Norwich Western Link

Environmental Statement

Chapter 12 Road Drainage and the Water Environment

Appendix 2 Flood Risk Assessment

Sub Appendix A – Figures

Part 3 of 5

Author: WSP UK Limited

Document Reference: 3.12.02a

Version Number: 00

Date: March 2024

Contents

Figures

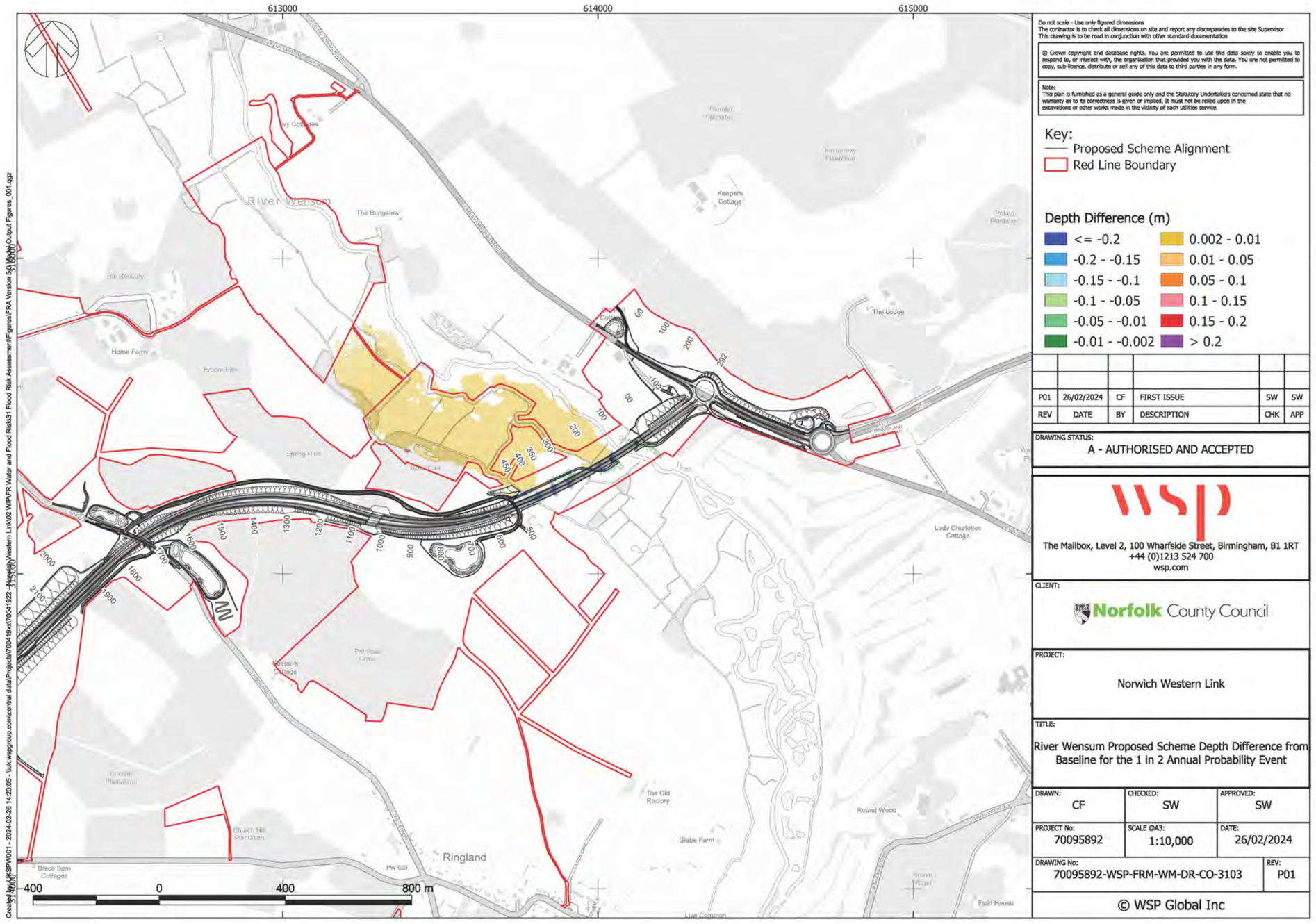
1.1.1 This Sub Appendix presents the figures associated with the **Flood Risk Assessment** (Document Reference 3.12.02). Figures are generally spit into four sections as follows:

- Scheme wide figures
- River Wensum figures
- Foxburrow Stream figures
- Ringland Lane overland flow path figures

Scheme wide

1.1.2 The following figures provide an overview of the Proposed Scheme as a whole, the various elements that make up the Proposed Scheme and the local infrastructure and environment in the vicinity of the Proposed Scheme and the interactions of all these elements with the Environment Agency's Flood Map for Surface Water.

River Wensum proposed scheme depth difference from baseline in the 1 in 2 annual probability event



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Key:
- Proposed Scheme Alignment
- Red Line Boundary

Depth Difference (m)

<= -0.2	0.002 - 0.01
-0.2 - -0.15	0.01 - 0.05
-0.15 - -0.1	0.05 - 0.1
-0.1 - -0.05	0.1 - 0.15
-0.05 - -0.01	0.15 - 0.2
-0.01 - -0.002	> 0.2

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CLIENT: Norfolk County Council

PROJECT: Norwich Western Link

TITLE: River Wensum Proposed Scheme Depth Difference from Baseline for the 1 in 2 Annual Probability Event

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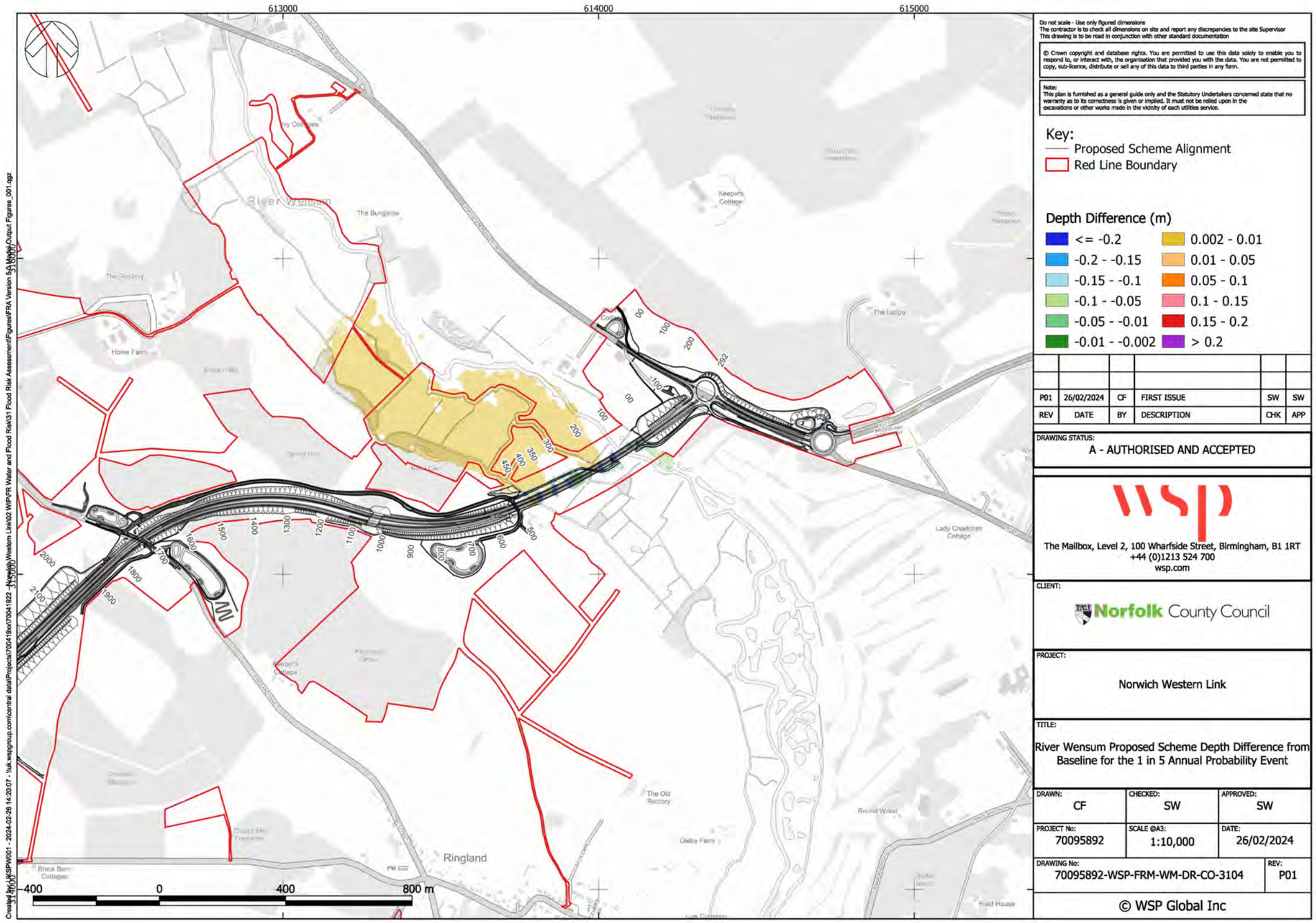
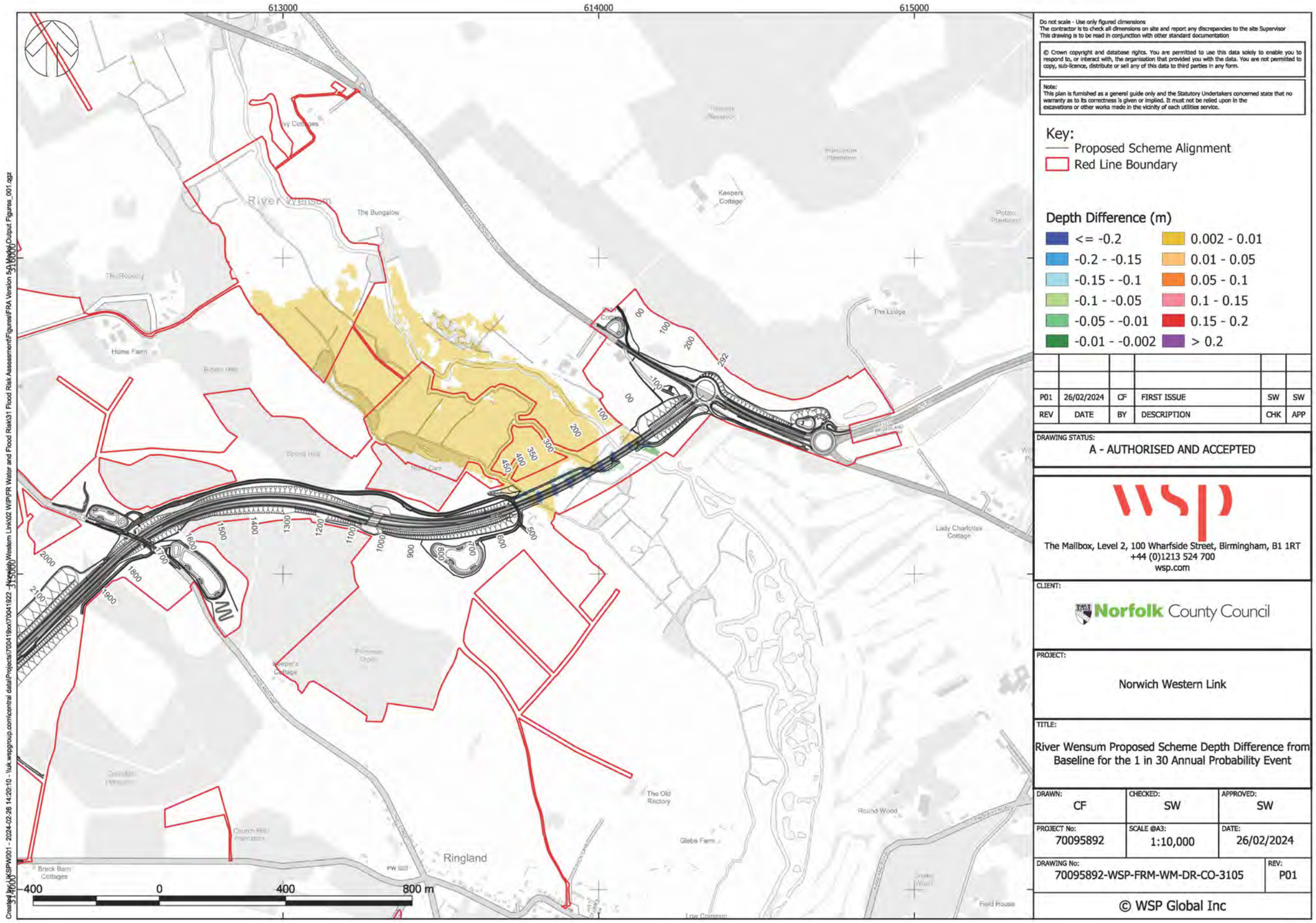
River Wensum proposed scheme depth difference from baseline in the 1 in 5 annual probability event



River Wensum proposed scheme depth difference from baseline in the 1 in 30 annual probability event



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Depth Difference (m)

<= -0.2	0.002 - 0.01
-0.2 - -0.15	0.01 - 0.05
-0.15 - -0.1	0.05 - 0.1
-0.1 - -0.05	0.1 - 0.15
-0.05 - -0.01	0.15 - 0.2
-0.01 - -0.002	> 0.2

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TITLE: River Wensum Proposed Scheme Depth Difference from Baseline for the 1 in 30 Annual Probability Event

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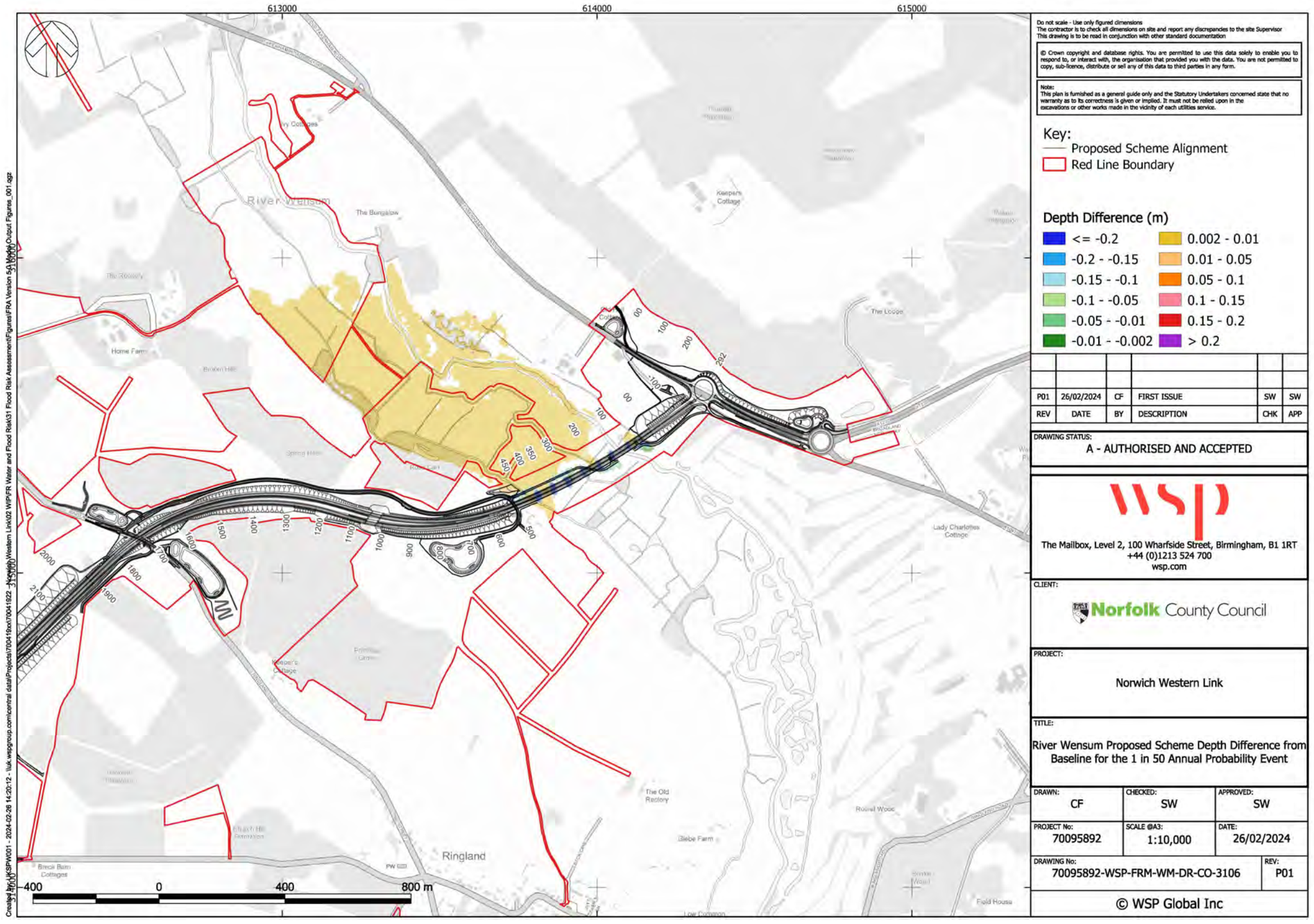
River Wensum proposed scheme depth difference from baseline in the 1 in 50 annual probability event



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Depth Difference (m)

<= -0.2	0.002 - 0.01
-0.2 - -0.15	0.01 - 0.05
-0.15 - -0.1	0.05 - 0.1
-0.1 - -0.05	0.1 - 0.15
-0.05 - -0.01	0.15 - 0.2
-0.01 - -0.002	> 0.2

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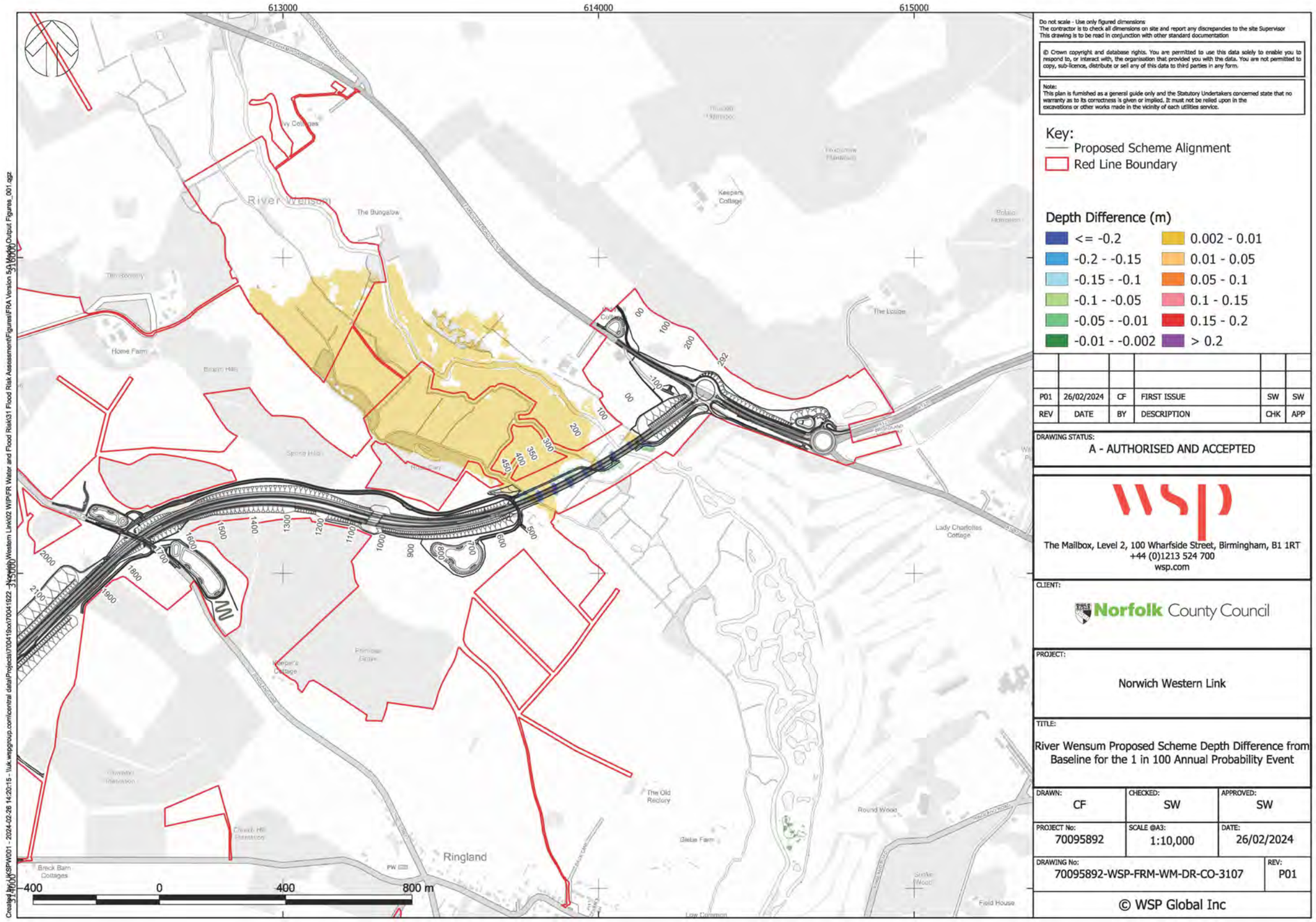
River Wensum proposed scheme depth difference from baseline in the 1 in 100 annual probability event



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Depth Difference (m)

<= -0.2	0.002 - 0.01
-0.2 - -0.15	0.01 - 0.05
-0.15 - -0.1	0.05 - 0.1
-0.1 - -0.05	0.1 - 0.15
-0.05 - -0.01	0.15 - 0.2
-0.01 - -0.002	> 0.2

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70095892	1:10,000	26/02/2024

