Rother Valley Railway

Proposed Rail Extension

A21(T) Crossing Options Feasibility Report

REP/239025/R002

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Executive Summary

The Rother Valley Railway is located between the mainline station at Robertsbridge (on the London and Hastings Line) and the existing Kent and East Sussex Railway, which runs between Tenterden and Bodiam.

When completed, the Rother Valley Railway will restore railway transport links between the main line railway system from Robertsbridge Junction to Bodiam and the Kent & East Sussex Railway and the attractions it serves. The railway already has full planning consent which incorporates arrangements for crossing a number of roads. The key focus of this report is the four options to cross the A21(T) Robertsbridge bypass (described below).

The options assessment has considered the feasibility and (industry standard) construction costs of each option so as to provide a "like for like" comparison between the option, as summarised in Table 1.

In addition, the assessment reports the actual cost estimate for delivery of the level crossing, as worked up by RVR for the purposes of the planning consent, granted in March 2017, and the application for Transport and Works Order submitted in April 2018. It is noted that it is not possible to advance a similar worked up costing for the other three crossing options because RVR would not be equipped to design and construct them "in-house". It is therefore appropriate for a further comparison to be made between the fully worked up costs of implementation of Option 1 by RVR and the "industry standard" costs of Options 2 to 4. This is included in Table 1.

Option 1, involving an at-grade level crossing, introduces the fewest engineering challenges and is likely to involve the least disruption during construction. This option formed part of the design for the railway that received planning permission in March 2017. Construction costs for this option are the lowest.

Option 2 looks at the feasibility of taking the rail beneath the existing road. Principal engineering and approval challenges are around the railway being placed below the level of the adjacent River Rother. Mitigation of this is likely to require a long length of waterproof trough structure, with significant engineering challenges, including maintenance of water flow paths during flood events and long-term pumping requirements. Disruption to local residents and road users is likely to be most significant with this option and it would require significant additional land from third party landowners.

Option 3 considers the potential to take the rail over the existing road. This scheme introduces a sizeable length of elevated viaduct structure which will have significant impact on cost and visual intrusion. Construction duration for this option is also likely to enhance the difficulties around gaining acceptance for this option from the relevant authorities. Again, this option would require significant additional land take from third party landowners.

Option 4, involving vertical realignment of the existing highway will result in a series of engineering works for both the road and rail. Extension of existing 40mph speed restrictions close to the roundabout are likely to be required for this option with long temporary highway diversions and prolonged construction durations relevant to this option.

RVR have stated that they have already undertaken significant work on the project in the anticipation of Option One. As referred to above, following detailed studies and designs, extensive discussion and liaison with all the key authorities, RVR has full Planning Approval for this Option. Paragraph 6.7.1 of the report to the Rother District Council planning committee in March 2017 recorded that "*Bridges and/or tunnels are not a feasible option in this case and in the circumstances, the installation of a barrier-operated rail crossing over each of the roads is proposed in the application*." RVR has the engineering expertise to construct the level crossing option and has a detailed cost estimate, utilising quotes from existing sub-contractors. It is understood that RVR has already purchased a proportion of the key materials needed, as described in the RVR Cost Estimate at Appendix D.

Table 1 provides a summary of the main features of each option in relation to the key categories considered. Using industry standard allowances, Option 1 is some £4.5M cheaper than the least expensive alternative option (Option 4), rendering those other options very significantly more expensive in the context of the overall £5.3 million costs of building this single track railway (as set out in RVR's Estimate of Costs submitted with its application for TWAO). If one compares Option 4 with the actual costs of the level crossing, then the difference is £9.8M (a ratio of 7.5:1).

Table 1 – Referenced Documents

Option	Structures	Highway/Traffic	Flooding	Environment	Maintenance	Cost
1 At grade level crossing	Rail embankment Level Crossing Flood relief bridges and culverts	Most impact on permanent traffic flows H&S concerns associated with level crossings to be mitigated Least impact on traffic during construction	Modelling and FRA completed showing minimal effect to the wider area	Low land take Neutral impact on visual Best recreates the historic route Minor footpath diversions Low embodied CO2	Maintenance requirements for level crossing Maintenance and inspection of flood relief bridges and culverts	£6.8M
2 Rail under existing highway	U-Shaped RC trough A21 road bridge Inverted siphons for watercourses and flood relief	Temporary diversion required during construction No impact on permanent traffic flows as highway remains unchanged during construction phase	Modelling and FRA would have to be redone EA likely to have significant concerns regarding the use of inverted siphons making approval of the scheme unlikely	Low land take but large volume of cut Lower visual impact Inverted siphons, pumps etc detrimental to the stream environment Footpath diversion Moderate embodied CO2	Expensive and difficult for inverted siphons Maintenance and inspections required to make railway operational after flood Maintenance and inspection of road over rail bridge	£11.8M
3 Rail over existing highway	Embankments	No impact on permanent traffic flows as highway remains unchanged Restricts future highway improvements	Modelling would have to be checked. Likely to have minimal impact on flooding in the wider area so FRA would probably not need updating	Significant construction period High embodied CO2	maintenance requirements due to height and length of viaduct structure.	£20.2M
4 Highway raised by 2m with rail under	Rail embankment A21 road bridge A21 embankment Flood relief bridges and culverts	Temporary diversion required during construction Slight impact on permanent traffic due to reduced speed limit	Modelling would have to be checked. Likely to have similar results to Option 1 so FRA would probably not need updating	Low land take Moderate impact on visual Minor footpath diversions Low embodied CO2	Maintenance and inspection of road over rail bridge Maintenance and inspection of flood relief bridges and culverts	£11.3M
RVR fully costed option 1 – at grade level crossing designed and constructed by RVR	Rail embankment Level Crossing Flood relief bridges and culverts	Most impact on permanent traffic flows H&S concerns associated with level crossings to be mitigated Least impact on traffic during construction	Modelling and FRA completed to satisfaction of EA showing minimal effect to the wider area	Low land take Slight impact on visual Best recreates the historic route Minor footpath diversions Low embodied CO^2	Maintenance requirements for level crossing Maintenance and inspection of flood relief bridges and culverts	£1.5M

1 Background

The Rother Valley Railway is located between the mainline station at Robertsbridge (on the London and Hastings Line) and the existing Kent and East Sussex Railway, which runs between Tenterden and Bodiam.

When completed, the Rother Valley Railway will restore railway transport links between the main line railway system from Robertsbridge Junction to Bodiam and the Kent & East Sussex Railway and the attractions it serves. RVR has invested a significant sum of money to deliver a main line connection to the railway and a section of running line between Robertsbridge station and Northbridge Street. The proposals outlined in this report directly connect to this section of the line.

In addition to the construction of bridges and embankments to cross the flood plain of the River Rother, the railway must incorporate appropriate arrangements for crossing a number of roads. These are Northbridge Street (The Clappers), A21(T) Robertsbridge bypass and B2244 Junction Road. The railway must also cross a bridleway. Key to the scheme is the selection of a solution for crossing the A21 Robertsbridge Bypass.

Over a number of years significant work has been completed by Rother Valley Railway (RVR) and its partners to explore the feasibility of reinstating the missing railway link between Bodiam and Robertsbridge. This includes exploration into the impact of the scheme on issues such as flooding, road safety and ecology.

In addition to the previous work, Arup has modelled potential highway and rail alignments within a 3d drafting package. Further checks including highway junction sighting, confirmation of structural spans/extents and a series of bulk earthwork estimates were completed. This work was then used by Arup to inform an order of magnitude costing exercise for each option to provide a representative comparison between options, as a further mechanism to inform feasibility, rather than to provide any form of construction stage budget.

This report describes the scheme in general, discussing the various constraints and solutions and then discusses the four main options for the A21 crossing in more detail.

2 Summary of Available Information

The following reports, studies and drawings are relevant to the submission. If required they can be obtained by contacting RVR.

No.	Reference	Title	Author	Date
[1]	313090-ITD-ITQ-006-A	Highway Assessment Report	Mott MacDonald	Nov 12
[2]	A21 tech note_ 20110515	Level crossing technical note	John C. Sreeves	May 11
[3]	RotherValley Railway_FRA_June 2016	RVR Flood Risk Assessment	Capita	Jun 16
[4]	Rother Valley Railway_FRA_Modelling Report_2016	RVR Flood Risk Assessment Modelling report 2016	Capita	Jun 16
[5]	REP/239025/R001	RVR – A21 (T) Alignment review	Arup	Dec 14
[6]	Railway Safety Publication 7	Level Crossings: A guide for managers, designers and operators	ORR	Dec 11
[7]	DMRB TD19/06	Requirement for Road Restraint Systems	DoT	Aug 06
[8]	TIS_Addendum	Addendum to Traffic Impact Study	Mott MacDonald	Dec 06
[9]	Statement of Case	TWAO 1992 RVR Statement of Case of the Applicant	RVR	2018
[10]	RVR 24 ES non tech Vol 1	Environmental Statement, Volume 1 Non technical summary	Temple Group Ltd	Jun 14
[11]	RVR-QS-001	GRIP 2 Cost Estimate	Arup	Feb 19
[12]	RIG-2014-06	New level crossings – How ORR applies its policy of no new level crossings unless there are exceptional circumstances	ORR	Aug 2018

Table 2 - Referenced Documents

	Drawings			
No.	**Reference**	**Title**	**Author**	**Date**
[D1]	RVR-S-001	Sections CH 0-2100	RVR	Feb 18
[D2]	RVR-EW-005	A21 Crossing Options	RVR	Jul 18
[D3]	239025-A21-G-001	Option 1 GA	Arup	Feb 19
[D4]	239025-A21-G-002	Option 2 GA	Arup	Feb 19
[D5]	239025-A21-G-003	Option 3 GA	Arup	Feb 19
[D6]	239025-A21-G-004	Option 4 GA	Arup	Feb 19
[D7]	C.950.G.102	A21(T) Robertsbridge Bypass General Arrangement	Arup	Feb 15

Table 3 – Referenced Documents

3 Location and Scheme Description

3.1 Location

The proposed rail line extension is in East Sussex, located between Robertsbridge Junction and Bodiam, around 20 miles north of Hastings in East Sussex.

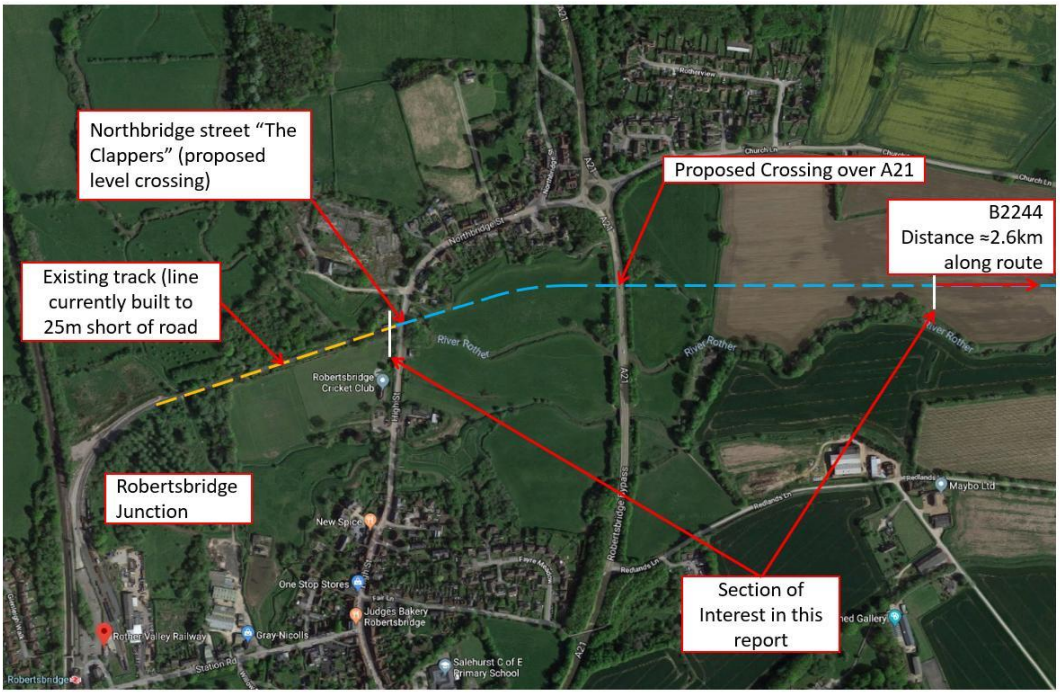


Figure 1 - Proposed location of RVR A21 crossing

This report will mainly focus on the first 1km of proposed route, heading east from the end of the existing track before the Clappers Crossing to just beyond the A21 as shown in Figure 1.

Chainage markers based on work previously undertaken by RVR will be used to describe key locations. They are based on locations by chainage and are tabulated below:

Approx. Chainage	Description
814	Northbridge street "The Clappers" crossing
1122	A21(T) Robertsbridge bypass crossing
1450	Point at which line returns to desired levels

Table 4 – Key features with chainage

3.2 Scheme Description

Rother Valley Railway plans to reopen the historic route, linking with an existing section of heritage railway at Bodiam. The section of railway which RVR is seeking to complete is termed "the missing link" which is the section of former railway corridor, approximately 3.42km long, running from Junction Road (the B2244) in Udiam to the Clappers crossing in Robertsbridge. The intention is that the proposed route crosses the floodplain, following the alignment of the historic route. At isolated locations minor deviations may be required.

3.2.1 Horizontal alignment

As noted the aim is to rebuild the railway as close as possible to the historic alignment. RVR has achieved this by overlaying the 1972 1:2,500 Ordnance Survey mapping onto the current mapping. The only minor deviation to the original alignment is around the A21 crossing where a new flood relief culvert has been built on the line of the original railway. To minimise disruption and to maintain sufficient separation between the two structures the proposed rail alignment has been relocated around 5m to the north.

From Robertsbridge station the proposed line heads eastwards, crossing the Northbridge Street/Clappers Road at coordinates 573819, 124014. Following this, the line continues to head eastward approximately 300m before meeting the main A21 Robertsbridge bypass at coordinates 574118, 124080. The line then runs roughly parallel to the river on the northern bank until it ties into the existing Kent and East Sussex Railway immediately after crossing the B2244 at coordinates 577100, 124268.

Drawing RVR-S-001 [D1] in Appendix A gives further detail on the proposed horizontal alignment.

3.2.2 Vertical alignment

In addition to a number of river crossings the proposed route involves the crossing of three existing highway routes;

1) The Clappers (Northbridge Street, Robertsbridge);

2) A21(T) Robertsbridge Junction bypass; and
3) B2244 Junction Road.

From a vertical alignment perspective, an at grade level crossing at existing road levels would be the most practicable solution.

For the purpose of this report, the Clappers and the B2244 (Junction Road) crossings will be assumed to be at grade level crossings. No further commentary on the suitability of these junctions for at grade level crossings will be given in this report. It is however noted that similar considerations apply to these crossings as to the A21 in terms of the potential crossing options (i.e. bridges and/or tunnels). As with the A21 level crossing, each of the other crossings has extent planning consent and forms part of the scheme for which RVR is seeking a TWAO.

The introduction of level crossings to the proposed scheme requires a number of important steps to be taken, including adherence to relevant guidance and policy advice. Central to this is the Office of Rail and Road's(ORR) internal guidance relating to new levels crossings [12]. In simple terms the ORR policy is that new levels crossings should only be considered appropriate in exceptional circumstances.

Due to its status as a trunk road, under the remit of Highways England, any consideration of introducing a level crossing to the A21 Robertsbridge bypass is likely to attract increased scrutiny. The purpose of this report is to summarise the various engineering options or alternative methods of crossing the A21, reviewing and, where necessary, extending on the feasibility work undertaken to date.

Outline costing has been undertaken for the options considered. The purpose of this is not to determine an actual construction cost but more to give a representative figure to allow comparison of the relative costs between the options and to understand the order of magnitude.

3.2.3 Fixed points

Northbridge Street/Clappers Junction

A number of challenges exist in altering road levels at Northbridge street.

Clappers Junction

These include:

Proximity to flood gate still crossing the road (~33m to sill);

Proximity to residential properties;

Based on the above and a desire to minimise wider disruption to adjacent properties and road users, alteration from the current road levels is not considered feasible. Therefore, for the purpose of this report the levels at the Clappers junction will be assumed to be fixed. The current elevation is 11.54mOD.

A21 Crossing

The existing road levels at the location where the proposed rail crosses the existing A21 is between 11.10m and 11.49m. More details will be given on anticipated rail levels in subsequent sections of this report. Some of the options alter levels at this point.

300m East of A21

The B2244 crossing is around 2.9km east of the A21 crossing, hence the vertical alignment around the area of the A21 crossing is not sensitive to the levels at the B2244. For the purposes of this options report any work involving the vertical alignment will target a level matching that of the Northbridge street road crossing, i.e. 11.54m at a roughly equivalent distance to the east of the A21. As noted a chainage of 1450 will be assumed.

Based on this, two fixed levels are introduced into the scheme roughly equidistant from the A21, the level for both will be taken as 11.54m.

3.3 Structures

3.3.1 Consideration of Design Presented by RVR

Drawings RVR-S-001[D1] and RVR-EW-005[D2] provide information on the number and extent of the various structures required along the length of the route considered. These drawings only consider the at grade option but are suitable for the purpose of identifying the location of key features to be crossed in all options. These are indicated as generic structural types at this stage. Broadly these comprise: level crossings over highways; rail over larger culverts (typically box culverts); smaller diameter pipe culverts; steel girder bridges taking rail over river/road; and a reinforced concrete integral box structure supporting the road with the rail placed underneath.

Individual structures are listed out below for more information.

Approx. chainage	structure type	obstacle crossed	RVR Identifier	approx. span
839	rail bridge	River Rother	bridge no. 6	12.0
855	culvert	Flood Relief	bridge no. 7	0.75
920	culvert	Flood Relief	culvert no. 8	0.75
943	rail bridge	Flood Relief & Drainage ditch/river	bridge no. 8	6
1070	culvert	Flood Relief & Drainage ditch/river	culvert no. 9	0.75
1085	rail bridge	Flood Relief & Drainage ditch/river	culvert no. 10	0.75
1120	varies	A21 crossing	varies	Varies

1150	culvert	Flood Relief & Drainage	culvert no. 11	0.75
		ditch		
1205	rail bridge	Mill stream & Flood Relief	bridge no. 12	10.2
1245	rail bridge	Flood Relief viaduct	bridge no. 13	30
1280	culvert	Flood Relief & drainage ditch	culvert no. 14	0.75
1360	rail bridge	Flood Relief	bridge no. 15	60

Table 5 – List of Structures

The potential variation of the above structures between the various options will be discussed in more detail in later sections.

3.4 Highways

For Options 1 to 3, variations in existing road levels are not generally being proposed. This includes both horizontal and vertical alignments. Whilst no changes are being made to the alignments, both rail over road and rail under road options introduce additional risks to the highway, through the form of new hazards in the verge. Mitigation of these risks e.g. via relevant set-backs and verge widths has been considered as part of the engineering proposals described.

Option 4 describes the potential to raise the vertical alignment of the A21, allowing the rail to pass beneath the road but at a higher level than Option 2. This option does not propose to alter the horizontal alignment of the road.

Consideration of increased street lighting provisions and review of existing speed restrictions are both potential risk reduction strategies relevant to all options. Alongside this a Road Restraints Risk Assessment Process (RRRAP) would be required to determine how to best avoid, reduce or control any residual risks. At this stage it is expected that a Vehicle Restraint System would be recommended for a distance in advance of the over/under bridges for options 2-4.

3.5 Flooding

Capita were commissioned to do a flood risk assessment [3] for the 3.4km length of proposed reinstated railway. Work undertake by Capita assumes the railway is reinstated to (approximately) historic levels; i.e. Option 1 as described in this report hence includes relatively low embankments and at grade level crossings over all three highways. The Purpose of the FRA was to determine the flood risk to the development and whether that risk is acceptable and to determine whether the development has an impact on flood risk to other properties.

Arup understands (from the Statement of Case) that the Environment Agency worked closely with Capita throughout the flood modelling and provided input into a number of flood mitigation measures, particularly the introduction of additional culverts beneath the rail line, which have since been incorporated into

designs and documents developed by RVR. All options described in this report continue to include the additional structures agreed with the Environment Agency.

3.5.1 Flood risk to the Proposed Railway

In regards to fluvial flooding it is proposed to build most of the railway within flood zone 3a (annual probability >1% or 1:100yrs) but partially within the functional floodplain (annual probability of flooding >5% or 1:20yrs). Railways are usually classified as “less vulnerable”. A “less vulnerable” development would be accepted in flood zone 3a but not within the functional floodplain (according to the Planning Practice Guidance). However, the Capita report notes that there is a case forgrading this railway as “water compatible” because it is a recreational railway line not vital infrastructure, It is therefore possible to close the line if flooding is predicted. Where a railway is accepted as a “water compatible” development, then that would be acceptable for construction within the functional floodplain.

The danger would be if passengers were to get stranded on a flooded train. The operator would have procedures in place to manage and mitigate this risk. Such measureswould be likely to include signing up to the flood warnings and having procedures in place to shut down and evacuate the line should a flood warning be issued.

According to the Capita report, fluvial flood risk is the biggest issue and the other flood mechanisms are less important. Surface water flooding is categorised as low to medium risk along the route.This will require that the culverts operate properly to prevent water ponding more than currently. Sea, reservoir and ground water are all low or non-existent.

Following review, Arup consider this approach to be logical. It also notes that the railway has planning consent under the Town and Country Planning Act 1990 and that the Environment Agency has withdrawn its objection to the proposed TWAO.

It is logical to assume that the Environment Agency has already accepted the above classification of the scheme as "water compatible".

The Capita FRA also applied the sequential and exception tests which aim to try and steer developments away from high risk areas. However Capita states that as the purpose of the proposed development is to connect two existing lines along a historic route within the floodplain there is little other option. Looking at the maps it does not look like they can move the route outside flood zone 3 and still connect the two existing lines, hence on this basis Arup agree with the interpretation.

3.5.2 Impacts on Flood Risk

As part of the above review Capita also explored the impact the proposed railway would have on flooding to other properties. To do this it undertook flood modelling of the area in a number of different return periods with and without the railway in place. An existing model provided by the Environment Agency was used with updates appropriate to the proposed works. Modelling was done using

Flood Modeller (ISIS) and TUFLOW. The updates to the model are detailed in the modelling report [4] and were done to fix errors and anomalous results found.

It is noted that verifying these minor modifications is not possible within the scope of Arup's work, although we note that on the face of it they seem to be sensible. The purpose of the modelling was to get comparative results therefore any modelling errors will be in both the 'with' and 'without railway' model runs and therefore the comparison should be valid. Capita detailed the various assumptions it made in the modelling. Again, it is beyond Arup's scope to verify them all but, in general, they all seem to be reasonable. The assumption that all the proposed culverts will be built is a particularly important one as this will allow the flood water to cross the embankment and reach the entire floodplain.

Results from the model comparison show no increase in flood risk to residential properties with the proposed rail line in place. It shows very minor increase in flood depth to fields in certain places and minor reductions in others. A lot of these differences are within the tolerance of the model and can therefore be discounted as negligible. The overall conclusion in the Capita report is that the track will not have a detrimental impact on flooding in the area. Again, it is noted that the Environment Agency and local planning authority have already approved the proposals and that the modelling was done in collaboration with the Environment Agency.

As noted, the work by Capita explores the impacts of an at grade solution, i.e. Option 1. No flood modelling has been undertaken on the other options covered within this report. Where Arup comments on the flood risk potential of these other options, we have based them on a review of the work undertaken by others to date. These comments are based upon considered application of engineering judgement with a view to providing further awareness on the likely impacts.

3.6 Environmental Effects

An Environmental Impact Assessment (EIA) has been carried out by Temple Group Ltd on behalf of RVR which outlines the likely impact of the proposed at grade scheme (Option 1) in relation to a range of key areas. Reference has been made to the non-technical summary for the purposes of this report.

This report provides summary on the likely impact of the proposals to the following key environmental areas:

- Noise and vibration;
- Air quality;
- Landscape and visual;
- Ecology;
- Pollution of waterways (accidental)
- Embodied CO_2based on extent of construction activities only
- Archaeology and cultural heritage

- Socio economic
- Traffic, transportation and access;
- Land use and agricultural.

The EIA report notes that mitigation measures have been proposed and committed to by RVR which if implemented would be expected to reduce the effects (of Option 1) to acceptable levels.

Arup is not aware of any work in relation to the alternative options described within this report. Detailed commentary on environmental issues will not be given, however where individual options are discussed in more detail consideration of any relative differences between options or significant changes from the existing will be highlighted. These observations on alternative options are based upon considered application of engineering judgement with a view to providing further awareness on the likely impacts. Refer to Sections 5 - 8 for more details.

3.7 Site Management

For all options, the management of access to the site for construction traffic will be critical to the impact on the community, in particular construction activities which impact upon the A21 trunk road. Clearly the potential impact on the community will vary depending on the option considered, with the level crossing (Option 1) expected to have fewer construction impacts due to the relatively limited scope of works. The following mitigation measures and control procedures have been proposed by RVR. Whilst Arup understand that these were developed on the basis ofa level crossing over the A21, they are be considered applicable to all options. These are outlined in the planning application by RVR and include:

- No direct construction access to be provided from or to the A21,
- Number of lorry movements to be minimised,
- Signage provided to control construction traffic,
- Dust suppression measures to be employed for site haul roads all construction traffic.

3.7.1 Utilities

In accordance with ‘Groundwise’ Services search dated 28/01/15, the following summarises the utilities present at the A21 crossing:

- BT – 2No. lines of underground plant either side of the A21. Another line and pole are present 20m east of the existing A21 in line with the intended path of the railway.
- Southern Gas Networks – LP mains either side of the A21
- Southern Water (sewers) – No indication of services by the A21

- South East Water – 200mm diameter water main
- UK Power Networks – No services by the A21

Any solution involving taking the railway across the A21 will therefore need to consider in detail the existing services.

Based on typical depth to buried services, any road crossing options at grade will require protection or diversion of the BT, LP Gas and water.

Depending on depth and location, options taking rail over existing road may allow services to remain in place. However, liaison with providers will have to take place to agree any necessary protection or access requirements. Options taking rail under existing road will require diversions for the existing services to allow works to proceed. Provision for diverted services may be required in structures crossing the A21.

Due to the low number and relatively small scale of these services, it is considered likely that in all cases diversion of the services may be the most economic approach and should be considered in advance of detailed design. It is noted that the TWAO includes the usual protective provisions for statutory undertakers and that there are no objections to the application (i.e. including level crossing) by utilities.

4 Review of Proposed Options

Four key options for the crossing of the A21 have been explored. In summary these include:

Option 1 – At grade level crossing

Option 2 – Rail under existing highway

Option 3 – Rail over existing highway

Option 4 – Highway raised by 2m with rail under

This report will examine each option in more detail and provide a summary of available information on each.

