

## Note on Floodplain Compensation Storage provision north of Robertsbridge Station

The Environment Agency<sup>1</sup> have advised that although they cannot provide a decision regarding the requirement for floodplain compensation storage until the detailed design and associated flood modelling is complete, if the impact on flood risk is negligible then compensatory storage will not be required.

On 27<sup>th</sup> July 2021 Mr Patmore and Mrs Callaway discussed and agreed that final calculations on volumes are not possible until the detailed design is available. Floodplain Compensation Storage is normally calculated up to the 1% AEP with climate change design flood event maximum water level. The final calculations will need to take into consideration the detailed design of the embankment (both cut and fill), culverts, bridges, abutments, and access ramps and slopes.

The latest Flood risk assessments: climate change allowances (20<sup>th</sup> July 2021) states that:

*The appropriate allowance to assess off-site impacts and calculate floodplain storage compensation depends on land uses in affected areas. Use the:*

- *central allowance for most cases*
- *higher central allowance when the affected area contains essential infrastructure*

The preliminary estimate of volumes required have been based on the maximum flood level predicted for the 1% AEP design event with 105% allowance for climate change. The recently published climate change allowances for the River Rother are 28% (central) and 38% (higher central). Therefore, the maximum flood level up to which the floodplain compensation storage is required will be lower. The total volume of floodplain compensation storage required will also reduce when reassessed using the latest climate change allowances.

If, at detailed design stage, compensatory storage is required by the Environment Agency, locations are available for this to be provided. The area identified for floodplain compensation storage to mitigate the proposed railway embankment from The Clappers/Northbridge Street to the section immediately downstream of the A21 is the area north of the existing railway at Robertsbridge (referred to as Area 1 in the note on Tree Planting INQ/074 and shown in Figure 1). Some mitigation can be provided as part of the ground works between The Clappers/Northbridge Street and the A21 and will be accounted for in the calculation of floodplain compensation storage as part of the detailed design. This will include the removal of some material from the floodplain as part of the replacement of the 30m stretch of flood defence embankment with a flood wall, which will not be as wide as the existing embankment.

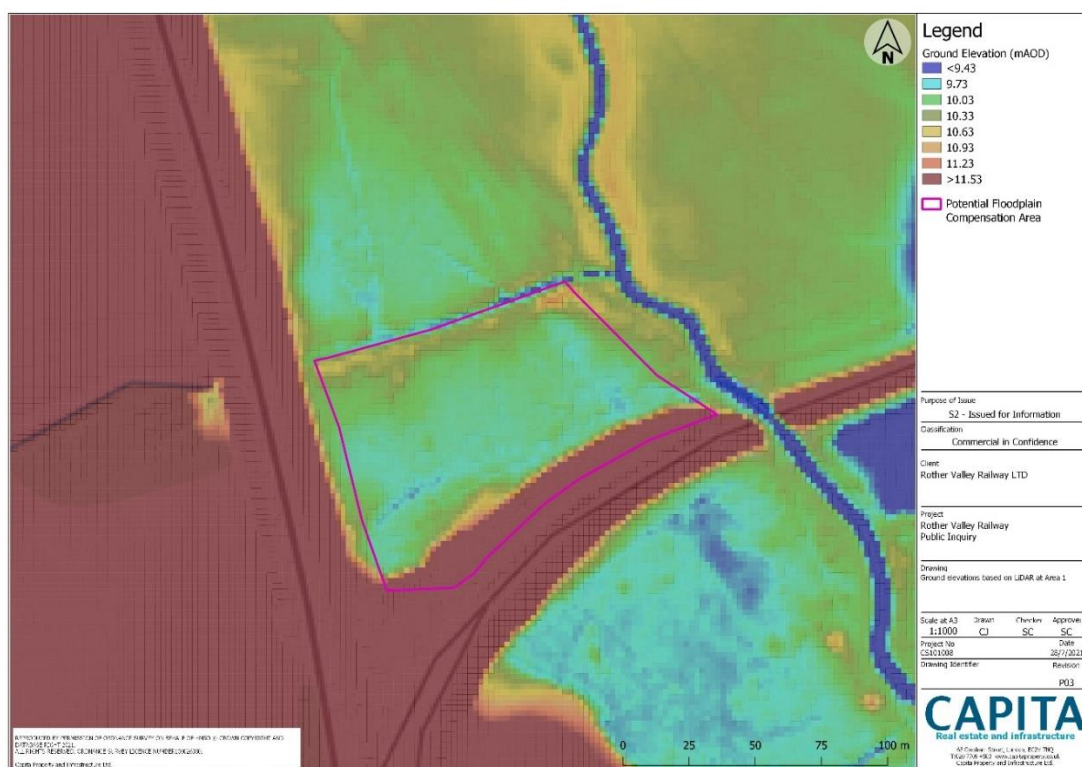
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<sup>1</sup> Meeting on 30<sup>th</sup> June 2021 attended by RVR, EA and Capita

The location and elevation of the land north of Robertsbridge Station identified for floodplain compensation storage is within the purple boundary shown in Figure 1. The area assessed includes most of Area 1 as shown on sheet 1 in INQ/074 and a small strip of land to the south which is also within Rother Valley Railways ownership.