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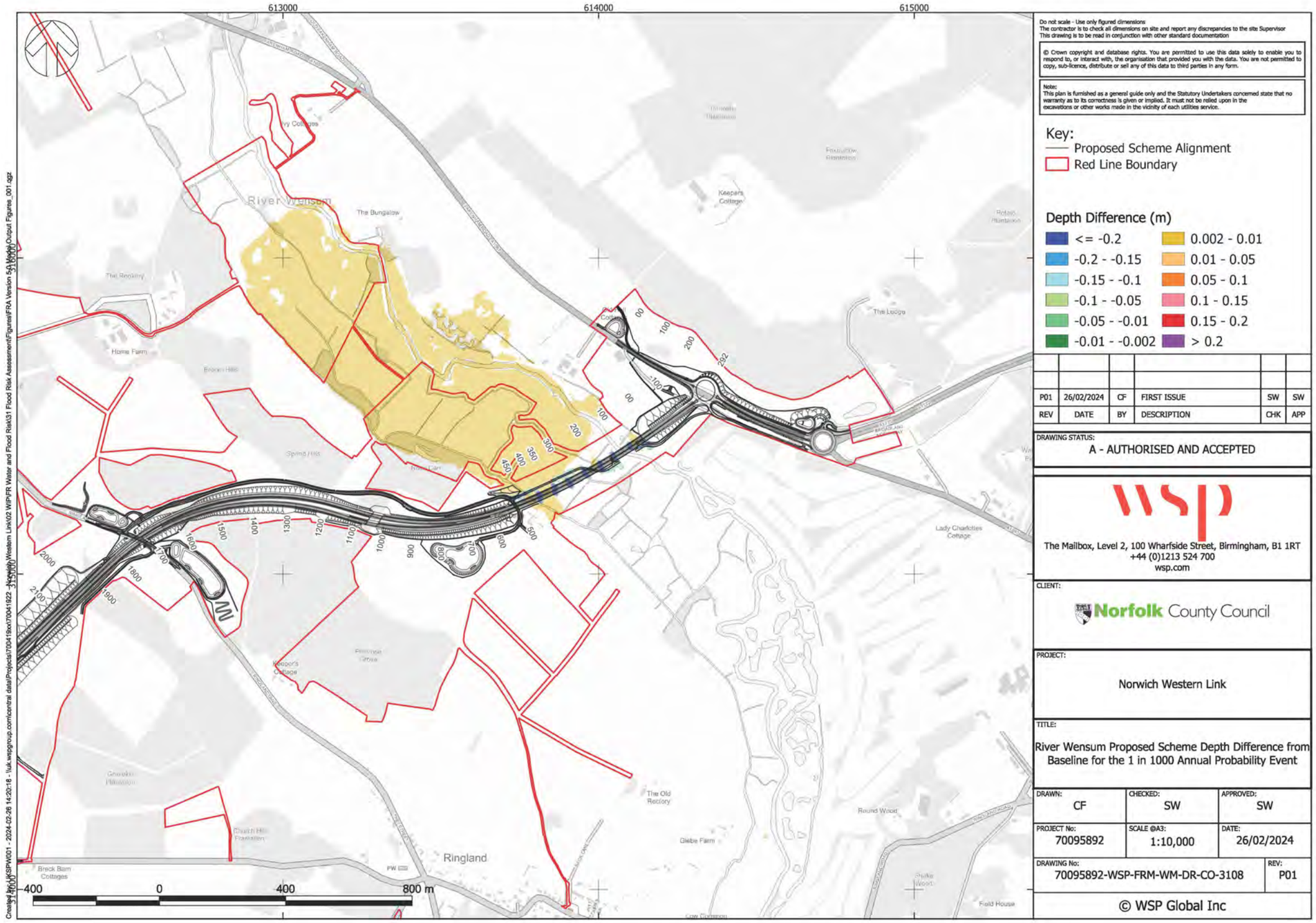
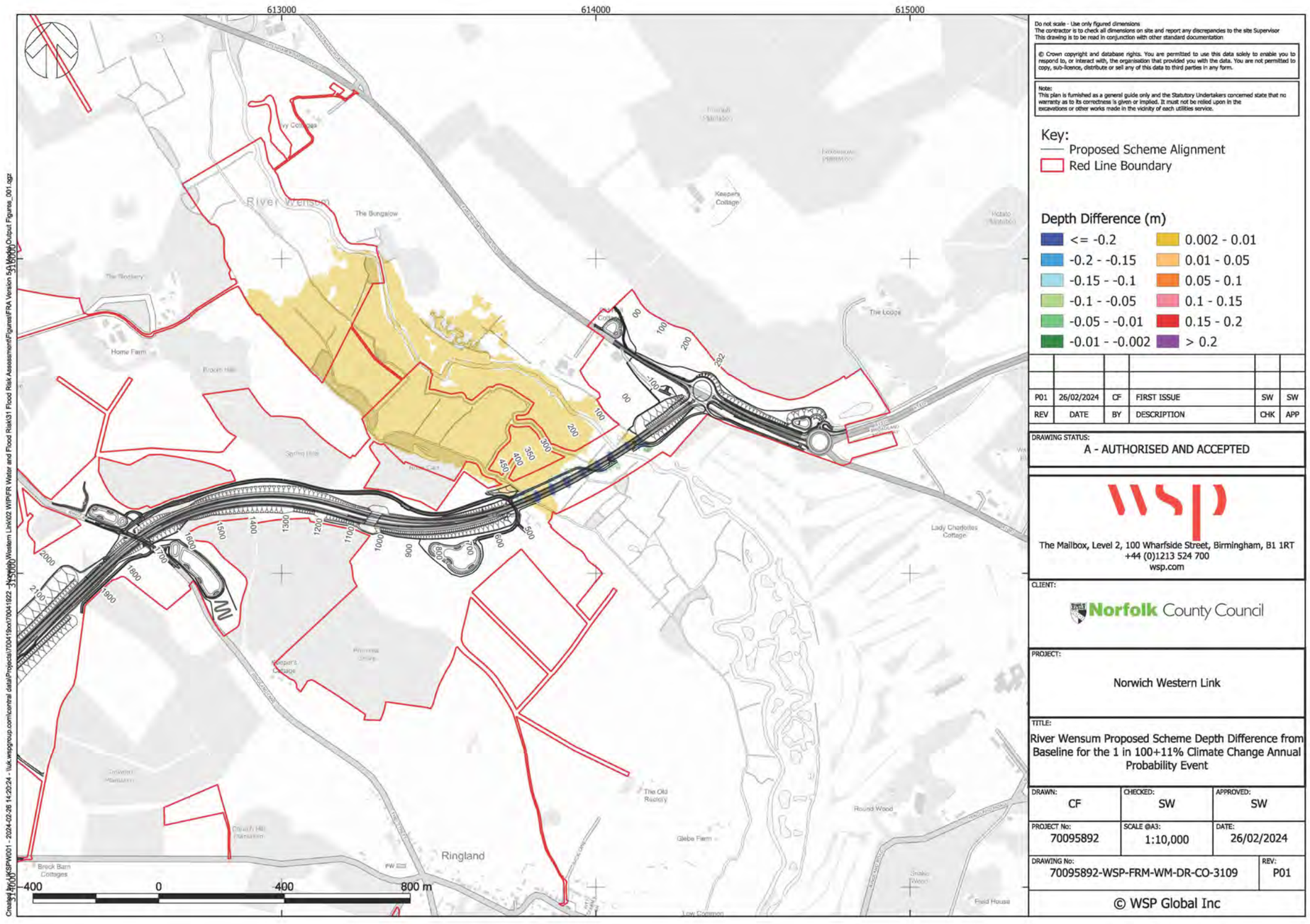
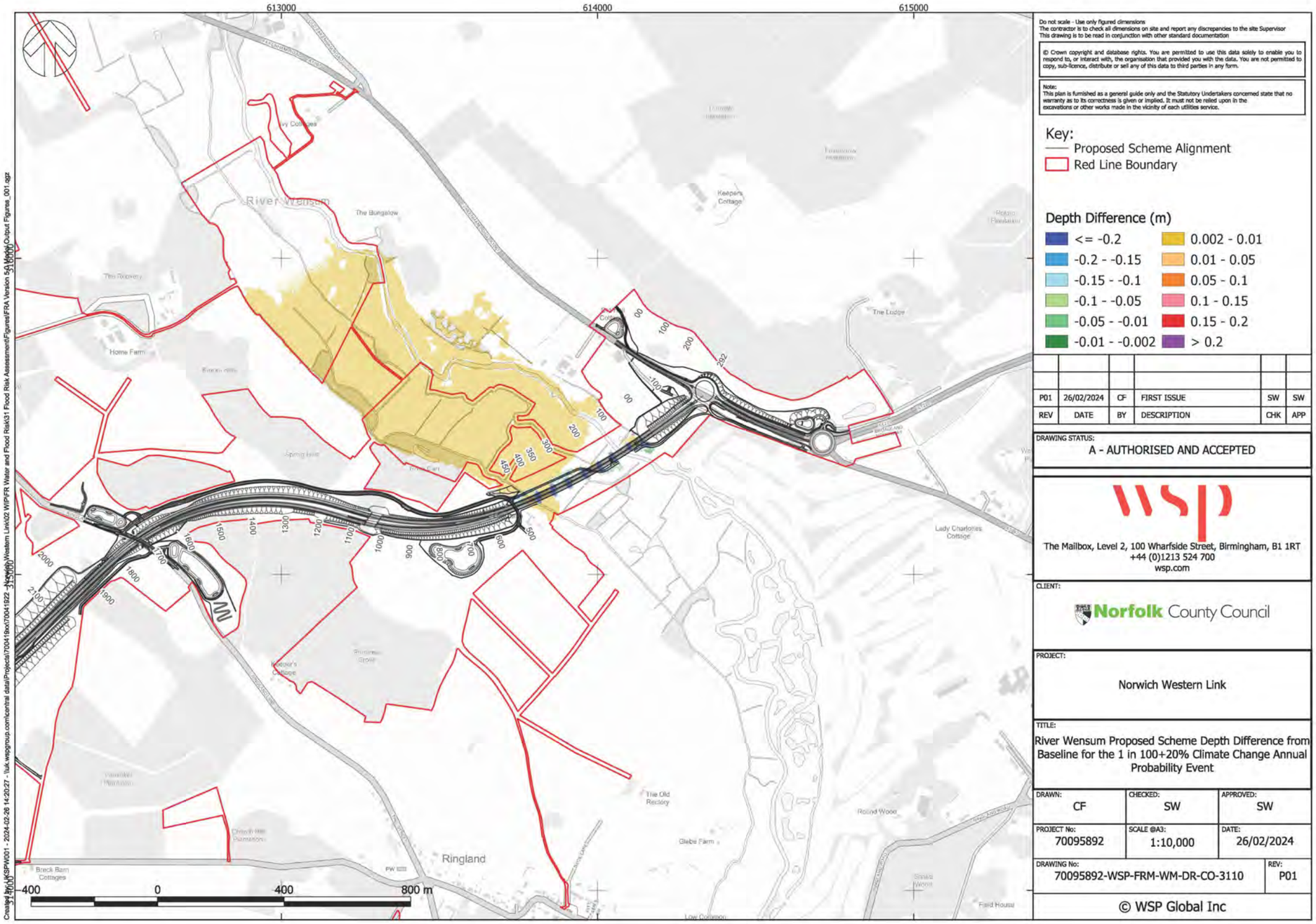
River Wensum proposed scheme depth difference from baseline in the 1 in 1000 annual probability event



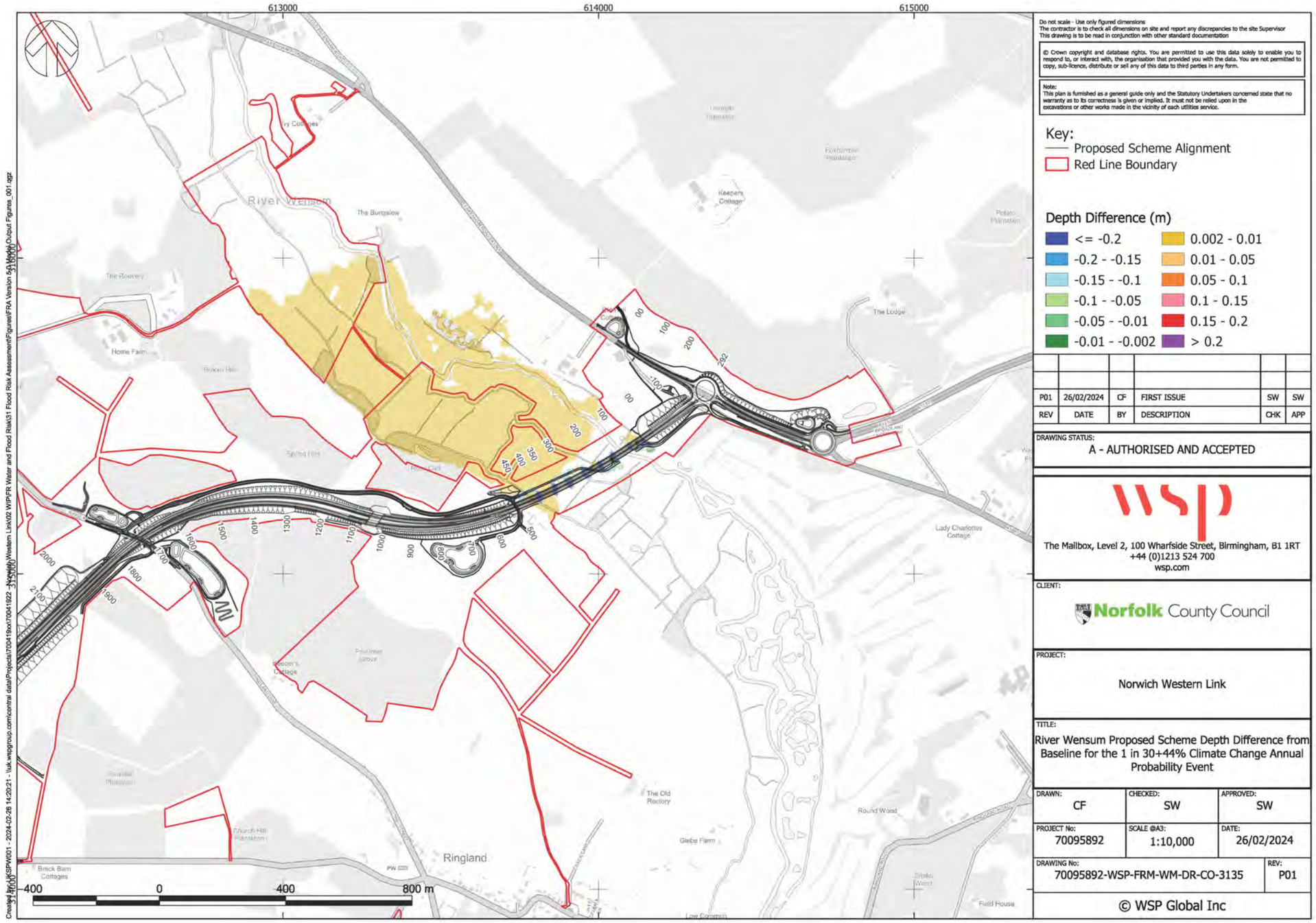
River Wensum proposed scheme depth difference from baseline in the 1 in 100+11% annual probability event



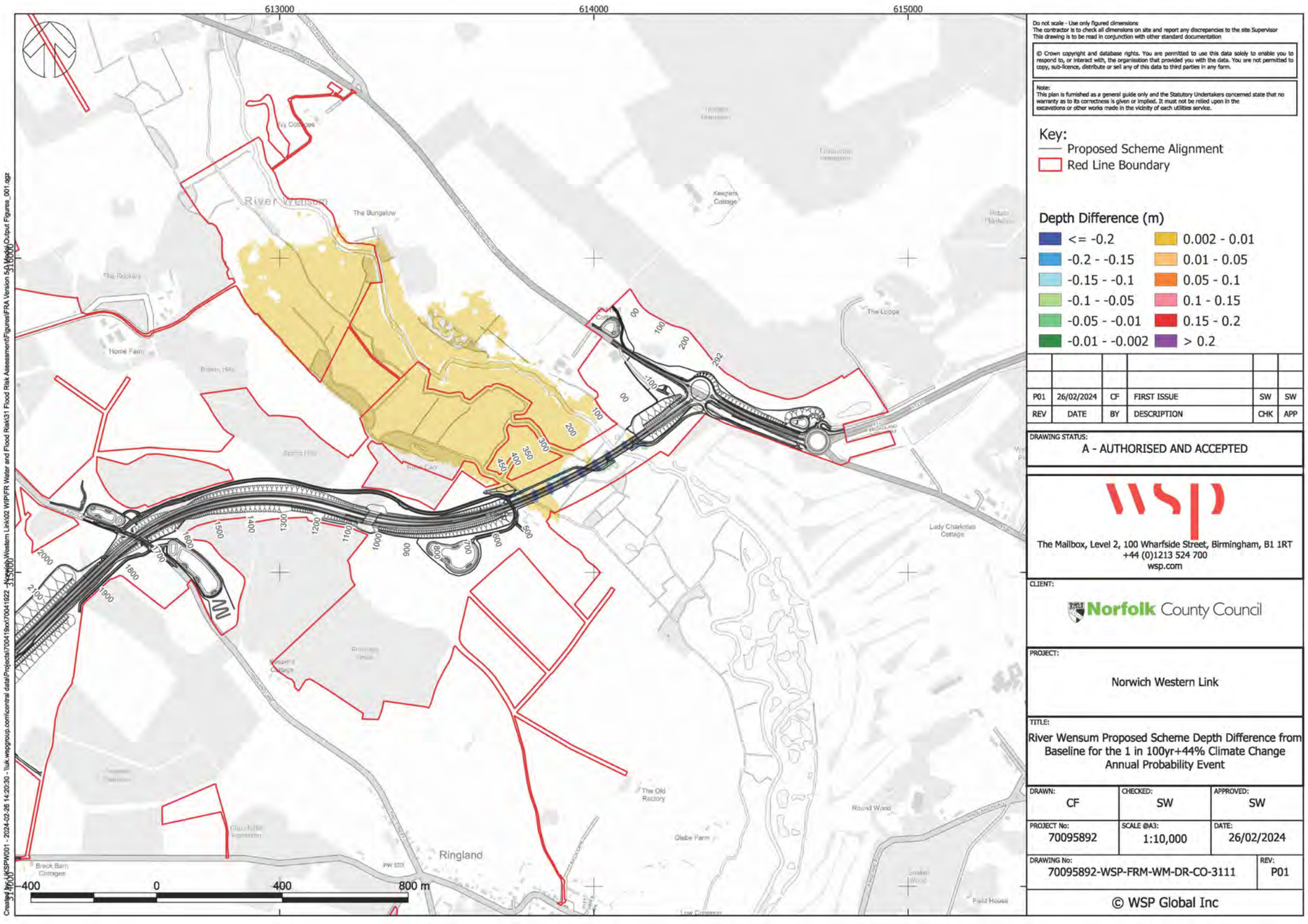
River Wensum proposed scheme depth difference from baseline in the 1 in 100+20% annual probability event



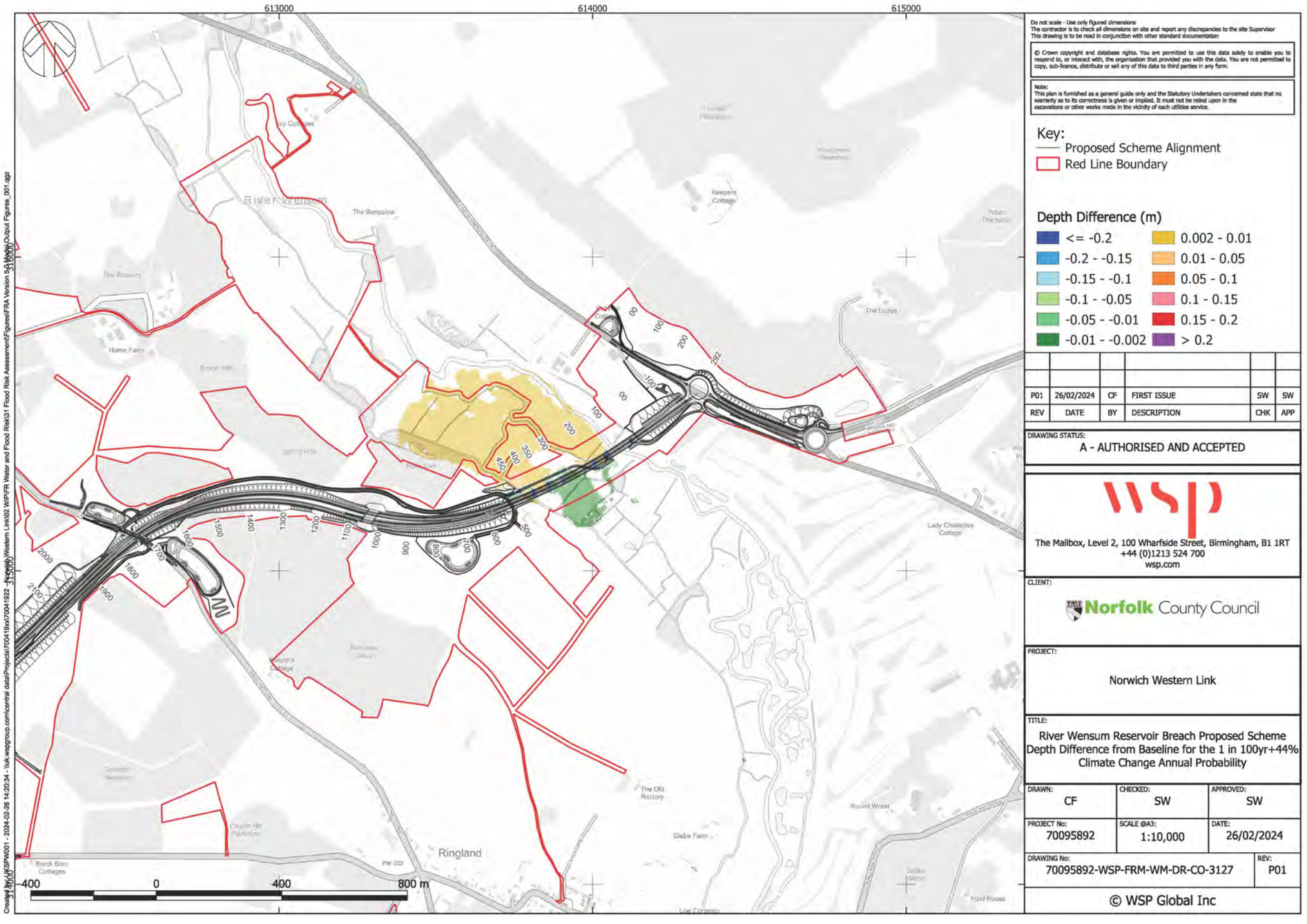
River Wensum proposed scheme depth difference from baseline in the 1 in 30+44% annual probability event



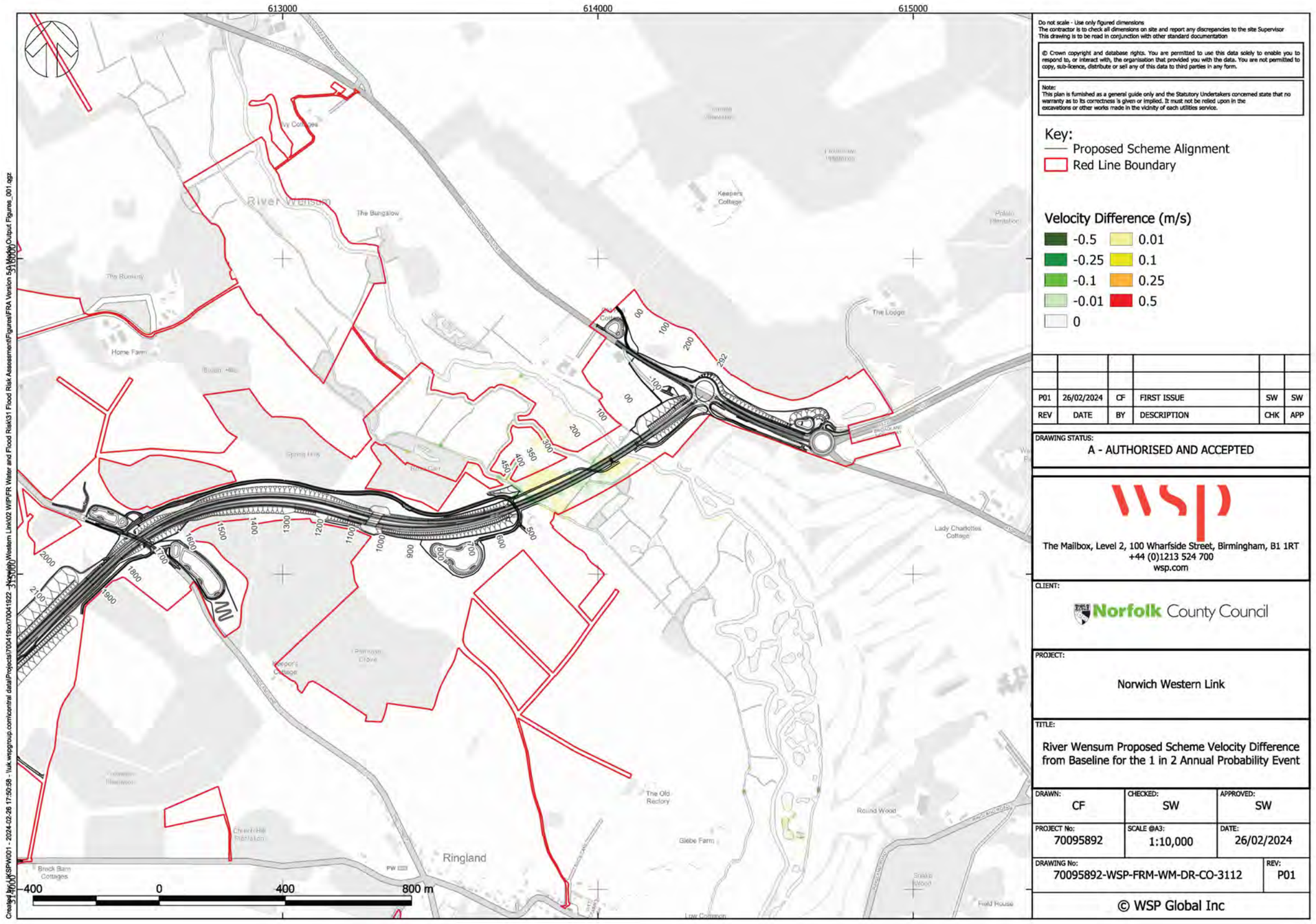
River Wensum proposed scheme depth difference from baseline in the 1 in 100+44% annual probability event



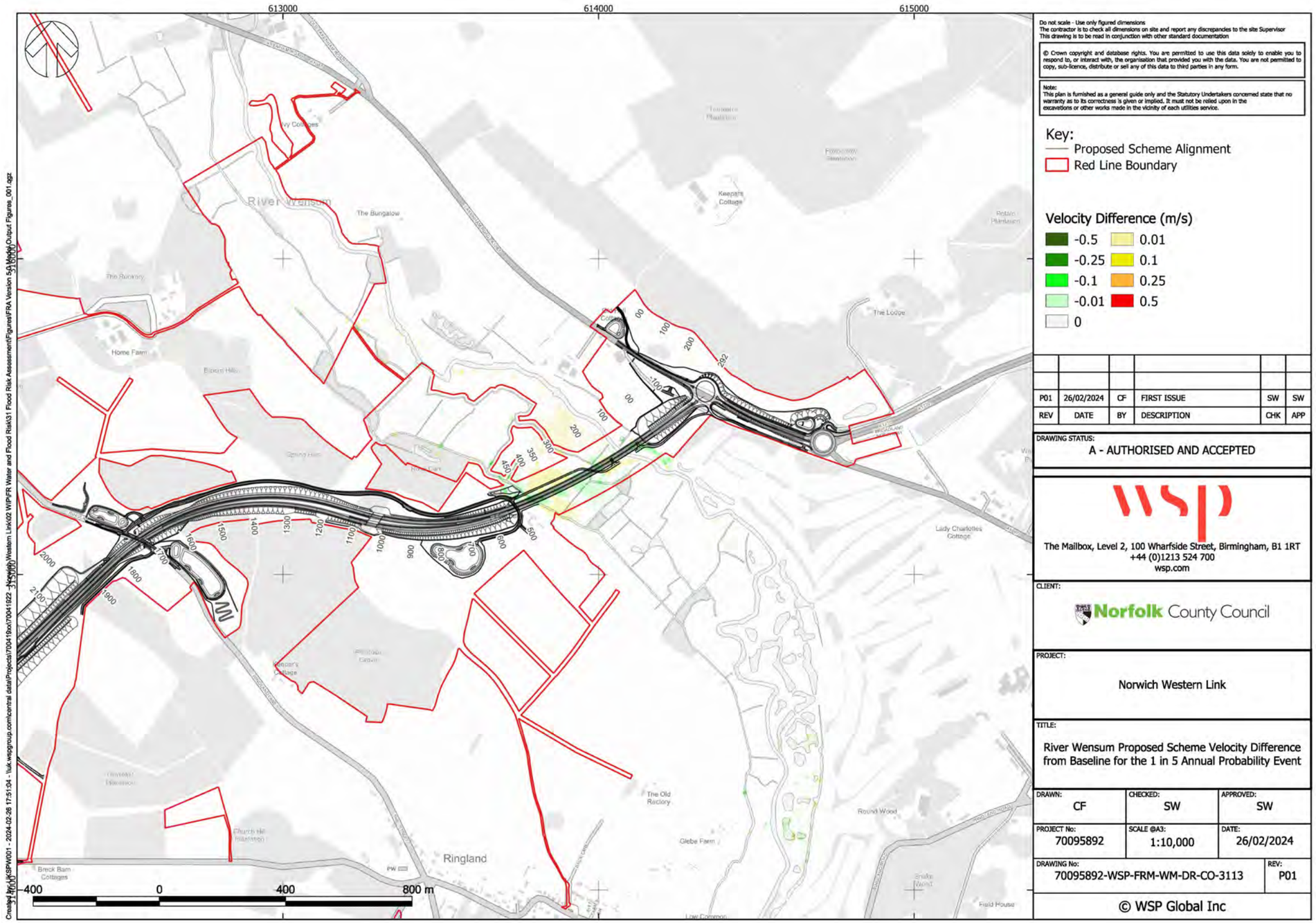
River Wensum reservoir breach proposed scheme depth difference from baseline in the 1 in 100+44% annual probability event



