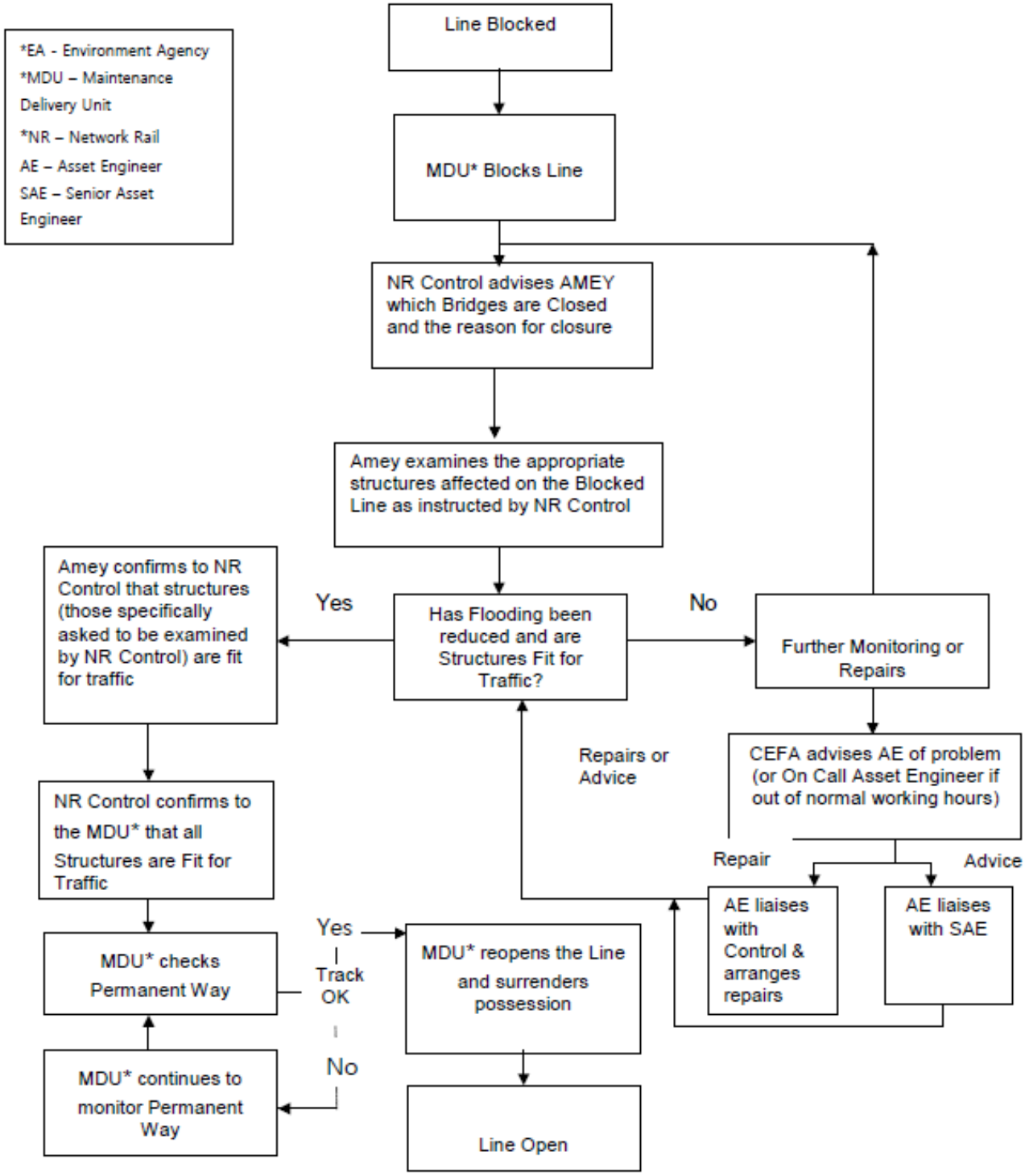


Figure 2. A flow diagram of the process to be followed for reopening a blocked railway line once flood risks have reduced to an acceptable level.