4.1 Costings

A costing exercise has been undertaken to provide comparison between the four options for an extension of the Rother Valley Railway.

This cost estimate is for the purpose of providing a high-level comparison and is not intended to provide a budget estimate for construction. The estimate offers an indicative forecast of the likely costs of construction of civil engineering elements of the project only. See costing report in Appendix C.

Costs are provided to a level roughly equivalent with Network Rail GRIP 2 stage.

They include reasonable (industry standard) assumptions for civil engineering design, delivery and construction costs for provision of the main elements of the scheme between chainages 800 and 1350. A full list of costing assumptions is provided within the costings report (Appendix C). However, it is worth noting that the cost of the individual structures – as standalone elements – has not been calculated. It stands to reason that, if one excludes the common works between those chainages and simply looks at the elements required to get across the A21, the comparative costs between the laying of a level crossing and construction of complex alternative structures are even more different.

They do not include for costs associated with licensing, permissions or land acquisition.

In addition to these costings, we have included in this report the worked up costings for implementing Option 1 prepared by RVR for the purposes of its TWAO application. These costings are on the basis that (in common with other heritage railways) the design work and much of the construction is carried out by suitably qualified, but unpaid, volunteers with recent experience of carrying out similar work on the neighbouring Kent & East Sussex Railway and that materials are sourced from known suppliers etc. (See Appendix D.) It is understood, from RVR, that it would not be capable of delivering any of the other options on a similar basis and therefore it is not unreasonable to also allow the RVR costing for Option 1 to be compared with the ARUP costing for Options 2,3 and 4 albeit that this would not be a “like for like” comparison. The Estimate of Costs submitted

with the application for TWAO contains a worked up figure of £5.3 for the entirety of the railway, of which RVR have noted that £1.5m correlates to the ch 800-1350 section as costed by Arup.

5 Option 1 – At grade level crossing

This option has been explored in some detail by RVR and is described further within reference [2]. In order to ensure the validity of this data Arup has performed a review of the work undertaken, the results of which are described below.

Generally, this option includes a relatively low volume embankment across the flood plain with an at-grade level crossing over the A21 bypass close to the Northbridge street roundabout. Planning permission has already been obtained, subject to conditions directed by the (then) Highways Agency to protect the safety and efficiency of the A21, but further statutory power is required for the crossing. The need for further statutory authority is the key approval challenge for this option.

Guidance from the ORR Railway Safety Publication 7 [reference 6] provides that "Risk control should, where practicable, be achieved through the elimination of level crossings in favour of bridges, underpasses or diversions. Where elimination is not possible, risks should be reduced so far as reasonably practicable and in accordance with the principles of protection."

More recent guidance for the ORR [12] states that "other than in exceptional circumstances [there should be] no new level crossings on any railway therefore creating no new risks". The ORR guidance explains that there would be exceptional circumstances where there is no reasonably practicable alternative to a crossing on the level at the location in question. The ORR would consider an alternative to be reasonably practicable unless it can be demonstrated that the cost is grossly disproportionate when weighed against the safety benefits.

5.1 Vertical Alignment

The rail level is fixed at Clappers road crossing with an average level of 11.54m. Similarly, the road level at the A21 averages 11.31m with maximum values of 11.49 and minimum values of 11.10m.

This results in a fall in rail levels of 230mm over a distance of approximately 300m, corresponding to a gradient of approximately 1 in 1300.

Along this stretch the proposed route crosses fields and farmland, levels vary but existing ground is generally below the proposed levels at between 9.0m and 10.0m.

5.2 Structures

An at grade level crossing creates the least challenges from a structural perspective. Culverts, bridges and underpasses for this option are generally simpler and at a smaller scale than for the other options considered.

The level crossing itself is assumed to be a prefabricated precast concrete level crossing unit placed on well compacted sub-base.

There is no change to the road alignment so no significant variations to layout or loading of existing highway structures are anticipated. No special requirements are likely for any of the river/culverted crossings within the length under consideration.

Approaches to the level crossing for this option are likely to be on relatively low embankments of around 1.0m-2.0m height. It is understood that this represents roughly equivalent levels to the historic route. As such, issues such as settlement are less likely to be a concern for this option.

Using levels taken from both road topographical surveys and lidar surveys for the wider route Arup has estimated the likely volume of embankment required for this option. Calculations are based on a simple embankment with a width of 4.5m at the base of the track bed and formed with slopes set at 1:3. The length considered is that between the proposed Clappers crossing and the point at which rail levels can generally return to optimal (i.e. chainage 1450), a distance of 640m. This modelling exercise results in an embankment volume of around 10,400 cubic metres.

A schematic for the A21 crossing (239025-A21-G-001 [D3]) is included within Appendix B which gives outline information on the general arrangement of the proposed level crossing. Document C.950.G.102 [D7] provides further detail on the level crossing and associated signage. This drawing is included within Appendix A.

5.3 Highway

5.3.1 Impact to Existing Highway (A21)

Road alignment, horizontal or vertical would not be affected. A full barriered approach, signage and signals would be introduced into the highway boundary as part of the scheme.

This level crossing is likely to have lower risks than would be associated with a typical level crossing on the national network. This is due to the following factors:

- Fewer days of operation
- Fewer trains in winter when poor weather and visibility occurs
- Slow speed of trains
- Few trains operate at night/during the hours of darkness
- Few trains operating during weekday rush hours when road traffic is heaviest and motorists are impatient
- Monitored via CCTV with an attendant crossing keeper

However, residual safety concerns associated with a level crossing will need to be addressed, and would be subject to the oversight of the ORR. The following factors are likely to have a negative safety impact:

- Infrequent operation of the crossing might cause regular motorists to not expect to find it working
- Southbound traffic backing up and blocking Northbridge Street roundabout Northbound traffic queuing back from Northbridge Street roundabout blocking the crossing

Mott Macdonald undertook a series of traffic monitoring exercises to provide a traffic impact study to explore the effect of introducing level crossings. This work was undertaken in 2011 with further monitoring work undertaken in 2018 to inform an addendum to the TIA. See Section 5.4.2 for a summary of the findings of this work.

Further mitigation measures to improve the safety of the crossing could include extending the 40mph speed limit to include the approach to the crossing; improving visibility by extending the street lighting to include the crossing and clearing vegetation on the highway embankments to allow better views of both the rail and the road. Arup has been advised that RVR is aware of these potential opportunities and has been in discussions with the relevant authorities to engage on the issues.

5.3.1.1 Stopping Sight Distance

Stopping sight distance (SSD) has been assessed in accordance with TD 9/93 Highway Link Design, Table 3 and Section 2. SSD has been assessed Northbound from a distance 1.5 x SSD from the crossing location. Southbound has been assessed from the roundabout inscribed circle diameter (ICD). The analysis has been carried out using an eye height of 1.05m, with an object height of 0.26m. SSD of 215m has been assumed, based on 100kph.

Full SSD is achieved throughout the area of the proposed crossing. Results are shown in the A21(T) Alignment Review report [5].

The Office of Rail Regulation document “Level Crossings: A Guide for Managers, Designers and Operators” [6] Table 6 outlines recommended visibility requirements to the level crossing signals based on design speed. The requirements are 200m and 90m for 100kph and 70kph respectively. As full SSD of 215m is achieved in both directions, the requirements in this document have been met.

5.4 Traffic Impact

5.4.1 Construction Phase

As noted previously, construction works for the permanent way will be accessed via alternative site access locations not on the A21. Therefore, the elements of the construction works impacting on the A21 would be, the final approaches of the trackway, the barriers, the level crossing unit itself and any highway works necessary for signs lighting, signals and barriers.

Narrow lane running with potentially night-time lane closures, and/or temporary speed restrictions, may be required on the A21 for the preparatory barrier and

signal works. Minor delays may be caused as a function of these works, although mitigation measures such as working within holiday periods or working outside of commuter hours could be considered to mitigate any effects.

Installation of the track bed crossing is expected to be achieved via either single lane running over a short period or more likely a single night time road closure, allowing installation to both traffic lanes. As there are no proposals to alter highway levels the length of highway affected either side of the crossing is limited.

Clearly due to the nature of the road to be crossed, consultation with the HE would be required. This will need to include detailed proposals for the works, including construction phase programme and itemised works activity lists.

5.4.2 Operational Phase

It is suggested by RVR that there will be on average around 10 train movements per day on days when the railway is operational The delay to road traffic will be the time it takes for operation of lights, barriers, proving sequence and for a train to pass.

According to work undertaken by others, the sequence will start 27 seconds before the train arrives, it will take roughly 14 seconds for the train to pass and a further 10 seconds for the barriers to raise. Therefore, road closure will be limited to less than a minute for each train movement.

Based on this, the likelihood for queuing on the A21 has been investigated, with particular reference to the potential for negative safety impacts associated with this. A traffic impact study was undertaken by Mott MacDonald in 2011 and updated in 2018. They drew the following conclusions:

- *At the level crossing locations, predicted maximum queue lengths on the A21 are 60m-70m on weekdays, Saturdays and Sundays, increasing to 100m-120m on the Bank Holidays, using 2017 traffic demand.*
- *With traffic growth, these queue lengths increase to [the year] 2027 although the southbound queue length is only predicted to exceed 140m (the length from the level crossing back to the roundabout) on the May Bank Holiday in 2027 and even then it is only just exceeded at 143m.*

In order to limit the delays to road users, the timetable could be set up to ensure the crossing remains open during peak times. It is noted that the planning consent for the scheme includes a condition restricting the time periods within which the level crossing may be operated to avoid peak travel periods, including bank holidays.

Furthermore the rail crossing at the A21 is to include an attendant crossing keeper (refer to reference [9]) who will, where necessary, be able to control the movement of trains to mitigate against any unusual events (e.g. breakdowns or exceptional vehicles).

5.5 Flooding

The modelling work done by Capita used the at-grade level crossing option for the "with railway" scenario. Therefore, provided all relevant culverts and bridges are installed in accordance with the assumptions in that document then the conclusions drawn in section 3.5 of this report remain unchanged.

We have been advised that the FRA has been discussed in detail with the EA and has their full approval. Therefore, no further modelling/FRA work would be required for this option.

5.6 Environmental

As noted in section 3.6, environmental effects have not been considered in detail as part of this report. Through consideration of the significant differences between the four options, the standout features of this option would be:

- low level of land take and the lowest cut/fill volumes,
- slight impact from a visual perspective, and
- from a heritage perspective it is felt that this option best mirrors the levels and aesthetic of the historic route.
- there will be a minor footpath diversion to allow the path to use the same bridge as the Mill Stream.
- embodied CO_2 (due to construction and maintenance operations) for this option is low when compared to the alternative options presented within this report.

5.7 Maintenance

Level crossing infrastructure; lights barriers etc. would have to be regularly maintained to ensure they are in working order. It is assumed that maintenance of infrastructure introduced to support the introduction of a level crossing would be the responsibility of RVR, with regular reporting back to the ORR and HE as required.

To improve visibility vegetation along the road around the level crossing would have to be cut regularly.

Structures and embankments along the route would also require regular inspection and maintenance. As noted, the requirements for structures as part of this option are the least onerous; this would also translate to the requirements for inspection and maintenance.

5.8 Cost

The costs for this option include the railway embankment, bridges and culverts and the level crossing. Level crossing capital costs have been provided directly by RVR and are expected to be around £300k. The budget estimate for this option is in the region of £6.8million.

For further details refer to the costing report contained in Appendix C. There will be additional costs associated with temporary closure of a single lane and overnight road closures.

As explained elsewhere, outwith the Arup budget estimate costings provided in this report, RVR has provided specific costing information based on previous projects procured and managed by RVR. Costs utilising the 'RVR' construction model demonstrate significant savings over the industry standard allowances given in the Arup costs review exercise. RVR has provided estimated costs of £1.5million based on this model. Further discussion is provided in section 9.2 with full breakdown of the costing information supplied by RVR contained in Appendix D. In our professional judgment is not unreasonable to assume that these, much lower costs are achievable given that they are specific to this single track heritage railway line, relate to the actual costs incurred elsewhere on the Kent & East Sussex line, that the design work and much of the construction would be carried out by volunteers or local contractors and that materials would be sourced from known suppliers. Due to this delivery mechanism, the RVR experience of delivering projects this way and given the efficiencies noted by RVR, Arup consider the cost build-up provided to be credible

6 Option 2 – Rail Under Existing Road

In order to explore the feasibility of removing the level crossing over the A21, this option involves the railway being dug into a cutting that passes under the existing A21 road. The level of the A21 would remain unchanged.

6.1 Vertical Alignment

The ORR Guidance on Minor Railways defines the headroom and lateral clearance requirements for new bridges over railways. They set the minimum headroom at 4.572m or 15'. As it is not a modern railway and it is unlikely the route will be electrified in the future then it is likely that a reduced headroom would be allowable.

Prior to 1977 the guidance was given in the "Blue Book" (Requirements for Passenger Lines and Recommendations for Goods Lines, 1950) and provided that the absolute minimum headroom value should be the load gauge plus 6'. By limiting the height of permanent and visiting rolling stock this value could potentially be reduced to 4.115m (13'6") which would be sufficient for W6a rolling stock (including the Flying Scotsman). However, this would require authorisation from the ORR. The minimum lateral distance between the abutments would be 4.673m (15'4").

For this option the highway level remains the same due to the complications involved with raising it. The two main issues being the vertical alignment on the approaches to the crossing and roundabout and the potential to reduce visibility to queueing cars. Also altering the road level could mean having to make modifications to the two culverts nearby as the loadings will change.

Based on the span, of less than 5m, a reinforced concrete structure is likely to represent the most appropriate structural form. In terms of structural depth, the minimum likely to achieve sufficient capacity would be a slab, around 400mm thick, with 120mm non-structural depth above for road surfacing and any waterproofing requirements.

Based on the above and an existing road level of 11.10m and the minimum vertical clearance noted above, it is possible to determine the minimum suitable rail running level beneath the A21.

⇨ 11.10 – 4.115 - 0.4 – 0.12 = 6.46mOD. = rail level

Further allowing 370mm for rail head and sleepers plus a minimum of 200mm ballast below with a nominal allowance for construction tolerance and vertical curves (~40mm) then an approximate formation level can be calculated.

- 6.46 – 0.37 – 0.2 -0.04 = 5.85mOD = track formation level

Based on the above and the level at the Clappers junction, an approximate gradient can be calculated, noting that the two crossings are separated by 306m.

Work undertaken by others notes that vertical curves of 900m and 600m are required at the west and east ends respectively. Account for this results in a peak gradient of around 1 in 57 over a length of around 280m.

Work within this report includes for a similar gradient to the east of the A21, although space exists for a more relaxed gradient should this be preferred. This gradient, whilst possible, is considered to be extremely steep in Permanent Way terms.

It should be noted that the rail vertical alignment described above is outside the best practice guidance and may result in unforeseen design challenges. Therefore, any further, more detailed, design work may identify areas where alterations to the alignment are required. As alignments are already at extreme values there is little scope for amendment within allowable gradients. As such any changes from the values proposed have a high risk of altering the overall levels achievable, making this option highly sensitive.

Noting that the water levels of the adjacent River Rother are around +7.0mOD, this formation level is below the level of the river. Based on similar gradients in both directions the formation level sits below river level for a distance of at least 75m in each direction. An allowance of double this to account for variation in river levels seems reasonable giving a minimum length of 150m in each direction and increasing the size of the structure considerably.

6.2 Structures

Two main structural challenges arise out of this option. This first being the need for a structural solution to the A21 road over the railway below, and the second being the fact that for a significant length the line is below the level of the adjacent River Rother.

As noted previously a reinforced concrete integral box is likely to represent a suitable structural form. This aligns with previous work undertaken, which noted that this form removes the need for movement joints and bearings, thus reducing maintenance liability. Ground pressures under a box would be reduced significantly over other solutions, which would likely have significant benefit in terms of the foundation solution. Whilst ground investigation (GI) has not been completed it is considered reasonable to assume that this form of solution could be supported on the existing geological formation at this depth.

As the structure, likely a reinforced concrete box structure, sits below ambient water levels then the trough structure will need to prevent ingress of water. As this structure would sit below water levels, buoyancy would need to be prevented. This would necessitate some form of holding down system (e.g. ground anchors or piles) or alternatively a thicker (heavier) cross section to add weight.

Despite attempts to prevent water ingress, pumping of the section of the line would still be required. This would need to be sized to deal with the likely levels of water entering the trough under typical rain events and from leakage ingress. Inundation of the system, such as under a large-scale flood event would require temporary closure of the railway until levels returned to normal and any remedial

works completed to remove all water and any silt. Timescales would depend on the scale of the flood event but would likely be a number of days, if not weeks.

It is expected that the walls of the U-shaped trough would have to extend above ground levels by around 1m to prevent flood water from high frequency events from flooding the track.

As explained in section 5.2, Arup has estimated the likely volume of cut required for this option. Calculations are based on a U-shaped box with a width of 7m at the base of the track bed. Again the length considered in calculations is 640m. This modelling exercise results in a cut volume of around 5000 cubic metres.

There is a box culvert under the A21 located to the south of the proposed crossing. This may be affected by the construction of the railway under the road and therefore may require replacing/strengthening or moving.

A schematic for the A21 crossing is included as 239025-A21-G-002 [D4] within Appendix B.

Other more minor structural works are likely to be required for this option. For example works to divert the footpath adjacent to Mill Stream will need to consider the level changes, without compromising the waterproof nature of the trough.

6.3 Highway

6.3.1 Impact to Existing Highway (A21)

Following completion of the works the vertical alignment would not be affected. Approach to the road bridge would need to be considered as part of a RRRAP process but would likely involve Vehicle Restraint Systems and a full H4a parapet to protect vehicles from impact with the structure at the crossing.

6.4 Traffic Impact

6.4.1 Construction Phase

Significant structural works are required in the vicinity of the A21 for this option. It is therefore reasonable to assume that construction of a temporary diversion would be required in advance of construction for this option. Whilst no detailed assessment work has been carried out, we would anticipate this would need to take the form of a short temporary bypass diversion located on third party land around 50m to the east of the existing road. Due to the level differences from the A21 to adjacent ground levels the temporary works associated with a diversion would be significant. The diversion would likely require a total length in excess of 400m, 2No. small span road bridges and a minimum of 2No. culverts.

We would anticipate that the construction works for this option would take a minimum of 6 months and potentially as long as 12 months to complete.

6.4.2 Operational Phase

Following completion of the construction works the highway would be reinstated back to current levels. Based on this, the effect on traffic flows in the operational phase is expected to remain as currently.

Significant routine maintenance and inspection would be required, but this is not envisaged to have adverse impacts on traffic flows or highway users.

6.5 Flooding

Building a deep cutting in the flood plain would create a number of challenges for the operation of the railway. As noted above, the formation level for the railway would be around 5.85m, excluding the depth of structural concrete required for the u-trough. This is approximately 1m below the average river bed level in the area and therefore will put the railway line below the water-table (how far below will vary throughout the year).

In addition to the issues of constructing a railway below the water table, the proposed line of the route would effectively sever a number of watercourses and surface water flow paths, most notably the Mill Stream, which is an EA designated main river. At this location, ambient levels in the Mill Stream would be at a similar level to that of the rails. Hence, to allow water to cross the proposed tracks it would have to pass beneath the trough structure using an inverted siphon. This would create a pinch-point in the stream that could back up during higher flow events, could also become blocked, and would therefore potentially increase flood risk in the area during higher frequency events.

The proposed Mill Stream bridge, along with a second large viaduct, serve as flood relief culverts in extreme events and they are a requirement in the FRA. Some form of inverted siphon system beneath the structure would be required to replace these proposed structures. In addition to the issues mentioned above, inverted siphons would not function as efficiently as a culvert in flood conditions and therefore would be detrimental to the flood relief requirements.

Given the designation of the Mill Stream as a main river and the sensitivity of the wider floodplain to water flows across the line of the proposed route, we would consider it unlikely that the Environment Agency would approve the introduction of inverted siphons in this area.

As this option puts rail levels below existing ground levels, preventing flood water from flowing into the U-shaped trough would be an engineering challenge. To combat this, we would anticipate that the walls of the trough would need to extend approximately 1m above existing ground level, tying into embankments at either end. However, even this would be unlikely to prevent flooding of the troughs in larger flood events. Higher walls would also increase visual impact and engineering complexity to prevent buoyancy of the trough. Whilst solutions may exist, in general these would act to increase the environmental impact and construction costs of this option.

During low frequency major flood events overtopping of the trough walls is likely. On this basis, the flood plain would be likely to behave in a similar way to the current situation. However, during smaller flood events (higher frequency) the trough would act to sever water flow paths thereby increasing flood risk to surrounding properties.

No flood modelling has been done for this option, so the flood model and FRA would both have to be updated in order to gain approval from the Environment Agency. It is not certain that an affordable, viable solution, where flood risk to the surrounding area remains unchanged, could be found for this option.

6.6 Environmental

Through consideration of the significant differences between the four options, the standout features of this option would be:

- Relatively low level of permanent land take but higher levels of earthworks cut
- Lower visual and noise impact since below existing ground levels
- Railway levels below existing water levels leading to pumping, siphon drain/culvert to east of A21 and potential inundation of the structure under flood events
- Inverted syphons in watercourses are barriers to habitat migration and sediment transport and are therefore very detrimental to the stream environment
- The footpath near the Mill Stream would have to be diverted to cross the rail, either by going alongside the A21 and using the bridge, or by constructing a new footbridge
- Embodied CO_2 for this option is moderate when compared to the alternative options presented within this report.

6.7 Maintenance

As discussed in section 6.5, during a flood event the section of railway within the trough structure (in cutting) would fill with flood water which would then have to be pumped dry. This means that after a flood event there would be significant additional construction cost and maintenance implications; for example, providing suitable electric and signalling equipment which would then have to be dried tested before the railway can be put back into operation. The cutting would also fill with silt and debris, which would have to be cleared. There is a risk that the track bed would eventually become clogged with silt and no longer be free draining, thus requiring replacement.

The pump would have to be tested and maintained regularly as, if it were to fail, the cutting would fill with water during rain events or if the waterproofing failed.

Structures installed specifically as part of this option; road bridge, Mill Stream siphon and around 300m of U-shaped reinforced concrete trough would require regular inspection and periodic maintenance.

Other structures, such as culverts, whilst common to all schemes may be longer or more complex in this scenario, again leading to increased inspection and maintenance challenges. Any inverted siphons would require trash screens that have to be cleared periodically. They are prone to blockages therefore additional capacity may be required to provide redundancy during extreme events, e.g. by providing multiple siphons. There are also health and safety concerns regarding the inspection and maintenance of inverted siphons due to difficulty of access and the potential that they could be filled with stagnant water.

6.8 Cost

The costs for this option include the railway U-shaped trough, bridges and culverts/inverted siphons. The budget estimate for this option is in region of £11.9million.

For further details refer to the costing report contained in Appendix C.

7 Option 3 – Rail over Existing Highway

This solution involves taking the railway above the A21, providing sufficient headroom clearance to the existing levels of the highway. There are two principal options to achieve this, namely running the railway on top of an embankment or supporting it with a viaduct structure over a significant length.

In order to achieve representative comparison between the four main options this report will focus on the viaduct option as the most practicable, although many of the issues discussed are common to both approaches. The principal reasons for taking this option forward, in place of the embankment option, are the following:

- Land: at its maximum height the embankment would be around 8.7m above existing ground levels. Assuming a 6.2m crest and 1:3 slopes, that means it would be 58m wide at ground level. It is unlikely that RVR would be able to acquire the requisite third party land for such a large footprint.

- Flood risk: As stated above the embankment would have a very large footprint in the floodplain, this would reduce the floodplain storage and alter flow paths, which would be likely to increase flood risk in the area. Compensatory flood storage would have to be provided, the flood modelling and FRA would have to be re-done, and it is unlikely that asolution acceptable to the EA could be found to maintain the current levels of flood protection.

- Visual: an 8m high embankment through and Area of Outstanding Natural Beauty is unlikely to get approval and would be less popular with local residents.

By using the viaduct solution the first two issues would be capable of being resolved. However, the visual impacts would also be a relevant for the viaduct.

Should it be considered that taking the rail over the road is worth further consideration then it is recommended that the above is revisited.

7.1 Vertical Alignment

The Highways Agency Standard TD 27/05 sets out the minimum headroom and lateral clearance requirements for new bridges. The route in question is not considered to be a high load route (HE map dated 2007 but noted as published 2012), therefore the minimum headroom required would be 5.3m. The clear span of the bridge would need to be a minimum of 14.3m, assuming a verge width of 2.5m and 9.3m of carriageway.

Based on the span of less than 15m, a steel bridge similar or equivalent to the Network Rail standard D type deck would be suitable. This structure requires a minimum of 975mm from deck soffit to running rail. Alternatively looking at the standard viaduct section (refer to 7.2) for this span it is felt reasonable to assume an equivalent depth from rail to underside of the structure.

Based on this and an existing (highest) road level of 11.487m the lowest allowable deck soffit can be found as below, an allowable construction tolerance of 50mm has been included.

⇨ 11.487 + 5.30 = 16.787mOD = deck soffit level

Further allowing 975mm for structural depth, minimum ballast, sleepers, rail and construction tolerance an approximate level for the PWay can be calculated.

- 16.787 + 0.975 + 0.05 = ~17.82mOD = track running level.

Based on this, and the level at the Clappers junction, which is taken as fixed at 11.54m, an approximate level change can be calculated. This is (17.82-11.54) 6.28m. Noting that the two crossings are separated by 306m this results in peak gradients of approximately 1 in 43 over a length of around 270m

Work undertaken by others note that vertical curves of 900m and 600m are required at the west and east ends respectively. Account for this results in a peak gradient of 1 in 45.5 over a length of around 270m.

RVR has serious concerns that gradients of this nature would both increase complexity of train operation and affect the ability of the trains to brake to a halt at crossings. Concerns of this nature would need to be considered in the protocols for use of the line and could impact allowable speed limits and/or the operational times of the level crossing (Clappers).

Work within this report includes for a similar gradient to the east of the A21, although space exists for a more relaxed gradient should this be preferred.

Therefore any further, more detailed, design work might identify areas where alternations to the alignment are required. As alignments are already at extreme values there is little scope for amendment within allowable gradients. As such, any changes from the values proposed have a high risk of effecting the overall levels achievable.

7.2 Structures

This report assumes a 50m long embankment starting at the Clappers crossing. Once it reaches around 3m in height, we would anticipate the solution change to a reinforced or prestressed concrete viaduct of approximately 500m. After the A21 crossing, when the viaduct goes back down to 3m in height, it would revert to the embankment. The bridge over the Rother adjacent to the Clappers crossing would still be required, however the viaduct would cross all the other watercourses and other obstacles in the area so there would be no need for the other bridges, culverts or footpath diversions.