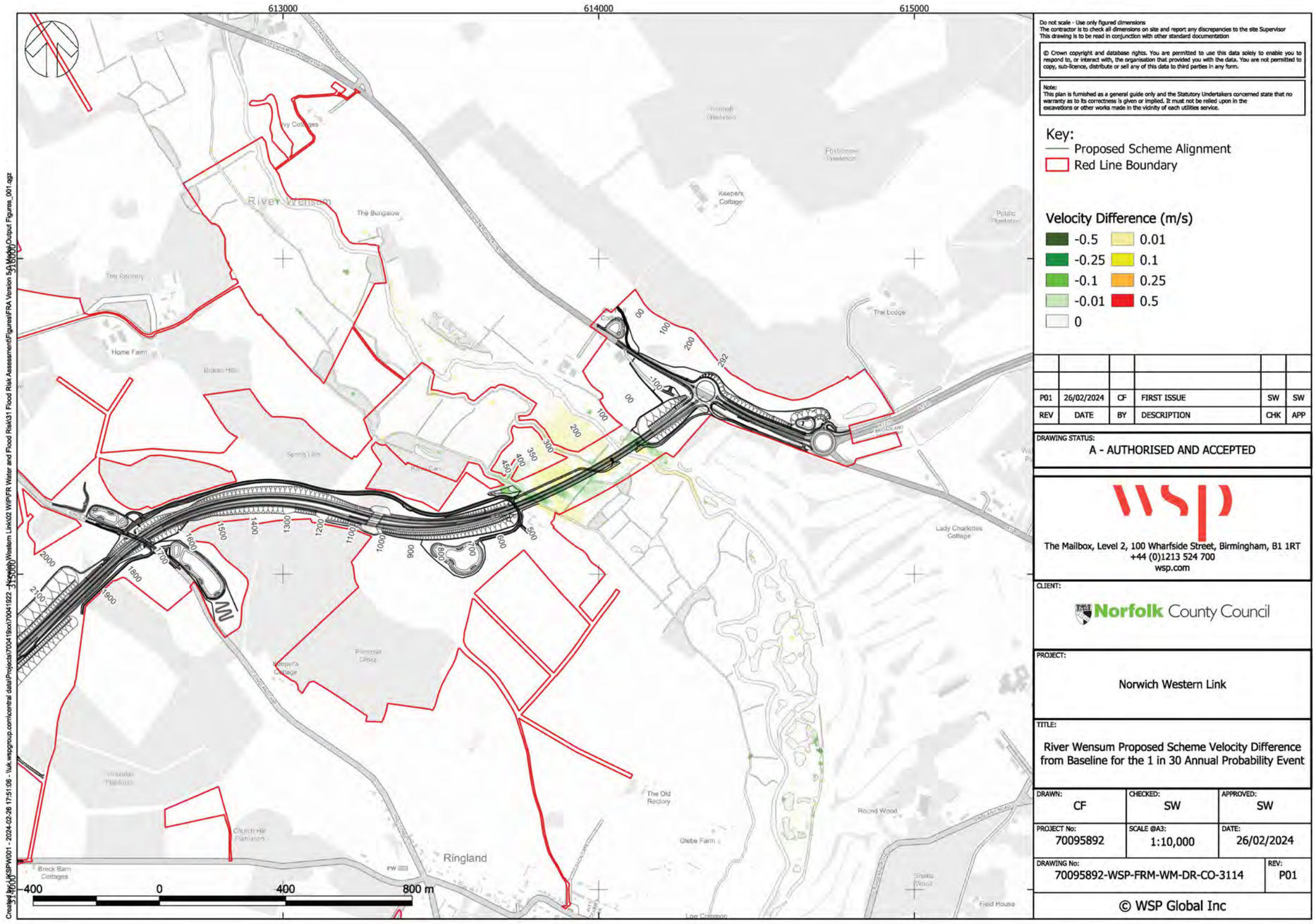
River Wensum proposed scheme velocity difference from baseline in the 1 in 2 annual probability event



River Wensum proposed scheme velocity difference from baseline in the 1 in 5 annual probability event



River Wensum proposed scheme velocity difference from baseline in the 1 in 30 annual probability event



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Velocity Difference (m/s)

-0.5	0.01
-0.25	0.1
-0.1	0.25
-0.01	0.5
0	

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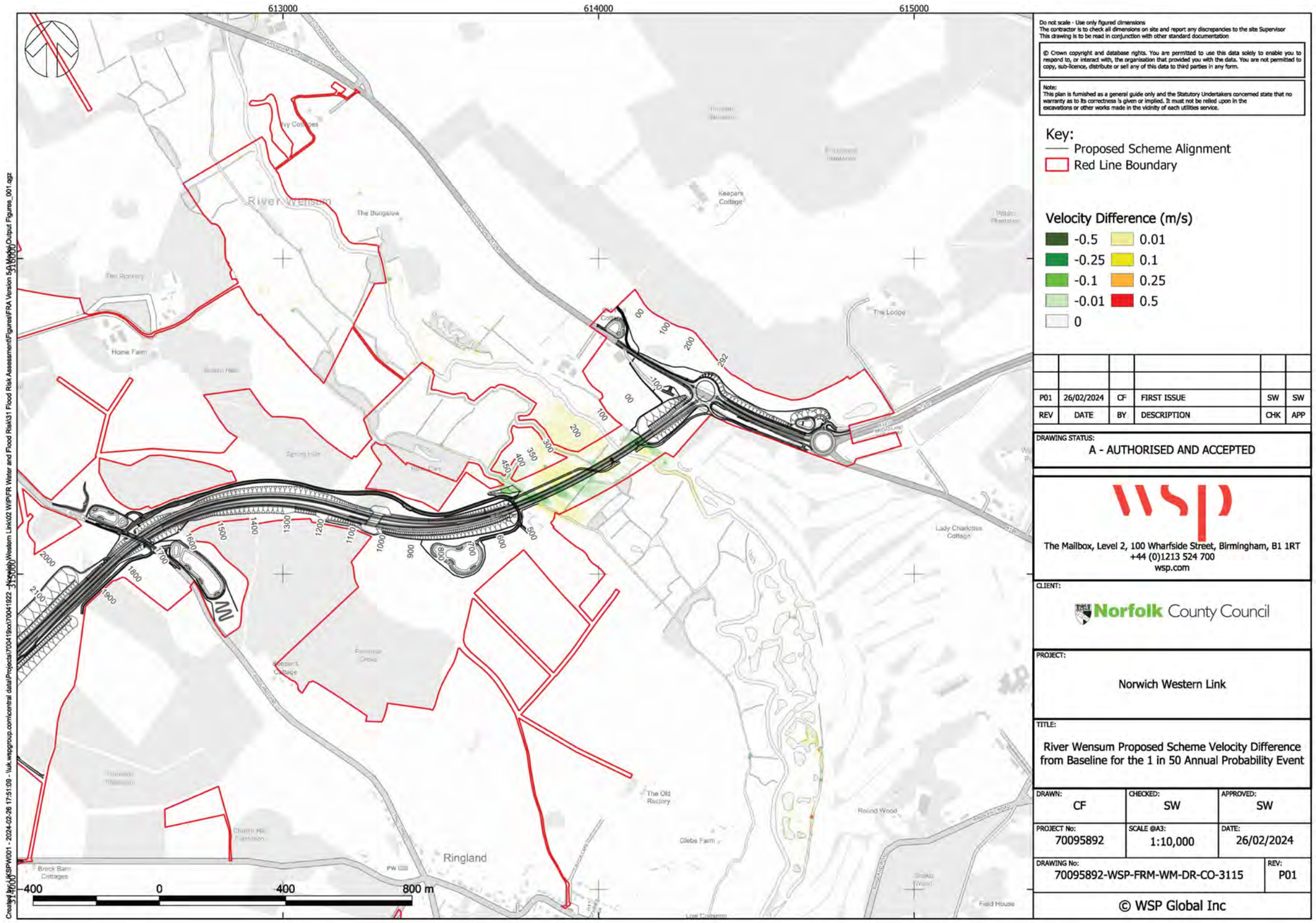
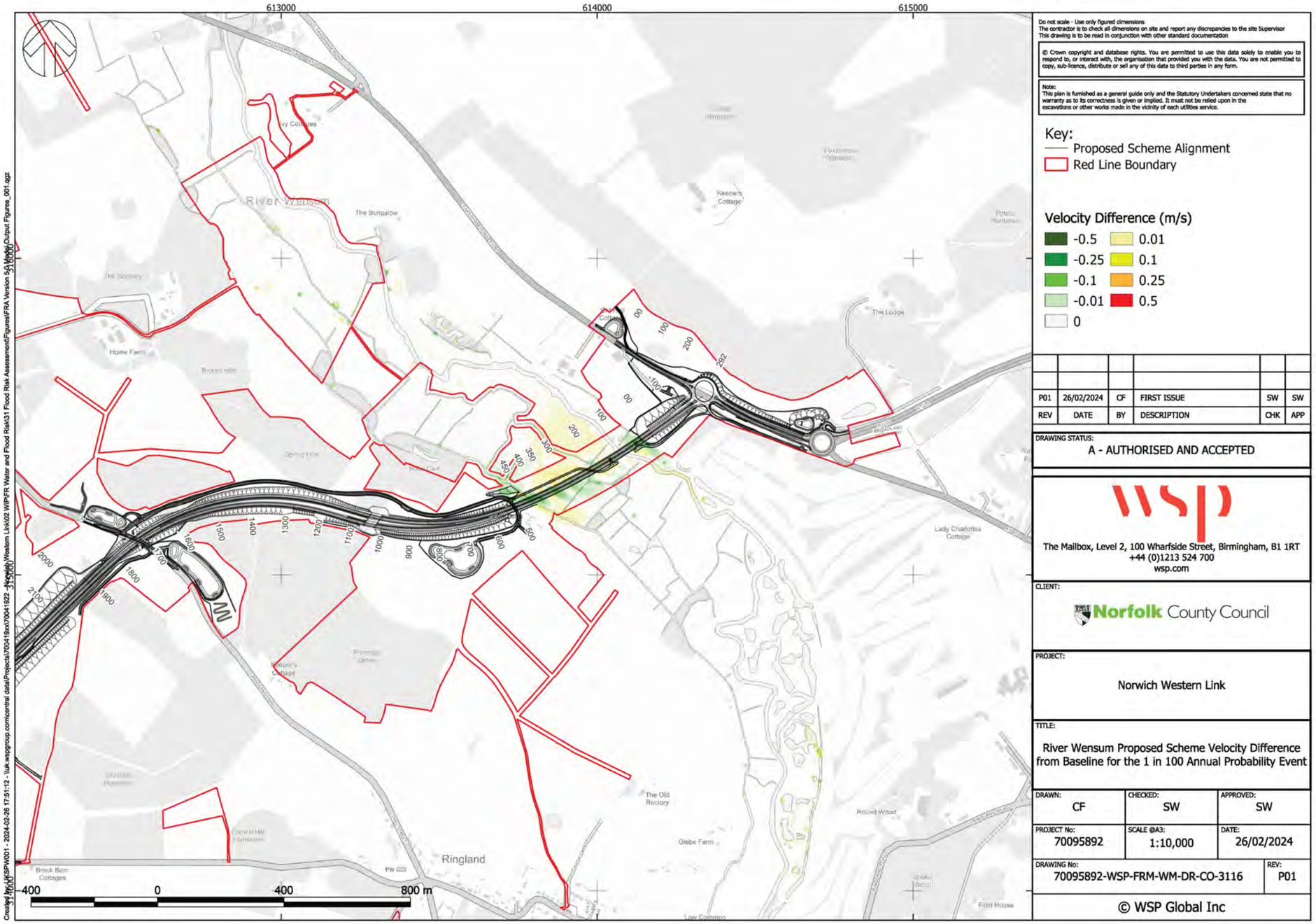
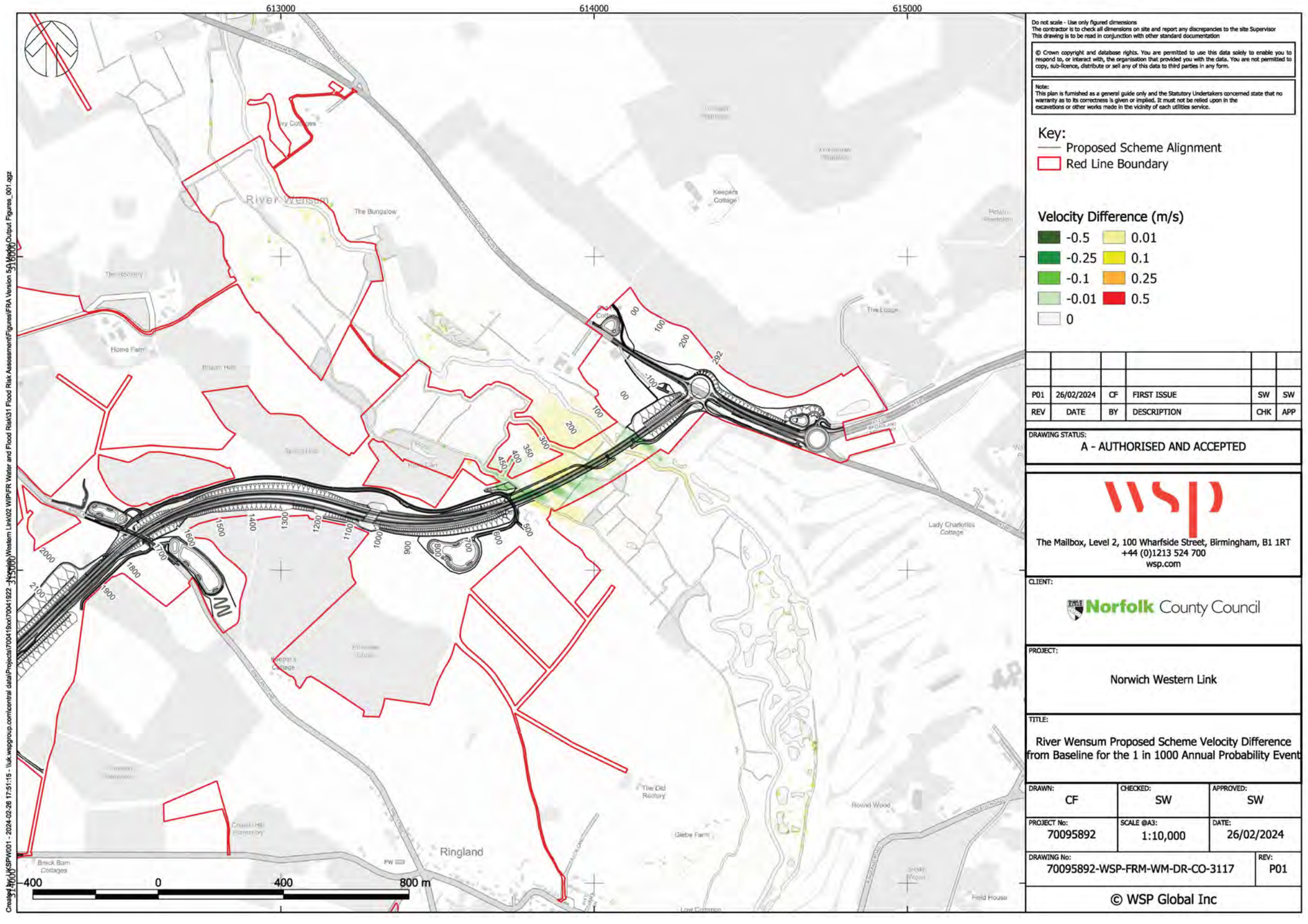
River Wensum proposed scheme velocity difference from baseline in the 1 in 50 annual probability event



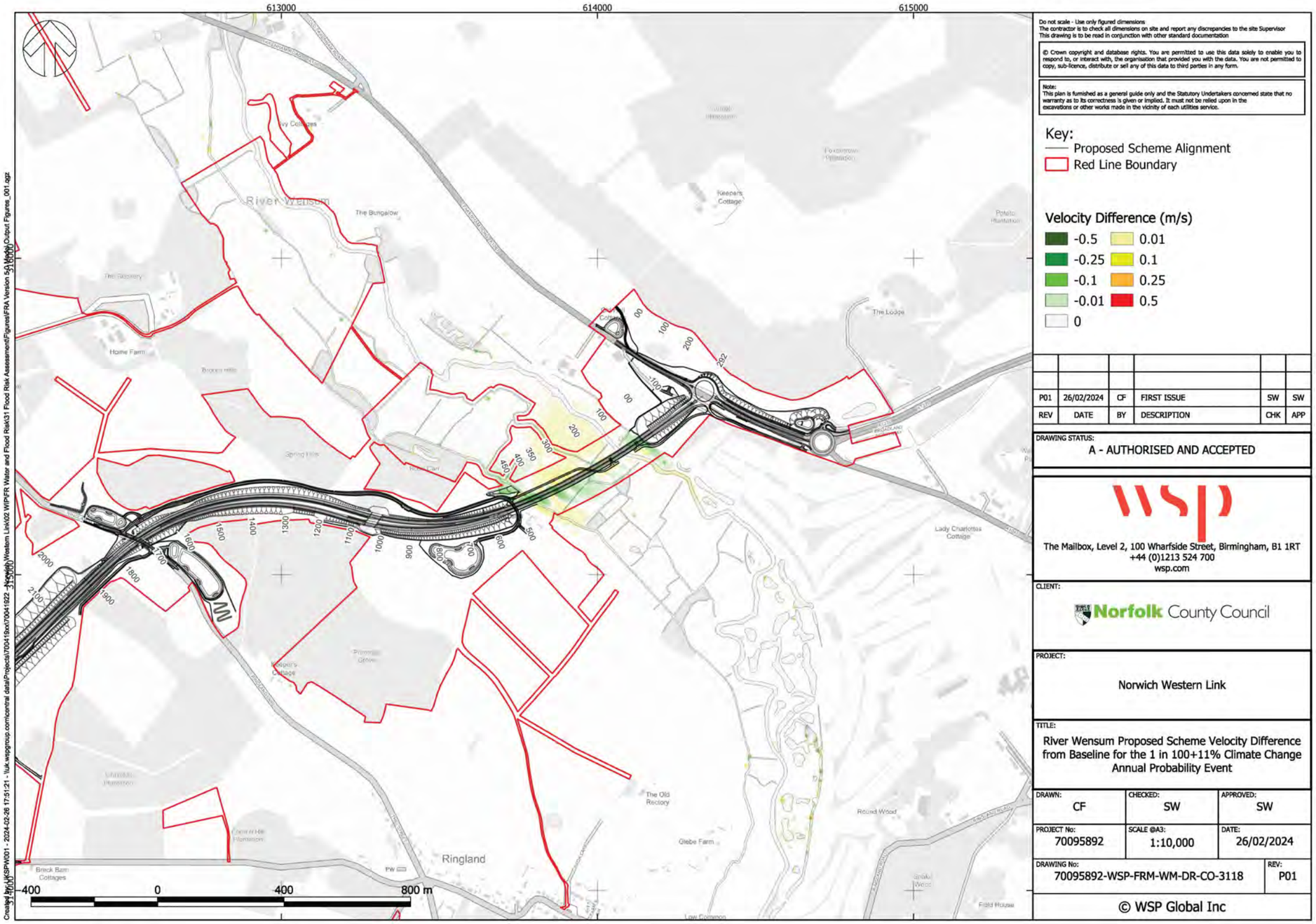
River Wensum proposed scheme velocity difference from baseline in the 1 in 100 annual probability event



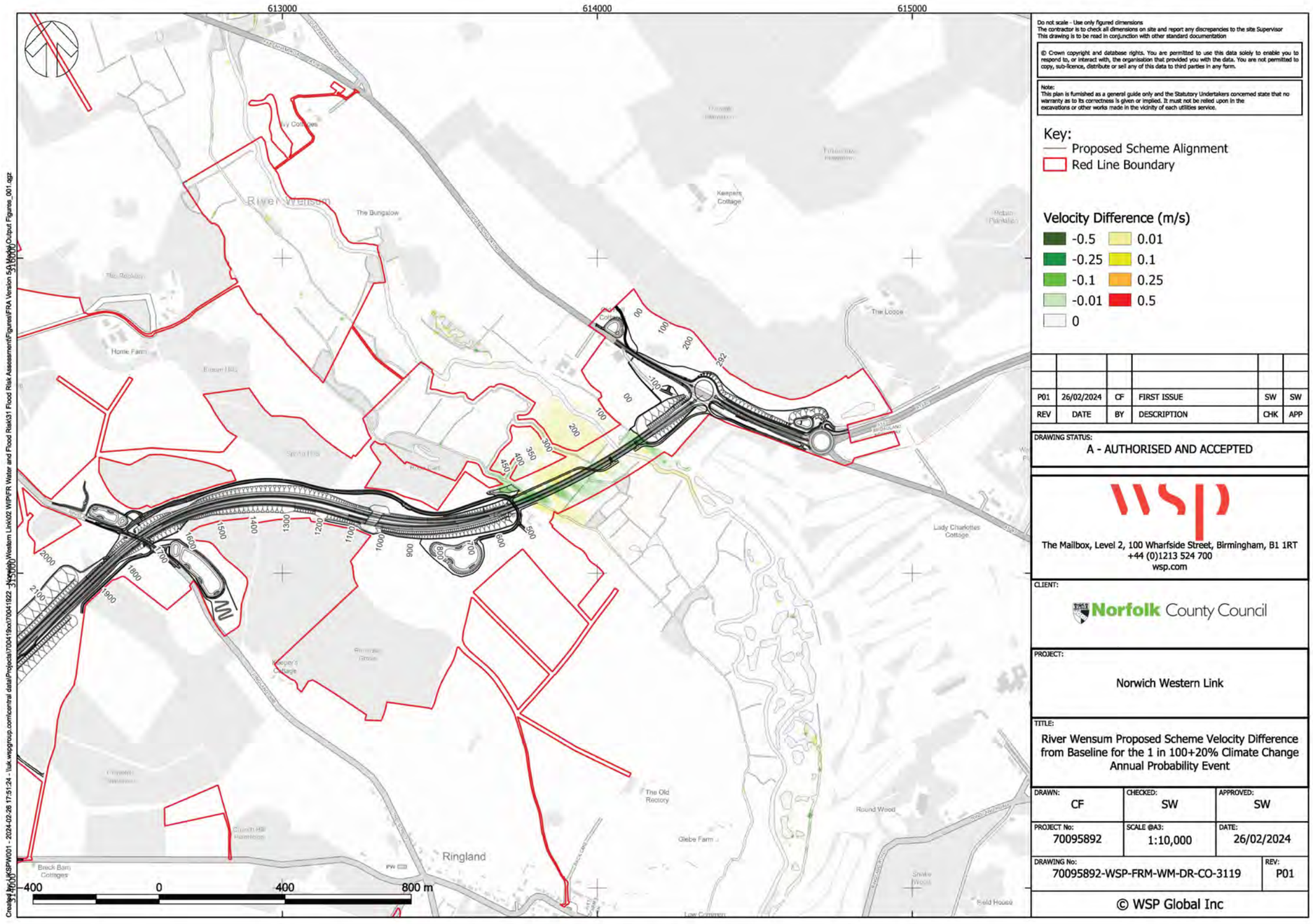
River Wensum proposed scheme velocity difference from baseline in the 1 in 1000 annual probability event



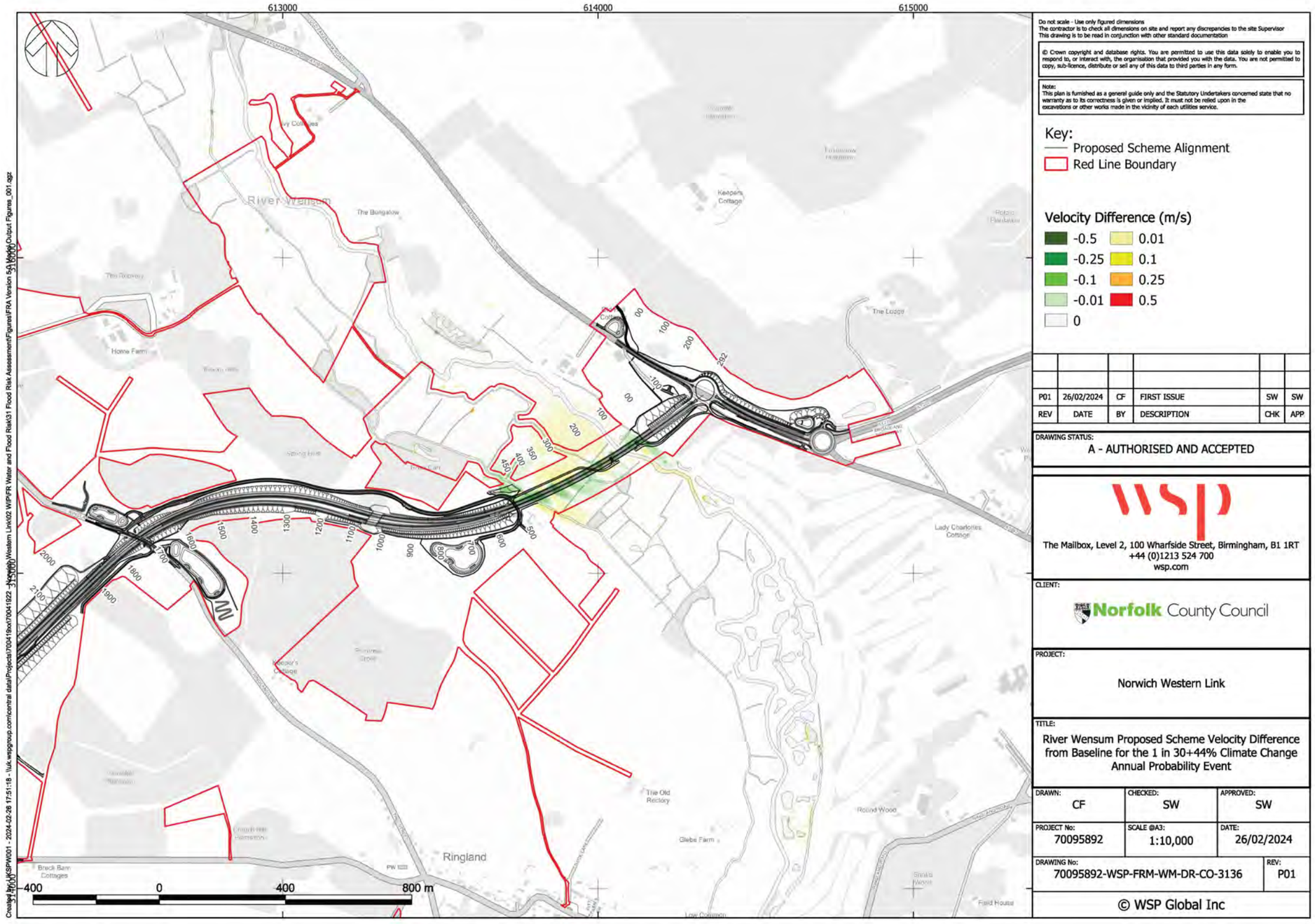
River Wensum proposed scheme velocity difference from baseline in the 1 in 100+11% annual probability event