2.2.5 Responses to Flood Warnings

Under circumstances whereby personnel detailed to maintain observation on a structure cannot reach the structure in order to monitor it adequately and as required by this Flood Plan, the personnel shall advise the signaller and request that the line is blocked to traffic until such time as the site can be reached and the appropriate inspection undertaken.

The procedure for blocking the line by the person observing the structure involves contacting the signaller or NR Control to request a line blockage.

Where it has been necessary to block a line or part of a line through implementation of this procedure, the requirements of NR/L1/CIV/032 will be followed before it can be re-opened to traffic. Figure 2 presents an outline of the proceedure to be followed before a blocked line can be re-opened.

In the event of a line block it will be necessary to ensure that structures are not damaged nor the riverbed scoured such that foundations have been undermined. Underwater inspection will be required to all structures subject to scour before a decision to re-open a line is made. It shall also be necessary to carry out a structural examination.

The MDU will be responsible for opening the line once they are satisfied that both they and the Civil Examination Framework Agreement (CEFA) contractor have met all relevant procedures stipulated in final Flood Plan document. The MDU shall determine if any special precautions, such as a temporary speed restriction, are required and make the appropriate arrangements accordingly.

The CEFA contractor will be provided with all relevant information, records, drawings, plans, surveys, assessments and calculations by Western Route to enable them to determine whether the specified structures are fit to carry traffic. NR Control will then advise the CEFA contractor of any section of blocked lines. It will then be the responsibility of the CEFA contractor to advise members of their staff as necessary. In addition to any structural examination carried out by CEFA, the MDU shall carry out any necessary inspections of the track and formation. They shall confirm that the track and formation are in a satisfactory condition to re-open the line to traffic. The line shall only be re-opened for traffic following confirmation to NR Control by the CEFA contractor that all structures instructed for inspection have been examined and found to be ‘fit for purpose’. If there is any doubt concerning the structural integrity of any part of a structure, or should technical advice and/or remedial works be necessary the Asset Engineer or On Call Engineer must be advised. NR Control may be contacted by telephone on 01793 389235 (Swindon).

2.2.6 Hazard Warning Guidance Notes

The final Flood Plan will include Hazard Warning Guidance Notes based on those identified below.

Those required to inspect must know the structure and the watercourse in normal conditions. Certain structures may have supplementary instructions, should the pre-commisioning assessment deem them necessary. Any supplementary instructions must be adhered to during times of flood. Personnel detailed to observe specific structures should check the conditions regularly as detailed below:

Rise and Fall in Water Levels
It shall be noted whether the flow of water is considerably faster than normally experienced, and whether the flow is uniform across the watercourse. If varying speeds can be observed, then look upstream for any obstructions, breach of the bank, etc., which alter the flow patterns and can induce scour. Observe water levels over a period of 5 minutes, noting any rapid rise or fall in level.

Sudden Changes in Turbulence
Check the watercourse for turbulent water both up and downstream, but with more concern for this characteristic being observed upstream. This will usually indicate underwater obstruction, which alters the flow patterns and induces scour.

Obstructions in the River Up Or Down Stream
Check the areas around piers and abutments to the upstream face of a structure for debris that might have built up. This is a critical observation, as the blockage at a structure will induce rapid scour around piers and abutments. Note any defects such as cracks. Note if these appear to be new and try to establish: (1) if there is any change in the state of the defect, or (2) any evidence of settlement such as cracking or the displacement of any structural elements.

Openings Running at Full Capacity
Over a period of time, observe the height of water passing and note if any rapid rise or fall is occurring.

Following observation of conditions given above, the person carrying out the inspection will need to decide whether to close the line or seek further advice. IF THERE IS DOUBT THE LINE WILL BE BLOCKED. If the water levels exceed the maximum at the site, then the instruction to close the line must be given. An instruction to block the line will be given if the river is approaching the highest water level and there are signs of high speed flow and turbulent water in the immediate proximity of the site or heavy debris around piers or abutments.

3. Summary

This Outline Flood Plan presents a brief summary of the potential flood risks which may be faced by the operational scheme, togther with an overview of how flood waters may affect critical scheme infrastructure. Further, it identifies the approach that NR will adopt in response to flood warnings and floods themselves. The material contained within this Outline Flood Plan requires development ahead of scheme commissioning in conjuction with the asset management team in Western Route and updated with the latest pratice and standards which will apply at the time the scheme is commissioned.