Whilst detailed consideration has not been given to this solution from a structural perspective, comparison to other projects would suggest that a reinforced concrete system incorporating u-shaped trough elements acting as both the track support and structure span would likely result in the most cost-effective solution. On this basis a

reinforced concrete trough structure spanning between piers at around 30m centres would be a reasonable estimate at this stage. Piers would then be supported on buried pile caps with piled foundations to limit the potential of differential settlements associated with the increased loadings.

Whilst in general the proposed route follows the line of the historic route, the viaduct is likely to result in higher surcharge values. As the ground is located within the floodplain the potential for settlement of the viaduct exists, this would need to be considered within any detailed design.

A schematic for the A21 crossing is included as 239025-A21G-003 [D5] within Appendix B.

7.3 Highway

7.3.1 Impact to Existing Highway (A21)

Following completion of the works the vertical alignment of the highway would not be affected. Approach to the rail bridge would need to be considered as part of a RRRAP process as the introduction of abutments to the road corridor would likely constitute an increased risk to road users. The outcome of this process could be the introduction of Vehicle Restraint systems or similar over a length before and after the bridge.

There are no proposals to alter the existing horizontal road alignment under this arrangement.

This option would have a significant impact on the possibility of upgrading the A21 in the future. Arup understands that various schemes for upgrading the road have been proposed previously, including dualling and grade separation of the roundabout junction to the north but there are no current proposals for any change to the existing layout. Building the viaduct over the road would severely constrain future options and may prevent the A21 from being upgraded without significant expense to work around the viaduct. This is because options to elevate the highway would also require further elevation of the railway and any widening could be constrained by the locations of the piers.

7.4 Traffic Impact

7.4.1 Construction Phase

As noted high levels of standardisation are likely to benefit this option. On that basis a clear span of around 30m would be considered appropriate at the road crossing.

Given this, it is plausible that piers and foundations could be constructed with low impact to the highway. However, economic construction of the deck structure could require road closures. If these road closures prove to be significant then a temporary diversion would be likely to be required. As the temporary diversion is not a confirmed requirement it has not been included in the cost estimate for this

option, but the associated costs would be significant and would require the use of third party land.

The alternative solution of a lightweight (shorter span) steel bridge lifted in over a single closure would likely also result in similar levels of impact to the highway as construction of the abutments/piers would be in close proximity to the highway.

This option includes the most significant structural works and on this basis could have the second highest impact on local transport networks during the construction phase.

On this basis the disruption to the highway can be classified as significant with impacts likely to extend over a minimum period of 6 months.

Construction of the wider scheme would result in a prolonged period of significant disruption to local residents and ecology which is likely to be unpopular. It is not known whether a prolonged disruption of this nature would be acceptable to the residents or relevant authorities.

7.4.2 Operation Phase

Following completion of the construction works the highway would be reinstated back to current levels. Based on this, the effect on traffic flows are expected to remain as per the current situation.

7.5 Flooding

The construction of a viaduct would negate the requirement for additional culverts or bridges over the various watercourses and surface water flowpaths. Therefore this option is considered likely to have relatively similar levels of impact to flooding as those of Option 1.

This option would have to be tested in the flood model and the FRA may need updating accordingly.

7.6 Environmental

Through consideration of the significant differences between the four options, the standout features of this option would be:

- Significant visual intrusion and noise issues associated with the higher embankment. As this is an Area of Outstanding Natural Beauty (AONB), a large embankment or viaduct would need considerable justification to get approval

- Significant construction period (noise, visual disruption, construction traffic etc.)

- Embodied CO_2 for this option is high when compared to the alternative options presented within this report.

7.7 Maintenance

As noted previously this option is considered the most significant in terms of structural works. Ongoing periodic inspection and maintenance of these works would be required for the duration of the structures lifetime and, in common with Options 2 and 4, would add considerably to the operating costs of the railway.

Whilst not specifically a maintenance concern, consideration would be required to the potential for the structure to be adversely affected by flood events during which foundations would be anticipated to be submerged.

7.8 Cost

The costs for this option are based on the (cheaper) viaduct solution. Principal costs include the viaduct and approach embankments. This is by far the most expensive option with budget estimate costs in the region of £20.2million.

For further details refer to the costing report contained in Appendix C.

8 Option 4 – Rail under raised highway

Option 4 is similar to Option 2 in that it would be rail under road; however, this proposal would raise the level of the road in order to reduce the depth of the cutting.

8.1 Vertical Alignment

An assessment has been done on the potential to alter the vertical alignment of the A21 at this location. The principal constraint was taken as the A21 Robertsbridge roundabout located approximately 140m north of the proposed rail alignment. To maximise the benefits of this option over those discussed previously, a design speed of 40mph (70kph) has been used for the design of the trunk road throughout.

This option results in an allowable increase in road levels of around 2.0m above the current highway alignment. Based on the altered road levels, the introduction of a suitable bridge structure allows for rail levels to be provided at 8.5m OD at the location of the A21.

8.2 Structures

This option would have similar issues to Option 2 but they would be reduced in severity due to the reduction in the depth of the cutting. Introduction of a bridging structure to support the highway over a length of around 15m would be required, with reinforced concrete trough structures for around 60m in each direction also being needed to support existing ground levels and provide an element of flood protection to the railway.

In addition to the structures highlighted in Option 2 the road level would be raised on an embankment for a length of approximately 300m. On the basis that embankment slopes are maintained at 1 in 3 there would be a relatively sizeable increase in land take for the highway, with adjacent structures (such as the culvert) requiring extension and potentially strengthening to deal with the increased embankment volumes. An alternative solution to reduce land take would be to construct concrete retaining walls for the lengths where the embankments would extend outside the present land take. This has not been explored further or included in the costings.

8.3 Highway

8.3.1 Impact to Existing Highway (A21)

From a highways perspective, assuming a 40moh speed limit throughout, the updated alignment includes the introduction of a compliant sag curve from the roundabout, with K value of 20 in order to locally steepen the gradient up and over the rail alignment. A desirable minimum crest curve, with K value of 30 was introduced at the location of the rail line allowing the road to be brought back towards existing levels as quickly as practicable.

Sightlines and stopping sight distances were checked and could be achieved for this option.

An alternative arrangement involving the introduction of a 30mph speed limit throughout could be explored in more detail. Initial information suggests this would allow the highway to be raised by a further 1.2m. Due to the requirement for changes to A21 speed limits over a considerable length of trunk road, this option has not been explored further at this time.

8.4 Traffic Impact

8.4.1 Construction Phase

Works would be required to a significant length of the A21 to construct this option. As with Option 2, this proposal would be likely to require construction of a temporary diversion of the A21 with all the attendant issues. Whilst no detailed assessment work has been carried out, we would anticipate this would need to take the form of a short temporary bypass diversion located around 50m to the east of the existing road. Due to the level differences from the A21 to adjacent ground levels the temporary works associated with a diversion would be significant. The diversion would likely require a total length in excess of 400m, 2No. small span road bridges and a minimum of 2No. culverts.

We would anticipate that the construction works for this option would take a minimum of 9 months and potential as long as 18 months to complete.

8.4.2 Operation Phase

The vertical alignment of the A21 would include exacerbated changes in gradient over that currently present. In order to remain within desirable values outlined in the relevant design documents there would be a requirement to extend the current 40mph speed restriction for a longer duration, thereby covering the full length of highway affected by the works.

8.5 Flooding

It is expected that this option would be able to incorporate all the bridges and culverts in Option 1 unaltered. if so, the modelling work and FRA would also apply to this option and the conclusions drawn would remain the same.

The railway would be at a lower level as compared to Option 1; therefore it is likely that the track will flood more frequently and require more closures, although the current model results suggest that this will only occur in the 1:20yr event.

The A21 does not currently overtop in the 1:100yr +climate change event, therefore raising the road further should not impact the floodplain connectivity. However there could be an increase in the footprint of the road embankment which would affect floodplain storage. This could be minimised by using retaining walls rather than battered slopes and would be offset by the reduction in

rail embankment size. It is therefore unlikely that additional culverts would be required to maintain the current levels of flood risk.

It would be advisable to run this option through the flood model to ensure that there is no change to the results gained from Option 1 and ensure the FRA does not need updating.

8.6 Environmental

Through consideration of the significant differences between the four options, the standout features of this option would be:

- Relatively low permanent third party land take but higher levels of earthworks cut offset by higher landtake around the highway for embankments to support the higher road levels required as part of this option
- Lower visual and noise impact since below existing ground levels, again off set by negative impact of road raising by 2m and increase visual and noise
- The footpath near the Mill Stream would have to incorporate a walking rail crossing
- Embodied CO_2 for this option would be moderate when compared to the alternative options presented within this report.

8.7 Maintenance

Maintenance and inspection would be required for the new structures present on the route. This would include the increased embankments on the A21 and any changes to these structures. Consideration would be required as to how this would be managed as it seems appropriate that any existing assets supporting the A21 would remain the responsibility of Highways England.

As per Option 2, regular inspection and maintenance would be required for the structures on or over the railway. The potential for this option to require pumping (during extreme events) would introduce further maintenance liabilities which would need to be considered in more detail if required.

8.8 Costs

The costs for this option include the embankment for the railway and associated bridges and culverts, as well as raising the highway and the bridge to take the A21 over the railway. Budget estimate costs are in the region of £11.3million.

For further details refer to the costing report contained in Appendix C.

9 Cost Comparison

9.1 Typical industry benchmarked costs

The following summary table is taken from the high level cost comparison exercise, assuming industry standard costs and relationships. For details refer to the cost report which is contained within Appendix C.

Table 5: Summary of costs taken from Costing Report

	GRAND SUMMARY	Total (£) Option 1	Total (£) Option 2	Total (£) Option 3	Total (£) Option 4
1	**Direct Construction Works**				
1.01	Railway Control Systems (level crossing only)	£300,000	excl.	excl.	excl.
1.02	Train Power Systems	excl.	excl.	excl.	excl.
1.03	Electric Power and Plant	excl.	excl.	excl.	excl.
1.04	Permanent Way	excl.	excl.	excl.	excl.
1.05	Telecommunication Systems	excl.	excl.	excl.	excl.
1.06	Buildings and Property	n/a	n/a	n/a	n/a
1.07	Civil Engineering	£2,464,000	£4,796,000	£8,361,000	£4,607,000
1.08	Enabling Works	£276,000	£480,000	£669,000	£460,000
Sub -Total (Direct Construction Cost Only)		**£3,040,000**	**£5,276,000**	**£9,030,000**	**£5,067,000**
2	**Indirect Construction Works**				
2.01	Preliminaries (25%)	£760,000	£1,319,000	£2,258,000	£1,267,000
2.02	Contractor Overheads and profit (8%)	£304,000	£528,000	£903,000	£507,000
Sub -Total (Construction Costs)		**£4,104,000**	**£7,123,000**	**£12,191,000**	**£6,841,000**
3	**Project / Design Team Fees and Other Project Costs**				
3.01	Design Team Fees (10%)	£410,000	£712,000	£1,219,000	£684,000
3.02	Project Team Fees (5%)	£205,000	£356,000	£610,000	£342,000
3.03	Other Project Development Costs				
	Possessions	excl.	excl.	excl.	excl.
	Land	excl.	excl.	excl.	excl.
	Utilities	excl.	excl.	excl.	excl.
Sub -Total (before Risk/Optimism Bias)		**£4,719,000**	**£8,191,000**	**£14,020,000**	**£7,867,000**
4	**Risk**				
4.01	Optimism Bias 44%	£2,076,000	£3,604,000	£6,169,000	£3,461,000
5	**Inflation**				
5.01	Inflation	excl.	excl.	excl.	excl.
6	**Taxation & Grants**				
6.01	Tax allowance and grants	excl.	excl.	excl.	excl.
Grand Total		**£6,795,000**	**£11,795,000**	**£20,189,000**	**£11,328,000**

These comparative results show that Option 1 would be the lowest cost, with an estimate of around 60% of the next lowest cost option.

Option 3 is by far the highest cost, being 71% higher than the next highest cost option (option 2). Options 2 and 4 are of similar cost.

9.2 RVR costed delivery

It is relevant to highlight that RVR have delivered a number of schemes in recent times using a documented and successful delivery mechanism. This has resulted in projects costing less than if delivered through a more traditional client/contractor relationship.

As noted RVR has already been to the market and obtained prices for delivering Option 1 under this mechanism and these prices are included here.

See Appendix D for a full breakdown of the estimated costs as supplied by RVR. As per the attached the total is just over £1.5million.

These costings are on the basis that (in common with other heritage railways) the design work and much of the construction is carried out by suitably qualified, but unpaid, volunteers with recent experience of carrying out similar work on the neighbouring Kent & East Sussex Railway and that materials are sourced from known suppliers.

RVR has explained that it has already undertaken significant work on the project in the anticipation of Option 1. Following detailed studies and designs, extensive discussion and liaison with all the key authorities, RVR has full planning approval for this Option. It already has a detailed cost estimate, utilising quotes from their existing sub-contractors, and has already purchased a proportion of the key materials needed.

It should be noted that aspects of the other options covered in this report could potentially also be delivered at a lower cost, but RVR does not have access to the relevant resource/expertise to enable this. It would therefore be purely hypothetical and, for this reason, it does not warrant further investigation.

10 Summary

Arup was instructed to explore options to take the proposed RVR heritage railway across the A21(T) near Robertsbridge. Whilst it would be feasible to construct all of the four options assessed, each comes with differing impacts both during construction and through operation.

Option 1, involving an at-grade level crossing, introduces the fewest engineering challenges and would involve the least disruption during construction. Construction costs are the lowest for this option. Full planning consent exists for this option, but further statutory authority is required and RVR would be required to demonstrate that there are exceptional circumstances to justify the creation of a new road level crossing.

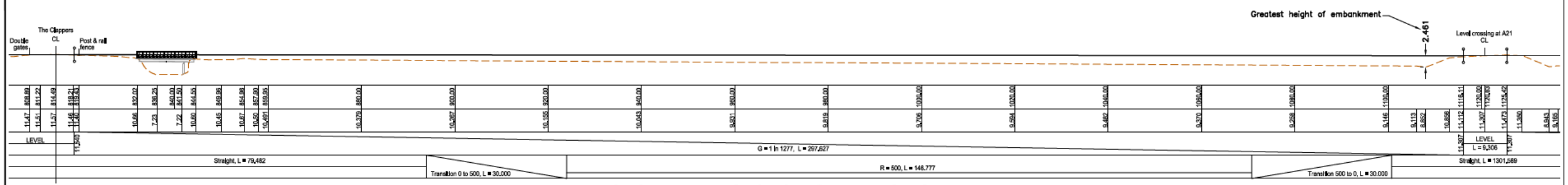
Option 2 looks at the feasibility of taking the rail beneath the existing road. Principal engineering and approval challenges are around the railway being placed below the level of the adjacent River Rother. Mitigation of this is likely to require a long length of waterproof trough structure, with significant engineering challenges including maintenance of water flow paths during flood events and long-term pumping requirements. Planned flood relief culverts and bridges would not be possible with this option and the alternatives would be unlikely to be accepted by the Environment Agency. Disruption to local residents and road users is likely to be very significant with this option.

Option 3 considers the potential to take the rail over the existing road. This scheme introduces a sizeable length of elevated viaduct structure which would have significant impacts, both on cost and visual intrusion. Construction duration for this option is also likely to enhance the difficulties around gaining acceptance for this option from the relevant authorities. The structural works for this option are by far the most extensive than any of the other options.

Option 4, involving realignment of the existing highway, would result in a series of engineering works for both the road and rail. Extension of existing speed restrictions close to the roundabout would be required for this option, together with temporary highway diversions and prolonged construction durations.

Appendix A

Existing Drawings and Schematics (by Others)



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LEVEL CROSSING AT A21
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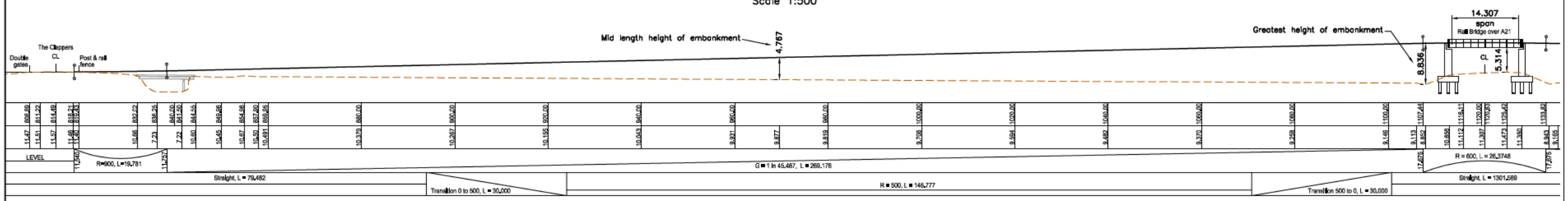
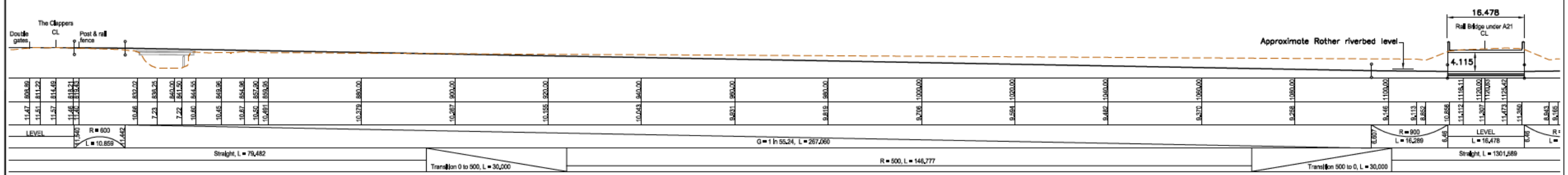
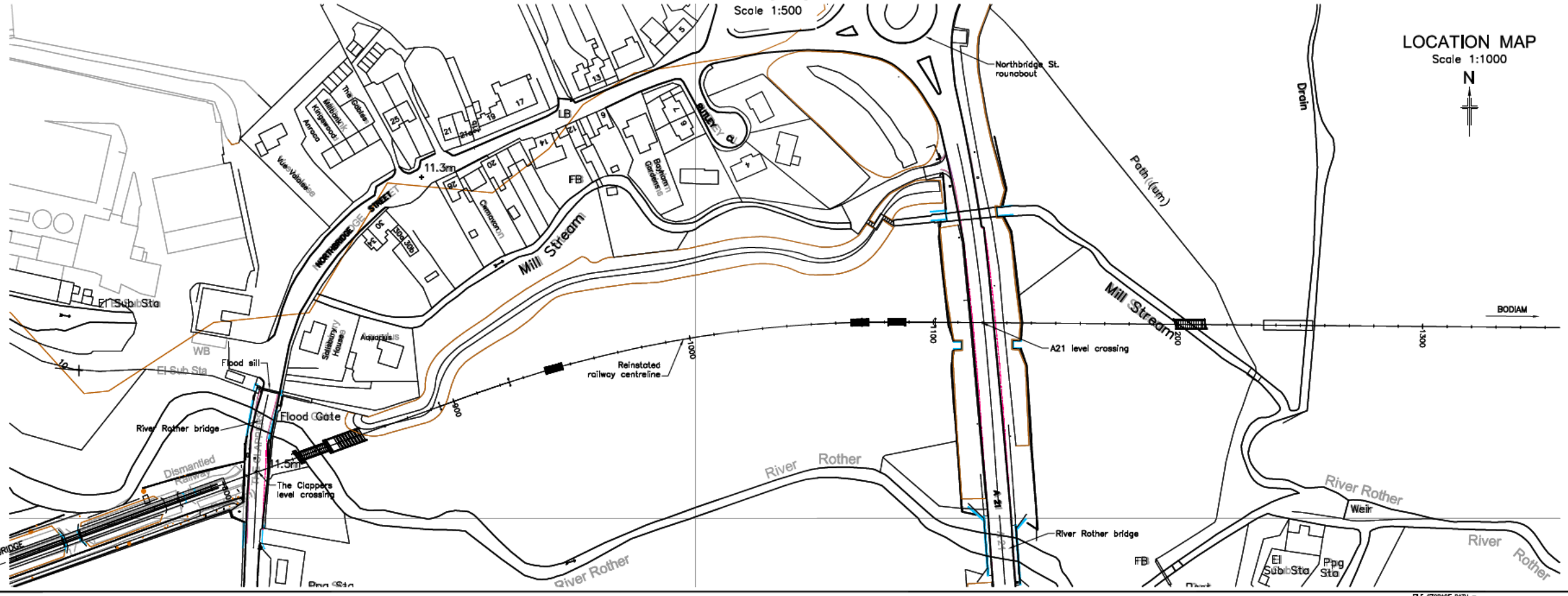


LONGITUDINAL SECTION CLAPPERS TO A21
RAILWAY BRIDGE OVER A21
Scale 1:500



LONGITUDINAL SECTION CLAPPERS TO A21
RAILWAY BRIDGE UNDER A21
Scale 1:500



Key to profile

Datum 5.00m
Chainage
Datum 0,00m
Exg. Ground Level
Vertical Profile
Horizontal Profile

PRELIMINARY

1:500 10 0 10 20m

1:1000 20 10 0 20 40m

Revision	By	Checked	Approved	Date	Description
A	JCS	–	–	18.07.18	Logo change

Client
Rother Valley Railway Ltd
Rother Valley Railway Station, Robertsbridge, East Sussex, TN32 5DG
Tel 01580 881833
www.rvr.org.uk

Rother Valley Railway

Project
ROTHER VALLEY RAILWAY

Drawing
A21 CROSSING OPTIONS

Drawn by JCS	Date: 18/07/18
Checked by -	Date: -
Authorised by -	Date: -

Drawing No. RVR - EW - 005
Revision A

Drawing Scale: 1:500, 1000 at A1

CAD Filename: -
Plot Scale: 1:1

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XREF STORAGE PATH =

ORIGINATING DEPT = HTI – BP
PLOT DATE = 18/07/18

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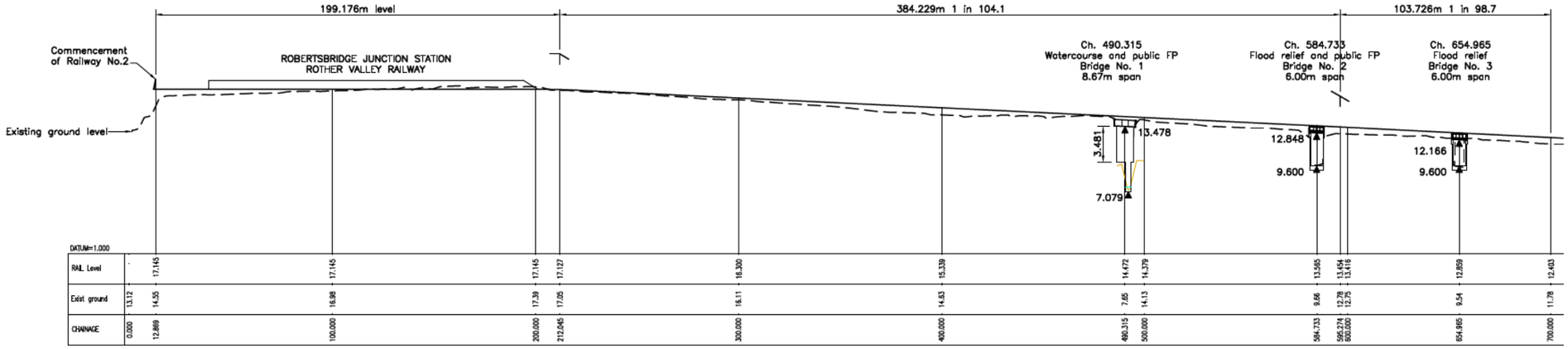
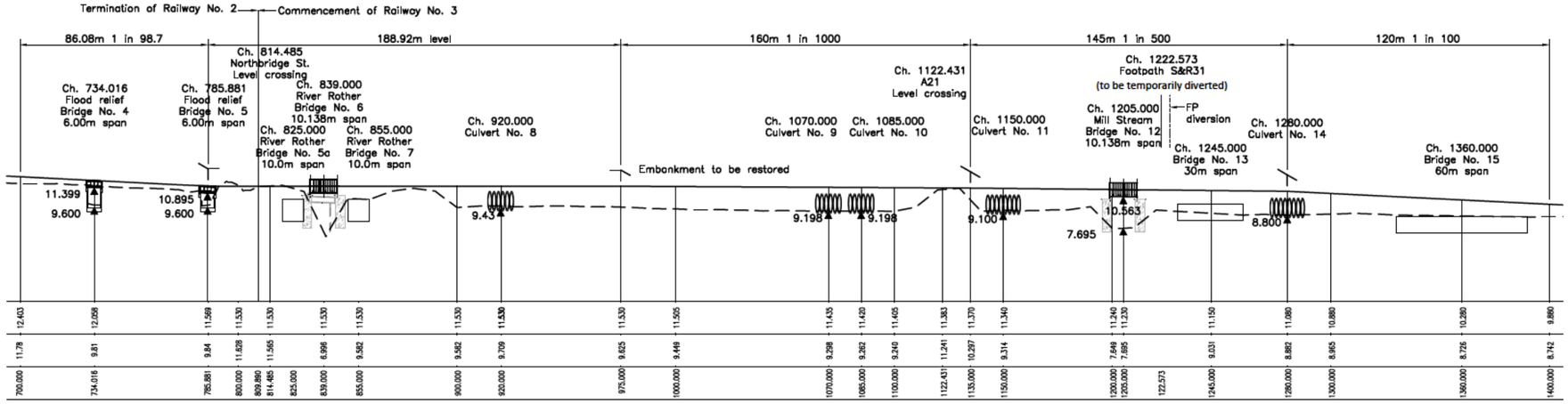
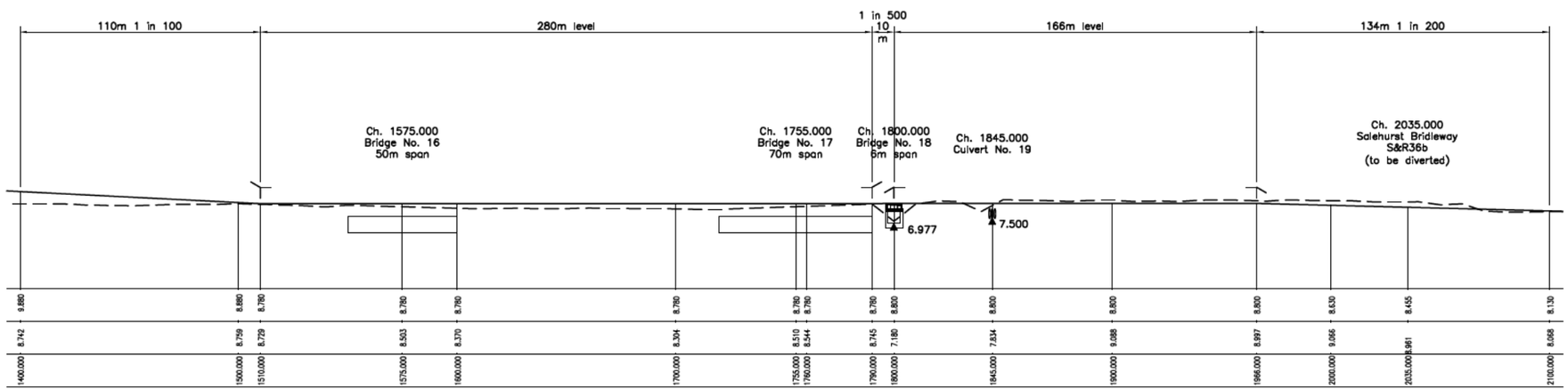
Date and Plot Time: 18/07/2018 - 9:58 am