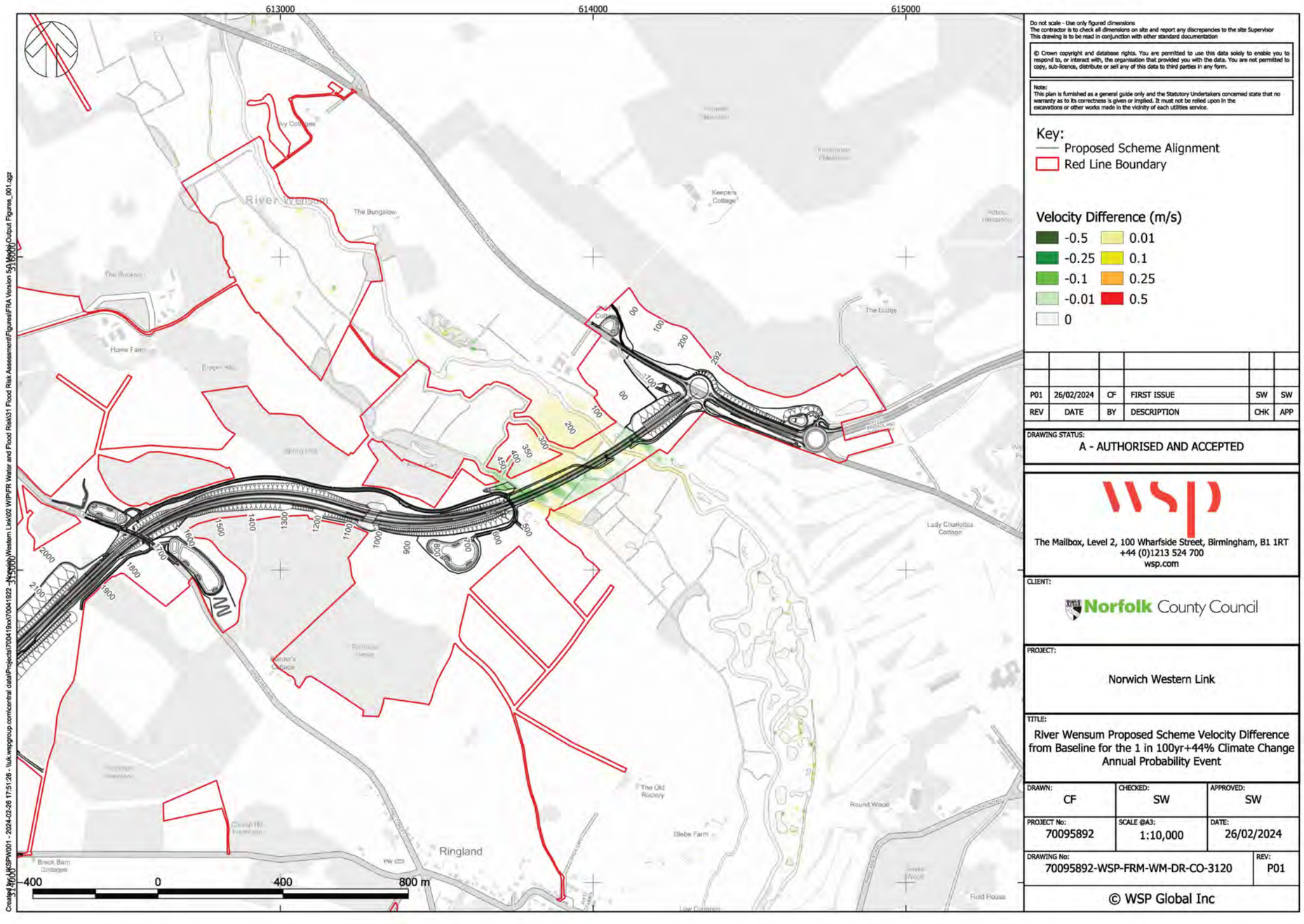
River Wensum proposed scheme velocity difference from baseline in the 1 in 100+20% annual probability event



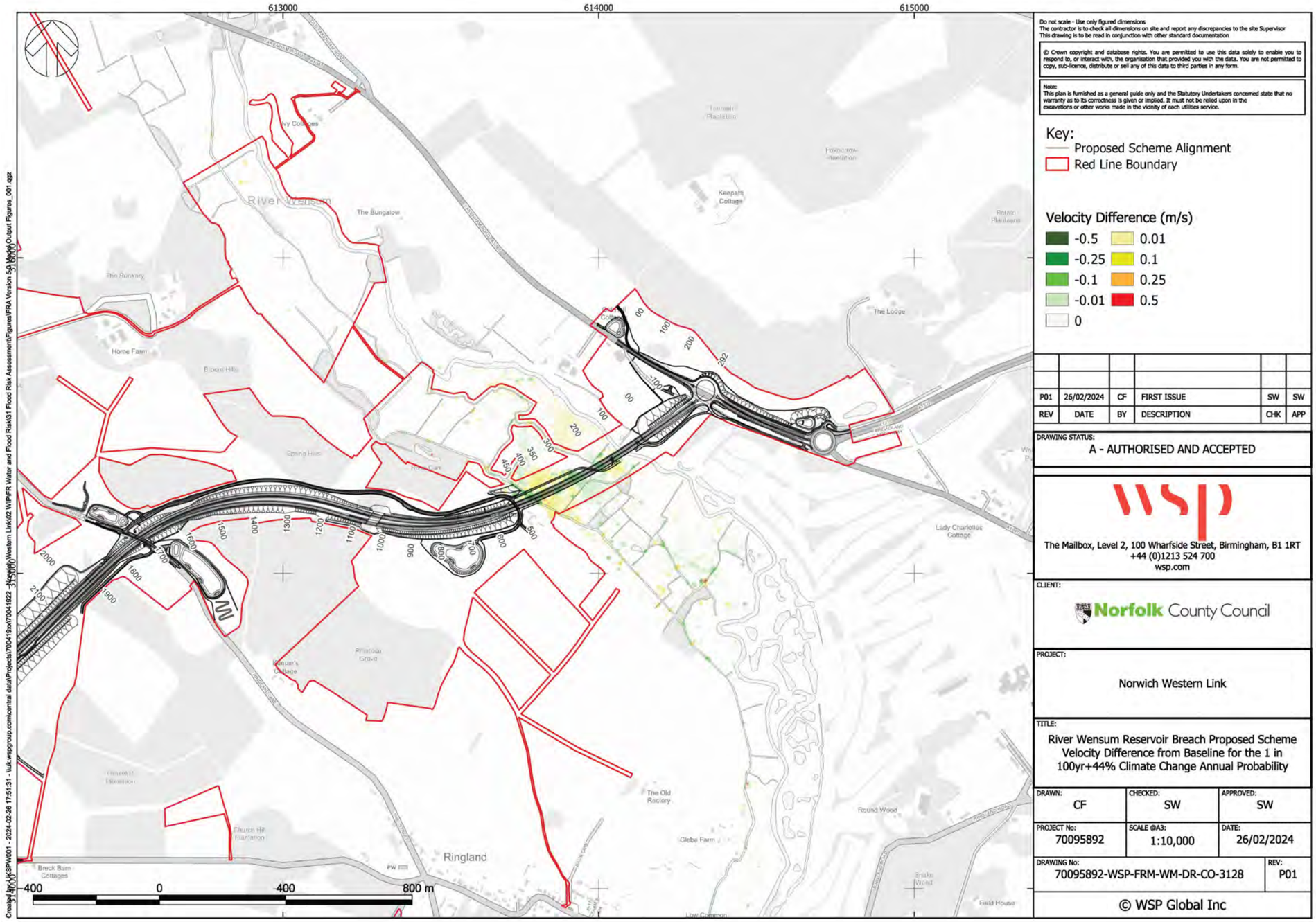
River Wensum proposed scheme velocity difference from baseline in the 1 in 30+44% annual probability event



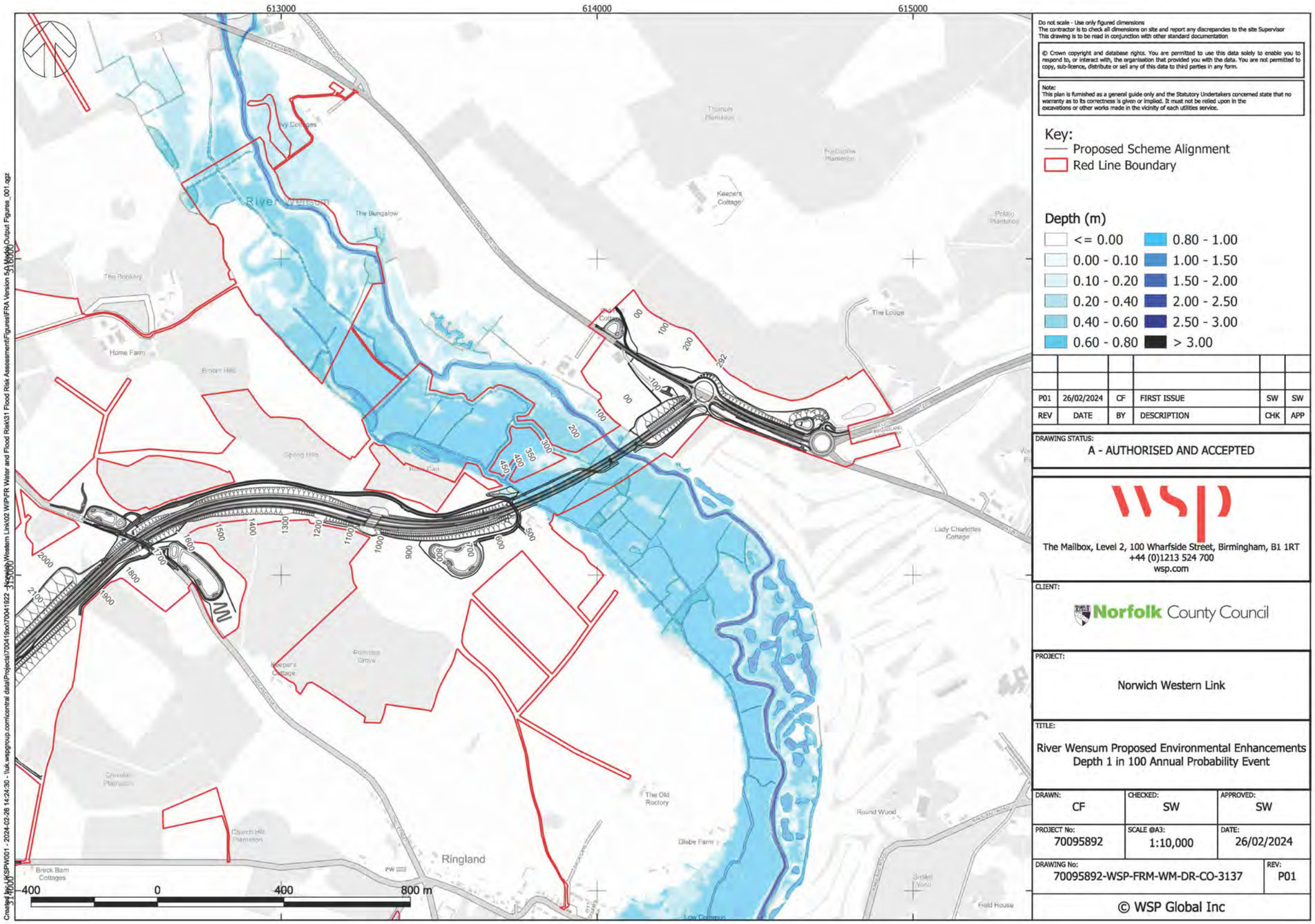
River Wensum proposed scheme velocity difference from baseline in the 1 in 100+44% annual probability event



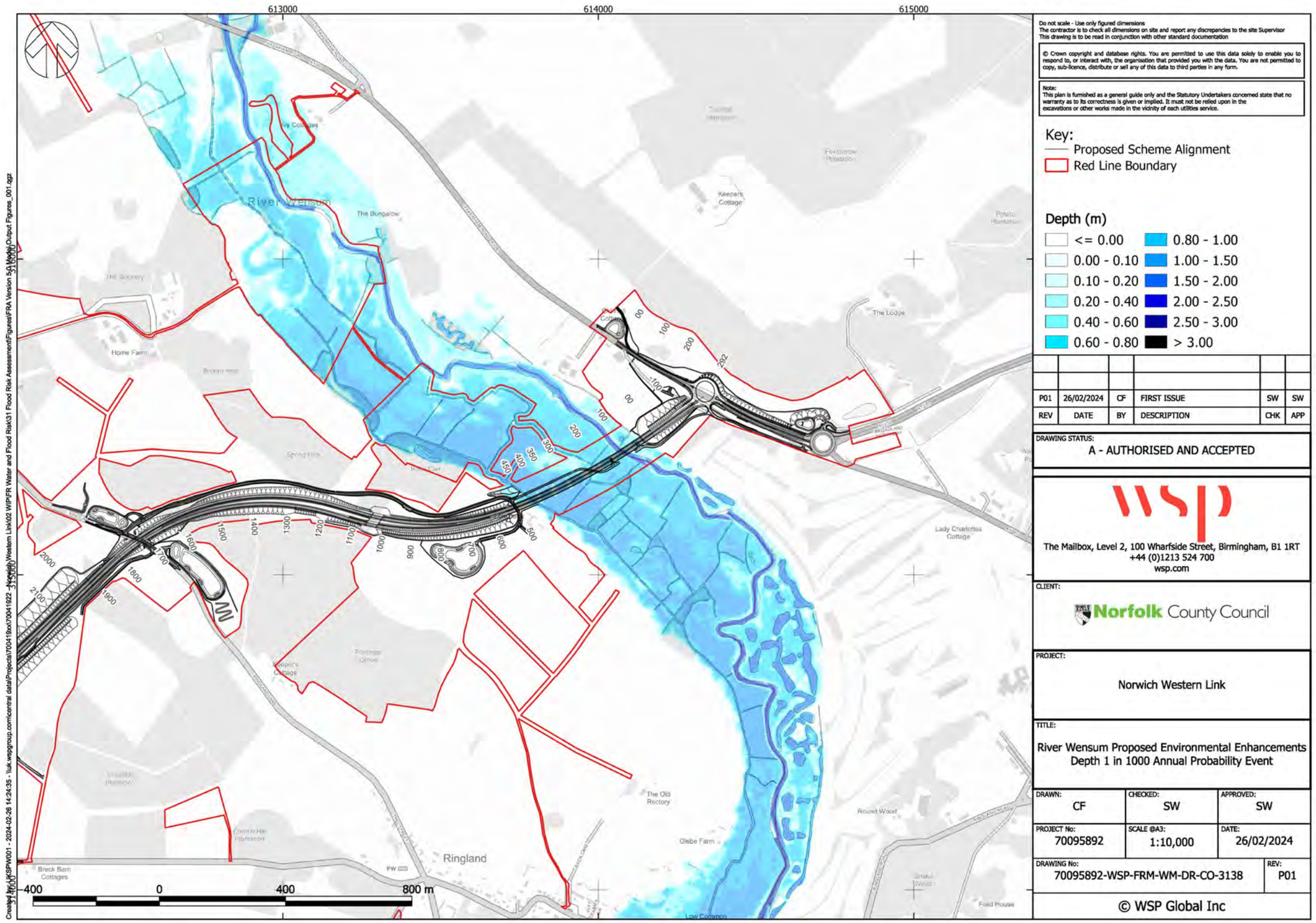
River Wensum reservoir breach proposed scheme velocity difference from baseline in the 1 in 100+44% annual probability event



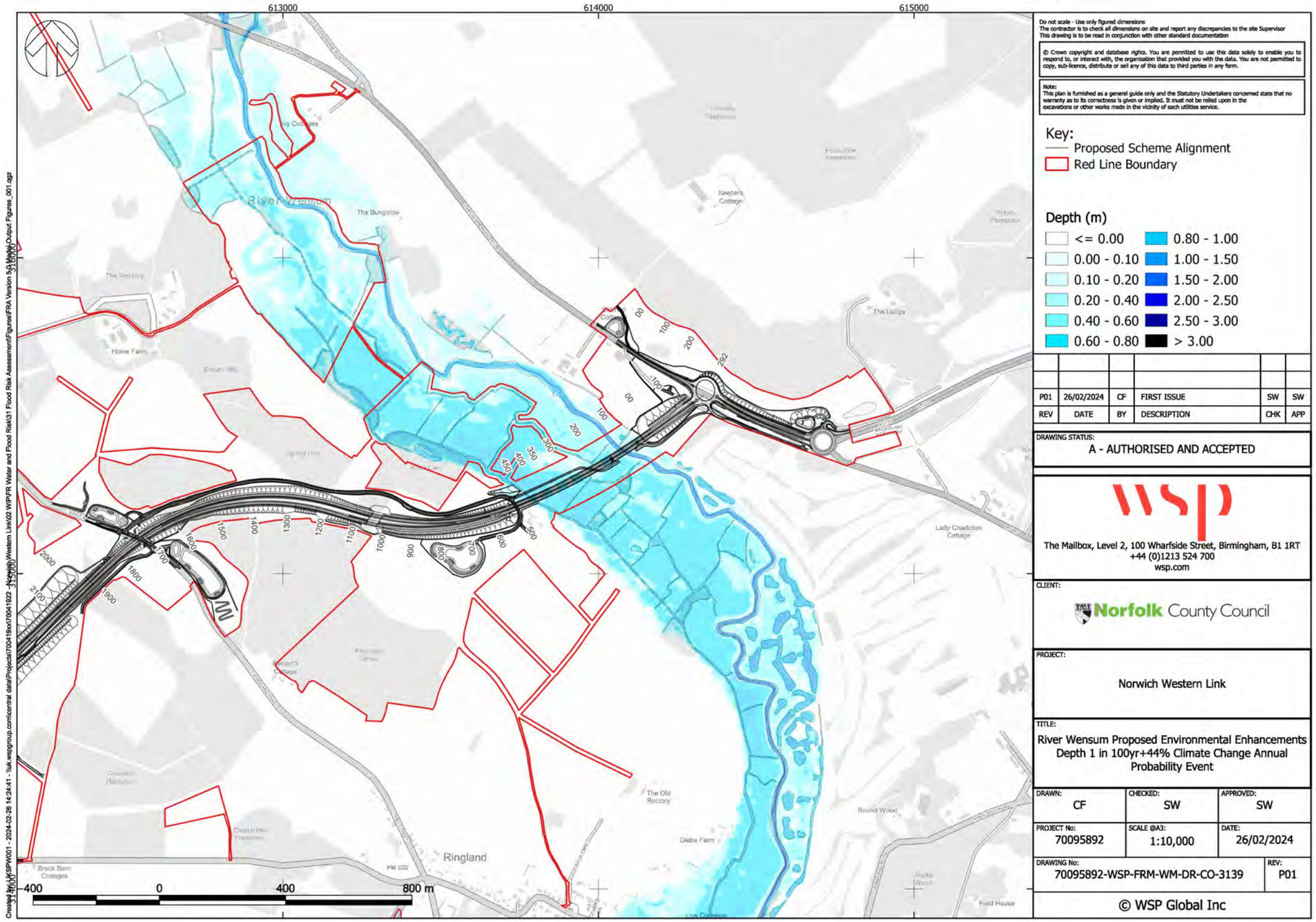
River Wensum environmental enhancements depth 1 in 100 annual probability event



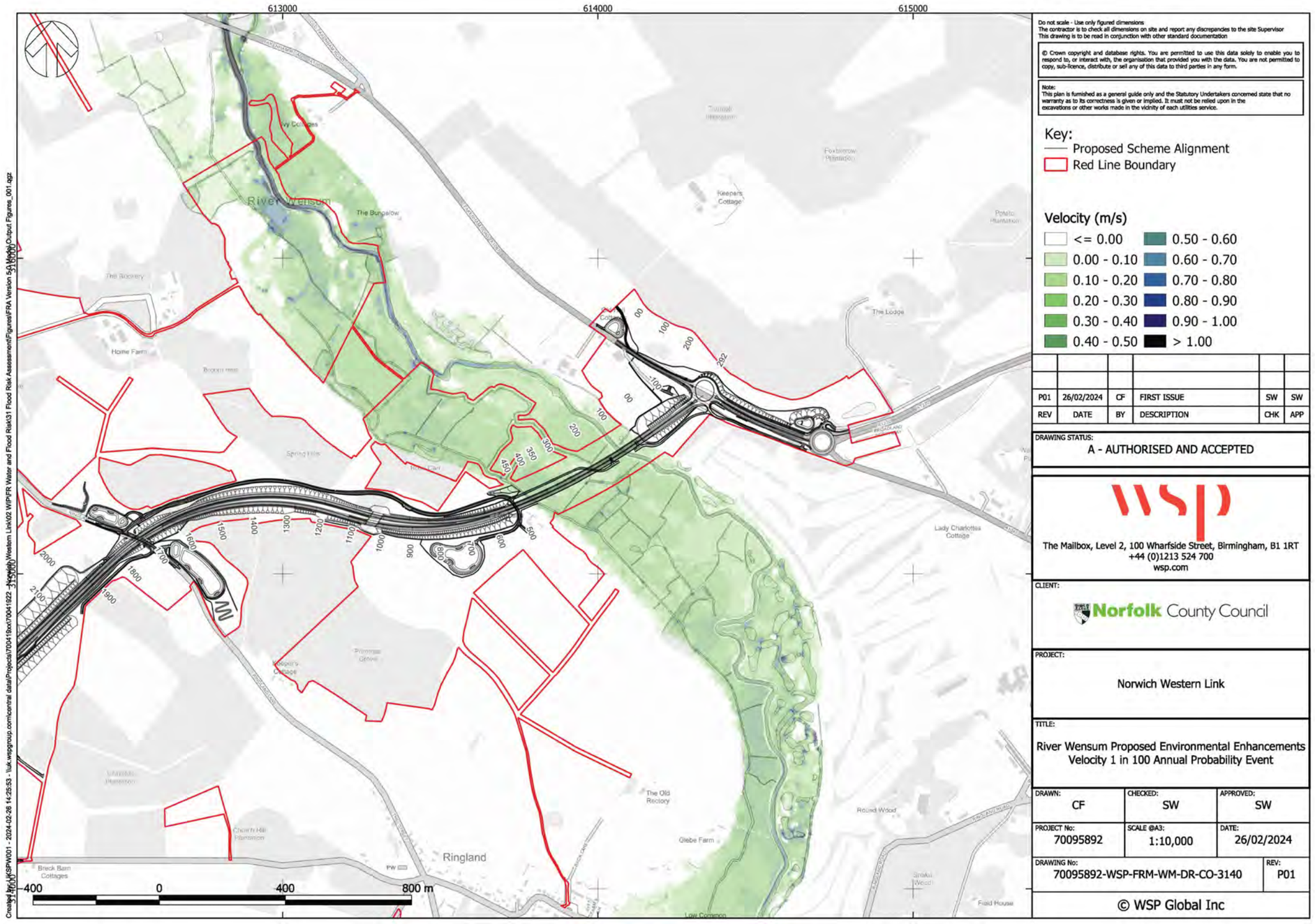
River Wensum environmental enhancements depth 1 in 1000 annual probability event



River Wensum environmental enhancements depth 1 in 100+44% annual probability event



River Wensum environmental enhancements velocity 1 in 100 annual probability event



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Velocity (m/s)

<= 0.00	0.50 - 0.60
0.00 - 0.10	0.60 - 0.70
0.10 - 0.20	0.70 - 0.80
0.20 - 0.30	0.80 - 0.90
0.30 - 0.40	0.90 - 1.00
0.40 - 0.50	> 1.00

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TITLE: River Wensum Proposed Environmental Enhancements Velocity 1 in 100 Annual Probability Event