MetroWest Phase 1: Flood Plan during construction for Proposed Infrastructure at Bower Ashton in Flood Zone 3b (Clanage Road construction compound)

1. Introduction

1.1 Project Background

The project known as MetroWest Phase 1 comprises the delivery of infrastructure and passenger train operations to provide:

- a half hourly service for the Severn Beach line (hourly for St. Andrews Road station and Severn Beach station);
- a half hourly service for Keynsham and Oldfield Park stations on the Bath Spa to Bristol line; and
- an hourly or 'hourly service plus' service for a reopened Portishead Branch Line with new/reopened stations at Portishead and Pill (and also serving existing stations at Parson Street, Bedminster and Bristol Temple Meads).

1.2 Scope and Purpose

The Portishead Branch Line (MetroWest Phase 1) scheme is presently the subject of a Development Consent Order (DCO) application (the DCO Scheme). As part of the DCO application, a Master Construction Environmental Management Plan (CEMP) has been prepared which pertains to construction stage of the scheme. The project alignment lies in Flood Zones 1, 2 and 3. At Bower Ashton in Bristol there are proposed railway works within the tidal River Avon Flood Zone 3b. This section of the railway alignment is existing operational railway. However, a new compound is proposed by the project near this location (between Clanage Road and the railway south of the former Police horse and dog training centre). This proposed compound lies in Flood Zone 3b. However assigning Flood Zone 3b based on hydraulic model results is considered precautionary in the context of understood modelling uncertainty and available historic flood information, which suggests a lower flood risk (discussed further in FRA Section 4). The compound is to be used both as a compound during the construction works and as a smaller, permanent compound post opening of the project to access the railway to undertake maintenance.

The scope of this Flood Plan is limited to the proposed Clanage Road compound only (in Flood Zone 3b, during construction. The proposed Clanage Road compound is the only compound for the scheme in Flood Zone 3b and clarification is sought from the Environment Agency on the acceptability of the compound proposals.

A separate Outline Flood Plan has been produced for the whole project alignment for the operational phase of the project, post completion of construction and this document should be read in conjunction with that document (the Outline Flood Plan for the operational phase). The Master CEMP outlines the need for the construction contractor to produce Flood Plans for each relevant Stage (as defined by the DCO) of the project for approval by the relevant local authority prior to the commencement of the construction phase.

2. Clanage Road construction compound – flood risk and use of compound

2.1 Flood Risk at Bower Ashton

The location of the proposed Clanage Road compound is shown in Figure 1.