SHEET 9

SECTION RAILWAY NO. 2

SECTION RAILWAY No. 3

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1:250 5 0 5 10m

Revision	By	Checked	Approved	Date	Description
A	–	–	–	–	–

Client
Rother Valley Railway Ltd
Rother Valley Railway Station, Robertsbridge, East Sussex, TN32 5DG
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Rother Valley Railway

Project

ROTHER VALLEY RAILWAY

Drawing

SECTIONS CH 0-2100
RAILWAY No. 2 (PART)
RAILWAY No. 3 (PART)

Drawn by JCS	Date: 12/02/18
Checked by -	Date: -
Authorised by -	Date: -

Drawing No. **RVR - S - 001** Revision **-**

Drawing Scale: 1:250 V, 1 : 1250 H

CAD Filename: - Plot Scale: 1:1

BODIAM

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XREF STORAGE PATH =

ORIGINATING DEPT = HTI – BP
PLOT DATE = 12/02/18

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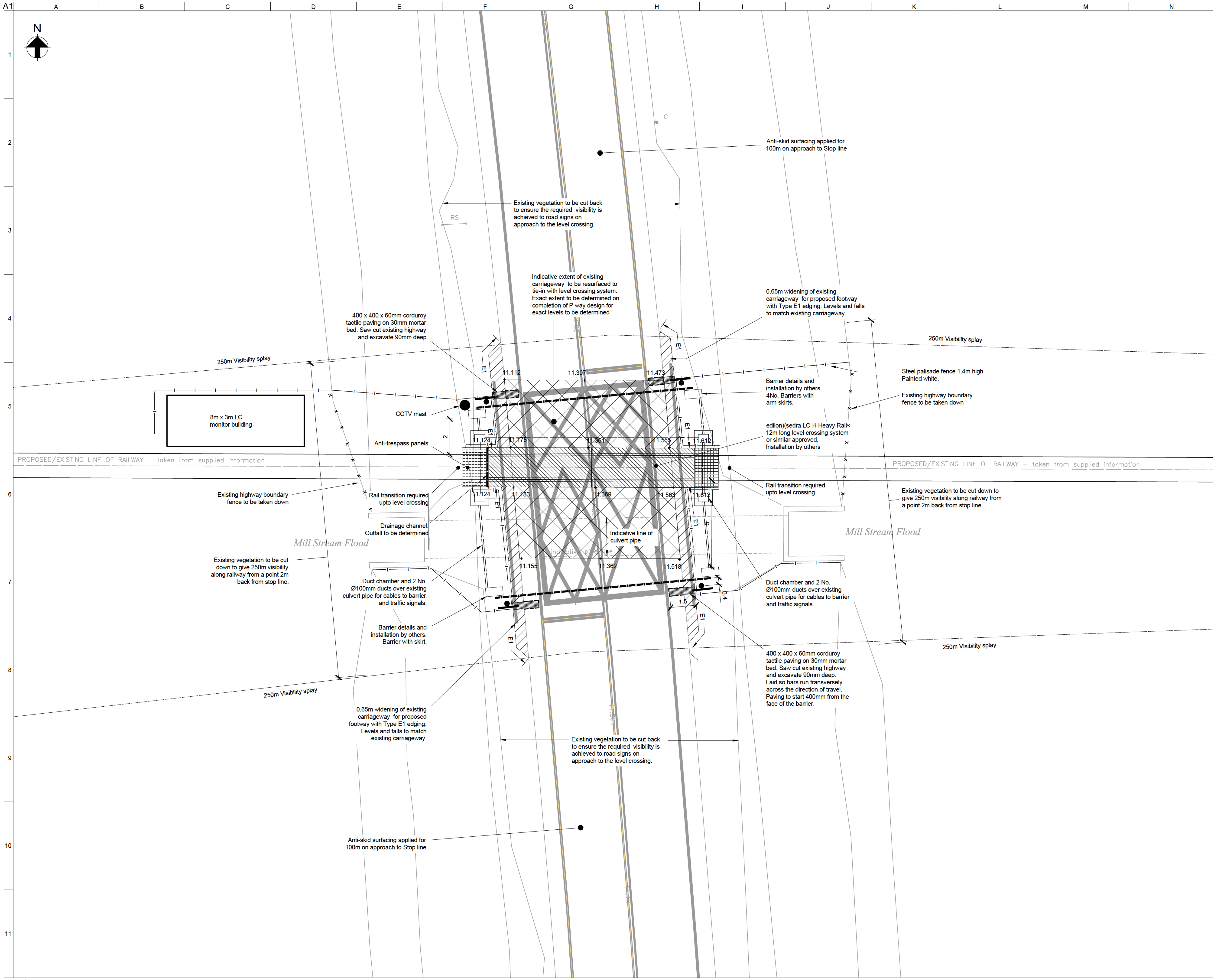

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Notes: -

1. All road markings and traffic signs are to be in accordance with the Traffic Signs Regulations and General Directions (2002) and the Traffic Signs Manuals.
2. For diagram numbers refer to the TSRGD.
3. For road markings refer to drawing C.950.G.103
4. For traffic signs refer to drawing C.950.G.104 and C.950.G.105.
5. For construction details refer to drawing C.950.G.106

Issue	Date	By	Chkd	Appd
P3	27/02/15	IAB	DC	JP
	Drainage channel and indicative levels added			
P2	18/02/15	IAB	DC	JP
	Drawing revised and details removed			
P1	13/02/15	IAB	DC	JP
	Preliminary issue			

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Client
Rother Valley Railway Limited

Job Title
RVR Level Crossing
Highway Works

Drawing Title
A21(T) Robertsbridge Bypass
General Arrangement

Scale at A1 1:100 1:10

Discipline Civils

Job No 239025-00

Drawing Status For Information

Drawing No C.950.G.102

Issue P3

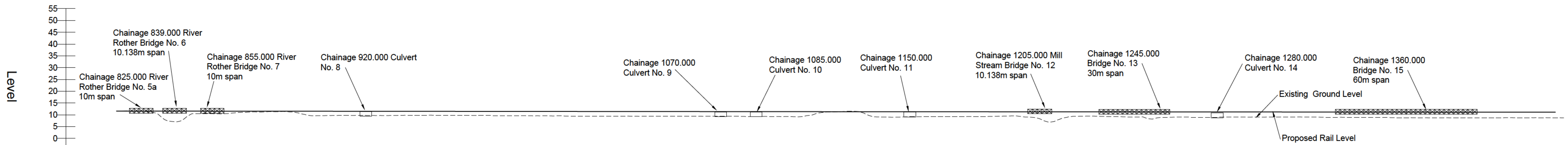
Do not scale

© Arup

Appendix B

General Arrangement Drawings

Plan View
Scale 1:10000



Chainage	Proposed Ground Levels	Existing Ground Levels
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810.000		
820.000	11.563	11.618
830.000	11.555	11.009
840.000	11.547	7.059
850.000	11.539	10.451
860.000	11.531	10.423
870.000	11.524	11.124
880.000	11.516	11.350
890.000	11.508	11.048
900.000	11.500	9.622
910.000	11.492	9.735
920.000	11.484	9.741
930.000	11.477	9.695
940.000	11.469	9.777
950.000	11.461	9.791
960.000	11.453	9.728
970.000	11.445	9.731
980.000	11.438	9.666
990.000	11.430	9.576
1000.000	11.422	9.503
1010.000	11.414	9.468
1020.000	11.406	9.477
1030.000	11.398	9.448
1040.000	11.391	9.371
1050.000	11.383	9.389
1060.000	11.375	9.430
1070.000	11.367	9.382
1080.000	11.359	9.313
1090.000	11.351	9.303
1100.000	11.344	9.230
1110.000	11.336	10.372
1120.000	11.331	11.312
1130.000	11.327	10.930
1140.000	11.320	9.038
1150.000	11.312	9.166
1160.000	11.304	9.217
1170.000	11.296	9.237
1180.000	11.288	9.297
1190.000	11.280	9.439
1200.000	11.273	9.030
1210.000	11.265	6.979
1220.000	11.257	9.390
1230.000	11.249	9.366
1240.000	11.241	9.160
1250.000	11.233	8.610
1260.000	11.226	8.966
1270.000	11.218	8.956
1280.000	11.210	8.969
1290.000	11.202	9.011
1300.000	11.194	9.019
1310.000	11.186	9.082
1320.000	11.179	9.017
1330.000	11.171	8.953
1340.000	11.163	8.906
1350.000	11.155	8.823
1360.000	11.147	8.774
1370.000	11.139	8.720
1380.000	11.132	8.715
1390.000	11.124	8.748
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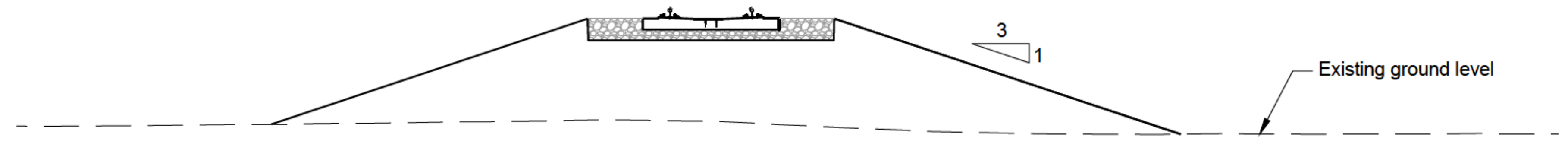
Longitudinal Section
Scale: 1:1000



Typical Section Through Embankment
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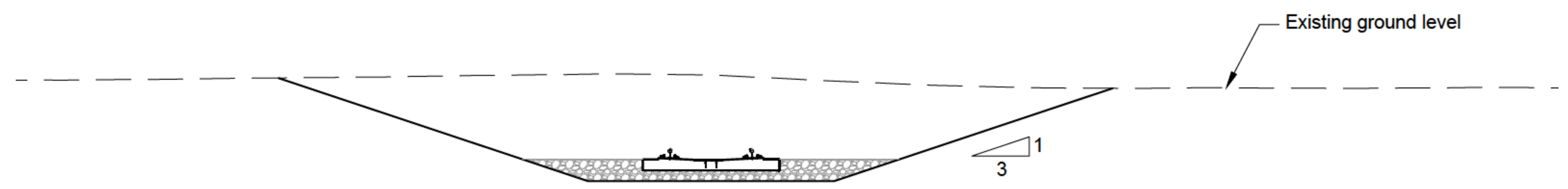

Typical Section Through Cutting
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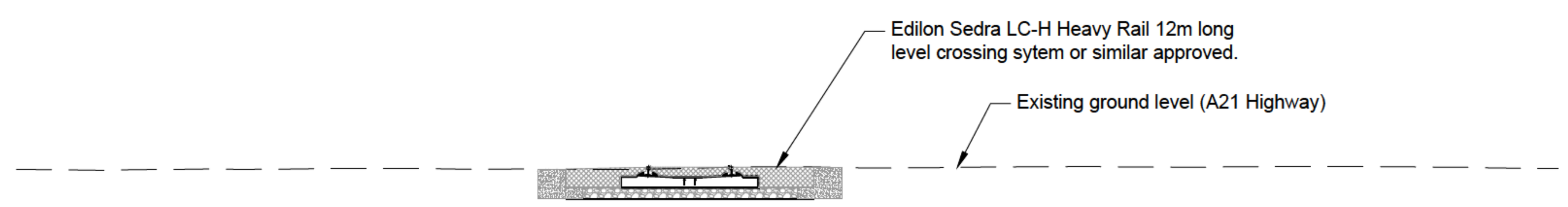

Section Through A21 Crossing
(CH 1120.000)
Scale: 1:100

Issue	Date	By	Chkd	Appd
P1	01 /02/19	PC	HS	JP
	Options feasibility			

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Client
Rother Valley Railway

Project Title
Rother Valley Railway
Proposed Rail Extension

Drawing Title
Option 1
Level Crossing
General Arrangement

Scale at A1 1:1000 (U.N.O.)
Role
Suitability -
Arup Job No 239025
Rev P1
Name 239025-A21-G-001

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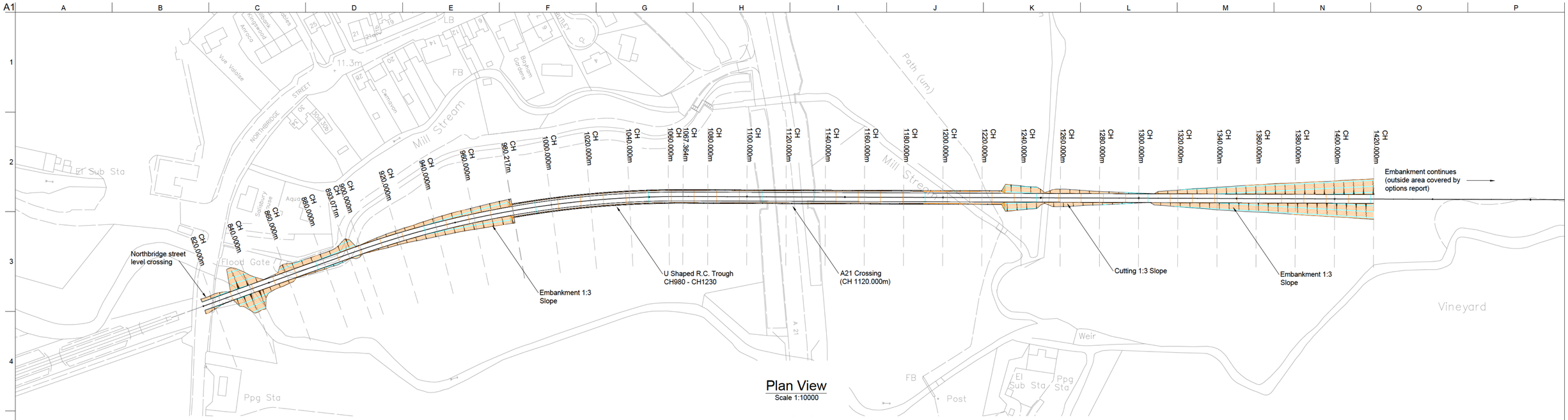
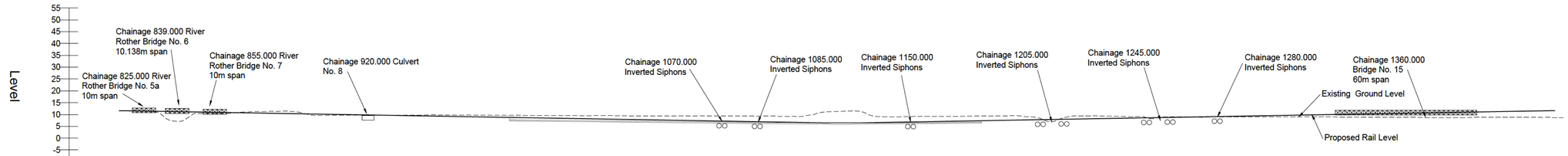


Plan View
Scale 1:10000



Chainage	Proposed Ground Levels	Existing Ground Levels
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820.000	11.538	11.618
830.000	11.365	11.009
840.000	11.193	7.059
850.000	11.020	10.451
860.000	10.847	10.423
870.000	10.675	11.124
880.000	10.502	11.350
890.000	10.329	11.048
900.000	10.157	9.622
910.000	9.984	9.735
920.000	9.811	9.741
930.000	9.639	9.695
940.000	9.466	9.777
950.000	9.293	9.791
960.000	9.121	9.728
970.000	8.948	9.731
980.000	8.775	9.668
990.000	8.603	9.576
1000.000	8.430	9.503
1010.000	8.257	9.468
1020.000	8.085	9.477
1030.000	7.912	9.448
1040.000	7.739	9.371
1050.000	7.567	9.389
1060.000	7.394	9.430
1070.000	7.221	9.382
1080.000	7.049	9.313
1090.000	6.876	9.303
1100.000	6.703	9.230
1110.000	6.531	10.372
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1130.000	6.498	10.930
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1170.000	7.202	9.237
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1190.000	7.553	9.439
1200.000	7.729	9.030
1210.000	7.905	6.979
1220.000	8.081	9.390
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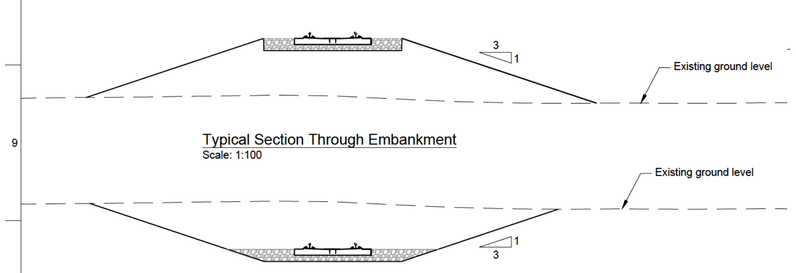
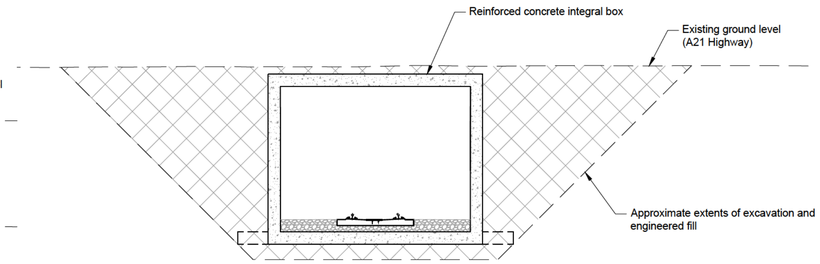
1410.000	11.421	8.768
1420.000	11.597	8.757

Longitudinal Section
Scale: 1:1000

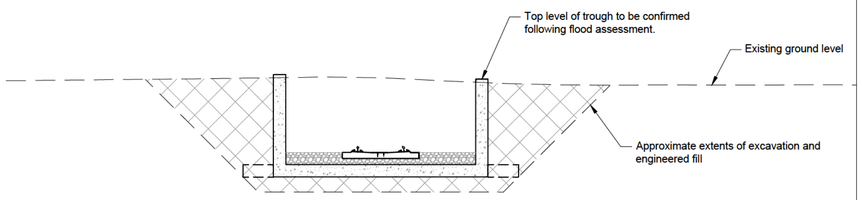


Typical Section Through Embankment
Scale: 1:100

Typical Section Through Cutting
Scale: 1:100



Section Through A21 Crossing (CH 1120.000)
Scale: 1:100



Typical Section Through Trough
Scale: 1:100

Issue	Date	By	Chkd	Appd
P1	01 /02/19	PC	HS	JP
Options feasibility				

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www.arup.com

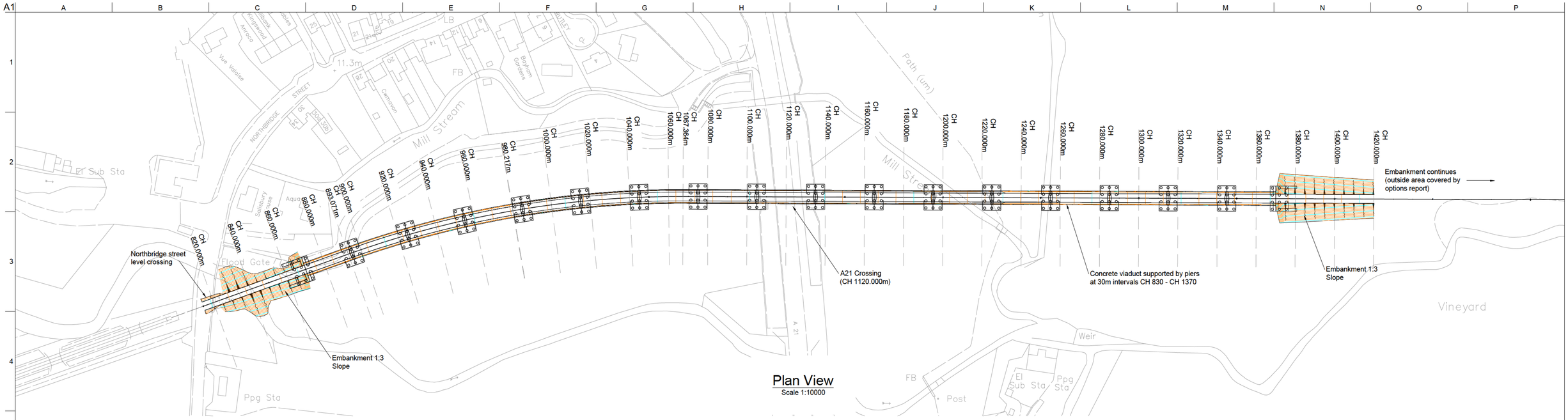
Client: Rother Valley Railway

Project Title: Rother Valley Railway
Proposed Rail Extension

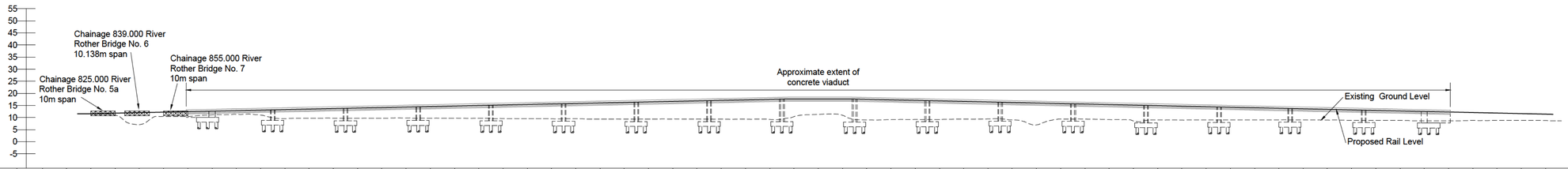
Drawing Title: Option 2
Rail Under Road
General Arrangement

Scale at A1: 1:1000 (U.N.O.)
Role:
Suitability: -
Arup Job No: 239025
Rev: P1
Name: 239025-A21-G-002

Do not scale

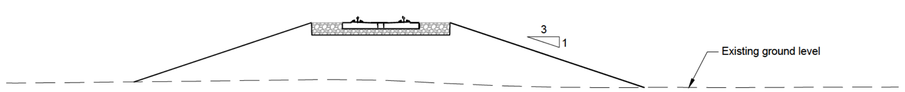


Plan View
Scale 1:10000

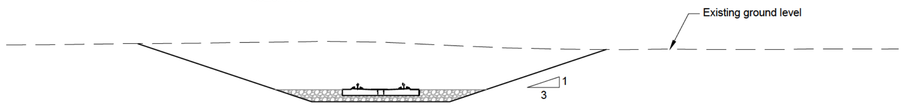


Chainage	Existing Ground Levels	Proposed Ground Levels
800.000		
810.000		
820.000	11.618	11.596
830.000	11.009	11.808
840.000	7.059	12.021
850.000	10.451	12.233
860.000	10.423	12.445
870.000	11.124	12.658
880.000	11.350	12.870
890.000	11.048	13.082
900.000	9.622	13.295
910.000	9.735	13.507
920.000	9.741	13.719
930.000	9.695	13.932
940.000	9.777	14.144
950.000	9.791	14.356
960.000	9.728	14.568
970.000	9.731	14.781
980.000	9.666	14.993
990.000	9.576	15.205
1000.000	9.503	15.418
1010.000	9.468	15.630
1020.000	9.477	15.842
1030.000	9.448	16.055
1040.000	9.371	16.267
1050.000	9.389	16.479
1060.000	9.430	16.692
1070.000	9.382	16.904
1080.000	9.313	17.116
1090.000	9.303	17.329
1100.000	9.230	17.541
1110.000	10.372	17.699
1120.000	11.312	17.699
1130.000	10.930	17.699
1140.000	9.038	17.563
1150.000	9.166	17.343
1160.000	9.217	17.124
1170.000	9.237	16.904
1180.000	9.297	16.684
1190.000	9.439	16.464
1200.000	9.030	16.244
1210.000	6.979	16.024
1220.000	9.390	15.804
1230.000	9.366	15.585
1240.000	9.160	15.365
1250.000	8.610	15.145
1260.000	8.966	14.925
1270.000	8.956	14.705
1280.000	8.969	14.485
1290.000	9.011	14.266
1300.000	9.019	14.046
1310.000	9.082	13.826
1320.000	9.017	13.606
1330.000	8.953	13.386
1340.000	8.906	13.166
1350.000	8.823	12.946
1360.000	8.774	12.727
1370.000	8.720	12.507
1380.000	8.715	12.287
1390.000	8.748	12.067
1400.000	8.760	11.847
1410.000	8.768	11.627
1420.000	8.757	11.408

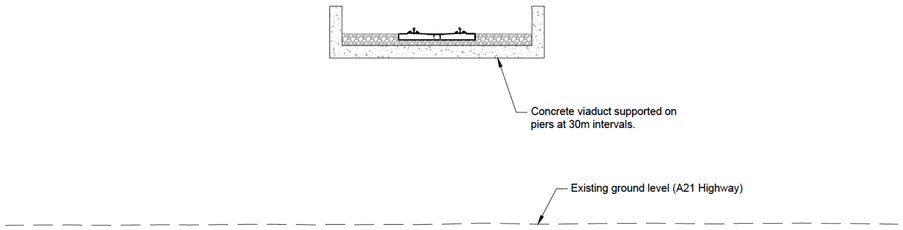
Longitudinal Section
Scale: 1:1000



Typical Section Through Embankment
Scale: 1:100



Typical Section Through Cutting
Scale: 1:100



Section Through A21 Crossing (CH 1120.000)
Scale: 1:100

Issue	Date	By	Chkd	Appd
P1	01 /02/19	PC	HS	JP
Options feasibility				

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www.arup.com

Client: Rother Valley Railway

Project Title: Rother Valley Railway
Proposed Rail Extension

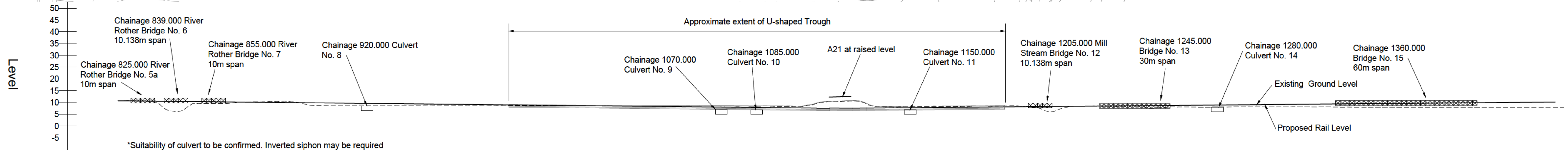
Drawing Title: Option 3
Rail Over Road
General Arrangement