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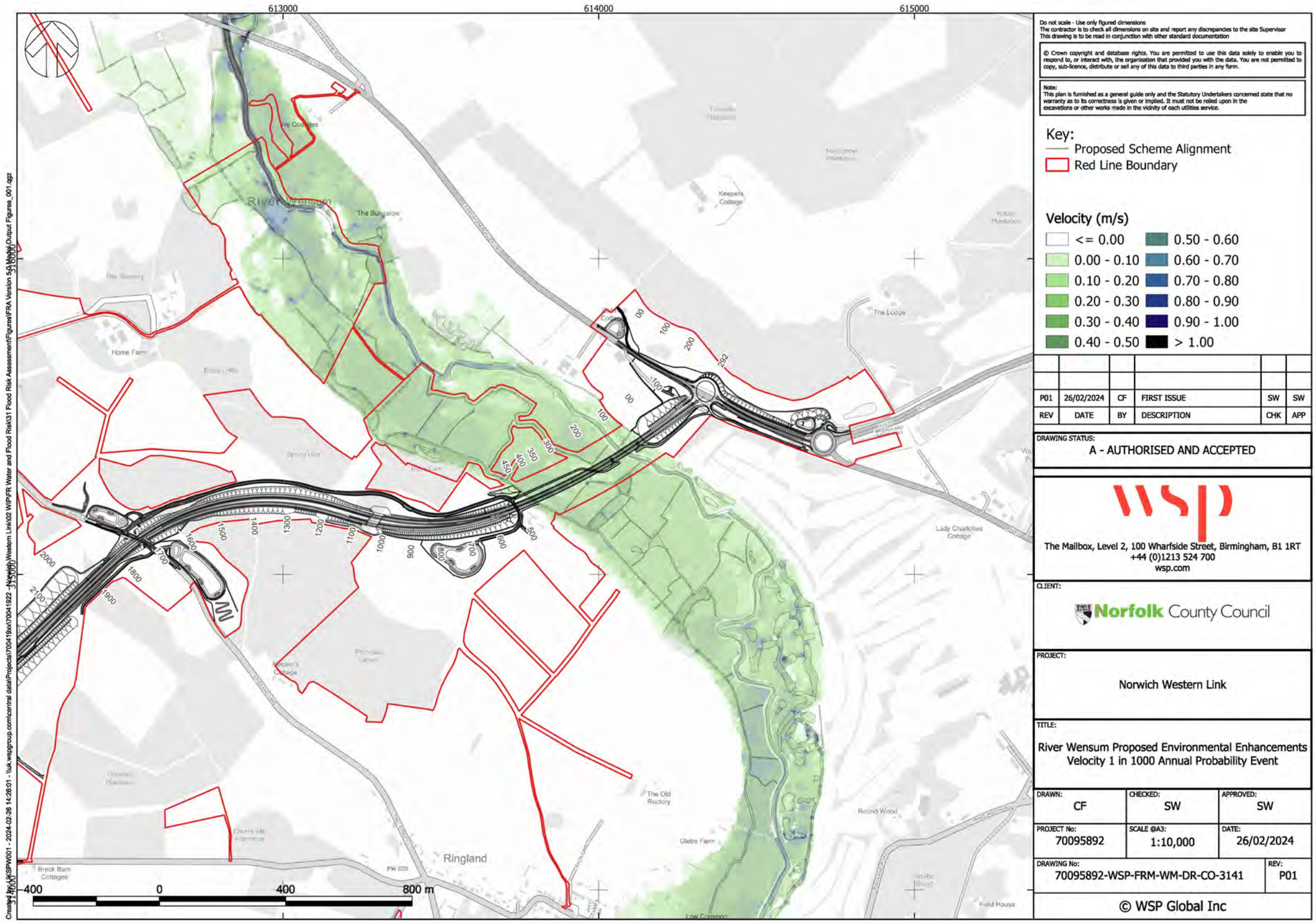
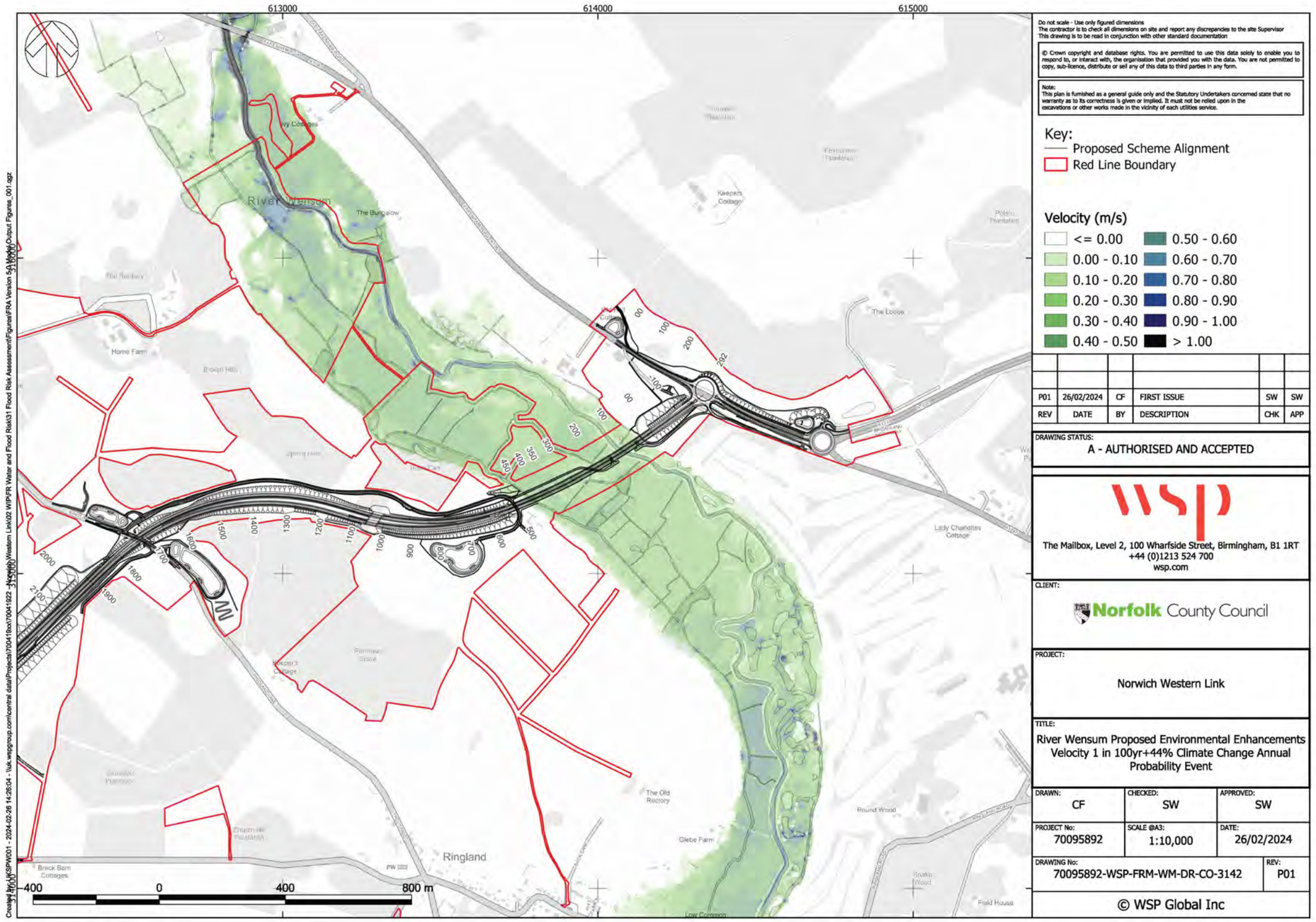
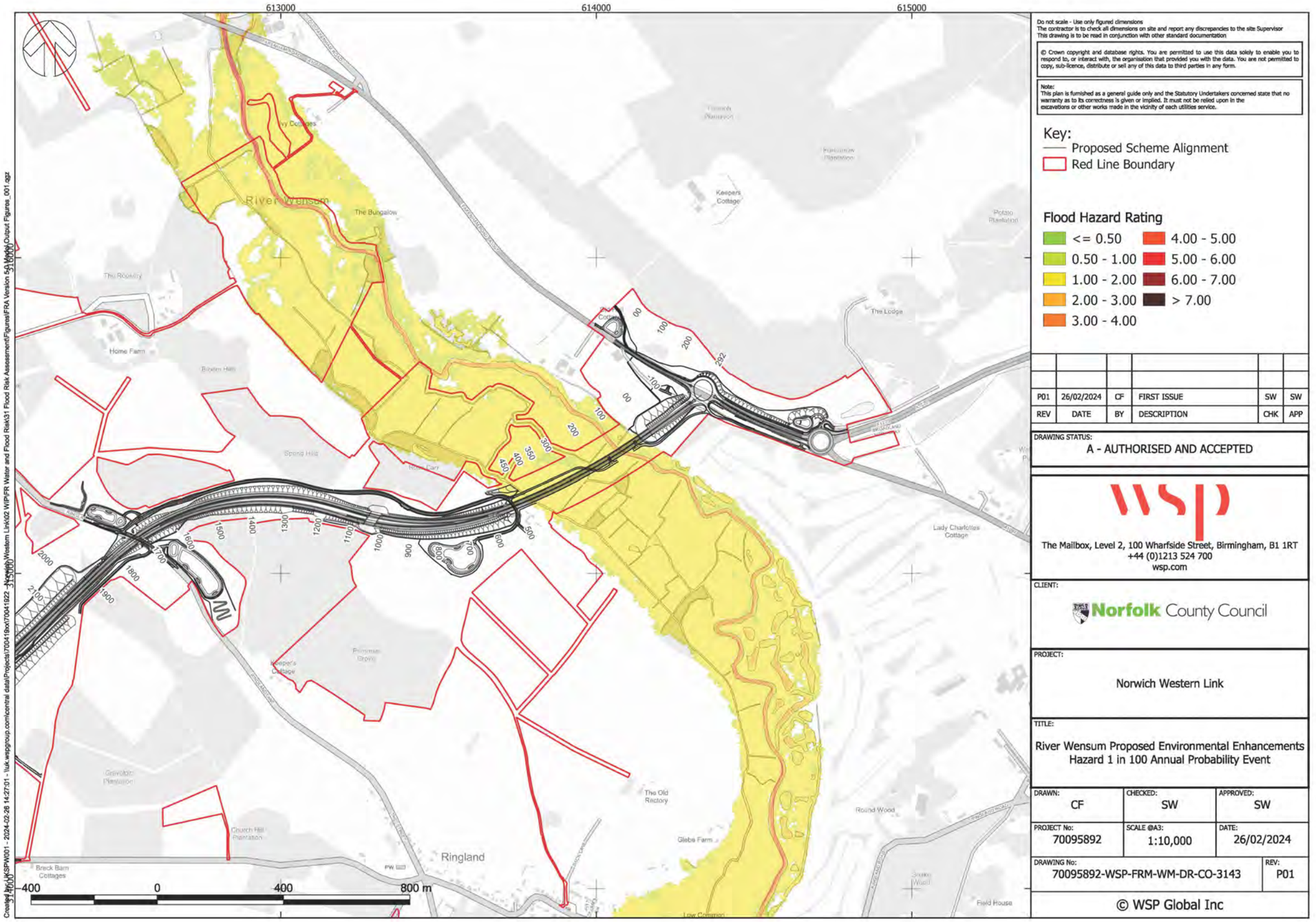
River Wensum environmental enhancements velocity 1 in 1000 annual probability event



River Wensum environmental enhancements velocity 1 in 100+44% annual probability event



River Wensum environmental enhancements hazard 1 in 100 annual probability event



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Flood Hazard Rating

<= 0.50	4.00 - 5.00
0.50 - 1.00	5.00 - 6.00
1.00 - 2.00	6.00 - 7.00
2.00 - 3.00	> 7.00
3.00 - 4.00	

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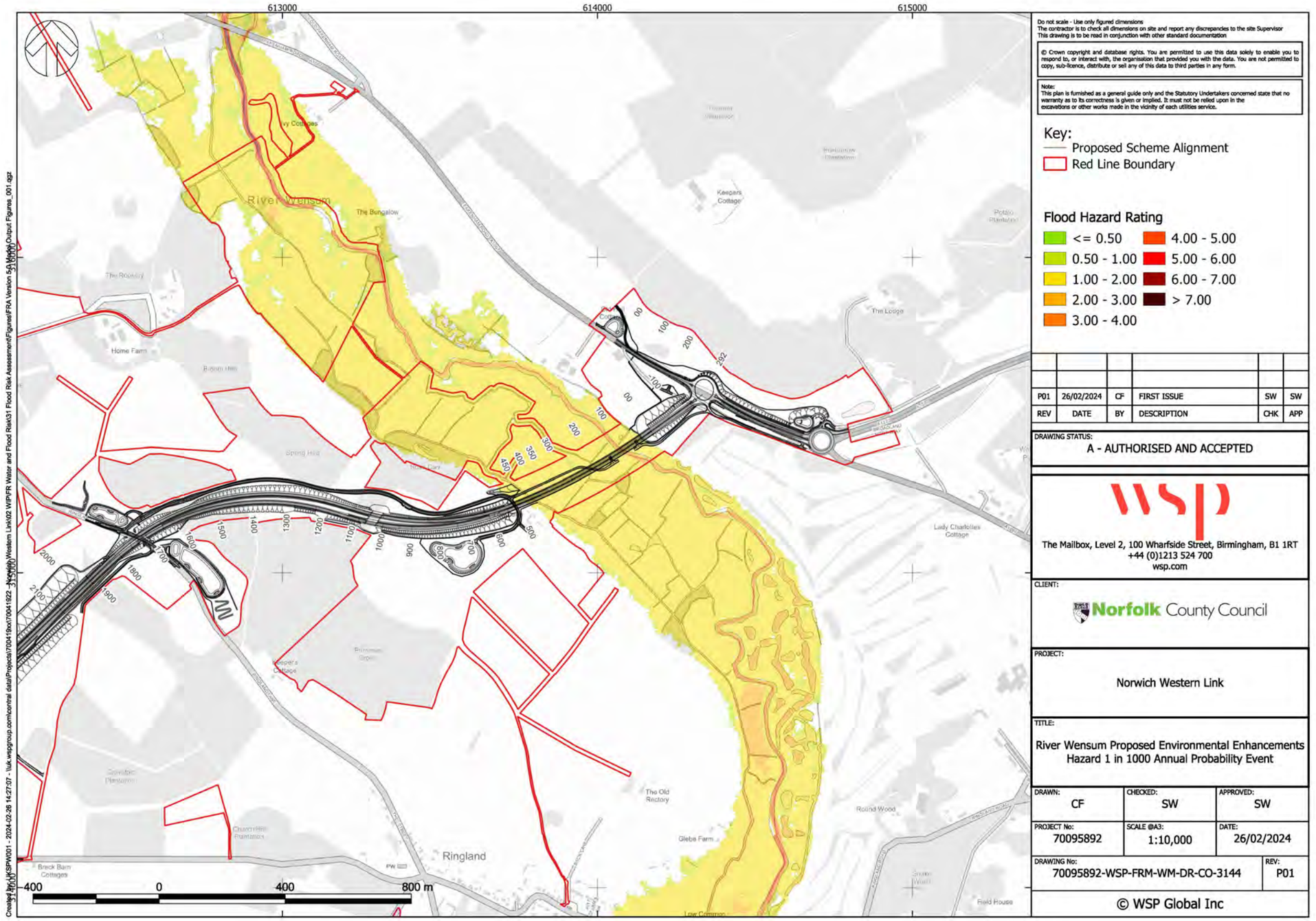
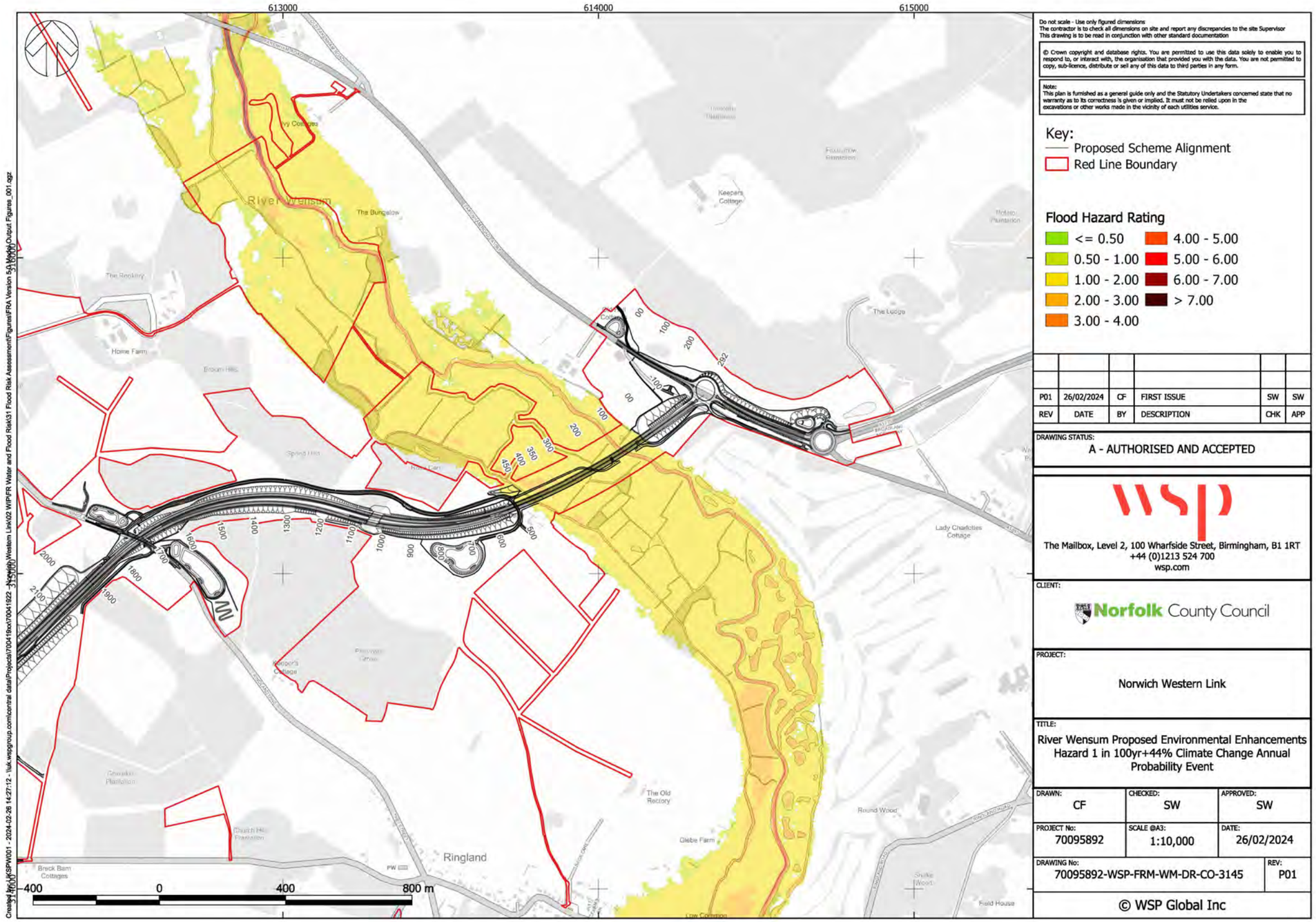


River Wensum environmental enhancements hazard 1 in 100+44% annual probability event



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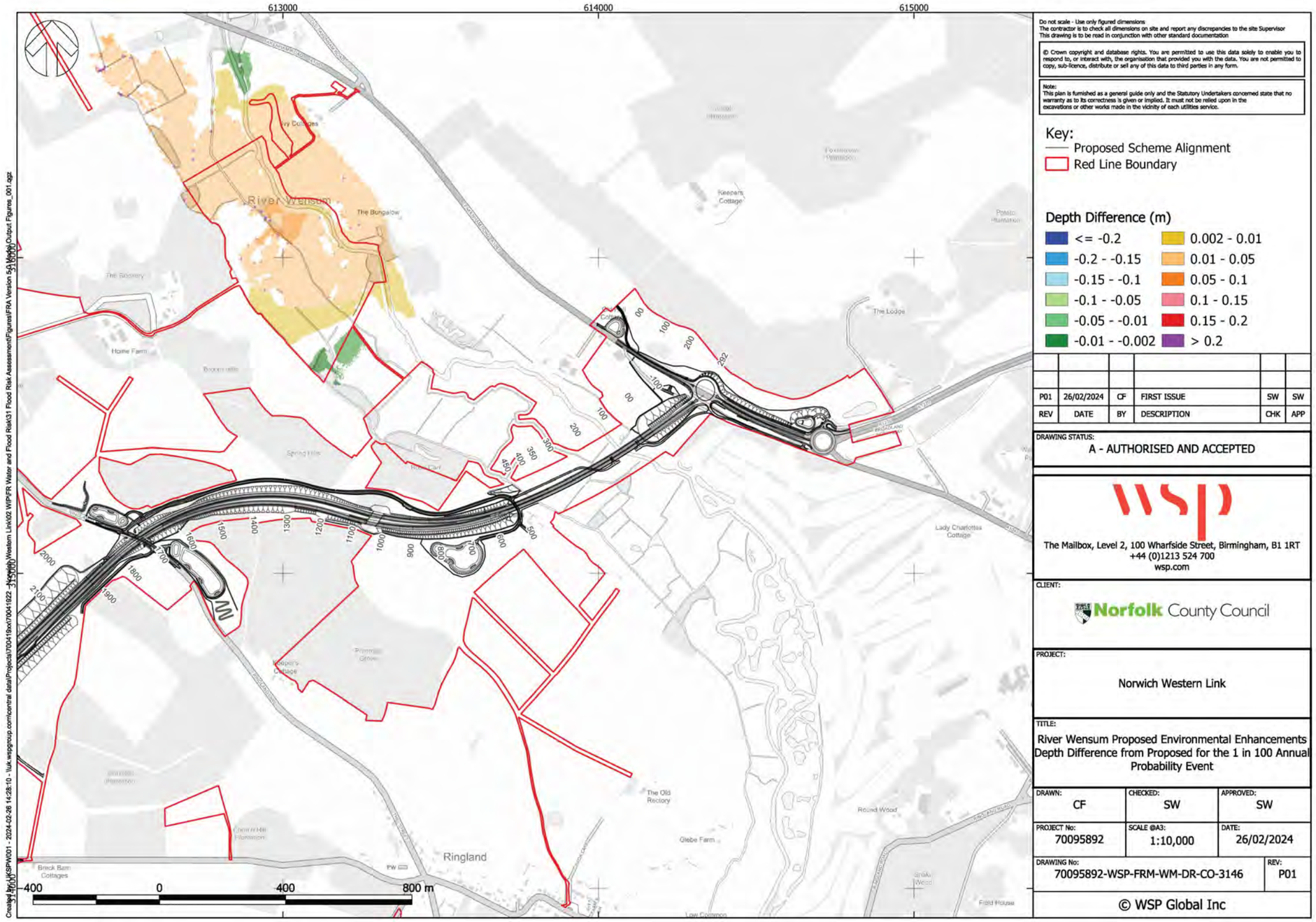
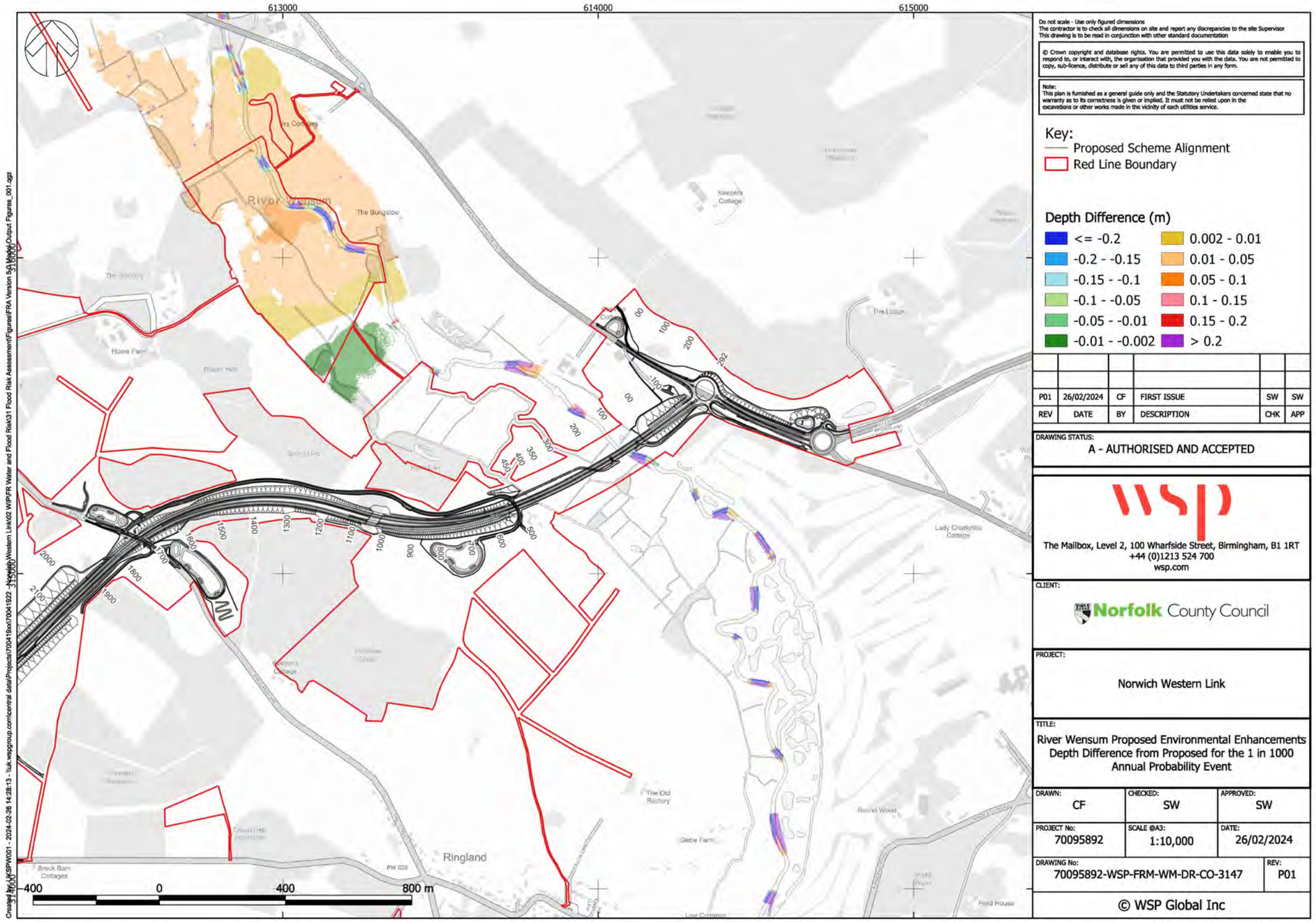
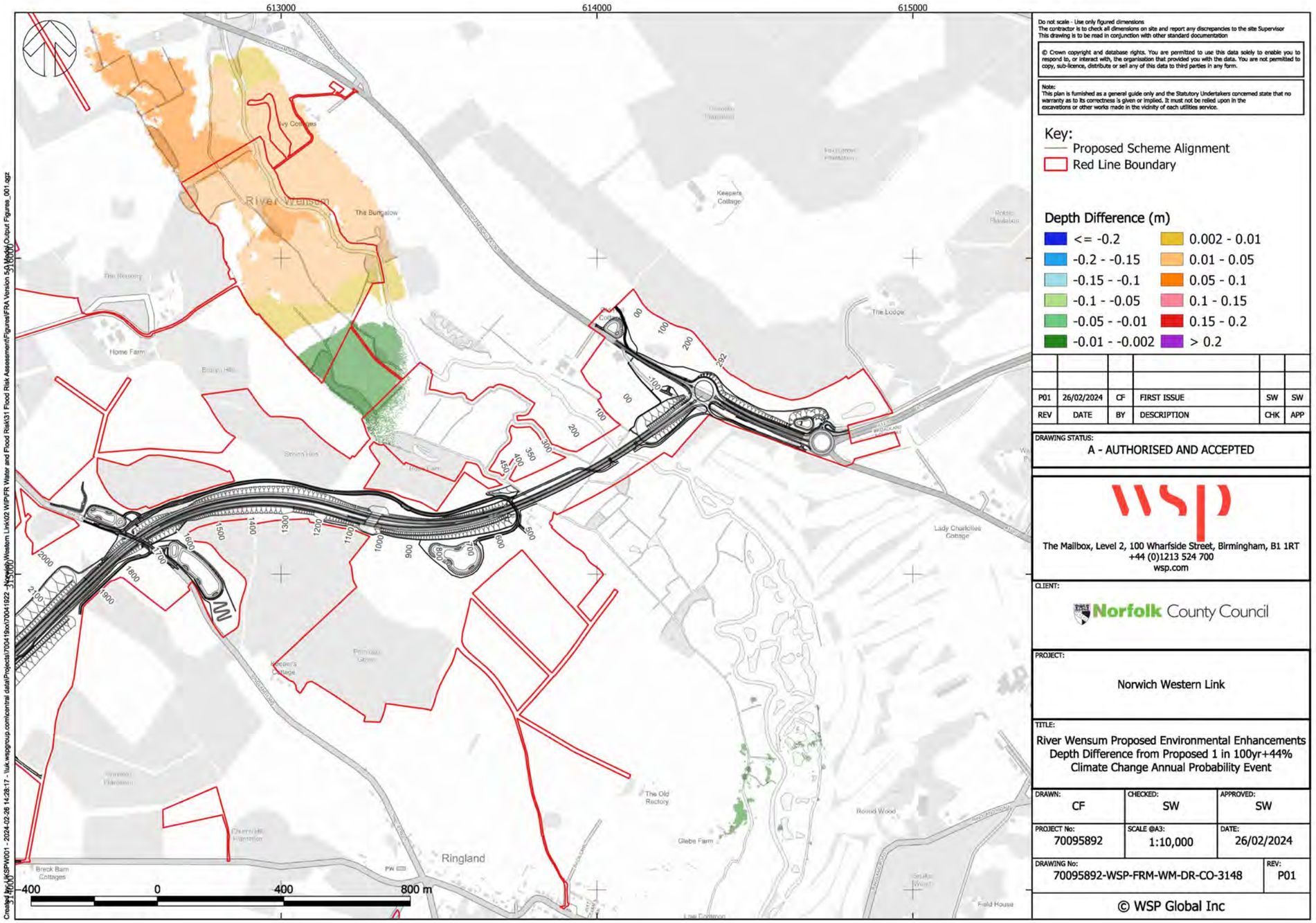