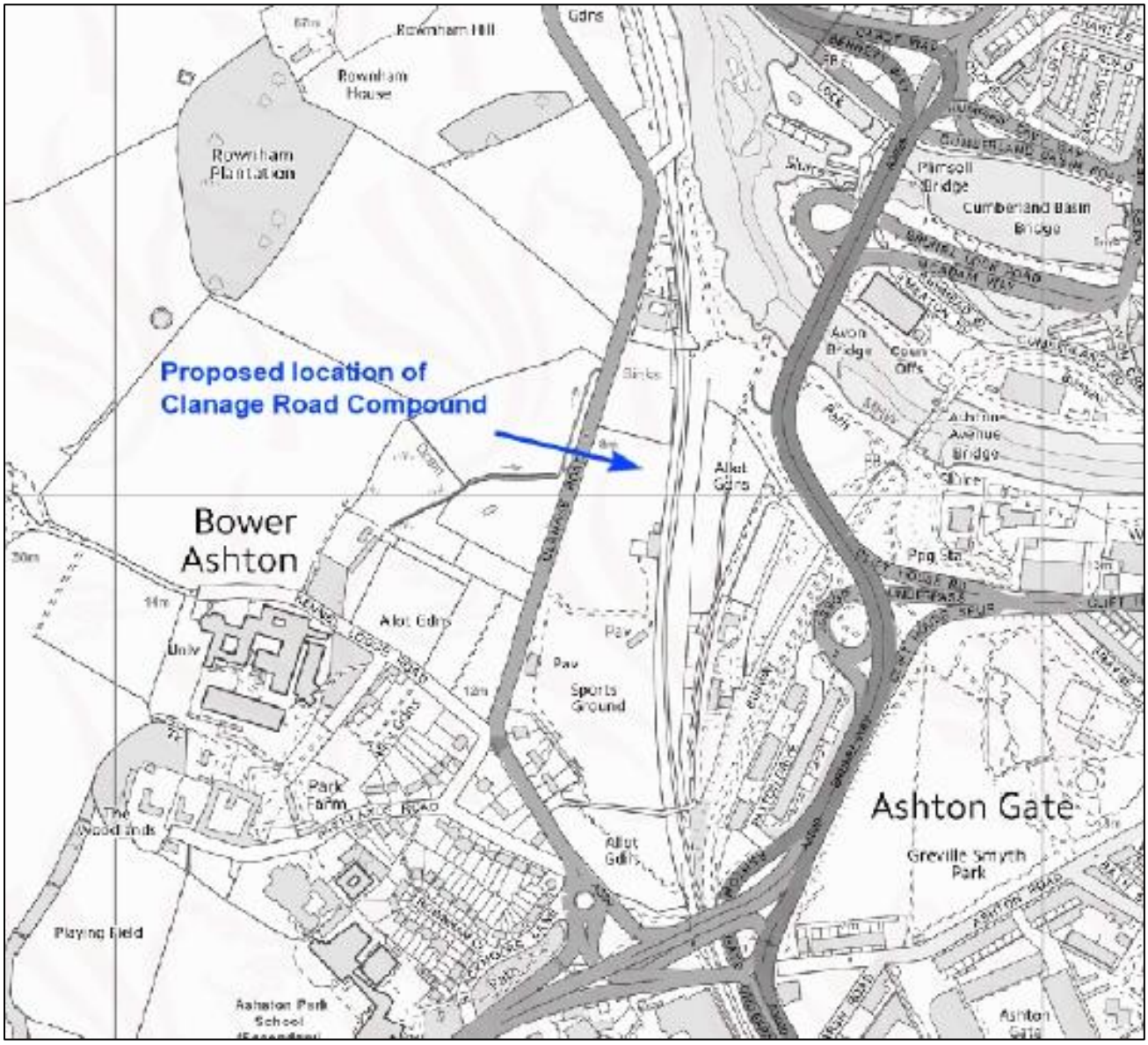


Figure 1: Location of Clanage Road construction and permanent compounds

The FRA identified that the most significant flood risk to the DCO Scheme is River Avon tidal flood risk in the vicinity of Bower Ashton. For the present day (2015) scenario, modelling undertaken for the schemes within the FRA indicates the proposed railway would flood once every 5 to 10 years on average near Bower Ashton, due to high tide/surge conditions, for the pre- and post-development situations.

Figures N1 to N4 of the DCO Scheme Flood Risk Assessment, included in Appendix 1, show modelled tidal River Avon flood extents for the present day (2015) 10 year and 20 year return period River Avon flood event. These figures show the Clanage Road compound to be outside of the tidal River Avon 10

year return period flood extents, and inside the 20 year flood extents, for both the pre and post-development situation i.e. within the tidal River Avon Flood Zone 3b. However, the FRA hydraulic model results are considered precautionary (FRA Sections 4).

Significant third party culverts under the railway will continue to be managed by existing arrangements to minimise the risk of blocked culverts resulting in increased flooding locally during a flood event.

For further detail about NR's approach to managing flooding impacts within the Extreme Weather Plan, refer to the Project Outline Flood Plan for the operational phase.

2.2 Clanage Road construction compound – rationale for site selection

The railway alignment north of the proposed Clanage Road compound has no highway access for HGV vehicles for 6.0 kilometres. The nearest HGV access will be a proposed new access at Ham Green at the eastern portal of Pill Tunnel. This access is constrained by topography such that it will not be suitable for a 44 tonne HGV articulated low loader and will only be suitable for use by smaller HGV vehicles. The next available access point which can be accessed by a 44 tonne HGV low loader is a further 2.1 kilometres to the west at the entrance to Royal Portbury Dock.