Scale at A1: 1:1000 (U.N.O.)
Role:
Suitability: -
Arup Job No: 239025
Rev: P1
Name: 239025-A21-G-003

Do not scale

Plan View

Scale 1:10000

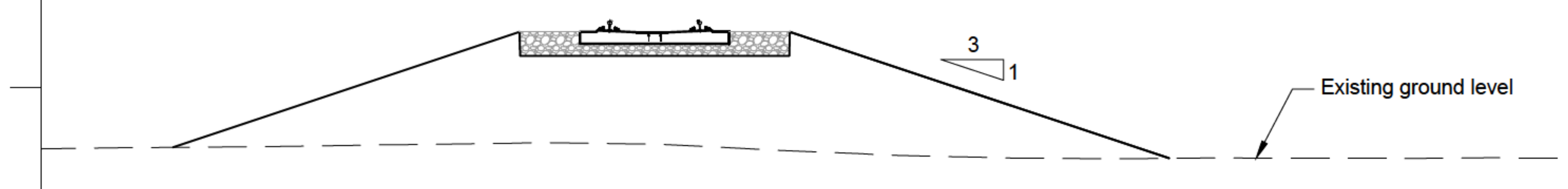


*Suitability of culvert to be confirmed. Inverted siphon may be required

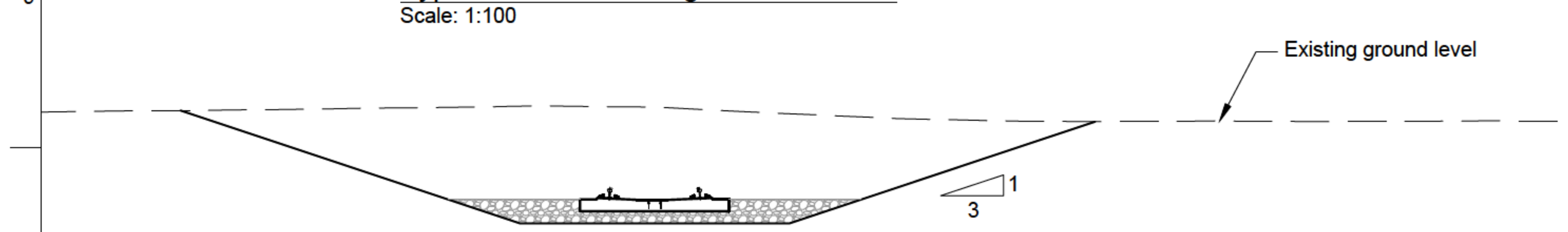
Chainage	Proposed Ground Levels	Proposed Ground Levels A21	Existing Ground Levels
800.000 / 800.500			
810.000			
820.000	11.548		11.618
830.000	11.444		11.009
840.000	11.340		7.059
850.000	11.236		10.451
860.000	11.132		10.423
870.000	11.028		11.124
880.000	10.924		11.350
890.000	10.820		11.048
900.000	10.716		9.622
910.000	10.612		9.735
920.000	10.508		9.741
930.000	10.404		9.695
940.000	10.300		9.777
950.000	10.196		9.791
960.000	10.092		9.728
970.000	9.988		9.731
980.000	9.884		9.666
990.000	9.780		9.576
1000.000	9.676		9.503
1010.000	9.572		9.468
1020.000	9.468		9.477
1030.000	9.364		9.448
1040.000	9.260		9.371
1050.000	9.156		9.389
1060.000	9.052		9.430
1070.000	8.948		9.382
1080.000	8.844		9.313
1090.000	8.739		9.303
1100.000	8.635		9.230
1110.000	8.531		10.372
1120.000	8.490	13.206, 13.385	11.312
1130.000	8.495		10.930
1140.000	8.582		9.038
1150.000	8.671		9.166
1160.000	8.760		9.217
1170.000	8.849		9.237
1180.000	8.938		9.297
1190.000	9.026		9.439
1200.000	9.115		9.030
1210.000	9.204		6.979
1220.000	9.293		9.390
1230.000	9.382		9.366
1240.000	9.471		9.160
1250.000	9.560		8.610
1260.000	9.649		8.966
1270.000	9.738		8.956
1280.000	9.826		8.969
1290.000	9.915		9.011
1300.000	10.004		9.019
1310.000	10.093		9.082
1320.000	10.182		9.017
1330.000	10.271		8.953
1340.000	10.360		8.906
1350.000	10.449		8.823
1360.000	10.538		8.774
1370.000	10.626		8.720
1380.000	10.715		8.715
1390.000	10.804		8.748
1400.000	10.893		8.760
1410.000	10.982		8.768
1420.000	11.071		8.757

Longitudinal Section

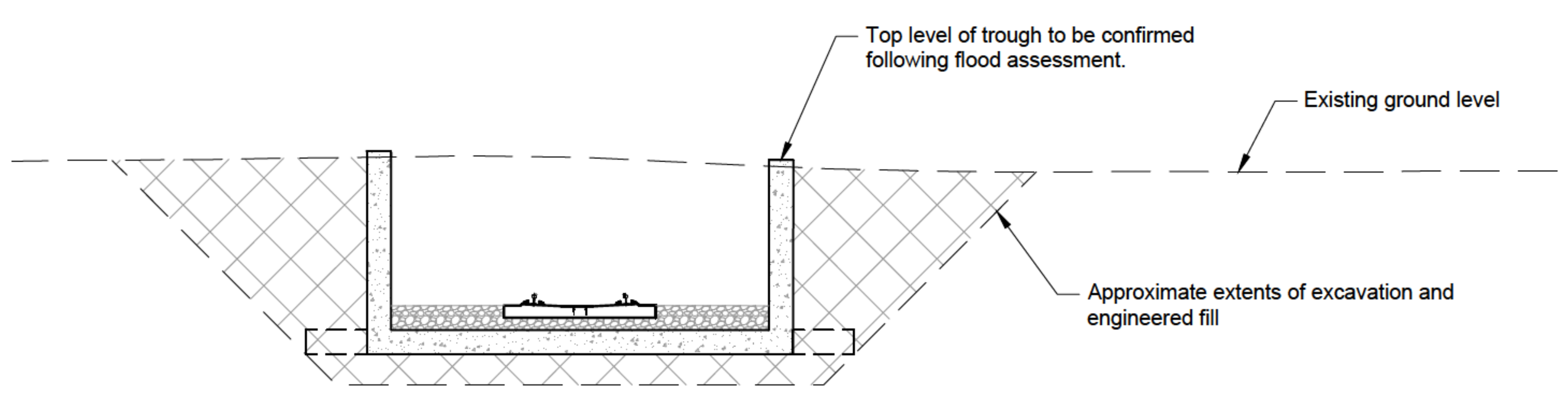
Scale: 1:1000



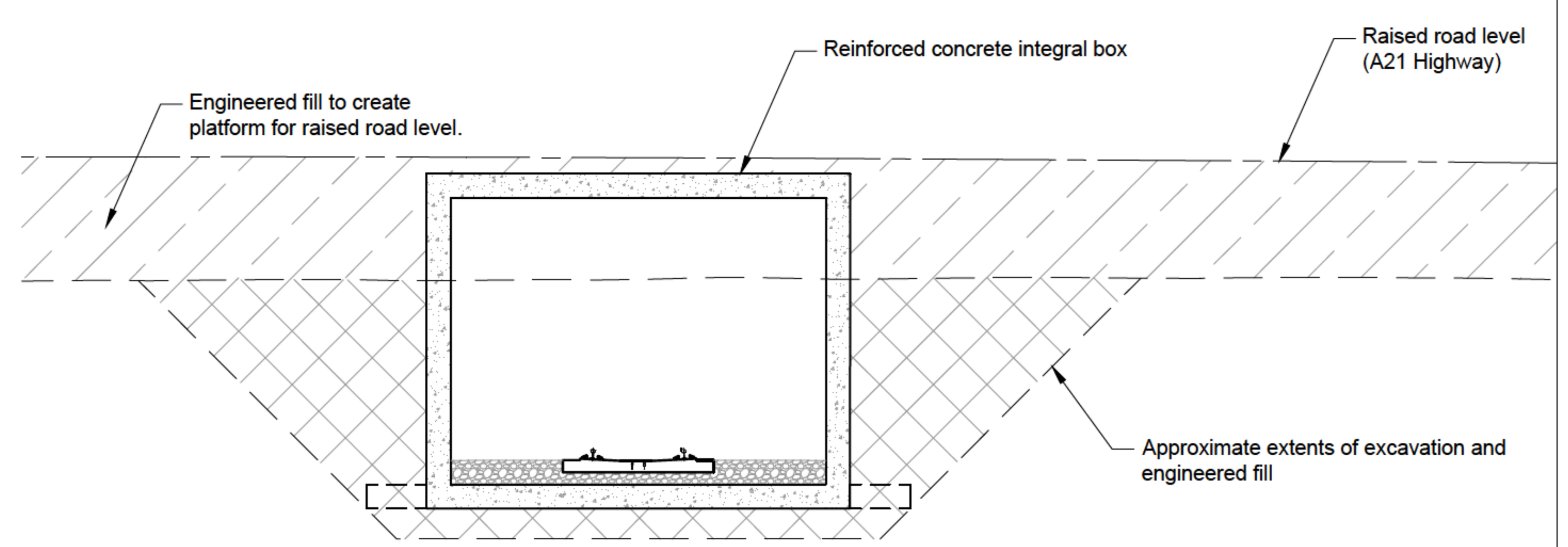
Typical Section Through Embankment
Scale: 1:100



Typical Section Through Cutting
Scale: 1:100



Typical Section Through Trough
Sca e: 1:100



Section Through A21 Crossing
(CH 1120.000)
Scale: 1:100

Issue	Date	By	Chkd	Appd
P1	01/02/19	PC	HS	JP
	Options feasibility			

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www.arup.com

Client
Rother Valley Railway

Project Title
Rother Valley Railway
Proposed Rail Extension

Drawing Title
Option 4
Road Over Rail
With Raised Road
General Arrangement

Scale at A1: 1:1000 (U.N.O.)
Role
Suitability
Arup Job No: 239025
Rev: P1
Name: 239025-A21-G-004

Do not scale

Appendix C

Costing Report

Rother Valley Railway

GRIP 2 Cost Estimate

05 February 2019

Revision Issue

ARUP

ARUP

Document Verification

Job Title	**Rother Valley Railway**			Job Number	**239025-02**
Document Title	**GRIP 2 Cost Estimate**			File Reference	
Document Ref	**RVR-QS-001**				

Revision	Date				
		Filename	RVR Cost Estimate		
Issue	05/02/2019	Description	Cost estimate for Rother Valley Railway		
			Prepared by: Alice Norbury	Checked by: Stuart Humphreys	Approved by: Stuart Humphreys
		Description			
		Signature			

Revision	Date				
		Filename			
		Description			
			Prepared by:	Checked by:	Approved by:
		Description			
		Signature			

Revision	Date				
		Filename			
		Description			
			Prepared by:	Checked by:	Approved by:
		Description			
		Signature			

Revision	Date				
		Filename			
		Description			
			Prepared by:	Checked by:	Approved by:
		Description			
		Signature			

ARUP

Section	Heading
1.0	Introduction
2.0	Basis of Costs
3.0	Assumptions and Exclusions
4.0	Referenced Documents
5.0	Executive Summary
6.0	Detailed Cost Estimate
6.1	Option 1
6.2	Option 2
6.3	Option 3
6.4	Option 4

Appendices

Document:	GRIP 2 Cost Estimate
Revision:	Issue
Date:	05-Feb-19
Arup Job Number:	239025-02

Quality Check

Rev	Status	Prepared by	Checked by	Approved by	Date
Issue	Issue	A Norbury	S Humphreys	S Humphreys	05/02/2019

Controlled Document Distribution

Issued to	Company	Nr Copies	Transmission	Date
J Murrells	Arup	1	Email	05/02/2019

1.0 COST REPORT

1.1 Introduction

The purpose of this report is to present a high level comparison between four options for an extension of the Rother Valley Railway.

This cost estimate is for the purpose of providing a relative cost comparison between four options which forms part of an option appraisal process.
These costs are not intended to provide any representative price for construction costings and budgeting. The estimate offers an indicative forecast of the likely costs of construction of civil engineering elements of the project only.

1.2 Method of Measurement

The structure of this cost estimate follows the structure of the Rail Method of Measurement 1 (RMM1).
The level of detail of design is at appoximately GRIP 2 Feasibility level. Therefore, the method of measurement used to prepare this cost estimate, the rates included method of measuring various works elements selected in order to complement the level of information, has been retained. It is prudent to allow an estimate sensitivity tolerance of +/- 40%.

1.3 Other Development / Project Costs

Other development / project costs are for costs that are not directly associated with the construction works or project / design team professional fees, but form part of the total cost of the project to the client. These costs may include insurances, planning fees, land purchase, rental costs, compensation, relocation costs of personnel / products / equipment / habitats, marketing costs and contributions to local authority obligations.

No allowance has been made within this cost estimate for other development / project costs at this stage.

1.4 Project Location

The proposed project site location is through green field within Rother Valley. There is limited interaction with live railway (only for tie in purposes).
The project will have impact on live roadway.

1.5 Project / Design Team Professional Fees

Project/ design team professional fees have been excluded from this estimate. The estimate has been produced to detail the estimated outturn costs of civil engineering construction activities only. Any specialist surveys necessary prior to the works, are expected to be undertaken by the contractor and as such will form part of the main contractor's preliminaries (i.e. GI surveys and the like)

1.6 Risk and Optimism Bias Allowances

Risk and optimism bias allowance considers risks associated with design development, construction related risks as the works progress onsite, for changes introduced by the client during both the design process and the construction process and any other risks to the client, including acceleration, postponement, unconventional tender action, special contract arrangements, and the like, to a reasonable extent.

An allowance of 44% has been included for optimism bias in line with HM Treasury Green Book Supplementary Guidance - No allowance has been made separately for Risk.

1.7 Inflation Forecast

No allowance has been made for inflation forecasting.

1.8 Conclusion and Recommendations

At this stage of design, it is clear that Option 1 - Level Crossing is the least expensive option within this option appriasal. The cost of options 2 and 4 are of a similar magintude and the cost of option 3 greatly outweights that of the other options.

2.0 BASIS OF COSTS

2.1 Rother Valley Railway

The proposed works for the Rother Valley Railway extension. The works extend from (but not including) the Clappers level crossing (Ch 814) to approximately 320m beyond the A21 crossing (Ch 1,450). There are four different options to be costed and these are outlined below.

Option 1

The extension of track will be laid on an embankment (average 2m high) with a level crossing at the A21. The works will also include a number of small bridges and culverts for flood alleviation purposes.

Option 2

The extension of track will be taken under the A21 through a combination of cutting, retained cut and cut & cover tunnel. The cut & cover tunnel is required at the A21 crossing. The works will include a small bridge and inverted siphons for flood alleviation purposes. There is an additional requirements of temporary diversion on the A21.

Option 3

The extension of track will be taken over the A21 using embankment and viaduct. The works will include 1 small bridge and 1 small culvert for flood alleviation purposes for embankment sections.

Option 4

The extension of track will taken under the A21 through a combination of cutting, retained cut and cut & cover tunnel. The works also include raising a 315m section of the A21 to allow for a more shallow alignment of rail. The works will also include a small bridge and inverted siphons for flood alleviation purposes. There is an additional requirements of temporary diversion on the A21.

The principle purpose of the costing is to provide a high level comparison between the four options as part of an options appraisal process, rather than to provide any representative prices for construction costing or budgeting. On this basis, elements common to all options, such as trackbed drainage, ballast, sleepers and rails have been excluded from cost estimates.

The estimate base date is Q1 2019.

Prices used in this estimate are drawn from historical in-house data and from published data.

Prices are based upon the assumption that the works will be procured by competitive tender.

3.0 ASSUMPTIONS AND EXCLUSIONS

3.1 Assumptions

The following assumptions have been allowed for within this cost plan:

1. This order of cost estimate has been based on the referenced documents and therefore, costs are indicative only. This should be taken into consideration when used in future reports.
2. Assumed all material excavated within the rail corridor cannot be reused and therefore shall be disposed off site.
3. Assumed all material required for embankments shall be imported from off site.
4. Assumed no contaminated earthworks are within the rail corridor.
5. Assumed no diversion of watercourses required.
6. Assumed to alterations to the A21 roundabout.
7. Assumed no alterations to existing rail corridor, west of The Clappers Crossing.
8. This cost estimate does not include any alteratiosn to Northbridge Street at Clappers Junction as this is present in all options and will therefore not affect the comparison.
9. Assumed no impact to adjacent properties.
10. Bridges 5a and 15 are not considered within these estimates as they are present in all options and will therefore not affect the comparison.

3.2 Exclusions

The following items are excluded from this cost estimate:

1. Additional land purchases and compensation costs
2. The effects of inflation beyond the estimate base date
3. Client's in house management and administration costs
4. Cost of financing the works
5. VAT, taxes and other levies
6. Rolling Stock
7. Permanent Way
8. Railway control systems (apart from Level Crossing at A21)
9. Operational telecommunication systems
10. Utility Diversions
11. Risk (other employer risks not covered by optimism bias)
12. Possessions (TOC)
13. Operational/Maintenance (OPEX) costs.

4.0 REFERENCED DOCUMENTS

4.1 Documents

The following documents have been referenced for the basis of this cost estimate:

Ref.	Date	Document Description	Author
239025-A21-G-001 P1	01/02/2019	Rother Valley Railway Proposed Rail Extension - Option 1 Level Crossing General Arrangement	Arup
239025-A21-G-002 P1	01/02/2019	Rother Valley Railway Proposed Rail Extension - Option 2 Rail Under Road General Arrangement	Arup
239025-A21-G-003 P1	01/02/2019	Rother Valley Railway Proposed Rail Extension - Option 3 Rail Over Road General Arrangement	Arup
239025-A21-G-004 P1	01/02/2019	Rother Valley Railway Proposed Rail Extension - Option 4 Road Over Rail With Raised Road General Arrangement	Arup
REP/239025/R001	05/02/2019	A21(T) Crossing Options Feasibility Report	Arup

5.0 EXECUTIVE SUMMARY

	GRAND SUMMARY	Total (£) Option 1	Total (£) Option 2	Total (£) Option 3	Total (£) Option 4
1	**Direct Construction Works**				
1 01	Railway Control Systems (level crossing only)	£300,000	excl	excl	excl
1 02	Train Power Systems	excl	excl	excl	excl
1 03	Electric Power and Plant	excl	excl	excl	excl
1 04	Permanent Way	excl	excl	excl	excl
1 05	Telecommunication Systems	excl	excl	excl	excl
1 06	Buildings and Property	n/a	n/a	n/a	n/a
1 07	Civil Engineering	£2,464,000	£4,796,000	£8,361,000	£4,607,000
1 08	Enabling Works	£276,000	£480,000	£669,000	£460,000
Sub -Total (Direct Construction Cost Only)		**£3,040,000**	**£5,276,000**	**£9,030,000**	**£5,067,000**
2	**Indirect Construction Works**				
2 01	Preliminaries (25%)	£760,000	£1,319,000	£2,258,000	£1,267,000
2 02	Contractor Overheads and profit (8%)	£304,000	£528,000	£903,000	£507,000
Sub -Total (Construction Costs)		**£4,104,000**	**£7,123,000**	**£12,191,000**	**£6,841,000**
3	**Project / Design Team Fees and Other Project Costs**				
3 01	Design Team Fees (10%)	£410,000	£712,000	£1,219,000	£684,000
3 02	Project Team Fees (5%)	£205,000	£356,000	£610,000	£342,000
3 03	Other Project Development Costs				
	Possessions	excl	excl	excl	excl
	Land	excl	excl	excl	excl
	Utilities	excl	excl	excl	excl
Sub -Total (before Risk/Optimism Bias)		**£4,719,000**	**£8,191,000**	**£14,020,000**	**£7,867,000**
4	**Risk**				
4 01	Optimism Bias 44%	£2,076,000	£3,604,000	£6,169,000	£3,461,000
5	**Inflation**				
5 01	Inflation	excl	excl	excl	excl
6	**Taxation & Grants**				
6 01	Tax allowance and grants	excl	excl	excl	excl
Grand Total		**£6,795,000**	**£11,795,000**	**£20,189,000**	**£11,328,000**

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www.arup.com

Rother Valley Railway

GRIP 2 Cost Estimate

6.0 Detailed Cost Estimate

ARUP

Job Number : 239025-02

Ref	Series	Description	Quantity	Unit	Rate	Total	Notes
6.1		Option 1					
1		Direct Construction Works					
	1 01	Railway Control Systems				300,000	
	1 02	Train Power Systems				excl	
	1 03	Electric Power and Plant				excl	
	1 04	Permanent Way				excl	
	1 05	Telecommunication Systems				excl	
	1 06	Buildings and Property				n/a	
	1 07	Civil Engineering				2,464,000	
	1 08	Enabling Works				276,000	
		Carried Forward to Grand Summary				3,040,000	

Ref	Series	Description	Quantity	Unit	Rate	Total	Notes
6.1		Option 1					
1 01		Railway Control Systems					
		Level Crossing	1 00	item		300,000	includes for the installation of the crossing, gates, controls and signals Provided by Client/Engineer
		Carried Forward to Construction Works Summary				300,000	

Ref	Series	Description	Quantity	Unit	Rate	Total	Notes
6.1		Option 1					
1 07		Civil Engineering					
	1 07 01	Earthworks					
		Embankment	10392	m³	47	494,000	
		Cutting	146	m³	40	6,000	
	1 07 02	Coastal and estuarial defences					
	1 07 03	Tunnels and shafts					
	1 07 04	Subways and underpasses					
	1 07 05	Bridges and viaducts					
		Bridge no 6	51	m²	3,366	172,000	
		Bridge no 7 - Culvert	10	m	6,235	62,000	
		Bridge no 8	30	m²	3,984	120,000	
		Bridge no 9	51	m²	4,260	217,000	
		Bridge no 10	51	m²	4,260	217,000	
		Bridge no 11	51	m²	4,260	217,000	
		Bridge no 12	50	m²	3,984	199,000	
		Bridge no 13	150	m²	3,608	541,000	
		Bridge no 14	50	m²	3,984	199,000	
	1 07 06	Footbridges					
	1 07 07	Retaining Walls					
	1 07 08	Fencing and enclosures					
	1 07 09	General drainage					
	1 07 10	Track foundations					
	1 07 11	Roads, pavements and hardstandings					
		Traffic Management allowance to A21	1 00	item	20,000	20,000	No major works to divert the A21 Traffic Management only, 2 overnight closures Assumed the level crossing installation can be completed within these 2 overnight closures
	1 07 12	Troughing					
		Carried Forward to Construction Works Summary				2,464,000	

Ref	Series	Description	Quantity	Unit	Rate	Total	Notes
6.1		Option 1					
1 08		Enabling Works					
	1 08 01	Extra ordinary site investigation works	2 5%			69,000	Allowance of 2 5% of direct works included for enabling works
	1 08 02	Site clearance and preparation works	2 5%			69,000	Allowance of 2 5% of direct works included for enabling works
	1 08 03	Structure specific enabling works	5 0%			138,000	Allowance of 5% of direct works included for enabling works
		Carried Forward to Construction Works Summary				276,000	

Ref	Series	Description	Quantity	Unit	Rate	Total	Notes
6.2		Option 2					
1		Direct Construction Works					
	1 01	Railway Control Systems				excl	
	1 02	Train Power Systems				excl	
	1 03	Electric Power and Plant				excl	
	1 04	Permanent Way				excl	
	1 05	Telecommunication Systems				excl	
	1 06	Buildings and Property				n/a	
	1 07	Civil Engineering				4,796,000	
	1 08	Enabling Works				480,000	
		Carried Forward to Grand Summary				5,276,000	

Ref	Series	Description	Quantity	Unit	Rate	Total	Notes
6.2		Option 2					
1 07		Civil Engineering					
	1 07 01	Earthworks					
		Cutting	5084	m³	40	202,000	
		Embankment	2222	m³	47	106,000	
	1 07 02	Coastal and estuarial defences					
	1 07 03	Tunnels and shafts	15 00	m	7,707	116,000	
	1 07 04	Subways and underpasses					
	1 07 05	Bridges and viaducts					
		Bridge no 6	51	m²	3,366	172,000	
		Bridge no 7 - Culvert	10	m	6,235	62,000	
		Bridge no 8 - inverted siphon 3m deep	8	m	10,417	83,000	
		Bridge no 9 - inverted siphon 4m deep	8	m	11,569	93,000	
		Bridge no 10 - inverted siphon 5m deep	8	m	12,759	102,000	
		Bridge no 11 - inverted siphon 5m deep	8	m	12,759	102,000	
		Bridge no 12 - inverted siphon 3m deep - 4 pipe	8	m	12,987	104,000	
		Bridge no 13 - inverted siphon 3m deep - 4 pipe	8	m	12,987	104,000	
		Bridge no 14 - inverted siphon 5m deep	8	m	12,759	102,000	
		Temporary Bridges to A21 diversion	200	m²	1,335	267,000	
		Temporary Culverts to A21 diversion	20	m	1,000	20,000	
	1 07 06	Footbridges					
	1 07 07	Retaining Walls (twin)	340 00	m	6,629	2,254,000	Retained Cut
	1 07 08	Fencing and enclosures					
	1 07 09	General drainage					
	1 07 10	Track foundations					
	1 07 11	Roads, pavements and hardstandings					
		Temporary Diversion of A21	1 00	item	346,000	346,000	including traffic management and removal
		Reinstatement of A21 following cut & cover tunnel completion	1 00	item	561,000	561,000	
	1 07 12	Troughing					
		Carried Forward to Construction Works Summary				4,796,000	

Rother Valley Railway

GRIP 2 Cost Estimate

6.0 Detailed Cost Estimate

ARUP

Job Number : 239025-02

Ref	Series	Description	Quantity	Unit	Rate	Total	Notes
6.2		Option 2					
1 08		Enabling Works					
	1 08 01	Extra ordinary site investigation works	2 5%			120,000	Allowance of 2 5% of direct works included for enabling works
	1 08 02	Site clearance and preparation works	2 5%			120,000	Allowance of 2 5% of direct works included for enabling works
	1 08 03	Structure specific enabling works	5 0%			240,000	Allowance of 5% of direct works included for enabling works
		Carried Forward to Construction Works Summary				480,000	