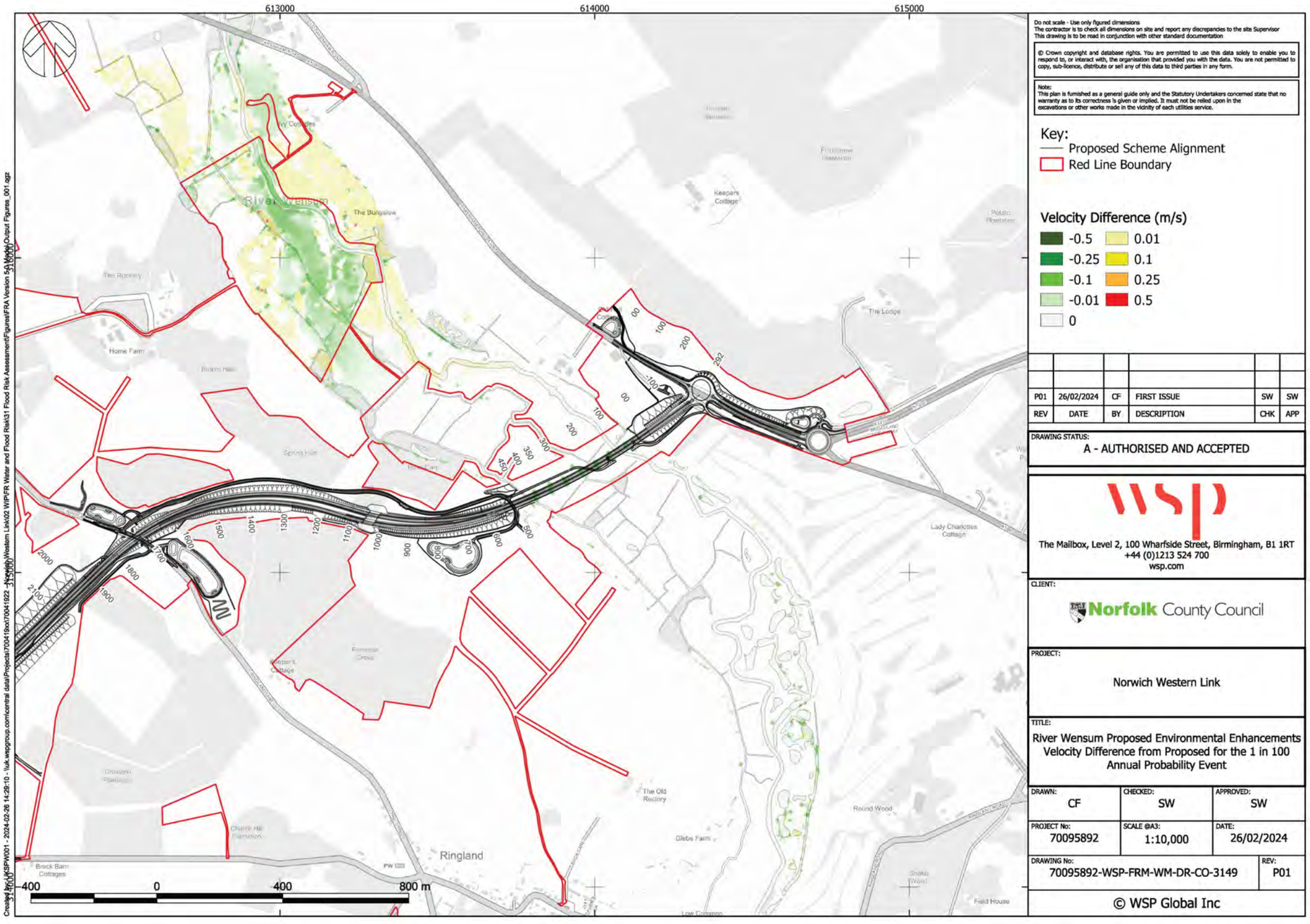
River Wensum environmental enhancements depth difference from proposed in the 1 in 1000 annual probability event



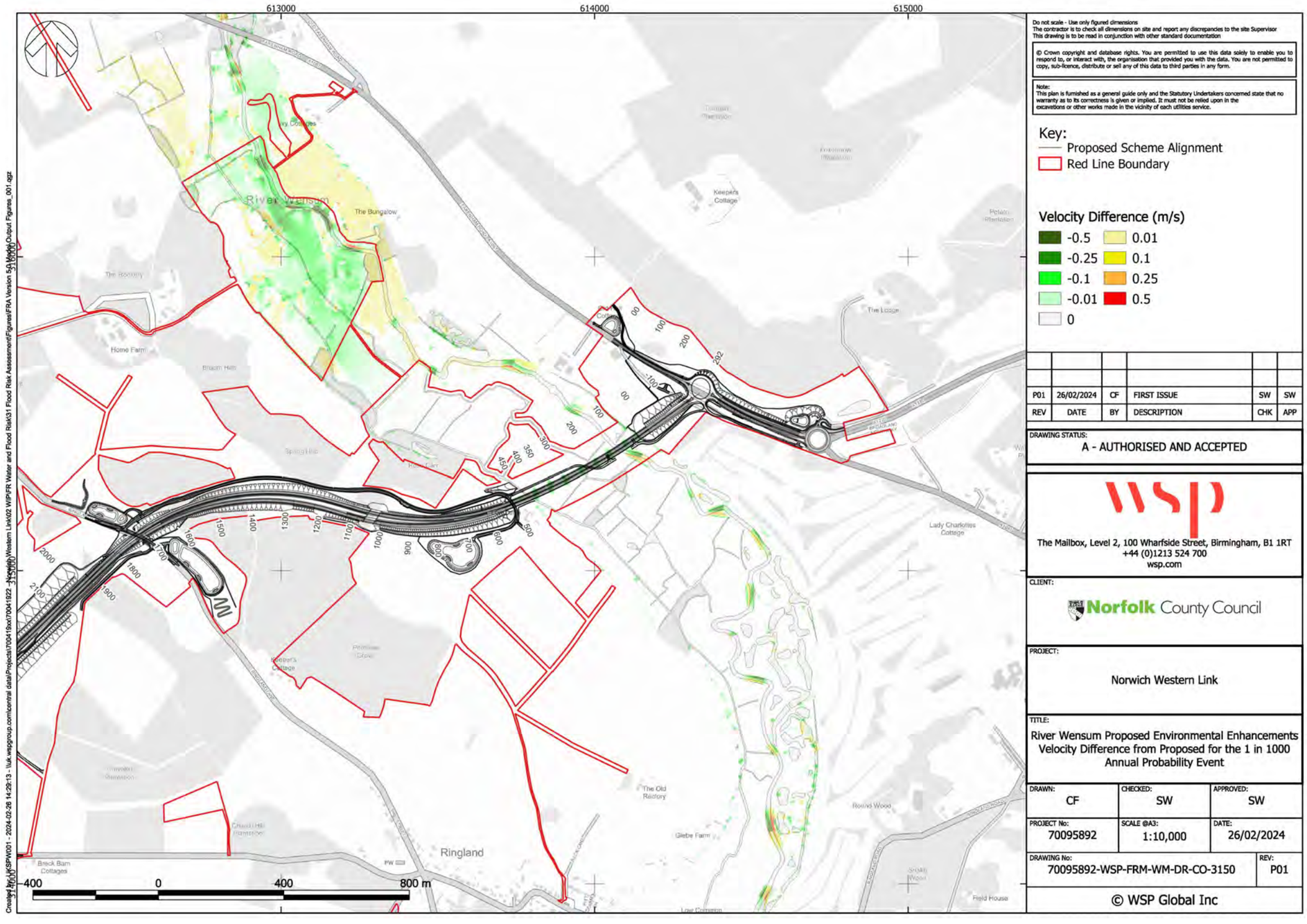
River Wensum environmental enhancements depth difference from proposed in the 1 in 100+44% annual probability event



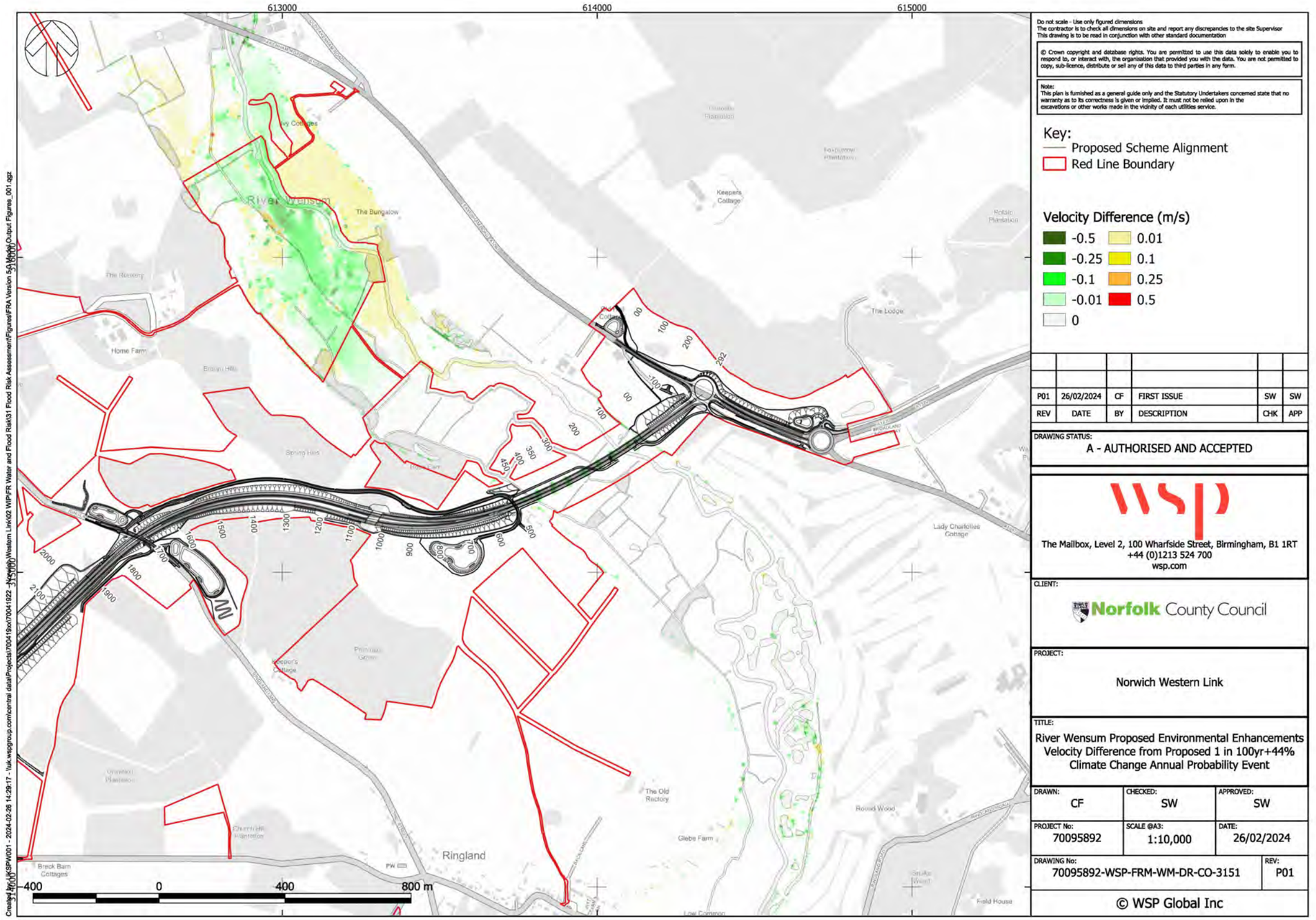
River Wensum environmental enhancements velocity difference from proposed in the 1 in 100 annual probability event



River Wensum environmental enhancements velocity difference from proposed in the 1 in 1000 annual probability event



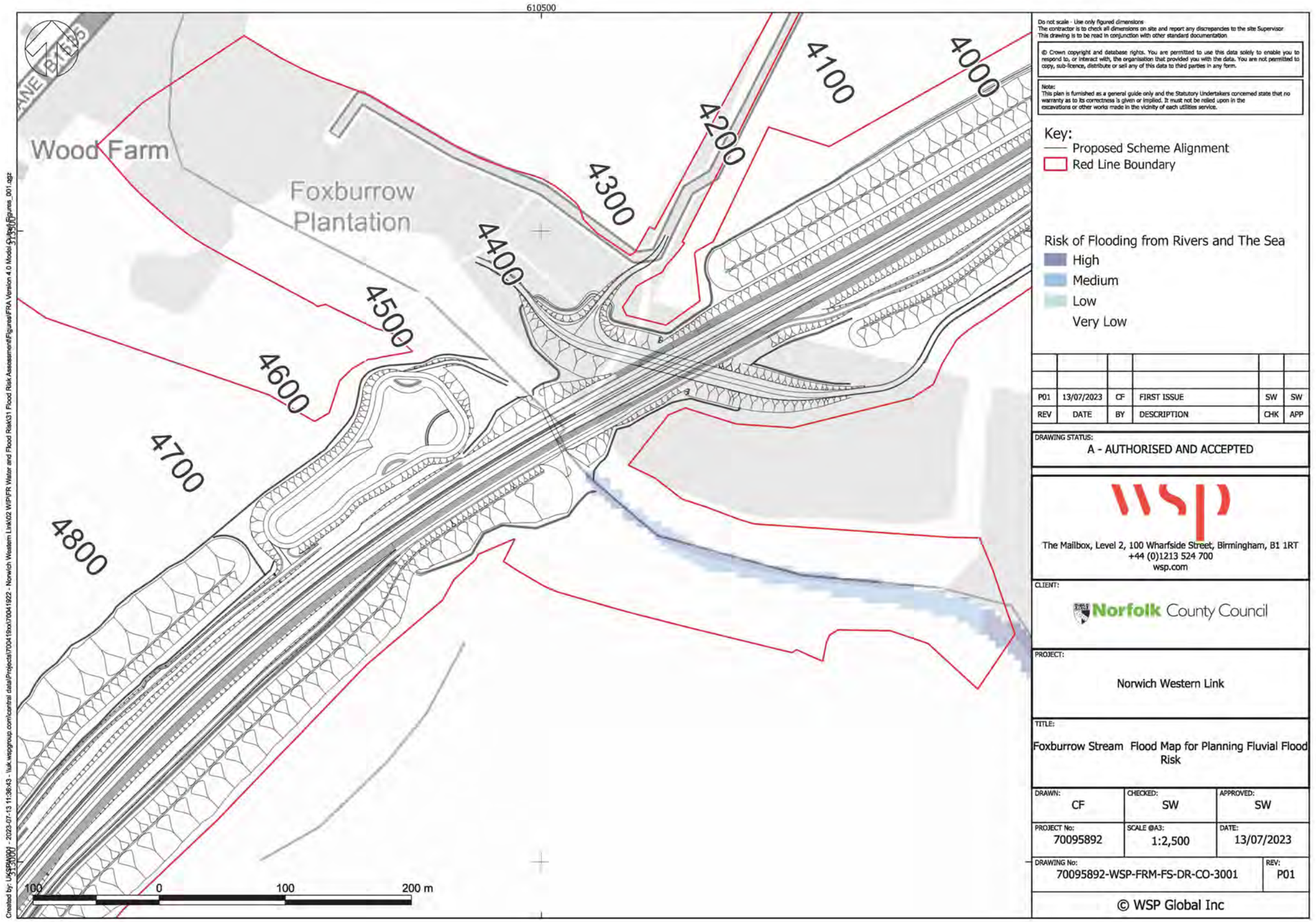
River Wensum environmental enhancements velocity difference from proposed in the 1 in 100+44% annual probability event



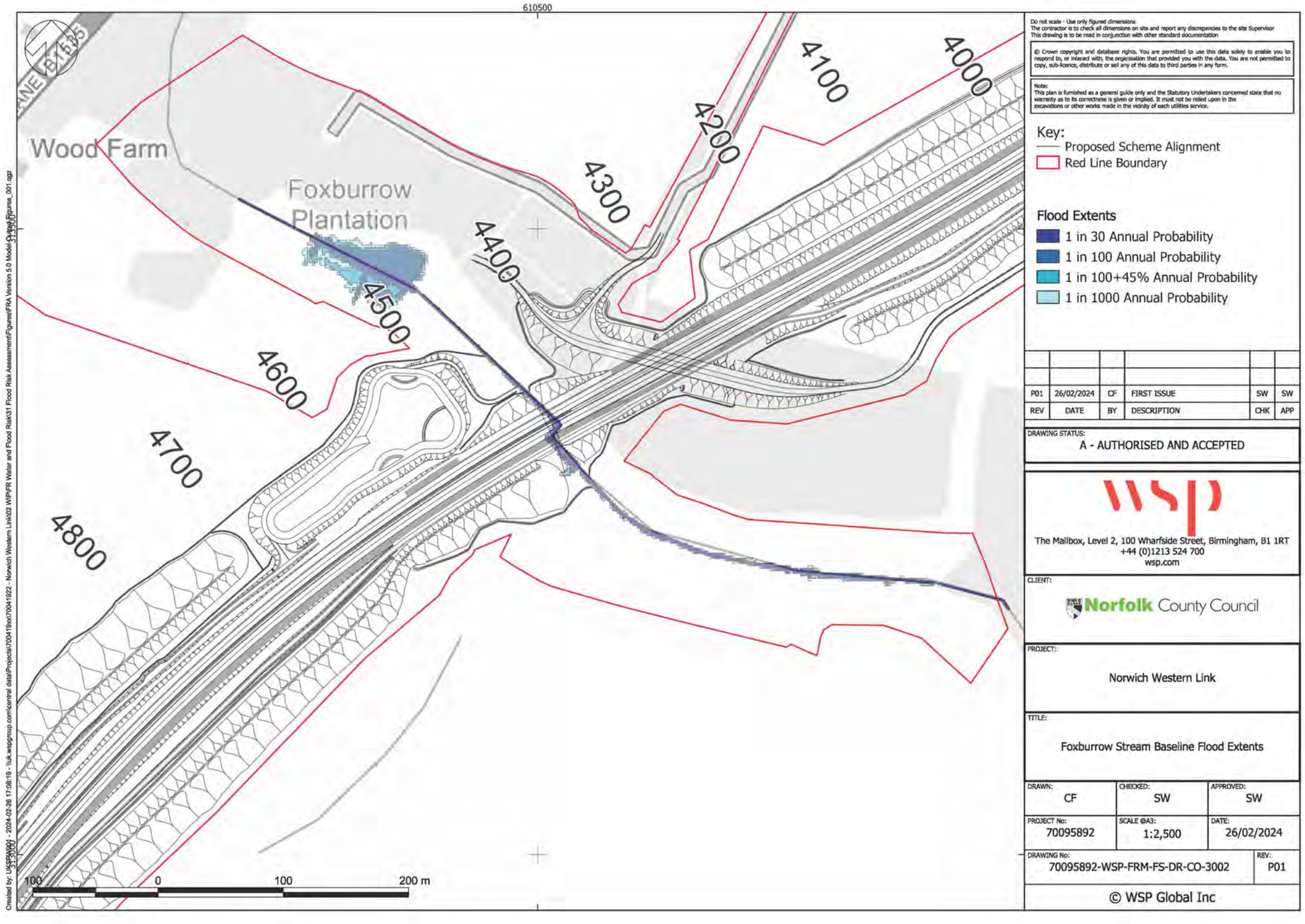
Foxburrow Stream

The following figures present the flood risk associated with Foxburrow Stream. They present the existing risk from the Flood Map for Planning. They also present the results of the detailed hydraulic modelling undertaken as part of the Flood Risk Assessment. The modelling results presented include depths mapping in the existing case and with the proposed scheme in place. Maps are presented for the 1 in 30, 100, 1000, 30+45% and 100+45% annual probability events. The differences in depth between the proposed and baseline are also presented.