The proposed Clanage Road construction compound will provide access to construction sites through the Avon Gorge and will include a permanent ramp and a Road Rail Access Point (RRAP) up to and across the track formation. The compound is an integral part of the project construction strategy, refer to section 2.4 for further details. A number of possible locations for the compound were identified and assessed as part of a site option selection assessment. A major factor in option selection assessment was the requirement to be able to manoeuvre safely a 44 tonne HGV articulated low loader into and out of the site. Due to the proximity of the bend at Rownham Hill, the gradient of the highway, the average speed of traffic and the site visibility distances, options to the north of the proposed location for the compound were not supported by the Local Planning Authority Bristol City Council and could not be taken forward. To the south of the proposed compound the land (which is also in flood zone 3a) is used for a range of recreational activities such that further land take would place the continuing viability of the business at risk. To the east of the proposed compound is the railway and the river Avon and to the west is Clanage Road, consequently constraining the selection of the compound location. Other sites for the compound were also considered further south east at Ashton Gate but were not accessible by a 44 tonne HGV low loader and did not provide sufficient compound space for the proposed use of the compound set out in section 2.3 below.

2.3 Proposed use of the Construction Compound

The layout and use of the Clanage Road Construction Compound will be controlled through the requirements set out in the Master CEMP, the tender documents, and the contractor's CEMP. The key constraints would be along the following lines.

- Temporary welfare facilities will be provided for construction staff and this will be mounted higher than the flood risk level (above the modelled 200 year return period tidal River Avon flood level of 8.10mAOD at the Clanage Road compound).
- The compound will not be used for open storage of lightweight materials or materials that are more prone to being washed away in a flood event. For example, storage of openly stock piled ballast will not be permitted and needs to be contained in bags.
- The compound will be used for storage of materials, plant and overflow car parking. The materials may include rail and other heavy parts. The Clanage Road compound will be used as a main compound to support works happening through the gorge including track lifts, other targeted track interventions, civil works, signalling and telecoms.
- The compound will not be used for storage of fuels, chemicals or hazardous material other than within appropriate storage, such as secure spill proof containers.
- The contractor will monitor Environment Agency flood warnings and will react appropriately to the risk according to its Flood Plan and Staff Evacuation Plan. This may include the contractor securing materials/plant (and where appropriate moving materials/plant off site) that could be a risk during a flood.
- The Master CEMP for the scheme requires the contractor(s) to produce a Flood Plan for the Clanage Road compound for the construction phase.

The design drawing for the proposed compound is attached in Appendix 2.

2.4. Flood Storage Compensation

The risk and impact associated with flooding of the Clanage Road construction compound is considered insignificant (low likelihood, low consequence), since:

- Whilst hydraulic model results show the Clanage Road compound to be within the 20 year return period flood extent, the modelling is considered precautionary (FRA Section 4).
- Appropriate constraints will be applied on the type of materials and equipment allowed to be stored in the compound (Section 2.3).
- For tidal flood risk, flood warnings have relatively long lead times enabling stored equipment and materials to be relocated in response to triggers and actions to be set out in the contractor's CEMP.
- The impact on flood levels due to floodplain storage displaced by any remaining stored equipment and materials would be minor as the displaced flood volume would be redistributed over a large surface area.

Therefore, no floodplain compensation for temporary storage in the Clanage Road compound is proposed[1].

2.5. Wider Site Context

Notwithstanding the assessment that the flood risk is considered insignificant as summarised in paragraph 2.4 above, there are constraints that would prevent the feasibility of implementing

[1] Floodplain compensation will be provided within the Clanage Road compound to mitigate the impacts of the permanent works within the compound. Details are in the DCO application Flood Risk Assessment.

floodplain compensation, for the proposed construction compound. The site to the north of the proposed construction compound (shown to be partly in Flood Zone 3b by the FRA modelling) has been acquired by the Caravan Club and it is understood they are preparing to submit a planning application for the use of the whole site, to the local planning authority shortly. The area of their site that bounds the northern boundary of the proposed construction compound is also constrained by multiple underground utilities. The site to the south of the proposed construction compound (also shown to be partly in Flood Zone 3b by the FRA modelling) is used for a range of recreational activities. The project is proposing to acquire some of this land on a temporary basis for the proposed construction compound, however it would not be feasible to acquire further land without placing the continuing viability of the business at risk.