Rother Valley Railway

GRIP 2 Cost Estimate

6.0 Detailed Cost Estimate

ARUP

Job Number : 239025-02

Ref	Series	Description	Quantity	Unit	Rate	Total	Notes
6.3		**Option 3**					
1		Direct Construction Works					
	1.01	Railway Control Systems				excl.	
	1.02	Train Power Systems				excl.	
	1.03	Electric Power and Plant				excl.	
	1.04	Permanent Way				excl.	
	1.05	Telecommunication Systems				excl.	
	1.06	Buildings and Property				n/a	
	1.07	Civil Engineering				8,361,000	
	1.08	Enabling Works				669,000	
		Carried Forward to Grand Summary				9,030,000	

Ref	Series	Description	Quantity	Unit	Rate	Total	Notes
6.3		Option 3					
1.07		Civil Engineering					
	1.07.01	Earthworks					
		Embankments	3274	m	47	155,000	
		Cutting	33	m	40	1,000	
	1.07.02	Coastal and estuarial defences					
	1.07.03	Tunnels and shafts					
	1.07.04	Subways and underpasses					
	1.07.05	Bridges and viaducts					
		Bridge no. 6	51	m²	3,366	172,000	
		Bridge no. 7 - Culvert	18	m	6,235	112,000	
		Viaduct	3500	m²	2,263	7,921,000	
	1.07.06	Footbridges					
	1.07.07	Retaining Walls					
	1.07.08	Fencing and enclosures					
	1.07.09	General drainage					
	1.07.10	Track foundations					
	1.07.11	Roads, pavements and hardstandings					
	1.07.12	Troughing					
		Carried Forward to Construction Works Summary				8,361,000	

Ref	Series	Description	Quantity	Unit	Rate	Total	Notes
6.3		Option 3					
1.08		Enabling Works					
	1.08.01	Extra ordinary site investigation works	2.5%			209,000	Allowance of 2.5% of direct works included for enabling works
	1.08.02	Site clearance and preparation works	2.5%			209,000	Allowance of 2.5% of direct works included for enabling works
	1.08.03	Structure specific enabling works	3.0%			251,000	Allowance of 3% of direct works included for enabling works
		Carried Forward to Construction Works Summary				669,000	

Ref	Series	Description	Quantity	Unit	Rate	Total	Notes
6.4		Option 4					
1		Direct Construction Works					
	1 01	Railway Control Systems				excl	
	1 02	Train Power Systems				excl	
	1 03	Electric Power and Plant				excl	
	1 04	Permanent Way				excl	
	1 05	Telecommunication Systems				excl	
	1 06	Buildings and Property				n/a	
	1 07	Civil Engineering				4,607,000	
	1 08	Enabling Works				460,000	
		Carried Forward to Grand Summary				5,067,000	

Ref	Series	Description	Quantity	Unit	Rate	Total	Notes
6.4		Option 4					
1 07		Civil Engineering					
	1 07 01	Earthworks					
		Embankment	2586	m³	47	123,000	
		Cutting	1817	m³	40	72,000	
	1 07 02	Coastal and estuarial defences					
	1 07 03	Tunnels and shafts	15 00	m	7,707	116,000	
	1 07 04	Subways and underpasses					
	1 07 05	Bridges and viaducts					
		Bridge no 6	51	m²	3,366	172,000	
		Bridge no 7 - Culvert	10	m	6,235	62,000	
		Bridge no 8	30	m²	3,984	126,000	
		Bridge no 9	51	m²	4,260	229,000	
		Bridge no 10	51	m²	4,260	229,000	
		Bridge no 11	51	m²	4,260	229,000	
		Bridge no 12	50	m²	3,984	211,000	
		Bridge no 13	150	m²	3,840	384,000	
		Bridge no 14	50	m²	3,984	211,000	
		Temporary Bridges to A21 diversion	200	m²	1,335	267,000	
		Temporary Culverts to A21 diversion	20	m	1,000	20,000	
	1 07 06	Footbridges					
	1 07 07	Retaining Walls (twin)	100 00	m	4,827	483,000	Retained Cut
	1 07 08	Fencing and enclosures					
	1 07 09	General drainage					
	1 07 10	Track foundations					
	1 07 11	Roads, pavements and hardstandings					
		Temporary Diversion of A21	1 00	item	346,000	346,000	including traffic management
		Reinstatement of A21 following cut & cover tunnel completion	1 00	item	561,000	561,000	
		Embankment to A21	16128	m³	47	766,000	
	1 07 12	Troughing					
		Carried Forward to Construction Works Summary				4,607,000	

Ref	Series	Description	Quantity	Unit	Rate	Total	Notes
6.4		Option 4					
1 08		Enabling Works					
	1 08 01	Extra ordinary site investigation works	2 5%			115,000	Allowance of 2 5% of direct works included for enabling works
	1 08 02	Site clearance and preparation works	2 5%			115,000	Allowance of 2 5% of direct works included for enabling works
	1 08 03	Structure specific enabling works	5 0%			230,000	Allowance of 5% of direct works included for enabling works
		Carried Forward to Construction Works Summary				460,000	

Appendix D

RVR Fully worked up estimate of actual cost to RVR of constructing level crossing (Option 1)

Rother Valley Railway
LIMITED
IN ASSOCIATION WITH THE KENT & EAST SUSSEX RAILWAY
ROBERTSBRIDGE JUNCTION STATION, STATION ROAD,
ROBERTSBRIDGE, EAST SUSSEX. TN32 5DG
www.rvr.org.uk

16 May 2019

Our ref: Chairman/GSC/761
Your ref:

RVR A21 Crossing Options Report
Option 1 - Pricing

1. Introduction

RVR has priced Option 1 (At-grade Crossing) on the basis that will be constructed using the well proven RVR construction model.

2. RVR Construction Model

Rother Valley Railway Ltd acts as the Engineering, Procurement, Installation, and Commissioning (EPIC) contractor delivering phases of the Bodiam to Robertsbridge Reconnection Project for the Client which is the RVR Heritage Trust.
RVR has within its EPIC team:

- Volunteer professional designers and certifiers,
- Volunteer project managers,
- Small local subcontractors,
- Volunteer track laying contractor

3. EPIC Team Construction Experience

RVR has already built 2km of railway to mainline railway standards, winning many industry awards:
Phases 1, 2, and 3 from Bodiam to Junction Road, 1.5km of rebuilt embankment, culverts, and track bed.
Phase 5 from Robertsbridge Junction Station to Northbridge Street includes 1 strengthened bridge with new steel deck, 1 bridge deck replacement, 3 new RC bridges with steel decks, and a steel sheet piling river wall. (Institution of Civil Engineers' Engineering Excellence Awards 2013 - Restoration Award)
Phase 6 includes an embankment widening, a new connection to the Network Rail mainline, a reinforced concrete retaining wall, five coach platform, (ICE SE Engineering Excellence Awards 2017 - Community Benefit Award)
Phase 7 includes the foundations for the water tower and water crane, and foundations for the booking hall and toilet block.
For Kent and East Sussex Railway (K&ESR), RVR project managed a new 4 road Carriage Storage Shed and sidings. (ICE South Coast Engineering Excellence Awards 2015 - Special Award (Community))
Working as K&ESR, the team reconstructed the 5.7km line between Northiam and Bodiam Stations
K&ESR more recently reconstructed the A26 level crossing with the deck system proposed for the RVR level crossings.

4. Cost Estimate

1	Design and Certification (Volunteer Professionals)	£0.00
2	Site Facilities	£18,310.00
3	Embankment and Culverts	£957,590.00
4	Steel Sheet Piling	£168,000.34
5	Bridge Decks (RVR owned)	£0.00
6	Bridge Deck Transport and Setting	£16,800.00
7	Level Crossing Installation	£171,000.00
	Subtotal	£1,331,700.34
8	Supervision	£28,600.00
9	Overheads	£39,317.00
10	Profit (Registered Charity)	£0.00
	Subtotal	£1,399,617.34
11	Contingency 10%	£139,692.00
	Total	**£1,539,579.34**

Note: Excludes VAT and Inflation

5. Attachments

A. Price build up
B. Copies of quotations
C. Andrew Wood's detailed estimate
D. Award certificates

Gardner Crawley BSc(Eng), CEng, FICE
Chairman Rother Valley Railway Ltd

Ref	Description	Amount
	Option 1 Cost Summary	
	Construction of Formation from Northbridge Street to East of A21 (Chainage 820+00 to 1420+00)	
1	Design and Certification (Volunteer Professionals)	£0.00
2	Site Facilities	£18,310.00
3	Embankment and Culverts	£957,590.00
4	Steel Sheet Piling	£168,000.34
5	Bridge Decks (RVR owned)	£0.00
6	Bridge Deck Transport and Setting	£16,800.00
7	Level Crossing Installation	£171,000.00
	Subtotal	£1,331,700.34
8	Supervision	£28,600.00
9	Overheads	£39,317.00
10	Profit (Registered Charity)	£0.00
	Subtotal	£1,399,617.34
11	Contingency 10%	£139,962.00
	Total	**£1,539,579.34**

Description	Element	Option 1	Option 2	Option 3	Option 4
Item 1 Design and Certification					
Volunteer Professional Engineers					
Graham Bessant	Certification	Yes	No	No	No
Alan Hayward	Culverts	Yes	No	No	No
Derek Kent	Temporary Works	Yes	No	No	No
John Streeves	Steel Bridges	Yes	No	Yes	No
Total to Summary		£0.00	N/A	N/A	N/A

Description	Qty	Unit	Rate	Amount	Total
Item 2 Site Facilities					
Construction Period					
Andrew Wood estimate 24-Apr-19					
AW Duration 6 months	6	months			
	26	weeks			
Wheelwash (Rahul Sodha)					
Hire	26	weeks	£255.00	£6,630.00	
Transport Each way	4	trips	£995.00	£3,980.00	
					£10,610.00
Toilet (4Jays)					
Hire	26	weeks	£200.00	£5,200.00	
Transport Each way	4	trips	£100.00	£400.00	
					£5,600.00
Office (4Jays)					
Hire	26	weeks	£35.00	£910.00	
Transport Each way	4	trips	£100.00	£400.00	
					£1,310.00
Storage (4Jays)					
Hire	26	weeks	£15.00	£390.00	
Transport Each way	4	trips	£100.00	£400.00	
					£790.00
Total to Summary					£18,310.00

Description	Detail	Total
Item 3 Embankment and Culverts		
Groundwork		
Andrew Wood Estimate 24-Apr-19		
North Bridge Street yard (RB.J side)		£17,120.00
North Bridge Street yard (A21side)		£17,680.00
Rother Bridge foundations	(Excl SSP & Crane))	£60,720.00
Rother Bridge flood bund retaining wall		£38,490.00
Bridge 7	pipe culvert	£29,320.00
Bridge 8	4 unit wide box culvert	£71,280.00
Bridge 9	2 unit wide box culvert	£42,865.00
Bridge 10	2 unit wide box culvert	£42,865.00
Bridge 11	2 unit wide box culvert	£42,865.00
Mill Stream Bridge foundations	(Excl SSP & Crane))	£67,720.00
Bridge 13	pipe culvert	£131,400.00
Bridge 14	2 unit wide box culvert	£42,865.00
Embankment		£352,400.00
Total to Summary		£957,590.00

Description	Qty	Unit	Rate	Total
Item 4 Steel Sheet Piling				
Installation				
Mobilisation and demobilisation of all equipment to and from site.	2	per visit	£8,050.00	£16,100.00
External Site Move	2	per move	£3,770.00	£7,540.00
Provide a Warranty - cost subject to agreed wording		sum		Not Offered
Production of a full sheet pile Design Report & drawings No. of Design Cases; Excludes work on Frame Design, AIP or Rail Forms **1**	1	sum	£750.00	£750.00
Provide a Bond - cost subject to agreed wording		sum		Not Offered
Reaction stand set up.	4	lin.m	£1,370.00	£5,480.00
Bridge 6 - River Rother East Abutment - Internal Dimensions - 4.14m x 7.14m	226.8	m²	£144.75	£32,829.30
Bridge 6 -River Rother West Abutment - Internal Dimensions - 4.14m x 7.14m	226.8	m²	£144.75	£32,829.30
Bridge 12 - Mill Stream East Abutment - Internal Dimensions - 4.14m x 7.14m	226.8	m²	£144.75	£32,829.30
Bridge 12 -Mill StreamWest Abutment - Internal Dimensions - 4.14m x 7.14m	226.8	m²	£144.75	£32,829.30
EO for Interlocking corner pieces	36	lin m	£67.69	£2,436.84
Flame cutting piles during installation, in free air	214.2	per visit	£20.00	£4,284.00
Mobilisation of welders to flame cut the sheet piles after removal of the frames	4	per visit	£1,100.00	£4,400.00
Mobilisation of an "Oasis Unit" as per our Pricing Notes		per visit	£520.00	Ext if Reqd
Hire of an "Oasis Unit" as per our Pricing Notes (minimum 1 week hire)		week	£270.00	Ext if Reqd
Supply 1no. O&M Manual in electronic format		sum	£1,000.00	Ext if Reqd
Supply a setting out engineer for the sheet piling element of our works		week	£2,144.00	Ext if Reqd
Supply a Non Working SSSTS Supervisor for the Piling element of our works		week	£2,400.00	Ext if Reqd
Due on Installation				£172,308.04
This estimate is based on the following durations for each specific task.				
Please allow for any potential delays that you consider may occur at the rates below -				
16 days to install the sheet piles with 1no piling gang		day	£2,990.00	Ext if Reqd

Description	Qty	Unit	Rate	Total
Item 4 Steel Sheet Piling				
2 days to cut down the sheet piles to top of abutment level with 1no gang		day	£1,750.00	Ext if Reqd
				£172,308.04
less 2.5% discount for prompt payment				-£4,307.70
Dayworks/Standing Time from Dayworks Page	1	item	£0.00	
				£168,000.34

Description	Detail	Total
Item 5 Bridge Decks		
RVRL already owned, in storage		
Bridge No 6 (River Rother) Bought from Cow Lane Bridge Replacement, Reading Scrap price paid Plus haulage		
Bridge No 12 (Mill Stream) - ditto -		
Total to Summary		£0.00

Description	Detail	Total
Item 6 Bridge Deck Transport and Setting		
Coussens Estimate 11-Apr-19		
Bridge No 6 (River Rother)		
Crane for each visit on CPA Contract lift		£3,200.00
Transport with escorting		£2,000.00
Crane for each visit on CPA Contract lift		£3,200.00
Bridge No 12 (Mill Stream)		
Crane for each visit on CPA Contract lift		£3,200.00
Transport with escorting		£2,000.00
Crane for each visit on CPA Contract lift		£3,200.00
Total to Summary		£16,800.00

Description	Qty	Unit	Rate	Amount
Item 7 Level Crossing Installation				
Site Works (Peter Barber email 4 Apr 2019):				
Ground investigations		Sum		£10,000.00
Surface water drainage		Sum		£5,000.00
Service diversions - none		Sum		£0.00
Approach signage		Sum		£10,000.00
Subtotal				
Level Crossing Installation (Peter Barber email 2 Feb 2019)				
Crossing units and rail bonded in	18	m	£2,000.00	£36,000.00
Crane hire		Sum		£5,000.00
Ground works to bottom of concrete level		Sum		£20,000.00
Make good road and white lining		Sum		£10,000.00
High friction road surface	40	m	£250.00	£10,000.00
Rail and corrosion protection		Sum		£5,000.00
Subtotal				
Level Crossing Equipment (Paul Baker and RH&DR)				
Road Management		Sum		£10,000.00
CCTV		Sum		£10,000.00
Lifting barriers & Control system		Sum		£40,000.00
Total to Summary				

Total
£25,000.00
£86,000.00
£60,000.00
£171,000.00

Description	Qty	Unit
Item 8 Supervision		
Average costs from Company Accounts		
6 months construction manager		
Weeks	26	
Days	130	
Rate	£160.00	
Total		£20,800.00
Expenses		
Days	130	
Accommodation	£60.00	
		£7,800.00
Total to Summary		£28,600.00

Description	Amount	Total
Item 9 Overheads		
Company Overheads		
Annual (2015)	£52,000.00	
Rate	£4,333.33	
Months	6	
Total		£26,000.00
Site Overheads		
Construction Cost	£1,331,700.34	
Phases 5, 6, 7	1.00%	
Total		£13,317.00
Total to Summary		£39,317.00

Details	2010	2011	2012	2013	2014	2015	2016	2017
From Annual Accounts – Trading, Profit & Loss Account								
INCOME:								
Rent Receivable	5,221	5,016	4,975	4,975	4,975	6,100	7,087	6,813
Donations	9,276	9,738	7,239	9,845	9,913	9,658	9,693	10,065
Sundry Income	31	281					4,340	158
Revenue grants	19,814	29,037	24,011	40,605	58,892	81,225	74,155	73,168
Bank Interest Received								
Sale of Scrap		3,199	6,164	2,455	2,953	1618	584	
Legacy					500			
Profit from disposal of Fixed Assets		3,903		7,304		87		
Total:	34,342	51,174	42,389	65,184	77,233	98,688	95,859	90,204
Per Accounts	34,342	51,174	42,389	65,184	77,233	98,868	95,859	90,204
EXPENDITURE:								
Rent Payable	4,376	4,382	4,377	4,377	4,376	4,372	5,126	4,901
Insurance	3,533	3,767	3,934	3,761	3,797	3,716	3,943	4,425
Electricity & Heating Gas	895	827	1,236	1,568	1,402	1,157	1,129	1,706
Telephone & Broadband	289	437	388	389	430	518	541	532
Water & Sewerage	87	150	314	358	241	228	158	265
Waste collection	162	318	384	457	729	905	1,172	793
Weedkilling								
Bank Charges	127	201	195	182	136	138	183	140
Health & Safety expenses	62	56	44	222	355	181	4	248
Legal & Professional Fees	55	14	14	13	13	13	380	13
Subscriptions	45	47	65	65	105	165	160	160
NR connection charge								
General Repairs & Maintenance	8,879	782	3,849	1,335	1,361	1,005	3,867	524
Maintenance of Rolling Stock	241	3,270	127	495	353	2,243	2,239	2,543
Diesel fuel	200	160	50	125	128	75	40	35
Tools & General cons	2,393	3,646	2,299	2,914	3,972	3,327	3,216	2,018
Forestry & Gardening		-	60		110		2,850	2,197
Cleaning			351		923	1,040	1,085	749
Sundry Expenses	754	632		1,499	861	875	2,443	2,181
Supervision					9,150	24,190	3,910	
Depreciation - Permanent Way	9,915	22,661	16,907	29,850	39,776	44,983	49,324	51,192
Depreciation – Buildings & Structures	669	669	858	858	189	189	3,074	11,075
Depreciation – Fixtures & Fittings	263	343	343	750	607	604	413	365
Depreciation – Plant & Equipment	457	311	589	730	675	1,698	1,807	1,901
Depreciation – Rolling Stock	3,858	7,003	7,888	7,458	7,318	7,318	7,318	7,318
Loss from disposal of Fixed Asset					1,884		567	
Total:	37,260	49,676	44,272	57,406	78,891	98,940	94,949	95,281
Overheads (Ex Depreciation & Superv	27,345	27,015	27,365	27,556	39,115	53,957	45,625	44,089

Rother Valley Railway
LIMITED
IN ASSOCIATION WITH THE KENT & EAST SUSSEX RAILWAY
ROBERTSBRIDGE JUNCTION STATION, STATION ROAD,
ROBERTSBRIDGE, EAST SUSSEX. TN32 5DG
www.rvr.org.uk

RVR A21 Crossing Options Report
Option 1 – Pricing Appendices

1 Design and Certification - Volunteer Professionals Confirmation
2 Site Facilities – Suppliers Quotations
3 Embankment and Culverts – Andrew Wood Quotation
4 Steel Sheet Piling – Berryrange Quotation
5 Bridge Decks (RVR owned)
6 Bridge Deck Transport and Setting – Coussens Quotation
7 Level Crossing Installation – Peter Barber Quotation
8 Supervision - RVRL records
9 Overheads - RVRL records
10 Profit - RVRL records

Rother Valley Railway Limited
RVR A21 Crossing Options Report
Option 1 – Pricing Appendices

Appendix 1- Design and Certification

Volunteer Professionals Confirmation:

Description	Element	Option 1	Option 2	Option 3	Option 4
Graham Bessant	Certification	Yes	No	No	No
Alan Hayward	Culverts	Yes	No	No	No
Derek Kent	Temporary Works	Yes	No	No	No
John Streeves	Steel Bridges	Yes	No	Yes	No
Total to Summary		£0.00	N/A	N/A	N/A

Rother Valley Railway Limited
RVR A21 Crossing Options Report
Option 1 – Pricing Appendices

Appendix 2 - Site Facilities

Suppliers' Quotations attached

Duration 6 months	6	months			
	26	weeks			
Wheelwash (Rahul Sodha)					
Hire	26	weeks	£255.00	£6,630.00	
Transport Each way	4	trips	£995.00	£3,980.00	
					£10,610.00
Toilet (4Jays 1 May 2019)					
Hire	26	weeks	£200.00	£5,200.00	
Transport Each way	4	trips	£100.00	£400.00	
					£5,600.00
Office (4Jays 1 May 2019)					
Hire	26	weeks	£35.00	£910.00	
Transport Each way	4	trips	£100.00	£400.00	
					£1,310.00
Storage (4Jays 1 May 2019)					
Hire	26	weeks	£15.00	£390.00	
Transport Each way	4	trips	£100.00	£400.00	
					£790.00
Total to Summary					£18,310.00

Lorry Wheel Wash Not included

From: Rahul Sodha
Sent: 23 April 2019 11:14
To: andrewwoodplant@hotmail.co.uk
Subject:

HI Andrew,

Hope you are well ...

Thanks for your time earlier on the phone. Sorry for the delay in someone getting back to you with a prices.

Please see below prices;

Adjustable Wheelwash
£255.00 + VAT Per week

Transport
£995.00 + VAT each way

If you have any questions, please do not hesitate to get in touch with me.

Thanks and kind regards,
Rahul Sodha

Microsoft Outlook Web App

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- Drafts [638]
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RE: Four Jays - contact form

Debs - Four Jays Group [Debs@fourjays.co.uk]

To help protect your privacy, some content in this message has been blocked. If you're sure this message is from a trusted sender and you want to re-enable the blocked features, click here.

Sent: 01 May 2019 08:16
To: Gardner Crawley
Cc: Jax - Four Jays Group [Jax@fourjays.co.uk]

Dear Crawley

We charge at present £200 p.w. for a 12ft x 8ft welfare which is a 6 man one and includes a weekly service, plus haulage + VAT.

We do stores and offices. A 12ft store is £15 p.w. and hiab delivery and collection + VAT we also do offices which can be static or trailer and these vary but are usually £35 - £45 p.w. depending on size.

If you hired the store and office and both were static they could be delivered together on one delivery and collection on the hiab lorry.

I hope this helps if you need any more information please call the office.

Kind regards,

Debs Roberts
Four Jays Group

PLEASE VIEW OUR WEBSITE
www.fourjays.co.uk

Tel.: 01622 843135
Fax: 01622 844410
Email: debs@fourjays.co.uk
www.fourjays.co.uk

MUTAmarq Best practice accredited

Find us on Facebook

From: Enquiries - Four Jays Group <enquiries@fourjays.co.uk>
Sent: 01 May 2019 08:06
To: Jax - Four Jays Group <Jax@fourjays.co.uk>

Subject: FW: Four Jays - contact form

Kind regards,

Sarah Worsfold
Director, Four Jays Limited
Partner, Janet's China Hire
Director, Smart Event Support Limited

PLEASE VIEW OUR WEBSITES
www.fourjays.co.uk
www.janetschinahire.co.uk
www.smarteventsupport.co.uk

Tel.: 01622 843135
Fax: 01622 844410
Email: sarah@fourjays.co.uk

From: Four Jays Group <gardner.crawley@dalsterling.com>
Sent: 01 May 2019 07:06
To: Commercial - Four Jays Group <commercial@fourjays.co.uk>
Subject: Four Jays - contact form

From: Gardner Crawley
Email: gardner.crawley@dalsterling.com
Telephone Number: 07776 236465
Items Required: welfare unit for 6 people 12ft office 12ft store
How did you hear about us?: Word of Mouth

Event Information
Date of Event:
Type of Event:
Location of Event:
Expected number of guests:

Commercial Information
Location of site: Robertsbridge
Requirements: We are looking at a 6 month construction project for Summer 2020. Please give me a budget price for on/off cost + hire for 12ft welfare unit + service costs
Duration: 6 months.

Connected to Microsoft Exchange

Appendix 3 - Embankment and Culverts

Andrew Wood Quotation dated 24 April 2019 attached

Andrew Wood Plant Hire

Elwyn Farm
Playden
Rye
East Sussex
TN31 7UN

VAT No: 702981340
Tel. 07860 837085

Quotation Page 1

Rother Valley Railway
C/O David Felton
78 Halstead Walk
Maidstone
Kent
ME16 0PW

Invoice No.	1522
Invoice/Tax Date	24/04/2019
Order No.	
Account No.	ROTHERV

Details	Net Amt	VAT
Groundwork estimate for proposed rail extension to Bodiam		
TOTALS		
North Bridge Street yard (RBJ side)	17,120.00	3,424.00
North Bridge Street yard (A21 side)	17,680.00	3,536.00
Rother Bridge foundations	60,720.00	12,144.00
Rother Bridge flood bund retaining wall	38,490.00	7,698.00
Bridge 7 pipe culvert	29,320.00	5,864.00
Bridge 8 4 unit wide box culvert	71,280.00	14,256.00
Bridge 9 2 unit wide box culvert	42,865.00	8,573.00
Bridge 10 2 unit wide box culvert	42,865.00	8,573.00
Bridge 11 2 unit wide box culvert	42,865.00	8,573.00
Mill Stream Bridge foundations	67,720.00	13,544.00
Bridge 13 pipe culvert	131,400.00	26,280.00
Bridge 14 2 unit wide box culvert	42,865.00	8,573.00
Embankment	352,400.00	70,480.00

BANK DETAILS. ACC NO 82457182
SORT CODE 60-18-09

PAYMENT TERMS: STRICTLY 28 DAYS FROM INVOICE DATE.