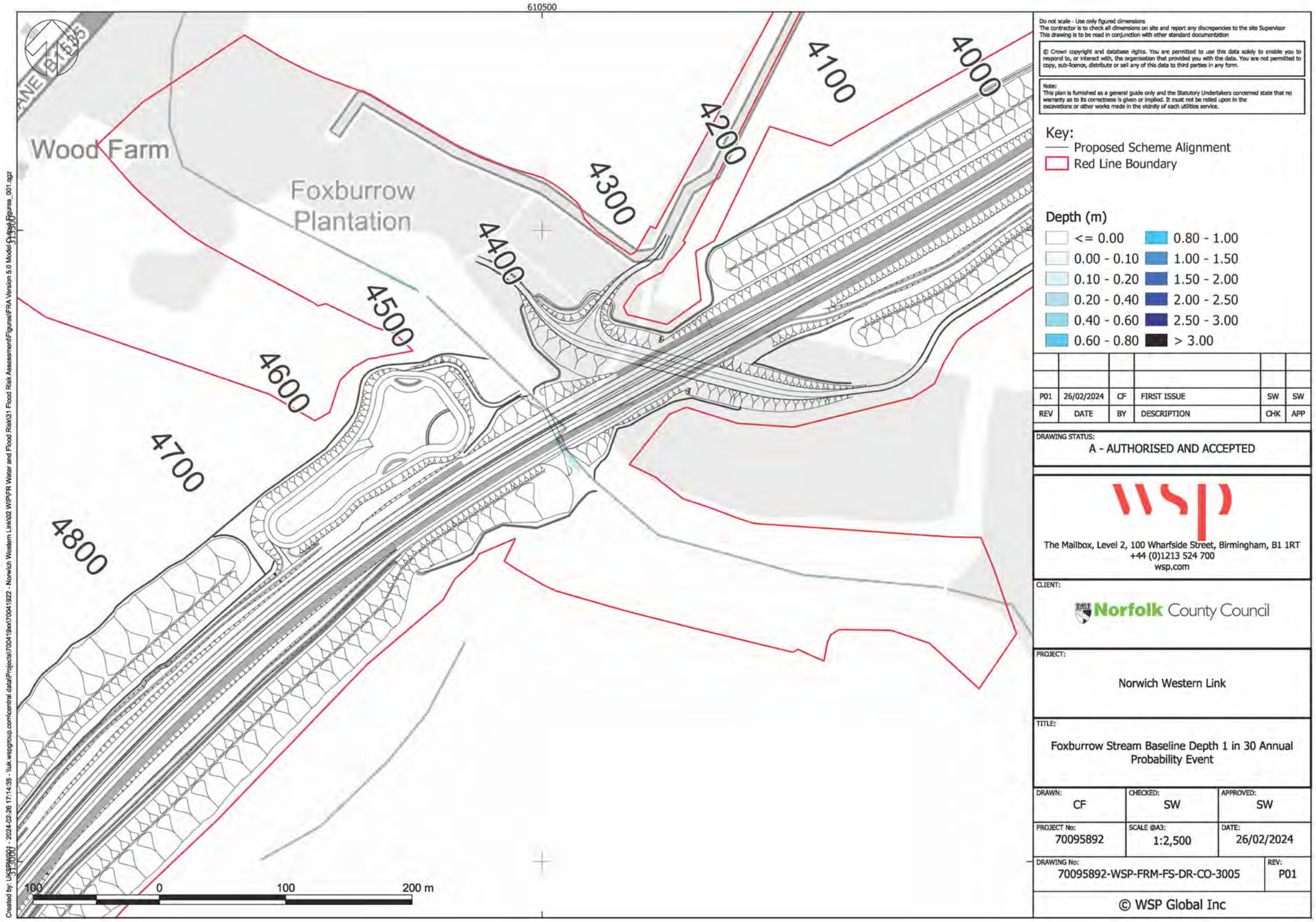
Foxburrow Stream flood map for planning fluvial risk



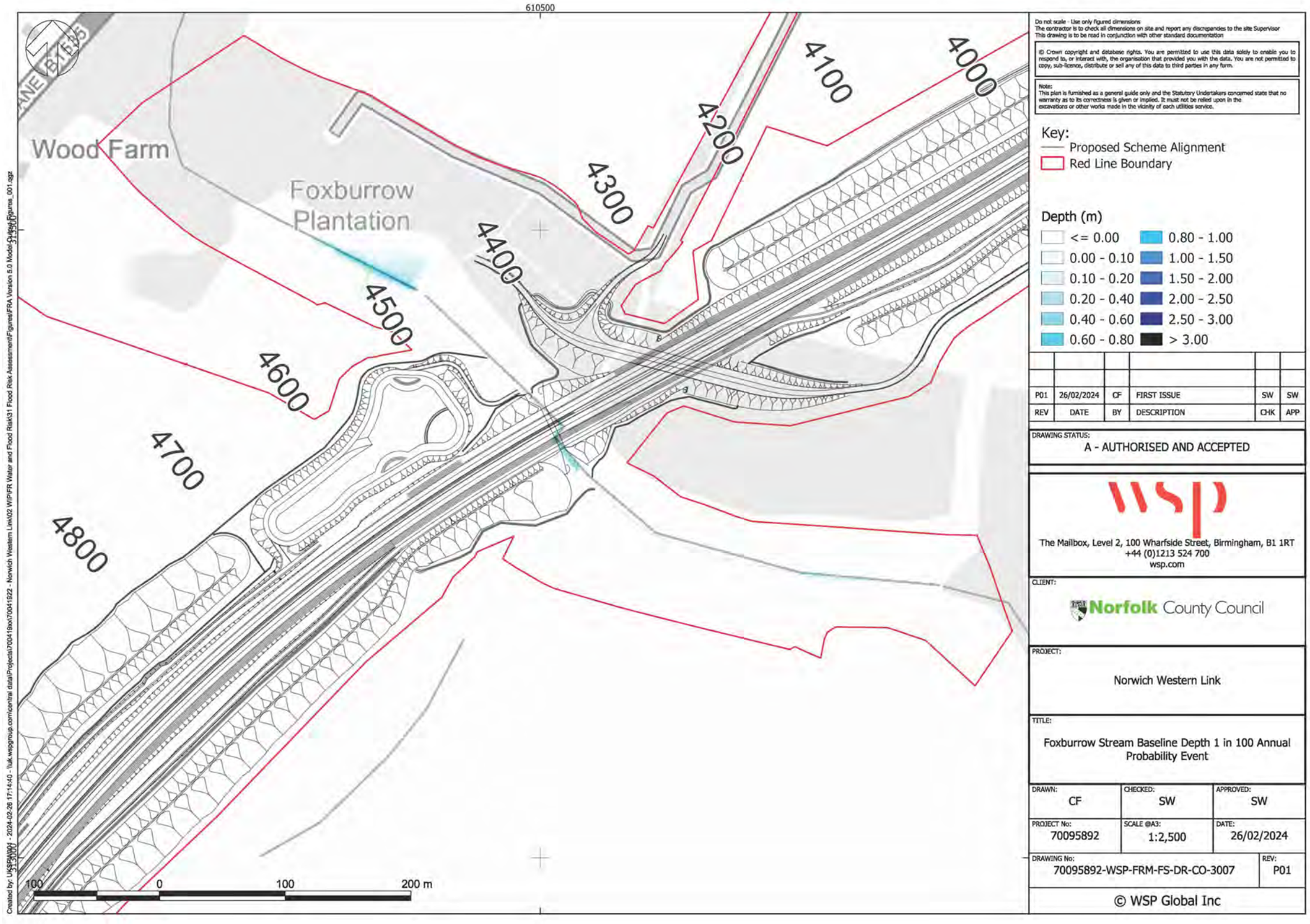
Foxburrow Stream baseline flood extents



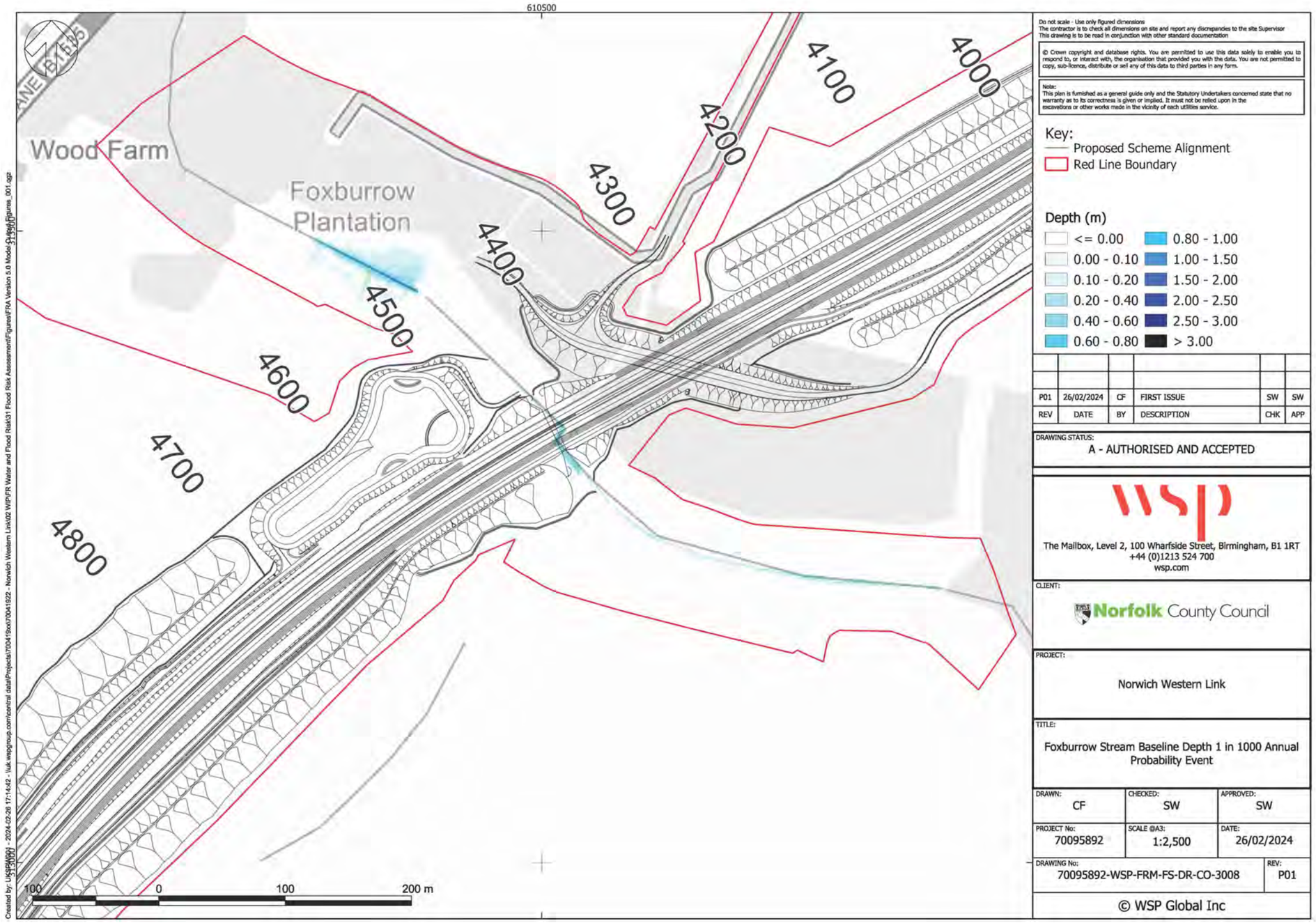
Foxburrow Stream baseline depth 1 in 30 annual probability event



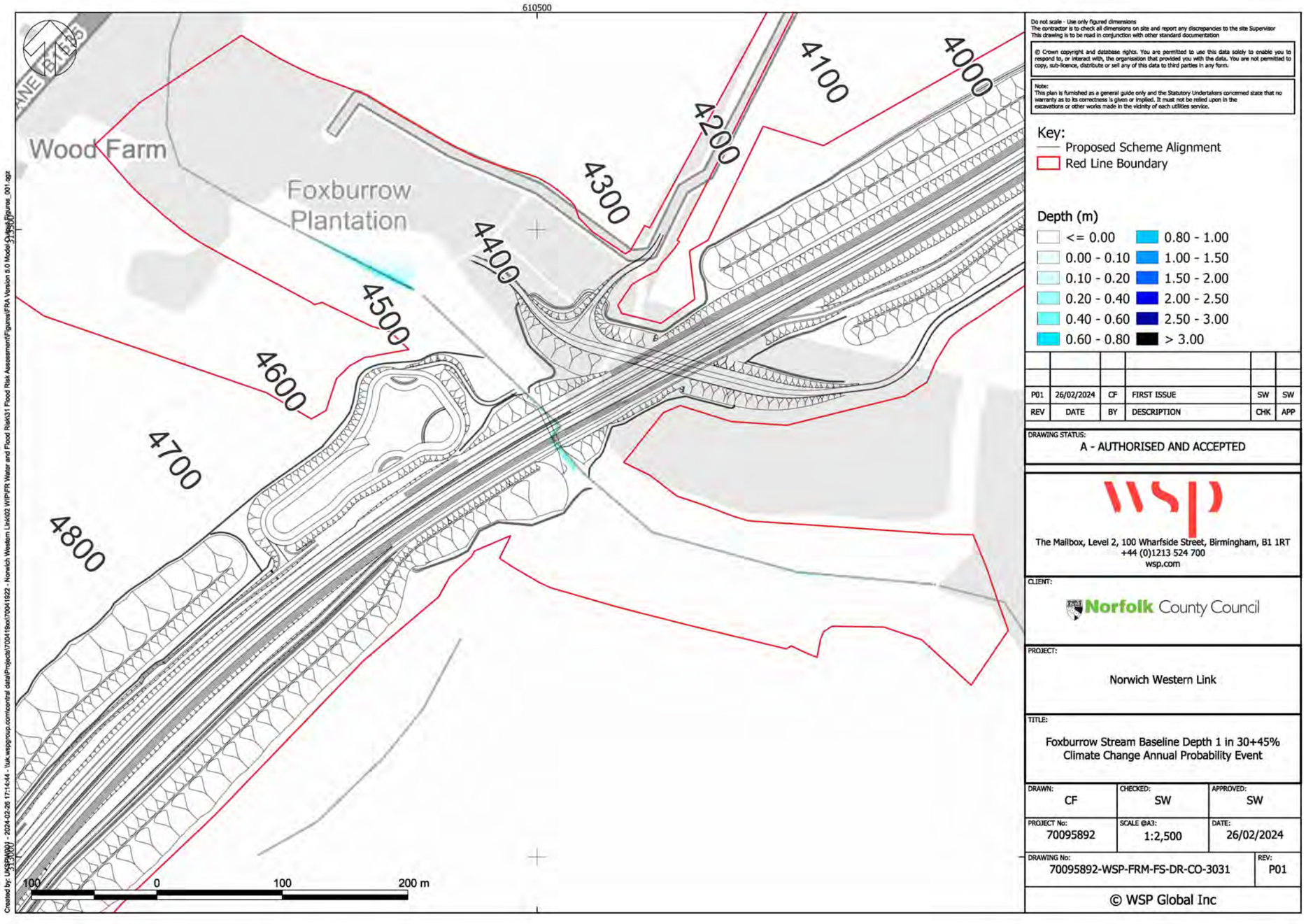
Foxburrow Stream baseline depth 1 in 100 annual probability event



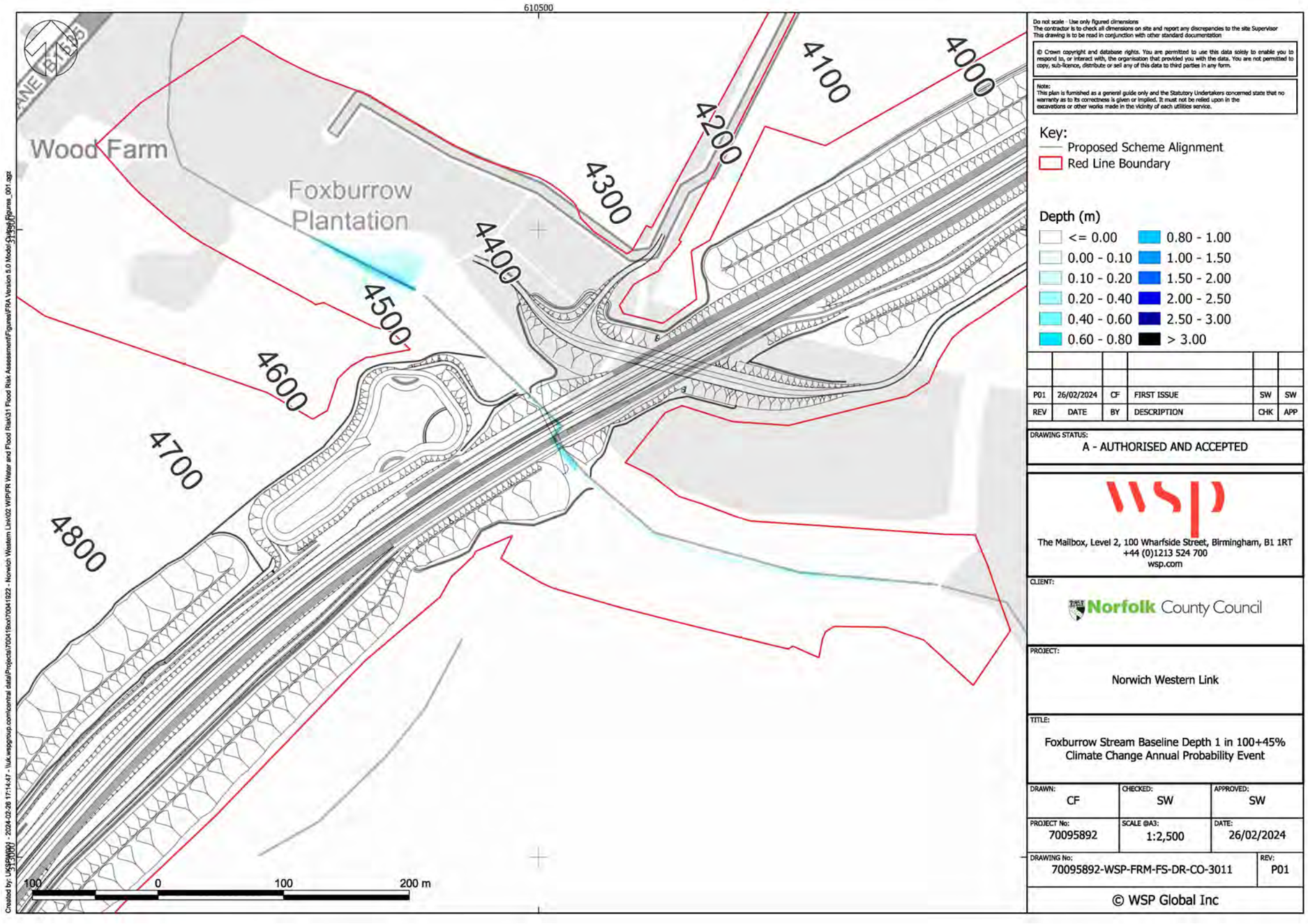
Foxburrow Stream baseline depth 1 in 1000 annual probability event



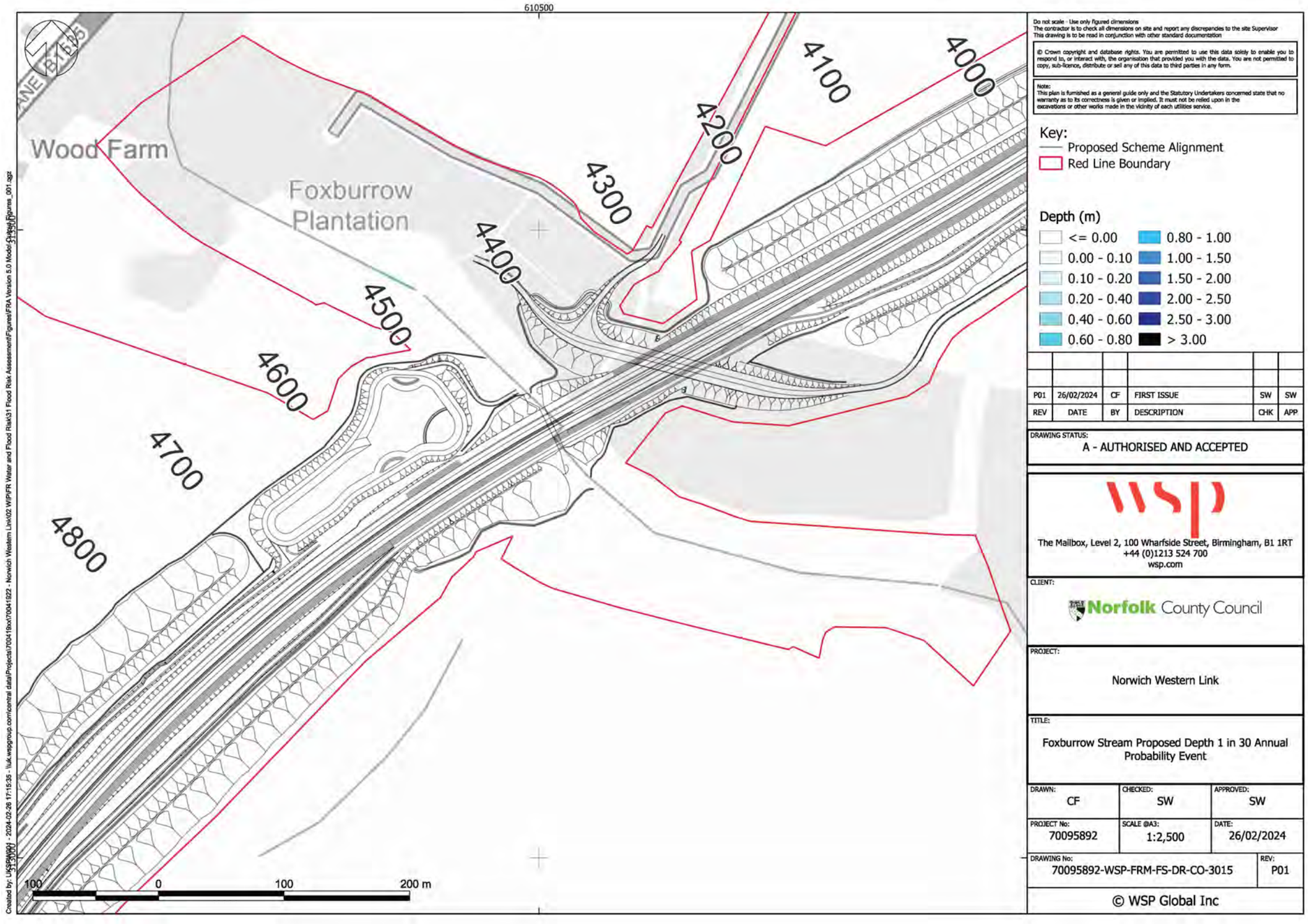
Foxburrow Stream baseline depth 1 in 30+45% annual probability event



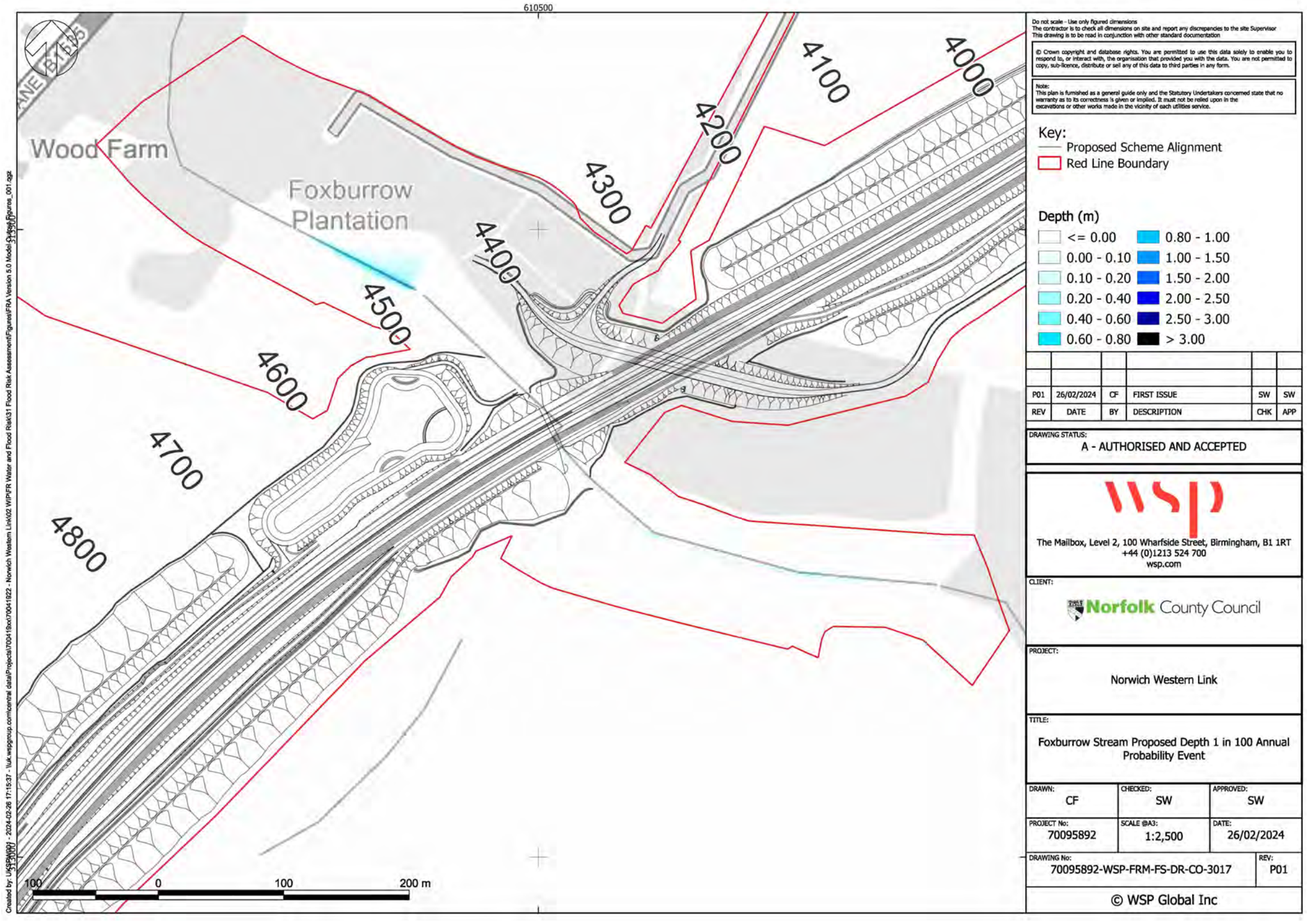
Foxburrow Stream baseline depth 1 in 100+45% annual probability event