The lowest ground elevation within the purple boundary is 9.56 mAOD. It is anticipated that floodplain compensation storage will be provide above this elevation, through reprofiling some areas within the purple boundary. This will include reprofiling the slope of the embankment to the south and the details of this will require consideration during detailed design.

Figure 1 Ground Elevations in the area being considered for floodplain compensation storage



The estimated volume of the embankment from The Clappers/Northbridge Street to the A21 up to the maximum flood level predicted for the 1% AEP design event with 105% climate change allowance, is approximately 2,500 m<sup>3</sup>. There is also sufficient volume north of the railway at Robertsbridge to provide floodplain compensation for a section of embankment immediately downstream of the A21 if required. The combined estimated required compensation volume for both these sections is shown in Table 1. Table 1 also shows the volumes available to provide compensatory storage within the purple boundary (Figure 1). The table demonstrates that there is sufficient volume within each elevation slice to provide the required floodplain compensation storage.

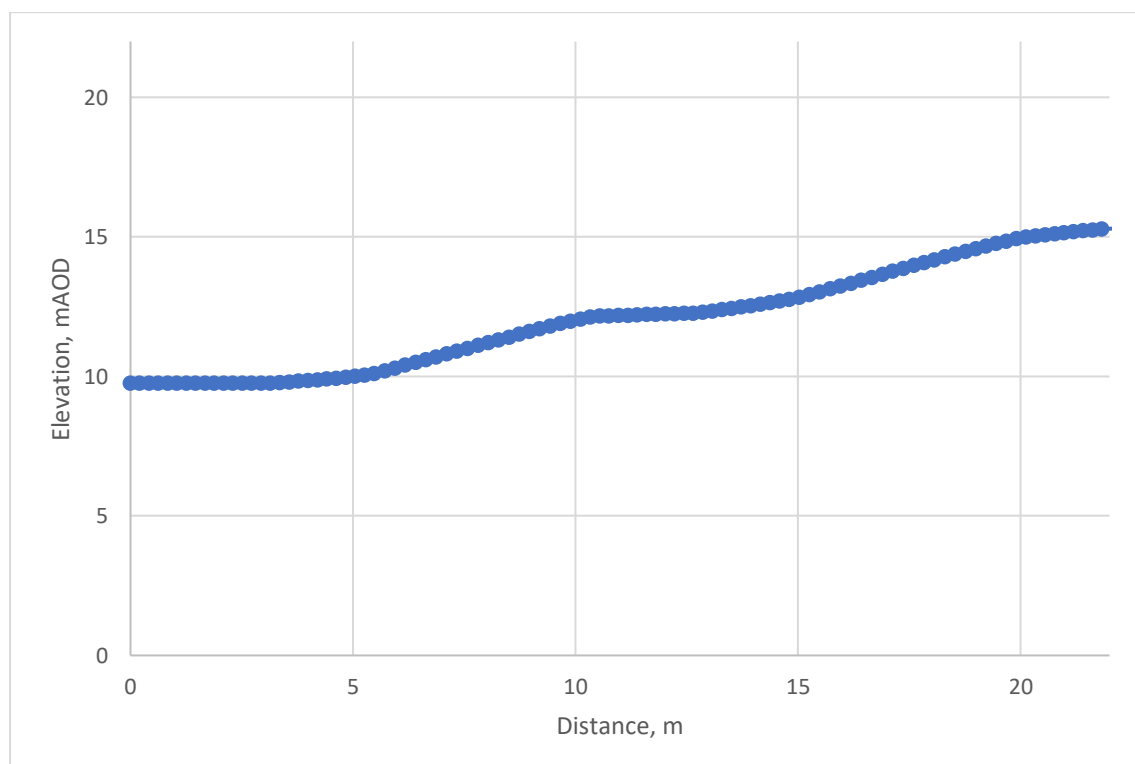
Table 1 Floodplain Compensation volume estimates

Elevation slice to be compensated for, mAOD	Estimated required compensation volume*, m <sup>3</sup>	Available volume for compensatory storage north of the railway at Robertsbridge, m <sup>3</sup>
11.23	0	NA
10.93	187	432
10.63	387	478
10.33	454	587
10.03	623	946
9.73	896	2072
9.53	813	1895
<b>Total</b>	<b>3360</b>	<b>6410</b>

\*The volumes quoted here do not account for the latest Flood risk assessment guidance: climate change allowances and therefore will reduce. The volumes are indicative and will be refined as part of the detailed design.

A profile through the southern part of Area 1 and the existing embankment is provided in Figure 2, which illustrates how the land rises to the south. This combined with Figure 1 and the calculations in Table 1 demonstrates how, if required, the compensation storage can be provided at the edge of the floodplain, through reprofiling the land.

Figure 2 Profile from the southern end of Area 1 to the south up the railway embankment



The preliminary analysis indicates that the required volumes are available to provide floodplain compensation storage at the required elevations in the area identified north of Robertsbridge Station.