Total Net Amount	957,590.00
Total VAT Amount	191,518.00
Invoice Total	1,149,108.00

Appendix 4 - Steel Sheet Piling

Berryrange Quotation dated 21 April 2019 attached

Date :- **21st April 2019** Our Ref :- **E7478A** /BQ/ 02 R0

Berryrange

Client :- **Rother Valley Railway - DAL Streling**

Contract :- **Phase 4, Rother Valley Railway, Robertsbridge.** **Option 2 - Non-Conforming Design**

F.A.O. **Mr. Gardner Crawley** **Installation with a WP 150 Piler**

Item	Description	Quant.	Unit	Rate	Amount
	Sheet Piling **Based on Berryrange design -** V1				
	Installation				
1	Mobilisation and demobilisation of all equipment to and from site.	2	per visit	£8,050.00	£16,100.00
(a)	External Site Move	2	per move	£3,770.00	£7,540.00
2	Provide a Warranty - cost subject to agreed wording		sum		Not Offered
3	Production of a full sheet pile Design Report & drawings No. of Design Cases; Excludes work on Frame Design, AIP or Rail Forms ***1***	1	sum	£750.00	£750.00
4	Provide a Bond - cost subject to agreed wording		sum		Not Offered
5	Reaction stand set up.	4	no	£1,370.00	£5,480.00
6	Bridge 6 - River Rother East Abutment - Internal Dimensions - 4.14m x 7.14m Supply, handle and install the following sheet piles using a WP150 silent piler or similar for a quiet and vibration free method	25.2	lin.m		
	42 no. GU21N @ 9.0 m long to retain 3.10 m Propped by others	226.8	m²	£144.75	£32,829.30
	Top of the sheet pile installed to +11.5m with an EGL at +10.65m to a formation level of +7.55m. Factor of Safety for Stability = 1.11 > 1.0 ok ***Temporary Prop/s;*** @ 11.25mOD, 27kN/m, (ULS) or 22kN/m (SLS) Suggest using a hired hydraulic frame. ***Surcharges;*** 10kPa General ***Anticipated Deflections*** < 5mm				
7	Bridge 6 -River Rother West Abutment - Internal Dimensions - 4.14m x 7.14m Supply, handle and install the following sheet piles using a WP150 silent piler or similar for a quiet and vibration free method	25.2	lin.m		
	42 no. GU21N @ 9.0 m long to retain 3.10 m Propped by others	226.8	m²	£144.75	£32,829.30
	Top of the sheet pile installed to +11.5m with an EGL at +10.65m to a formation level of +7.55m. Factor of Safety for Stability = 1.11 > 1.0 ok ***Temporary Prop/s;*** @ 11.25mOD, 27kN/m, (ULS) or 22kN/m (SLS) Suggest using a hired hydraulic frame. ***Surcharges;*** 10kPa General ***Anticipated Deflections*** < 5mm				
8	Bridge 12 - Mill Stream East Abutment - Internal Dimensions - 4.14m x 7.14m Supply, handle and install the following sheet piles using a WP150 silent piler or similar for a quiet and vibration free method	25.2	lin.m		
	42 no. GU21N @ 9.0 m long to retain 3.10 m Propped by others	226.8	m²	£144.75	£32,829.30
	Top of the sheet pile installed to +11.0m with an EGL at +10.35m to a formation level of +7.25m. Factor of Safety for Stability = 1.11 > 1.0 ok ***Temporary Prop/s;*** @ 10.75mOD, 27kN/m, (ULS) or 22kN/m (SLS) Suggest using a hired hydraulic frame. ***Surcharges;*** 10kPa General ***Anticipated Deflections*** < 5mm				
9	Bridge 12 -Mill StreamWest Abutment - Internal Dimensions - 4.14m x 7.14m Supply, handle and install the following sheet piles using a WP150 silent piler or similar for a quiet and vibration free method	25.2	lin.m		
	42 no. GU21N @ 9.0 m long to retain 3.10 m Propped by others	226.8	m²	£144.75	£32,829.30
	Top of the sheet pile installed to +11.0m with an EGL at +10.35m to a formation level of +7.25m. Factor of Safety for Stability = 1.11 > 1.0 ok ***Temporary Prop/s;*** @ 10.75mOD, 27kN/m, (ULS) or 22kN/m (SLS) Suggest using a hired hydraulic frame. ***Surcharges;*** 10kPa General ***Anticipated Deflections*** < 5mm				

10	EO for Interlocking corner pieces Interlocking corners - 4 no. allowed @ 9.0 m long	36.0	lin m	£67.69	£2,436.84
11	Flame cutting piles during installation, in free air	214.2	lin m	£20.00	£4,284.00
12	Mobilisation of welders to flame cut the sheet piles after removal of the frames	4	per visit	£1,100.00	£4,400.00
13	Mobilisation of an "Oasis Unit" as per our Pricing Notes		per visit	£520.00	Ext if Reqd
14	Hire of an "Oasis Unit" as per our Pricing Notes (minimum 1 week hire)		week	£270.00	Ext if Reqd
15	Supply 1no. O&M Manual in electronic format ***Please note that all As-Built drawings/Information to come from Setting Out Engineer***		sum	£1,000.00	Ext if Reqd
16	Supply a setting out engineer for the sheet piling element of our works ***(If required, please extend for 4 weeks)***		week	£2,144.00	Ext if Reqd
17	Supply a Non Working SSSTS Supervisor for the Piling element of our works ***(If required, please extend for 4 weeks)***		week	£2,400.00	Ext if Reqd
	This bill is to be read in conjunction with the pricing notes, design assumption notes, technical notes, piling attendances and our T's & C's				
	Due On Installation				£172,308.04
18	This estimate is based on the following durations for each specific task. Please allow for any potential delays that you consider may occur at the rates below -				
	16 days to install the sheet piles with 1no piling gang		day	£2,990.00	Ext if Reqd
	2 days to cut down the sheet piles to top of abutment level with 1no gang		day	£1,750.00	Ext if Reqd
					£172,308.04
	less 2.5% discount for prompt payment				-£4,307.70
A	Dayworks/Standing Time from Dayworks Page -	1	item	0.00	
	Total				**£168,000.34**
	Standing time for any reason beyond our control will be charged, based on a 10 hour working day, at the following hourly rates - Piling Gang **£299.00** Flame Cutting Gang **£175.00**				

Rother Valley Railway Limited
RVR A21 Crossing Options Report
Option 1 – Pricing Appendices

Appendix 5 - Bridge Decks

RVR owned, purchased for cost of scrap and transport from Cow Lane, Reading

Cow Lane, Reading 19 August 2011

Appendix 6 - Bridge Deck Transport and Setting

Coussens Quotation dated 11 April 2019 attached

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Drafts [636]
Inbox (14032)
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3008-Techint (17)
5092-KVE-Nordsee Ost (29)
8881-MC-Nuon (602)
8889-KS-Eldfisk (364)
8904-DEC-Sur IPP (16)
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Pending
Rotary

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RE: RVR Phase 4 Bridge Decks

Margaret Coussens [margaret@coussenscranes.co.uk]

You replied on 11/04/2019 20:45.

Sent: 11 April 2019 19:07
To: Gardner Crawley

Good Afternoon
From the current information available it would be difficult to give exact pricing but some ball park figures below

Loading and transport
Crane for each visit on CPA Contract lift circa £3200.00 plus Vat per visit
Transport with escorting circa £2000.00 per visit

If you need anything else please let me know
Thanks

Margaret
Hiredesk
Coussens Cranes Ltd
01424 892380
margaret@coussenscranes.co.uk

From: Paul Coussens [mailto:coussens.paul@googlemail.com]
Sent: 11 April 2019 08:49
To: Margaret Coussens <margaret@coussenscranes.co.uk>
Subject: Fwd: RVR Phase 4 Bridge Decks

Paul Coussens
Coussens Cranes
Tel 01424 892380
Mob 07860 643049
Fax 01424 893466

Begin forwarded message:

> **From:** Info <info@coussenscranes.co.uk>
> **Date:** 25 March 2019 at 08:46:00 GMT
> **To:** "'coussens.paul@googlemail.com'" <coussens.paul@googlemail.com>
> **Cc:** Margaret Coussens <margaret@coussenscranes.co.uk>
> **Subject: FW: RVR Phase 4 Bridge Decks**

Appendix 7 - Level Crossing Installation

Description	Qty	Unit	Rate	Amount	Total
Site Works (Peter Barber):					
Ground investigations		Sum		£10,000.00	
Surface water drainage		Sum		£5,000.00	
Service diversions - none		Sum		£0.00	
Approach signage		Sum		£10,000.00	
Subtotal					£25,000.00
Level Crossing Installation (Peter Barber email 2 Feb 2019)					
Crossing units and rail bonded in	18	m	£2,000.00	£36,000.00	
Crane hire		Sum		£5,000.00	
Ground works to bottom of concrete level		Sum		£20,000.00	
Make good road and white lining		Sum		£10,000.00	
High friction road surface	40	m	£250.00	£10,000.00	
Rail and corrosion protection		Sum		£5,000.00	
Subtotal					£86,000.00
Level Crossing Equipment (Paul Baker and RH&DR)					
Road Management		Sum		£10,000.00	
CCTV		Sum		£10,000.00	
Lifting barriers & Control system		Sum		£40,000.00	
					£60,000.00
Total to Summary					£171,000.00

RE: RVR A21 - Costing exercise by Arup in the "Options Report"

Peter Barber [peter.barber59@outlook.com]

Sent: 01 February 2019 09:52
To: David Gillett [david.gillett@davg.co.uk]
Cc: ian@bertramross.com; Gardner Crawley; 'David Keay' [david.keay@outlook.com]; 'Mike Hart (RWS)' [mikehart@railwaywheelset.co.uk]
Attachments: Offer - 1000008165 - Engla~1.pdf (3 MB) [Open as Web Page]

Hi David

I attached the offer for Jn Rd as reference but I would allow 18 m crossing and added in a bit of risk. The Jn Rd was done costing wise as a favour and as things stand we would get a reduction but we shouldn't rely on this.

Crossing units and rail bonded in @ £2k m £36.000
Crain hire £5,000
Ground works to bottom of concrete level £20,000
Make good road and white lining £20,000
High friction road surface circa 20 m each side of crossing £10,000
Rail and corrosion protection £5,000
Service diversion if any ????
Road management ????

As a ball park £100,00 but by pulling in some favours we get under this.

I have assume that we have a 52 hour closure but with detailed planning we may be able under traffic lights reduce the closure to 28 hrs but will have a knock on to cost.

I will get a more detailed breakdown and whole life cost based on a NR risk assessment for an A road but I relying on favours so is taking a bit longer.

Regards

Peter

-----Original Message-----
From: David Gillett <david.gillett@davg.co.uk>
Sent: 31 January 2019 13:27
To: 'Peter Barber' <peter.barber59@outlook.com>
Cc: ian@bertramross.com; 'Gardner Crawley' <Gardner.Crawley@dalsterling.com>; 'David Keay' <david.keay@outlook.com>
Subject: RE: RVR A21 - Costing exercise by Arup in the "Options Report"

Hi Peter,
Many thanks for the information on the crossing units etc. earlier today.
Sorry to chase, but have you managed to put any approximate costs together for the KESR crossing installation last year.
Kind regards
David(G)

-----Original Message-----
From: Peter Barber [mailto:peter.barber59@outlook.com]
Sent: 22 January 2019 17:14
To: David Gillett <david.gillett@davg.co.uk>
Cc: ian@bertramross.com; Gardner Crawley <Gardner.Crawley@dalsterling.com>; David Keay <david.keay@outlook.com>; Mike Burnham <mike@mikeburnham.com>

edilon)(sedra

edilon)(sedra bv · Postbus 1000 · NL-2003 RZ Haarlem · The Netherlands

Kent & East Sussex Railway Company
Registered Charity No. 2624812244

B2244 Junction Road
Robersbridge
TN32 5XD
United Kingdom

Haarlem, April 12, 2018

Project : 1000008165 – England – Kent & East Sussex Railway – B2244 Junction Road
Subject : e)(s LCS (Level Crossing System), including Corkelast® ERS (Embedded Rail System)
Our reference : 02.388.308

Dear Mr. Barber,

Following our discussions of last week we present you our final and best offer for the edilon)(sedra LCS (Level Crossing System) for the B2244 Junction Road Level Crossing.

The System

The e)(s LCS system combines prefabricated concrete level crossing slabs with the elastic edilon)(sedra Corkelast® Embedded Rail System (ERS) which provides continuously support of the rail in its fastening. This makes it very suitable for heavy (road) traffic loads. An additional advantage is the high durability of the slabs which provides a stable track support and a minimum of maintenance requirements. Road traffic safety is secured by the high skid resistance finish of the slab's upper surface.

Our offer

Standard pricing for edilon)(sedra LCS level crossing including ERS materials:

Quantity and system description	**Price per meter track**
e)(s LCS slabs three 3 or 4 m slabs (12 m single track) edilon)(sedra ERS design Ha 2016-0320D rail type to use: 56E1, rail inclination 1:20	€ 1.450,00

Afore mentioned price setting includes the following:

e)(s LCS prefabricated concrete LCS slabs (as per drawing Ma2016-0223B);

Concrete quality:

- Concrete strength class C45/55 according to DIN EN 206-1

Haarlem : March 12, 2018
Project : 1000008165 – England – Kent & East Sussex – B2244 Junction Road
Subject : e)(s LCS (Level Crossing System), including Corkelast® ERS (Embedded Rail System)
Our reference : 02.388.308

Structural Analysis:

- Verification of the level crossing slabs according to rail road
- traffic load model UIC 71 and road vehicle load model SLW 60

Surface treatment:

- Top surface of the slab; skid resistance treatment with Reckli Rhombus imprint.

ERS Materials:

- edilon)(sedra Corkelast®;
- edilon)(sedra Primers (both impregnating primer and bonding primer);
- Resilient rail strip and Dex-G 20 adhesive;
- Alignment materials to fix the rail in the channel;
- edilon)(sedra Joint Filler between slabs.

Additional items:

Slab protection shield (according to drawing Ma2016-0506)	€ 150,00 per set of two
Slab protection shield provision in slab ends (according to drawing Ma2016-0506). With this option dowels are provided in 2 slab ends so no drilling is necessary to fasten the protection shields	€ 190,00 per two slab ends
4 lifting devices (DEHA 6000-5,0-0120 5T) suitable for the lifting of slabs will be supplied for use at the project free of charge. However if these are not returned to edilon)(sedra within 2 weeks after slab installation we will invoice € 275,00 per lifting device	Free of charge / returnable
Flared flange ways at both level crossing ends (according to drawing Ma2016-0711A)	€ 250,00 each slab side
ERS Installation and Supervision Two operatives including travel and lodging	€ 5.600,00
Transport DAP work site Junction Road (B2244) near Robertsbridge (UK), according to Incoterms 2010	€ 2.700,00

edilon)(sedra

Haarlem : March 12, 2018
Project : 1000008165 – England – Kent & East Sussex – B2244 Junction Road
Subject : e)(s LCS (Level Crossing System), including Corkelast® ERS (Embedded Rail System)
Our reference : 02.388.308

Total cost overview	**Quantity**	**Unit**	**Unit price**	**Total price**
e)(s LCS system	12	m^1	€ 1.450,00	€ 17.400,00
Slab protection shield	2	pcs	€ 75,00	€ 150,00
Provision protection shield	2	pcs	€ 95,00	€ 190,00
Flared flangeways	2	slab end	€ 250,00	€ 500,00
Lifting devices	4	pieces		Free fo charge
ERS installation/ supervision	1	e)(s team		€ 5.600,00
Transport				€ 2.700,00
Total price				€ 26.540,00
One time only project discount				- € 2.654,00
Grand total:				**€ 23.886,00**

Prices for the standard edilon)(sedra LCS level crossing and materials include the following:

- **edilon)(sedra** provides delivery of edilon)(sedra to the agreed destination. Unloading at the work site is not included), transport costs include one waiting hour per delivery per truck. Further waiting hours, not caused by edilon)(sedra, are charged at € 80,00 per truck per hour.
- **edilon)(sedra** provides the supply of edilon)(sedra materials to the agreed destination. Transportation to and from the specific work location is the responsibility of the client.
- **edilon)(sedra** provides materials, equipment and personnel to install the edilon)(sedra Corkelast® Embedded Rail System.
- **edilon)(sedra** takes care of possible application of bad weather facilities and creation of appropriate climatic conditions, for the purpose of application of edilon)(sedra Corkelast® Embedded Rail System.

Prices do not included:

- Delivery and installation of nylon pull wire (to position cables in the ERS tubes);
- Logistical solutions to get edilon)(sedra materials and equipment on and off the job;
- The workplace must be free of any obstacles that can hinder the progress of edilon)(sedra activities;
- Removal and discard of old track and other materials;
- Preparation of subsoil;
- Unloading and placement of concrete elements;
- Supply, welding and handling of rail;
- Sandblasting and priming of rail;
- Surveyor for track alignment;
- Conditioned storage of materials if so required;
- Taking care of discharging edilon)(sedra packaging material;
- Road and traffic safety management;
- Permits and other locally required arrangements.

Haarlem : March 12, 2018
Project : 1000008165 – England – Kent & East Sussex – B2244 Junction Road
Subject : e)(s LCS (Level Crossing System), including Corkelast® ERS (Embedded Rail System)
Our reference : 02.388.308

Weather Services

When necessary, edilon)(sedra will install non storm proof bad weather facilities. Once these have been placed, we will try to create the right climate conditions, for instance by heating, to meet the requirements necessary for application of the edilon)(sedra Corkelast® Embedded Rail System.

When organizing the bad weather facilities the following shall be taken into account:

- Availability of tent materials
- Assembly and disassembly
- Lighting
- Heaters

Specific conditions:

- Client provides space and opportunity to install bad weather facilities.
- When necessary the client provides rail-bound equipment for the supply of materials.
- Depending on the location, the bad weather facilities can be applied up to wind force 6 beau fort.
- Client must prevent water flowing into the channels.

Planning influence:

The following times can be considered in the planning when applying these provisions:

- Setting up bad weather facilities, depending on the length, approximately one to two hours of work;
- Creating of proper climatological circumstances and blow drying / heating rail and channel, depending on the ambient temperature and humidity, about 2-3 hours;
- Cleaning up bad weather facilities approximately 1 hour work.

edilon)(sedra

Haarlem : March 12, 2018
Project : 1000008165 – England – Kent & East Sussex – B2244 Junction Road
Subject : e)(s LCS (Level Crossing System), including Corkelast® ERS (Embedded Rail System)
Our reference : 02.388.308

Terms and conditions:

Prices	: In euro's, excluding V.A.T.;
Delivery	: DAP work site Junction Road (B2244) near Robertsbridge (UK), according to Incoterms 2010; Unloading not included;
Lead time	: 8 weeks after receipt of a written order (except for works holiday closings);
Payment	: 30 days after receipt of invoice.
Other	: edilon)(sedra general terms of delivery will apply.

We trust to have made you an interesting offer. The undersigned will contact you within a few days after submittal of this offer to discuss possible further steps on this project.

If you have any questions sooner than that or if you require additional information, please feel free to contact us.

With kind regards,

Nick Duijvelshoff

Sales Engineer
edilon)(sedra bv

edilon)(sedra

Haarlem : March 12, 2018
Project : 1000008165 – England – Kent & East Sussex – B2244 Junction Road
Subject : e)(s LCS (Level Crossing System), including Corkelast® ERS (Embedded Rail System)
Our reference : 02.388.308

Attachments:

- General terms and conditions edilon)(sedra bv
- LCS system information sheet
- e)(s LCS formwork drawing Ma2016-0223B
- e)(s ERS cross section drawing Ha2016-0320D
- Flared flange way drawing Ma2016-0711A
- Slab protection plate drawing Ma2016-0506
- Cross section sketch of installed level crossing Ha2016-0825A
- General e)(s level crossing installation instruction

Rother Valley Railway Limited
RVR A21 Crossing Options Report
Option 1 – Pricing Appendices

Appendix 8 – Supervision

From RVRL Accounts

Description	Qty	Unit
Supervision		
6 months construction manager		
Weeks	26	
Days	130	
Rate	£160.00	
Total		£20,800.00
Expenses		
Days	130	
Accommodation	£60.00	
		£7,800.00
Total to Summary		£28,600.00

David Felton FCA

Alasdair Stewart Engineering Services

Rother Valley Railway,
C/0 David Felton,
78 Halstead Walk,
Maidstone,
Kent,
ME16 OPW.

3 Noddfa,
Penrhyndeudraeth,
Gwynedd,
LL48 6BT

Mob: 07931738976

ORDER No. DATE 09 / 09 / 2016

INVOICE No.

0110

QUANTITY	DESCRIPTION	AMOUNT
21 Days	Site supervision at Robertsbridge, & Rolvenden January – September 2016	£3,150.00
1	Mobilisation	£760.00

TOTAL £3,910.00

Appendix 9 – Overheads

From RVRL Accounts

Description	Amount	Total
Overheads		
Company Overheads		
Annual (from 2015 accounts)	£52,000.00	
Rate	£4,333.33	
Months	6	
Total		£26,000.00
Site Overheads		
Construction Cost	£1,331,700.34	
Rate from Phases 5, 6, 7	1.00%	
Total		£13,317.00
Total to Summary		£39,317.00

David Felton FCA

Appendix 10 – Profit

Rother Valley Railway Ltd is controlled by the Trustees of Rother Valley Railway Heritage Trust, a registered charity no. 1088452. The principal activity of the Company continues to be the reconstruction of the Kent & East Sussex Railway from Bodiam to Robertsbridge in East Sussex.

The reconstruction work is capital work and is not revenue earning.

No profit is added to the cost of the works. Individual subcontractors have included for their own profit within their prices.

David Felton FCA

Andrew Wood Plant Hire

Elwyn Farm
Playden
Rye
East Sussex
TN31 7UN

VAT No: 702981340
Tel. 07860 837085

Quotation Page 1

Rother Valley Railway
C/O David Felton
78 Halstead Walk
Maidstone
Kent
ME16 0PW

Invoice No.	1522
Invoice/Tax Date	24/04/2019
Order No.	
Account No.	ROTHERV

Details	Net Amt	VAT
Groundwork estimate for proposed rail extension to Bodiam		
TOTALS		
North Bridge Street yard (RBJ side)	17,120.00	3,424.00
North Bridge Street yard (A21 side)	17,680.00	3,536.00
Rother Bridge foundations	60,720.00	12,144.00
Rother Bridge flood bund retaining wall	38,490.00	7,698.00
Bridge 7 pipe culvert	29,320.00	5,864.00
Bridge 8 4 unit wide box culvert	71,280.00	14,256.00
Bridge 9 2 unit wide box culvert	42,865.00	8,573.00
Bridge 10 2 unit wide box culvert	42,865.00	8,573.00
Bridge 11 2 unit wide box culvert	42,865.00	8,573.00
Mill Stream Bridge foundations	67,720.00	13,544.00
Bridge 13 pipe culvert	131,400.00	26,280.00
Bridge 14 2 unit wide box culvert	42,865.00	8,573.00
Embankment	352,400.00	70,480.00

BANK DETAILS. ACC NO 82457182
SORT CODE 60-18-09

PAYMENT TERMS: STRICTLY 28 DAYS FROM INVOICE DATE.

Total Net Amount	957,590.00
Total VAT Amount	191,518.00
Invoice Total	1,149,108.00

Andrew Wood Plant Hire

Elwyn Farm
Playden
Rye
East Sussex
TN31 7UN

VAT No: 702981340
Tel. 07860 837085

Quotation Page 1

Rother Valley Railway
C/O David Felton
78 Halstead Walk
Maidstone
Kent
ME16 0PW

Invoice No.	1512
Invoice/Tax Date	22/04/2019
Order No.	
Account No.	ROTHERV

Details	Net Amt	VAT
Groundworks estimates for the proposed rail extension to Bodiam		
North Bridge Street (RBJ side) works yard 25m x 15m		
Clear site, lay compacted type 1 sub base with tarmac road frontage and 2.4m high solid site hoarding fence and 6m wide weld mesh gate		
Plant and labour	2,500.00	500.00
140t type 1	3,920.00	784.00
terram membrane	200.00	40.00
80m site fencing	8,000.00	1,600.00
Site gate	1,500.00	300.00
2m x 12m tarmac apron to front	1,000.00	200.00

BANK DETAILS. ACC NO 82457182
SORT CODE 60-18-09

PAYMENT TERMS: STRICTLY 28 DAYS FROM INVOICE DATE.

Total Net Amount	17,120.00
Total VAT Amount	3,424.00
Invoice Total	20,544.00

Andrew Wood Plant Hire

Elwyn Farm
Playden
Rye
East Sussex
TN31 7UN

VAT No: 702981340
Tel. 07860 837085

Quotation

Rother Valley Railway
C/O David Felton
78 Halstead Walk
Maidstone
Kent
ME16 0PW

Invoice No.	1513
Invoice/Tax Date	22/04/2019
Order No.	
Account No.	ROTHERV

Details	Net Amt	VAT
Groundworks estimates for the proposed rail extension to Bodiam		
North Bridge Street (A21 side) works yard 20m x 20m		
Clear site, lay compacted type 1 sub base with tarmac road frontage and 2.4m high soilid site hoarding fence and 6m wide weld mesh gate		
Plant and labour	2,500.00	500.00
160t type 1	4,480.00	896.00
Terram membrane	200.00	40.00
80m site fencing	8,000.00	1,600.00
Site gate	1,500.00	300.00
2m x 12m tarmac apron to front	1,000.00	200.00

BANK DETAILS. ACC NO 82457182
SORT CODE 60-18-09

PAYMENT TERMS: STRICTLY 28 DAYS FROM INVOICE DATE.

Total Net Amount	17,680.00
Total VAT Amount	3,536.00
Invoice Total	21,216.00

Andrew Wood Plant Hire

Elwyn Farm
Playden
Rye
East Sussex
TN31 7UN

VAT No: 702981340
Tel. 07860 837085

Quotation

Rother Valley Railway
C/O David Felton
78 Halstead Walk
Maidstone
Kent
ME16 0PW

Invoice No.	1514
Invoice/Tax Date	22/04/2019
Order No.	
Account No.	ROTHERV

Details	Net Amt	VAT
Groundworks estimate for the proposed rail extension to Bodiam		
Rother Bridge foundations		
Site preperation to provide 10m x 20m hard standing work site		
Plant and labour	1,000.00	200.00
80t type 1 sub base	2,240.00	448.00
Terram membrane	100.00	20.00
Excavate caisson, 8m x 5m x 3m, mass fill with concrete and build cast concrete ballast wall		
Plant and labour	27,000.00	5,400.00
260m concrete	28,600.00	5,720.00
8m Ballast wall concrete	880.00	176.00
Ballast wall steel reinforcing	900.00	180.00

BANK DETAILS. ACC NO 82457182
SORT CODE 60-18-09

PAYMENT TERMS: STRICTLY 28 DAYS FROM INVOICE DATE.

Total Net Amount	60,720.00
Total VAT Amount	12,144.00
Invoice Total	72,864.00

Andrew Wood Plant Hire

Elwyn Farm
Playden
Rye
East Sussex
TN31 7UN

VAT No: 702981340
Tel. 07860 837085

Quotation Page 1

Rother Valley Railway
C/O David Felton
78 Halstead Walk
Maidstone
Kent
ME16 0PW

Invoice No.	1519
Invoice/Tax Date	24/04/2019
Order No.	
Account No.	ROTHERV

Details	Net Amt	VAT
Groundwork estimate for the proposed rail extension to Bodiam		
Rother Bridge flood bund retaining wall section		
Plant and labour	14,000.00	2,800.00
Concrete	11,000.00	2,200.00
Steel reinforcing	1,000.00	200.00
Terram membrane	150.00	30.00
80 tons type 1	2,240.00	448.00
40 2m high concrete retaining L sections	9,500.00	1,900.00
Fixing bolts	600.00	120.00

BANK DETAILS. ACC NO 82457182
SORT CODE 60-18-09

PAYMENT TERMS: STRICTLY 28 DAYS FROM INVOICE DATE.