3. Conclusions

In order to construct the project a construction compound is needed south of the Avon Gorge to access work sites along the railway alignment in the southern part of the gorge, in the Ashton Gate area and at Parson Street Junction, as set out in the project Construction Strategy. The only suitable location for the compound which needs to be accessed from the highway by a 44 tonne articulated low loader is at the site shown in Figure 1. While the site is shown to be partly in Flood Zone 3b by the FRA modelling, the risk and impact associated with flooding of the Clanage Road construction compound is considered insignificant, therefore no floodplain compensation for temporary storage in the Clanage Road compound is proposed. This Flood Plan sets out proposed restrictions on the use of the compound in order to manage the flood risk, during the construction phase of the project and clarification is sought from the Environment Agency on the acceptability of these proposals.

Appendices

Appendix 1. Figures N1 to N4 of the DCO scheme Flood Risk Assessment - modelled tidal River Avon flood extents – please refer to FRA Appendix N

Appendix 2. Clanage Road Compound – Design Drawing (Jacobs) - *467470.BQ.04.20-621 Rev R.pdf*

E□istin□ □o□ndary wall retained

NOTE:
□o□ndary wall to □e determined d□e to e□ect on □nction visi□ility

NOTE:
Red□ced corner radii, w□ic□ does not cater □or le□t t□min□low loaders

Proposed □ootpat□

Dropped □er□ to allow pedestrians to cross

Loc□a□le □ate to compo□nd

Proposed tarmac area 20m lon□ □y 8m wide

E□istin□ □ootpat□

E□istin□ plantin□ to □e retained and en□anced to screen t□e compo□nd

NOTE:
Visi□ility splays as per DMR□ standard TD41□95 wit□ a rela□ation □or t□e □□ distance (2.0m), as it is a li□□tly □sed access, and a □y□distance o□90m

Approximate location o□ e□istin□ inspection c□am□er

Overr□n area □or ve□icles e□tin□ t□e compo□nd

For Section A re□er to drawin□ 467470.□□.04.20-630

□o□ndary wall to □e repositioned □y re□sin□ e□istin□stone

Appro□imate location o□e□istin□ 600mmØ culverted water course. Dept□ o□cover to □e con□rmed

E□istin□ □ootpat□

Post and wire □ence

Proposed plantin□ o□35 trees

Species Mi□ Oa□(□□erc□s) □ Sweet C□estn□t (Castanea sativa)

□er□

Proposed repositioned wall to □e tied into e□istin□ o□tside o□t□e □nction visi□ility splay

E□istin□ □o□ndary wall retained

Proposed □inal compo□nd □ence line

Proposed retainin□ wall to desi□ned to □rid□e t□e □o□ sewer □elow

Appro□imate location o□e□istin□ 225mmØ surface water sewer. Dept□ o□cover to □e con□rmed

Appro□imate location o□ existing 225mmØ foul sewer. Dept□ o□cover to □e con□rmed

Proposed □ence line to constr□ction compo□nd

Dropped □er□ to allow ve□icle access

Proposed repositioned wall to □e tied into e□istin□ o□tside o□t□e □nction visi□ility splay

NOTE:
Visi□ility splays as per DMR□ standard TD41□95 wit□ a rela□ation □or t□e □□ distance (2.0m), as it is a li□□tly □sed access, and a □y□distance o□ 90m

Proposed □o□ndary wall re□sin□e□istin□stone

Proposed 6m □ield □ate access

10m o□set □rom □o□ndary wall re□□red as temporary land to constr□ct new □ield access

N□rsery □□ildin□ appro□ 30m so□t□ o□ t□e constr□ction compo□nd □o□ndary □ence

Ass□med □ottom o□ramp level o□107.53m AOD

Type 1 access approa□ ramp 45m in len□t□ □rom trac□level. (First 3m at a □radient o□1:40 (2.5□) wit□ t□e remainin□42m at □radient o□1:25 (4□).

Widt□ o□ramp to □e 10m wide, wit□ retainin□walls to red□ce □lood compensation miti□ation

Proposed 10m wide Ve□ic□lar access to trac□via loc□ed □ate

Proposed repositioned Road Rail Access Point (RRAP)

Ass□med trac□level o□ 109.46m AOD

Ass□med top o□ramp level o□ 109.35m AOD

Proposed plantin□ area to screen t□e compo□nd □rom t□e proposed sports □acilities and views □rom wit□in □ower As□ton Conservation Area

E□istin□ trees

FO□L

C□5920m
C□5910m
C□5900m
C□5890m
C□5880m
C□5860m
C□5850m
C□5840m
C□5820m
C□5810m
C□5800m
C□5790m

CLANAGE ROAD

Note:

1. Permanent Network Rail Compound Approx. 3648 m²
2. Temporary Construction Compound Approx. 7075 m²
3. All dimensions are in metres □nless noted ot□erwise.
4. Spot levels are s□own at a□ove 100 metres d□e to t□e data □ein□ ta□en □rom topo□rap□ical s□rvey and Sna□eGrid

□EY:

Order Limits

Rev	□y	C□□d	Apprvd	Date	Description
R	ADS	ADL	ADL	31.07.2019	Desi□n amendments, contc□ data □ red line □o□ndary added
□	ADS	AL	AL	27.11.2018	E□istin□225mm dia. □ 3 sewer added d□ a□ to proposed ramp wit□retainin□ moved to t□e so□□ to ma□imise area
P	ADS	AL	AL	05.11.2018	Compo□nd layo□ revised to NRL In□ast□□□t□re Plant Man□al Mod□le P301 - Road Rail Access Points
O	OHP ADS	AL	AL	03.10.2018	□pdates to t□e □nction mo□□ overl□n area Red□ction in widt□ o□ 3m for t□e permanent and temporary compo□nd
N	OHP	ADS	ADL	20.03.2018	NR Minor Civils □pdate □ Permanent access added to t□e la□d □elow constr□ction compo□nd
M	OHP	□S	ADL	04.10.2017	Title amendments
L	OHP	ADS	ADL	15.09.2017	Minor amendments
□	OHP	AL	AL	17.07.2017	Temporary constr□ction □ Permanent compo□nds re-desi□ned
□	FG	AL	AL	06.01.2017	NR minor civils □pdate and indicative plantin□ species added
I	ECP	AL	AL	04.11.2016	Minor amendments
H	ECP	AL	AL	14.09.2016	Temporary constr□ction compo□nd 20 m lon□er
G	ECP	AL	AL	07.09.2016	Temporary constr□ction compo□nd 10 m wider
F	ECP	AL	AL	06.09.2016	Temporary constr□ction compo□nd re-desi□ned
E	ECP	AL	AL	31.08.2016	Compo□nd 5 m wider Minor amendments
D	ECP	AL	AL	11.08.2016	Compo□nd 5 m wider Minor amendments
C	ECP	AL	AL	14.03.2016	Space □r ramp provided Levels added
□	ADS	AL	AL	12.02.2016	Compo□nd re-desi□n
A	ADS	AL	AL	12.02.2016	Sports Development added

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Pro□ect

PORTISHEAD □RANCH LINE (METROWEST PHASE 1)

Drawin□

CLANAGE ROAD COMPO□ND LANDSCAPING AND ACCESS PLAN

Drawn □y: ADS Date: 05□01□2016
C□ec□ed □y: AL Date: 26□01□2016
Approved □y: AL Date: 26□01□2016

Drawin□No. 467470.□□.04.20-621
Revision R

Drawin□Scale: 1:250 □ A1

DO NOT SCALE. This drawing is to be read in conjunction with all relevant Architects, Engineers and Specialist Manufacturer's drawings and specifications. If in doubt please consult the Engineer.

0 5 10 15 20
SCALE 1:250 (A1)
SCALE 1:500 (A3)
METRES

Drawin□ □ile pat□ □ name - □:\Pro□ects\467470\NSC Framewor□ 2013□□_04.20.MM P□ase 1 Hi□□way En□ineerin□ 90 A 3to\CAD Pre□im 91.62 Clana□e Road\467470□□_04.20-621 Rev R.dw□