Total Net Amount	38,490.00
Total VAT Amount	7,698.00
Invoice Total	46,188.00

Andrew Wood Plant Hire

Elwyn Farm
Playden
Rye
East Sussex
TN31 7UN

VAT No: 702981340
Tel. 07860 837085

Quotation

Rother Valley Railway
C/O David Felton
78 Halstead Walk
Maidstone
Kent
ME16 0PW

Invoice No.	1516
Invoice/Tax Date	22/04/2019
Order No.	
Account No.	ROTHERV

Details	Net Amt	VAT
Groundworks estimate for the proposed rail extension to Bodiam		
Bridge 7, 10.8m span pipe culvert		
Plant and labour	11,600.00	2,320.00
36 750mm dia pipe sections	9,000.00	1,800.00
52m concrete	5,720.00	1,144.00
Steel reinforcing	600.00	120.00
120 Hollow blocks	300.00	60.00
Sand, ballast and cement	300.00	60.00
150t selected backfill	1,800.00	360.00

BANK DETAILS. ACC NO 82457182
SORT CODE 60-18-09

PAYMENT TERMS: STRICTLY 28 DAYS FROM INVOICE DATE.

Total Net Amount	29,320.00
Total VAT Amount	5,864.00
Invoice Total	35,184.00

Andrew Wood Plant Hire

Elwyn Farm
Playden
Rye
East Sussex
TN31 7UN
VAT No: 702981340
Tel. 07860 837085

Quotation

Rother Valley Railway
C/O David Felton
78 Halstead Walk
Maidstone
Kent
ME16 0PW

Invoice No.	1515
Invoice/Tax Date	22/04/2019
Order No.	
Account No.	ROTHERV

Details	Net Amt	VAT
Groundworks estimate for the proposed rail extension to Bodiam		
Bridge 8, 4 units wide box culvert		
PLEASE NOTE WEIGHT OF EACH UNIT IS 9.4 TONS SO WILL REQUIRE MOBILE CRANE TO UNLOAD AND PLACE. NOT INCLUDED IN COSTINGS		
Plant and labour	15,500.00	3,100.00
16 box culvert sections	40,000.00	8,000.00
120t type 1	3,360.00	672.00
54m concrete	5,940.00	1,188.00
Wing wall and coping construction labour	3,500.00	700.00
Steel reinforcing	1,000.00	200.00
Wing wall and coping concrete	1,980.00	396.00

BANK DETAILS. ACC NO 82457182
SORT CODE 60-18-09

PAYMENT TERMS: STRICTLY 28 DAYS FROM INVOICE DATE.

Total Net Amount	71,280.00
Total VAT Amount	14,256.00
Invoice Total	85,536.00

Andrew Wood Plant Hire

Elwyn Farm
Playden
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TN31 7UN
VAT No: 702981340
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Quotation

Rother Valley Railway
C/O David Felton
78 Halstead Walk
Maidstone
Kent
ME16 0PW

Invoice No.	1517
Invoice/Tax Date	22/04/2019
Order No.	
Account No.	ROTHERV

Details	Net Amt	VAT
Groundwork estimate for the proposed rail extension to Bodiam		
Bridges 9,10, 11 and 14 2 units wide box culvert COST PER BRIBGE		
PLEASE NOTE WEIGHT OF EACH UNIT IS 9.4 TONS SO WILL REQUIRE MOBILE CRANE TO UNLOAD AND PLACE. NOT INCLUDED IN COSTINGS		
Plant and labour	11,625.00	2,325.00
8 box culvert sections	20,000.00	4,000.00
60t type 1	1,680.00	336.00
28m concrete	3,080.00	616.00
Wing wall and coping construction labour	3,500.00	700.00
Steel reinforcing	1,000.00	200.00
Wing wall and coping concrete	1,980.00	396.00

BANK DETAILS. ACC NO 82457182
SORT CODE 60-18-09

PAYMENT TERMS: STRICTLY 28 DAYS FROM INVOICE DATE.

Total Net Amount	42,865.00
Total VAT Amount	8,573.00
Invoice Total	51,438.00

Andrew Wood Plant Hire

Elwyn Farm
Playden
Rye
East Sussex
TN31 7UN

VAT No: 702981340
Tel. 07860 837085

Quotation Page 1

Rother Valley Railway
C/O David Felton
78 Halstead Walk
Maidstone
Kent
ME16 0PW

Invoice No.	1518
Invoice/Tax Date	22/04/2019
Order No.	
Account No.	ROTHERV

Details	Net Amt	VAT
Groundworks estimate for the proposed rail extension to Bodiam		
Mill Stream Bridge 12 foundations		
Site preperation on A21 side to provide 10m x 20m hard standing work site		
Plant and labour	1,000.00	200.00
80t type 1 sub base	2,240.00	448.00
Teram membrane	100.00	20.00
Excavate caisson 8m x 5m x 3m, mass fill with concrete and build cast concrete ballast wall		
Plant and labour	27,000.00	5,400.00
260m concrete	28,600.00	5,720.00
8m Ballast wall concrete	880.00	176.00
Ballast wall steel reinforcing	900.00	180.00
Walkway under bridge using sheet pile side (not included) with concrete finish over sub base fill 2m wide x 30m long		
Plant and labour	4,000.00	800.00
Sub base fill	1,680.00	336.00
concrete	1,320.00	264.00

BANK DETAILS. ACC NO 82457182
SORT CODE 60-18-09

PAYMENT TERMS: STRICTLY 28 DAYS FROM INVOICE DATE.

Total Net Amount	67,720.00
Total VAT Amount	13,544.00
Invoice Total	81,264.00

Andrew Wood Plant Hire

Elwyn Farm
Playden
Rye
East Sussex
TN31 7UN

VAT No: 702981340
Tel. 07860 837085

Quotation

Rother Valley Railway
C/O David Felton
78 Halstead Walk
Maidstone
Kent
ME16 0PW

Invoice No.	1523
Invoice/Tax Date	24/04/2019
Order No.	
Account No.	ROTHERV

Details	Net Amt	VAT
Groundwork estimate for proposed rail extension to Bodiam		
Bridge 13 50m span pipe culvert		
Plant and labour	55,000.00	11,000.00
140 750mm dia pipe sections	35,000.00	7,000.00
300m concrete	33,000.00	6,600.00
600t selected backfill	7,200.00	1,440.00
Steel reinforcing	600.00	120.00
120 Hollow blocks	300.00	60.00
Sand, ballast and cement	300.00	60.00

BANK DETAILS. ACC NO 82457182
SORT CODE 60-18-09

PAYMENT TERMS: STRICTLY 28 DAYS FROM INVOICE DATE.

Total Net Amount	131,400.00
Total VAT Amount	26,280.00
Invoice Total	157,680.00

Andrew Wood Plant Hire

Elwyn Farm
Playden
Rye
East Sussex
TN31 7UN

VAT No: 702981340
Tel. 07860 837085

Quotation

Rother Valley Railway
C/O David Felton
78 Halstead Walk
Maidstone
Kent
ME16 0PW

Invoice No.	1520
Invoice/Tax Date	24/04/2019
Order No.	
Account No.	ROTHERV

Details	Net Amt	VAT
Groundwork estimate for the proposed rail extension to Bodiam		
Embankment and crushed concrete trackbed base		
To provide 5m wide at top x 500m embankment with min 200mm crushed concrete trackbed base over terram membrane		
PRICE ALLOWS FOR FILL AT £10/TON. IT MAY BE POSSIBLE TO OBTAIN SOME SUITABLE FILL FREE OF CHARGE SUBJECT TO AVAILABILITY		
Plant and labour	125,000.00	25,000.00
Embankment fill material	208,000.00	41,600.00
Terram membrane	1,400.00	280.00
Crushed concrete	18,000.00	3,600.00

BANK DETAILS. ACC NO 82457182
SORT CODE 60-18-09

PAYMENT TERMS: STRICTLY 28 DAYS FROM INVOICE DATE.

Total Net Amount	352,400.00
Total VAT Amount	70,480.00
Invoice Total	422,880.00

JP Concrete
DESIGN | SUPPLY | INSTALL

JP Concrete Quotation

Quotation Date: 24-04-2019
Quotation No: 21097

L Shaped retaining wall

Andrew Wood Plant
Peasmarsh Road
Rye

East Sussex
TN31 7UN

Andrew Wood
07860 837 085

Product Name	Dimensions (mm)	Description	Unit weight Kg	Price £	Quantity	Total
2.0m L Shape	1000mm wide	Bolt-down Retaining Wall	890kg	175.95	40.00	7,038.00
Ground Fixing Kit 1m - 2m	2 Holes per unit	Sika Anchorfix	-	21.84	40.00	873.60
2.5 Tonne Lifting Clutch	-	Pair	-	105.00	1.00	105.00
Installation Shackles	-	-	-	180.00	1.00	180.00
Haulage - Delivery	Flatbed 28t Payload	SITE TO OFFLOAD	Price dependent on haulage questionnaire	650.00	2.00	1,300.00

Total 9,496.60

VAT 20% 1,899.32
Total including VAT 11,395.92

SALES QUOTATION

D11/81600

John Davidson (Pipes) Ltd
Ellingham Way
Ashford
TN23 6JU

Fax: 01233 618324
General Tel: 01233 618323

Invoice Address
ANDREW WOOD LTD

ELWAN FARM PLAYDEN
RYE
EAST SUSSEX
TN31 7UN

Delivery Address
ANDREW WOOD LTD

TN23 6JU

Document Date: 08/04/19
Payment Terms: AR EOM + 1 Month
Account No: C013057
Your Ref: Andrew wood

Valid Until: 08/05/2019
Prepared By: D11 Ashford
Representative: ASHFORD
Method: Direct

Further to your recent enquiry, we have pleasure in confirming the prices requested as detailed.

ITEM CODE	DESCRIPTION	QTY	GROSS	DISC	PRICE	TOTAL
---- Pipe ----						
1811	750MM S&S PIPE	116.00 EA	238.32	0.00%	238.32	27,645.12
1801	LUBRICANT	5.00 EA	11.35	0.00%	11.35	56.75
---- Culvert ----						
1801	1500 X 2500 X 1500 CULVERT	48.00 EA	2,038.54	0.00%	2,038.54	97,849.92
1801	MILSEAL 25X40 JOINTING MATERIAL UNITS	29.00 EA	52.00	0.00%	52.00	1,508.00
1801	16X16 CAULKING GROOVE BITUMINOUS WATER PROOFING	47.00 EA	8.15	0.00%	8.15	383.05

Code	Rate %	Net Amount	VAT Amount	Total Amount	Currency
O1	20.00	127,442.84	25,488.57	152,931.41	GBP

We trust that you find our offer of interest and should you require any further information please do not hesitate to contact me.
All prices quoted are subject to VAT at the prevailing rate.
JDP Terms and Conditions of Sale apply and are available upon request.
This Quotation does not constitute an offer . E&OE.
This order may be subject to a charge for delivery in line with our standard terms and conditions.
BACS PAYMENTS TO: Barclays SORT CODE: 200000 A/C No: 40734853 VAT NO: GB265136463

MILTON PRECAST QUOTATION

PROVIDING CONCRETE SOLUTIONS

Project Number: MIPR005847A/- **Quote Number:** SQ5847A TENDER SMS
Your reference: **Date:** 19/04/2019
Customer: Jewson Ltd
Whitbread Lane, Northaim, East Sussex, TN31 6QF
For the attention of Mark Scott
Project: NORTHIAM STATION
Site: RYE, TN31 6QP

Dear Sir/Madam
We thank you for your enquiry of the 12-Apr-19 for our precast concrete box culverts which we have pleasure in quoting for the following:

CULVERT DETAILS - Requested size offered

Culvert MC
25.15T

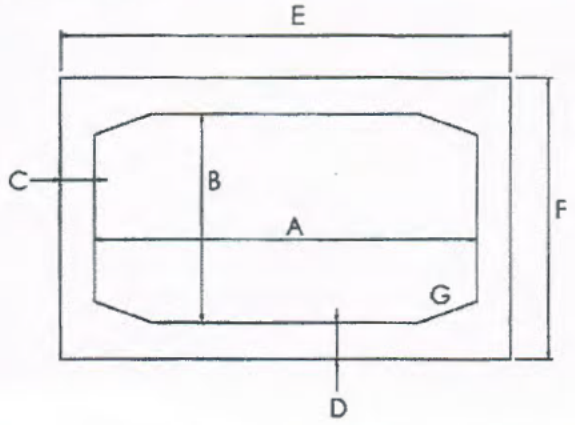
Cross Sectional Area
3.690 m²

Type
Flat Invert

Weight
9.396 t

CULVERT DIMENSIONS

FLOW RATE: 8.82m³/s



Internal Width A	Internal Height B
2.500m.	1.500m.
Wall Width C	Slab Width D
0.200m.	0.300m.
External Width E	External Height F
2.900m.	2.100m.
Corner Splay G	
0.300m.	
0.100m.	

Standard Walls & Slabs thickend by +75

CULVERT COSTING

QTY	LENGTH	WIDTH	HEIGHT	PRICE PER UNIT	TOTAL
48	1.500m.	2.500m.	1.500m.	£3,497.41	£ 167,875.68
					£ -
					£ -
29 No.	MILSEAL 25 X 40mm JOINTING MATERIAL UNITS				£ 1,539.55
	Includes works applied primer				

TOTAL PRICE FOR CULVERT UNITS **£ 169,415.23**

Milton Precast, off Gas Road, Milton Regis, Sittingbourne, Kent, ME10 2QB
Tel: **01795 425191** Culvert Sales: **01795 415686** Email: **Jane@miltonprecast.com**

QUOTATION

Project No.
Quote No. MI-SQ013561
Status of Quote

Milton Pipes Ltd.
England/Wales Sales & Head Office
Church Marsh, Off Gas Rd
Sittingbourne,ME10 2QF
Tel: 01795 425191
Fax: 01795 420360

Contact Name

JEWSON LTD
NORTHIAM 3180
WHITBREAD LANE
NORTHIAM
TN31 6QP

Contact Tel. No. 01797 252211
Contact Name: JEWSON LTD

Delivery Address:

JEWSON LTD
NORTHIAM 3180
WHITBREAD LANE
NORTHIAM
TN31 6QP

Date of Quote: 09/04/2019
Quotations are valid for one month from the above date

Quotation Raised and Managed by:
Name: Sharon Davidson
Tel:

Line No.	Product Code	Quantity (No)	Product Description	Weight Each	Price Each	Disc. %	Each Price after discount	Totals	
								Weight (T)	Price £
1	P750	118	750 X 2.50M SUPERSEAL PIPE HBR	1.96	£261.38		£261.38	231.52	£30842.84
2	059843	5	FORSHEDA PIPE LUBRICANT 2.5KG	0.00	£9.00		£9.00	0.01	£45.00
			The use of CPM lubricant is strongly recommended with the CPM integral jointed pipe system. Non-compliance may result in installation problems for which CPM can accept no responsibility. If we are called to site for pipe jointing issues and it is found that CPM lubricant has not been used, then there will be a charge of £150 to cover CPM costs.						
			Carriage paid in full loads, delivered direct to site on flat bed articulated vehicles, responsibility with site to off load. 14no = 1 full load.						
			TERMS 5% NETT MA.						

This Quotation, and all orders when accepted by Milton Pipes Ltd, are subject to the Milton Pipes Ltd Conditions of Trading, which are available on request or can be downloaded from www.miltonprecast.com
Advisory notes and recommendations regarding the above products can be found on our website :www.miltonprecast.com

Products are kitemarked where applicable

CE - For full markings go to www.miltonprecast.co.uk

Please note all deliveries are on flatbed articulated lorries for customer to offload unless otherwise specified.

Side Protection, Rigid/Restricted access and Crane Off-Load available on request but are not standard

One hour is standard time for off-loading. Waiting Time will apply after this time

Alterations to orders within 24 hours of delivery may result in charges being applied

Standard Surcharges applicable for short depth Chamber Ring - 50% for 500mm, 100% for 250mm
Surcharges applicable for Non-Stepped Chamber Ring
Pipes - MPC recommend MPC lubricant with integral jointed pipe system. Where problems arise on site when MPC lubricant has not been used, we reserve the right to charge for any site visits to resolve.
Pipes - Rockers and Butts charged at 3xmetre rate
Pipes - Bends charged at 10xmetre rate up to 45 degrees
Pipes - Bends over 45 degrees charged at 15xmetre rate

MILTON PRECAST QUOTATION

PROVIDING CONCRETE SOLUTIONS

MIPR005847A/-

Culvert Designed to Standards:

BS EN1990 BS EN1992-2
BS EN1991-2 PD6694-1
BS EN1992-1-1

Culverts to be laid

Bitumen Strip used to seal joints
5mm gap between joints
Units have spigot & socket faces for joining

Concrete Design Mix:

In accordance with:	**BS8500-1**
Compressive Stength Class:	**C40/50**
Cement:	**CIIB-V+SR**
DC Class:	**DC4**
Crack Width:	**0.3**

Manufacturing Tolerances: allowable dimensional variations in accordance with BS EN: 14844-2006

Finishes
External: Semi Dry F2 Wet Cast F3
Internal: All types F3

AIP - **Specification** -

Our quotation includes design costs and the provision of design calculations, general arrangement and Reinforcement drawings. These will be issued in electronic format for approval by the customer upon receipt of order.
Should an order be placed with us and subsequently cancelled, design and drawing costs will be charged in full.
Design and check certificates for Category 0 – 1 included in our quotation.
Category 2 / 3 – Price on application.

DELIVERY

Haulage: ARTIC 2 per load
All deliveries are on a flat bed artic unless otherwise requested. Side protection available at an additional charge. Culverts will be flat on vehicle. Units would need to be turned, suitbale strops and craneage required to unload and place. Care would need to be taken to protect the spigot and socket detail.

Lifting: M36 Lifting Loops/Swivel Eyes supplied but crane and chains required on-site for off-loading

Dates: To be arranged.
Delivery programme to be confirmed at the time of placing an order

Storage: £10.00 Charge per unit per week after 28 days after agreed delivery dates

Additional Notes:

All due care and attention is taken when reviewing the information provided via email/telephone/fax, however the responsibility lies with the purchaser that all information is correct. Should the actual design parameters vary from those shown, we reserve the right to adjust our quoted rates. This quotation is open for acceptance within 30 days and is based on current market prices and we reserve the right to adjust our rates following receipt of any order.

Yours Faithfully p.p. MILTON PRECAST

Milton Precast, off Gas Road, Milton Regis, Sittingbourne, Kent, ME10 2QB
Tel: **01795 425191** Culvert Sales: **01795 415686** Email: **Jane@miltonprecast.com**

MILTON PRECAST QUOTATION

PROVIDING CONCRETE SOLUTIONS

OPTIONAL EXTRAS - TO BE CONFIRMED MIPR005847A/-

	NO.	Each	Total
16x16 Caulking Groove	47x	£ 8.32	£ 391.04
Bituminous Water Proofing			
-			
Plain End	- 1x	£ 183.75	£ 183.75
Plain End & Starter Bars	-		
-			
Plain Splayed End (MAX...)			
-			
End Wall			
Access			
Radial Access			
Sockets & Bars/Kwikastrip			
-			
-			
Internal Insitu			
-			
Splayed Joint (MAX 4°)			
T-Junction			
90° Bend			
Steps			
Square Holes: 0 SQ for 0mm DIA.			
0 SQ for 0mm DIA.			
0 SQ for 0mm DIA.			
Round Holes: 0mm DIA. for 0mm DIA.			
0mm DIA. for 0mm DIA.			
0mm DIA. for 0mm DIA.			

Prices above are NETT M.A. plus VAT

TECHNICAL DETAILS

Cover Level 0.3m - 0.6m TO BE CONFIRMED

Cover to Reinf. 50mm

Loading RU

Cover idenified as underside of rainway sleepers

Design Life 120 years

Exposure Class XD3

Braking & Accel. NO

Reinforcement

500B/500C to BS4449 to BS4482 where applicable. Cages to be fabricated in accordance with HA DMRB BA 40/93

Milton Precast, off Gas Road, Milton Regis, Sittingbourne, Kent, ME10 2QB
Tel: 01795 425191 Culvert Sales: 01795 415686 Email: Jane@miltonprecast.com

safesite®
FACILITIES

Safesite Facilities Ltd
Unit 1 Martello Enterprise Centre
Courtwick Lane
Littlehampton
West Sussex
BN17 7PA
0845 463 5421
info@safesitefacilities.co.uk
www.safesitefacilities.co.uk

Customer: ANDREW WOOD PLANT HIRE
Address: Peasmarsh Road
Rye
TN31 7UN

Date: 09/04/2019
Site: Robertsbridge
East Sussex
TN32 5DG

Order No:
Acct No:
Quote No: 36365
Contact: Andrew Wood

SALES QUOTATION

Dear Sirs,

As discussed, here is the quotation for the supply of the goods detailed below.

Description	Stock No	Qty	Unit Price	Amount
2.4m Dug in Timber Hoarding	TIHS012	500	75.00	£37,500.00
To supply and install a timber framed hoarding using 150mm x 75mm timber posts at 1.8m centres, 3no. 100mm x 50mm rails horizontally fixed to the front of the upright posts with 18mm ply screwed directly to the front of the rails. Top and bottom 150mm x 22mm PAR capping and skirting fixed to front of ply. All timber FSC				
6m x 2.4m Double Leafed Welded Mesh Vehicle Gates - Dug in Posts	THGS025	2	1,550.00	£3,100.00
Painting - 2 Coats of 1 standard colour - priced in square metres	TIHAS0004	1200	6.50	£7,800.00
Site Specific Design/s and calculations	TIHAS0007	1	400.00	£400.00
			Sub-Total:	£48,800.00
			VAT:	£9,760.00
			Total:	**£58,560.00**

Subject to site visit and site specific design
Final measure upon completition

If you have any further questions, please do not hesitate in contacting us.

Yours faithfully,

Greig

Rother Valley Railway
LIMITED
IN ASSOCIATION WITH THE KENT & EAST SUSSEX RAILWAY
ROBERTSBRIDGE JUNCTION STATION, STATION ROAD,
ROBERTSBRIDGE, EAST SUSSEX. TN32 5DG
www.rvr.org.uk

RVR A21 Crossing Options Report
Option 1 – Attachment D
Awards and Industry VIPs

1 Institution of Civil Engineers (ICE) Engineering Excellence Awards 2013 - Restoration Award

2 National Railway Heritage Awards (NRHA) 2013 - The Volunteers Award

3 Institution of Civil Engineers Presidential Visit June 2014 - Geoff French

4 Institution of Civil Engineers South Coast Engineering Excellence Awards 2015 - Special Award (Community)

5 Network Rail Chairman Sir Peter Hendy 2016 - Official Opening Mainline Connection

6 Institution of Civil Engineers SE Engineering Excellence Awards 2017 - Community Benefit Award

7 Heritage Railway Association (HRA) Annual Awards 2017 - Small Groups

ICE South East England
Kent & East Sussex Branch

Engineering Excellence Awards 2013

Restoration Award
Winner

Rother Valley
Restoration Phase 5

ice
Institution of Civil Engineers

Project Team:

Rother Valley Railway Heritage Trust
Rother Valley Railway Supporters Association
Complete Land Management LLP
DDF Formwork Limited
D J Williams & Son
Beever Limited

Derek Kent
Graham Bessant
Alan Hayward
John Sreeves

Andrew Wood Plant Hire
Coussens Cranes Limited
Russell Norman Fencing
Rother Valley Railway Limited
J C White Geomatics Limited
Berry Range Limited

Geoff French
ICE Senior Vice President

Rob James
ICE Kent & East Sussex Branch Chair

National Railway Heritage Awards

NRHA

The Volunteers Award

Highly Commended Certificate

presented to:

Rother Valley Railway Heritage Trust for Rother Valley Railway Bridge Replacements

by Loyd Grossman OBE FSA

on the 4th December 2013

Rother Valley Railway Limited
RVR A21 Crossing Options Report
Option 1 – Awards and Industry VIPs

Institution of Civil Engineers Presidential Visit June 2014 - Geoff French

ICE South East England
Kent & East Sussex Branch

South Coast Engineering Excellence Awards 2015

Special Award (Community)

Kent & East Sussex Railway, Rolvenden Carriage Storage Shed

Project Team:

Funding Body:
Rother Valley Railway Heritage Trust
CDM Coordinator:
Rother Valley Railway Ltd

Client:
Kent & East Sussex Railway Ltd
Electrical Engineer:
LECS (UK) Ltd

Stewart Biggs
ICE Kent & East Sussex Branch
Chair

Suzanne Moroney
ICE South East England
Regional Director

South Coast Award

Kent & East Sussex Railway, Rolvenden Carriage Storage Shed

Cost:	**£500,000**
Location:	**Tenterden, Kent**
Completed:	**December 2014**
Submitted by:	**Rother Valley Railway Heritage Trust**
Team:	**Rother Valley Railway Heritage Trust, Kent & East Sussex Railway Ltd, Rother Valley Railway Ltd, LECS (UK) Ltd, Kent & East Sussex Railway Ltd, London Underground Ltd, D Kenward & Sons, Yiannis Doors Ltd, Scorpion Engineering Construction Ltd, Andrew Wood Plant Hire, CLM, Price-Whitehead**

Saving historic carriages on the Kent & East Sussex Railway from the ravages of the weather within the cost of £500,000 required an extremely economic design matched with donations of professional skills, volunteer labour, gifts and recycling of materials.

Rother Valley Railway funded and project managed the construction of a four road, 20 carriage storage shed 120m long by 18m wide with electric lighting and roller shutter doors. Carried out without interruption to the existing railway, the K&ESR volunteers fabricated and laid 1 mile of track and 12 points using materials recycled from elsewhere or donated.

Rother Valley Railway Limited
RVR A21 Crossing Options Report
Option 1 – Awards and Industry VIPs

Network Rail Chairman Sir Peter Hendy 2016 - Official Opening Mainline Connection

ICE South East England
Engineering Excellence Awards 2017

Community Benefit Award

Winner

In association with

ICE BENEVOLENT FUND

Robertsbridge Junction Station Platform and Mainline Connection

ice
Institution of Civil Engineers

Suzanne Moroney
Regional Director, ICE South East England

Tim Broyd
President, ICE

HERITAGE RAILWAY ASSOCIATION

ANNUAL AWARDS 2017

SMALL GROUPS

Rother Valley Railway

For the new connection at Robertsbridge

RUNNER UP

10 February 2018

DATE

HRA

BRIAN SIMPSON OBE
CHAIRMAN