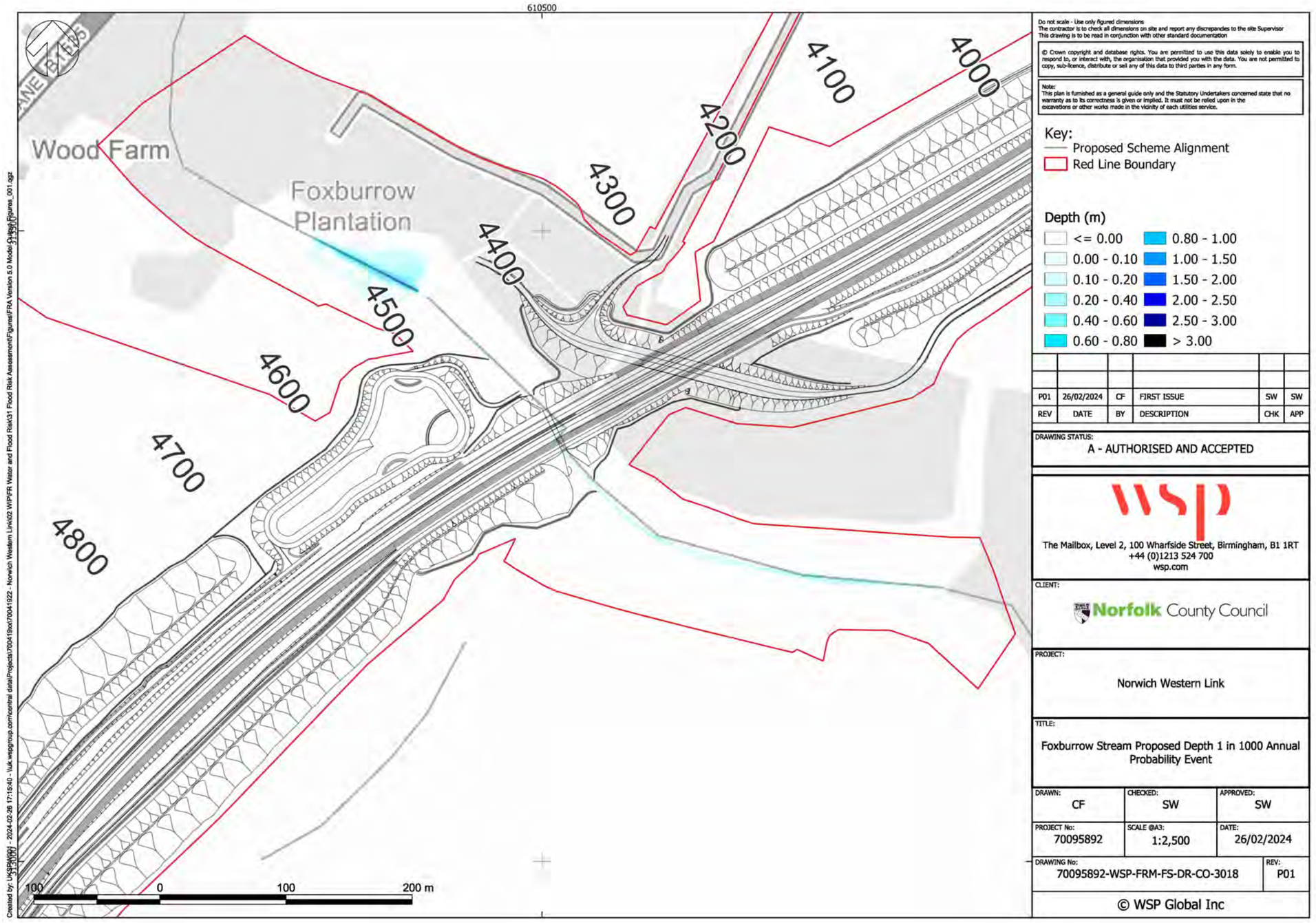
Foxburrow Stream proposed depth 1 in 30 annual probability event



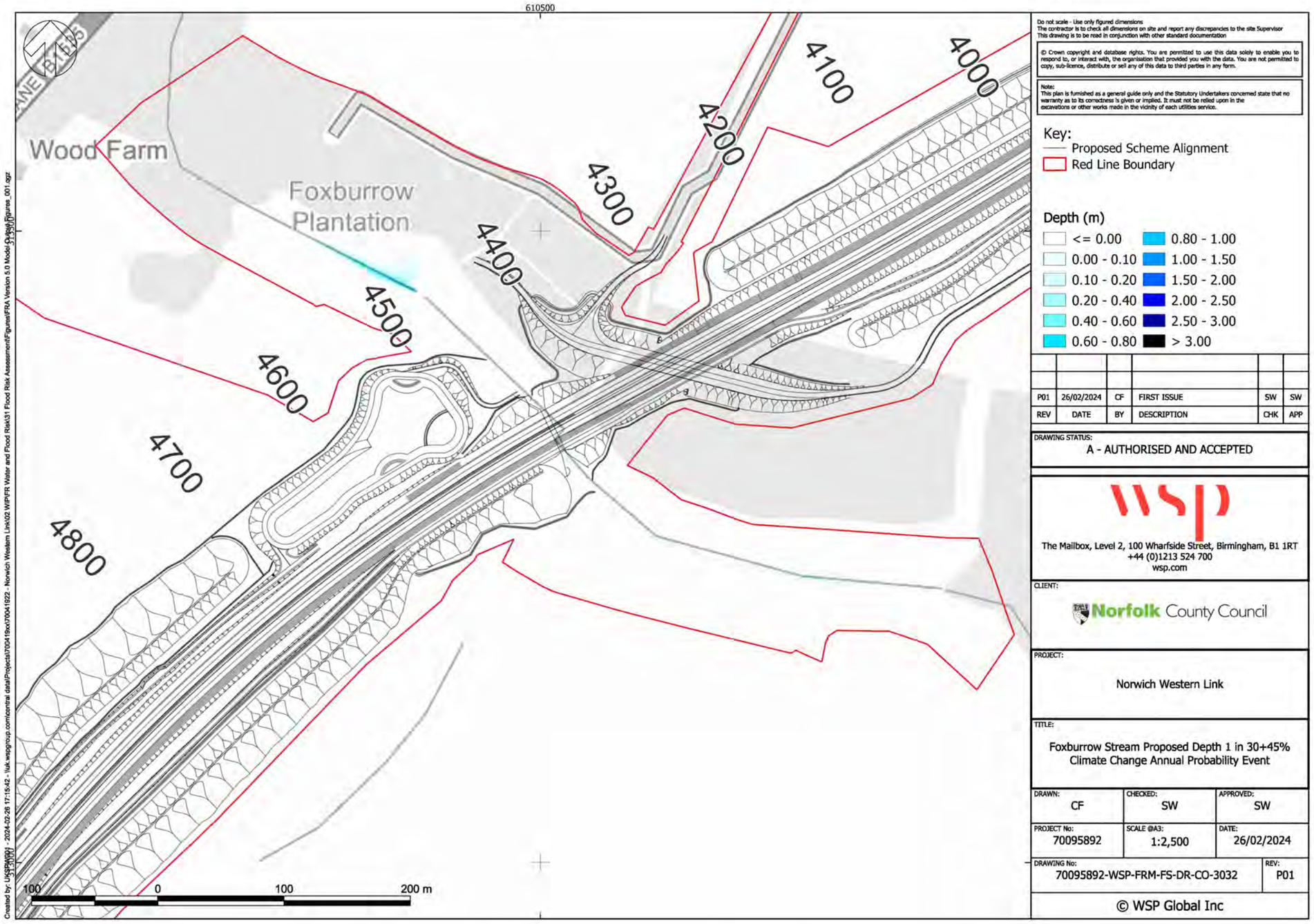
Foxburrow Stream proposed depth 1 in 100 annual probability event



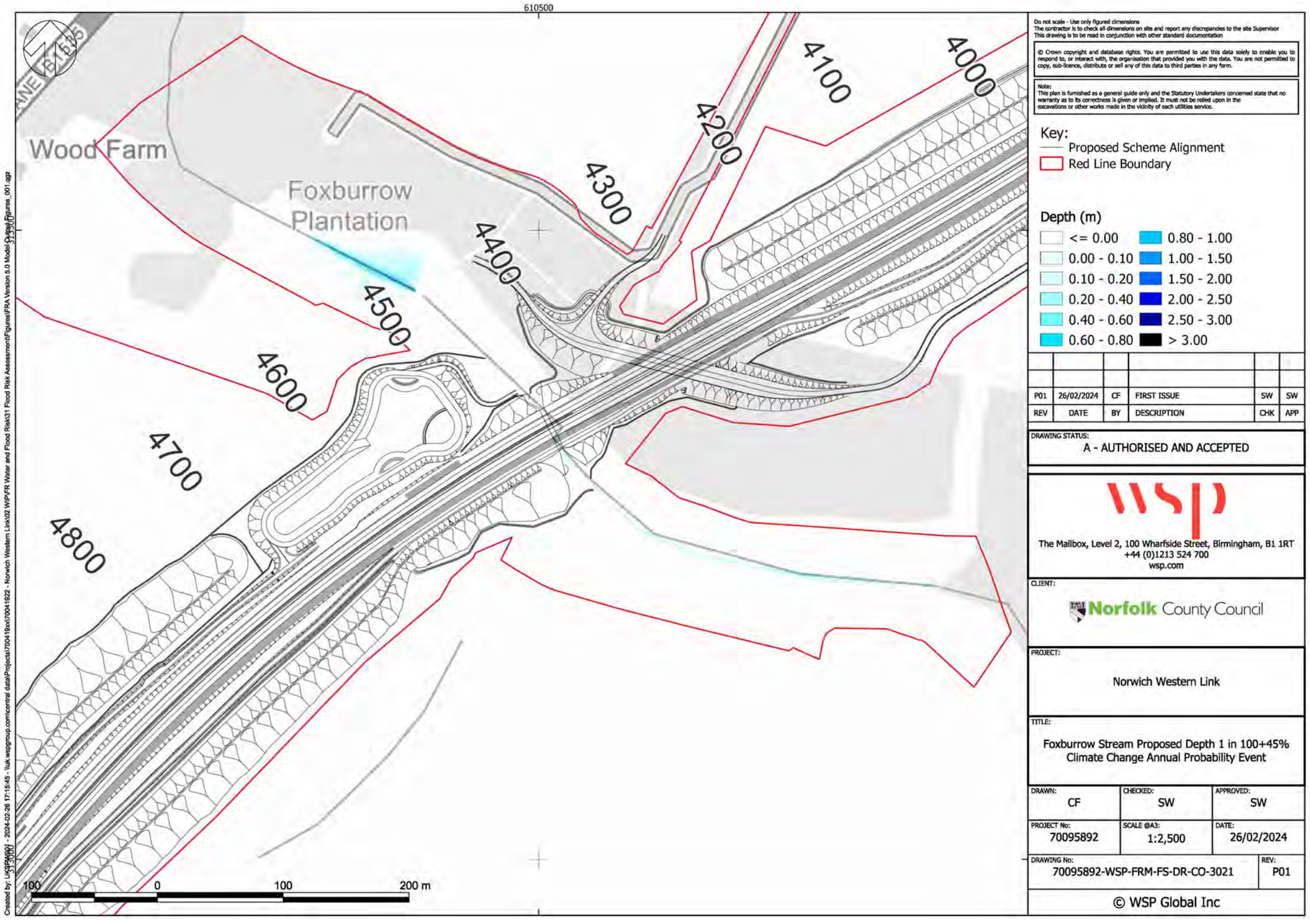
Foxburrow Stream proposed depth 1 in 1000 annual probability event



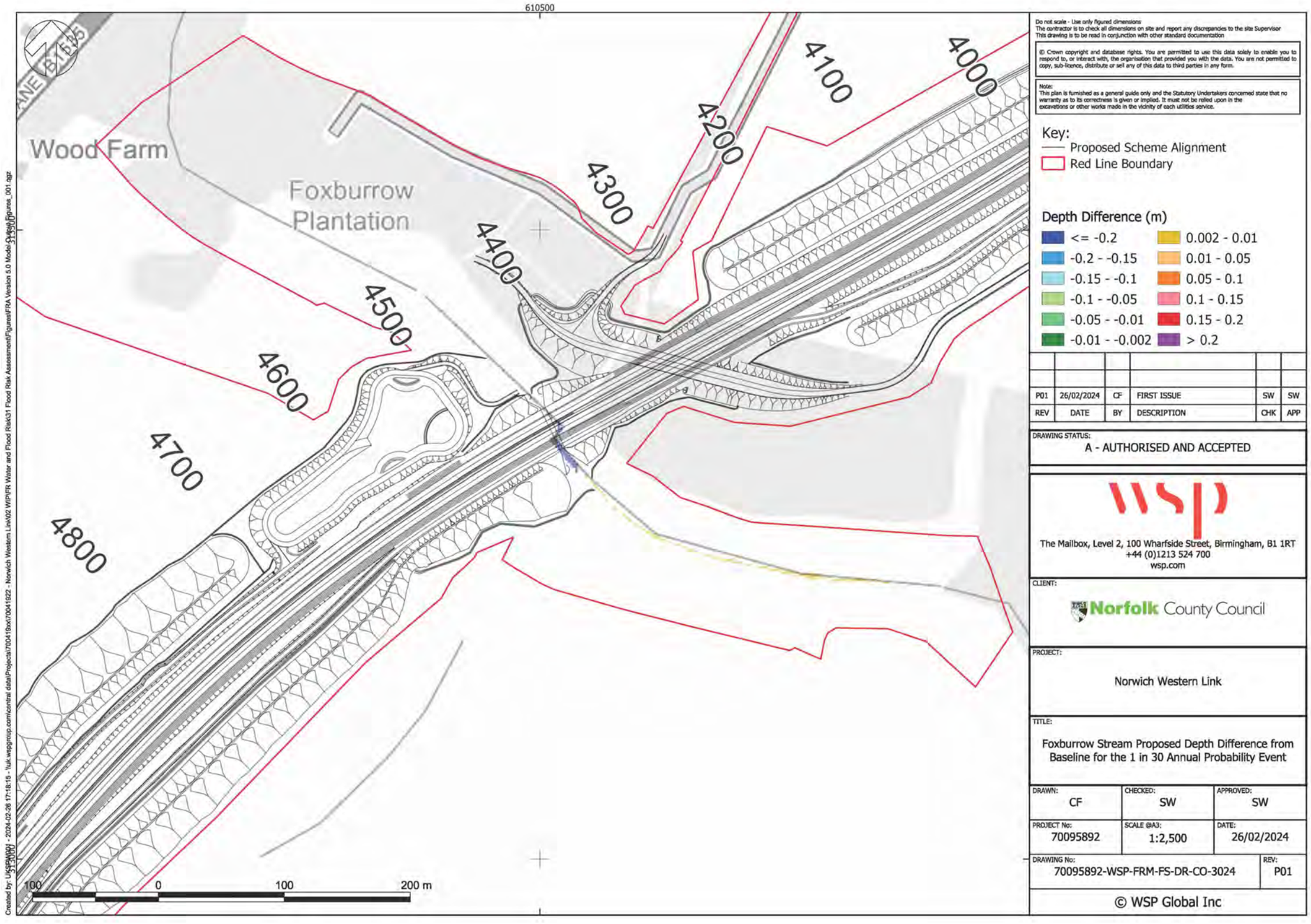
Foxburrow Stream proposed depth 1 in 30+45% annual probability event



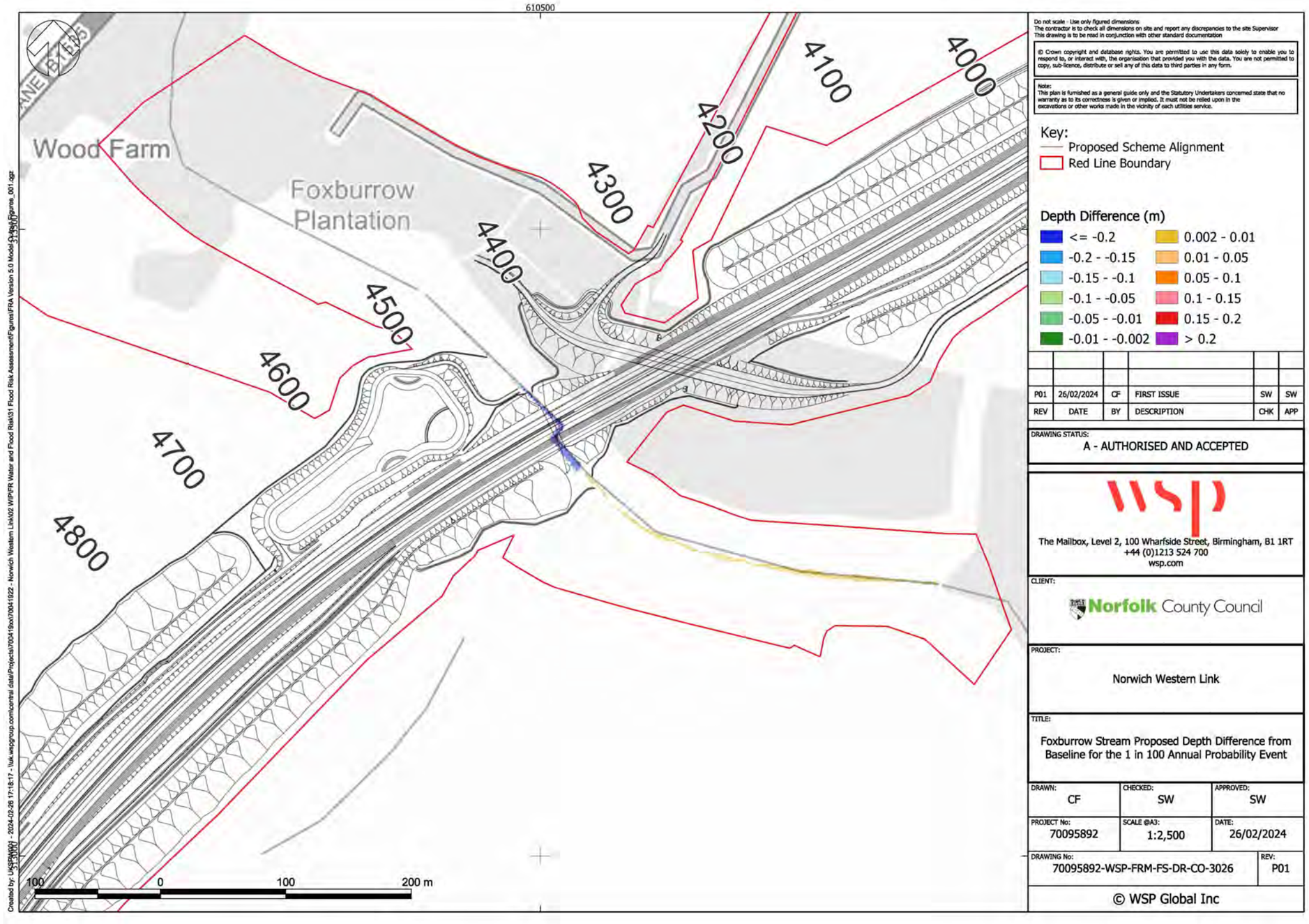
Foxburrow Stream proposed depth 1 in 100+45% annual probability event



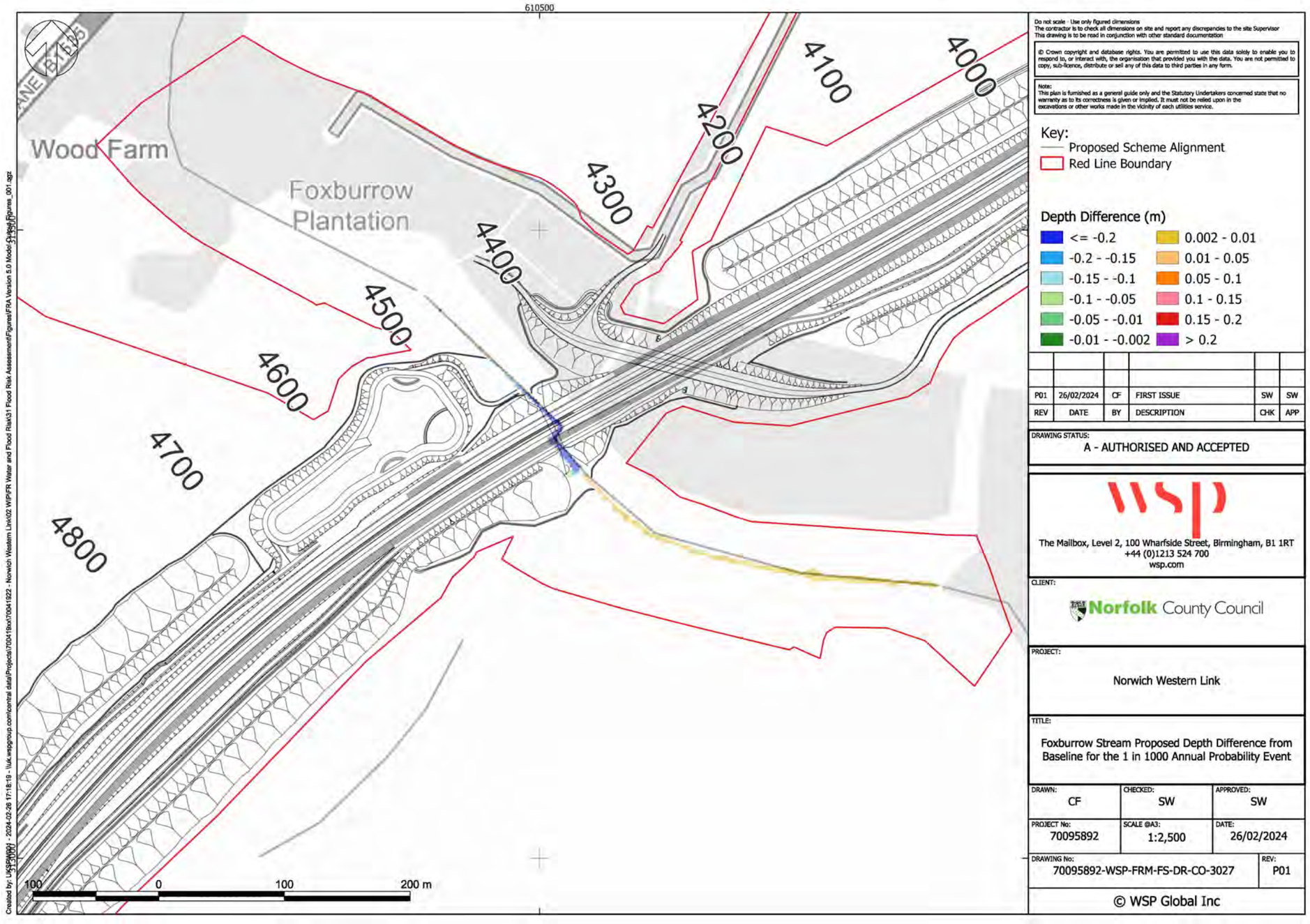
Foxburrow Stream proposed depth difference from baseline in the 1 in 30 annual probability event



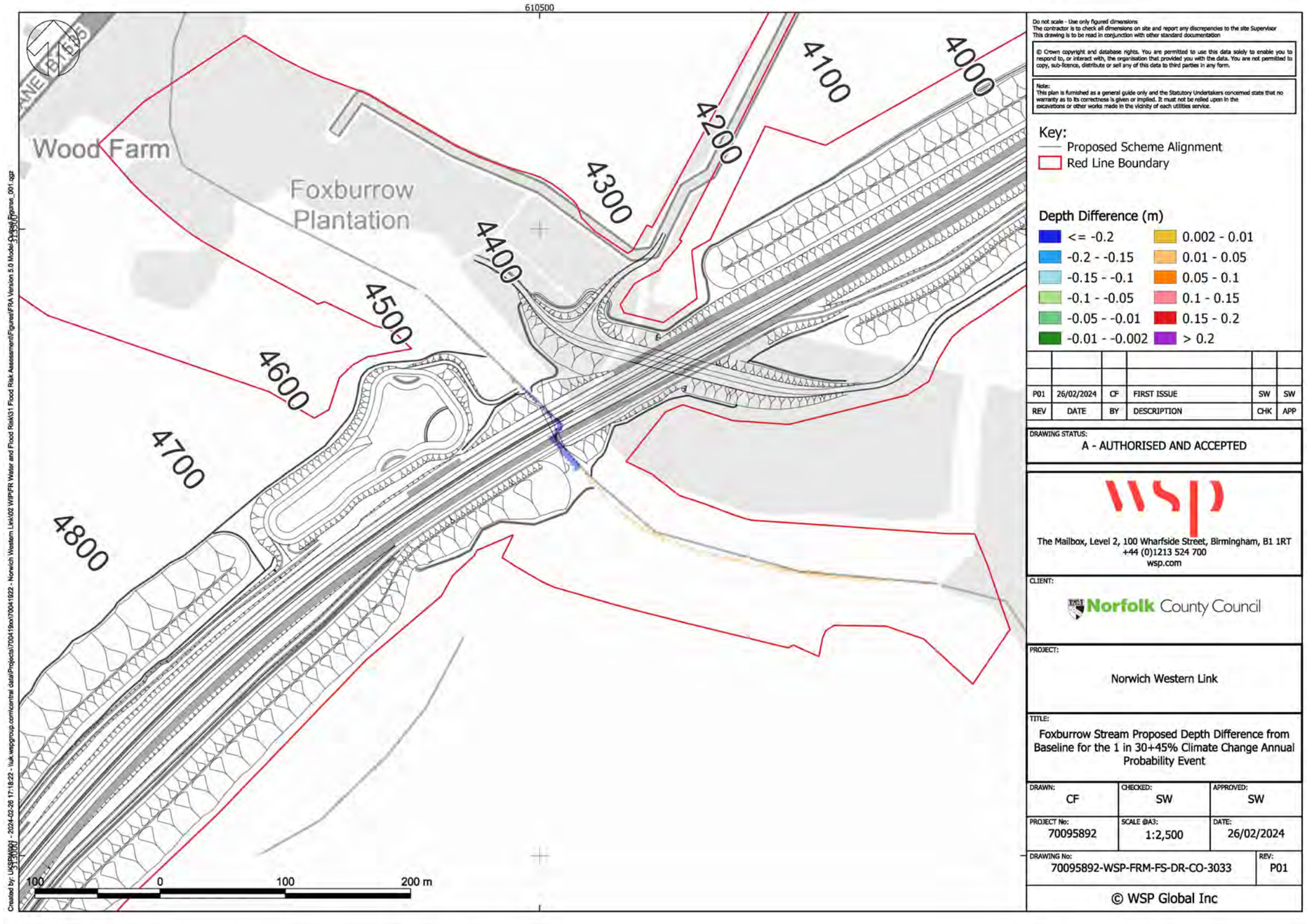
Foxburrow Stream proposed depth difference from baseline in the 1 in 100 annual probability event



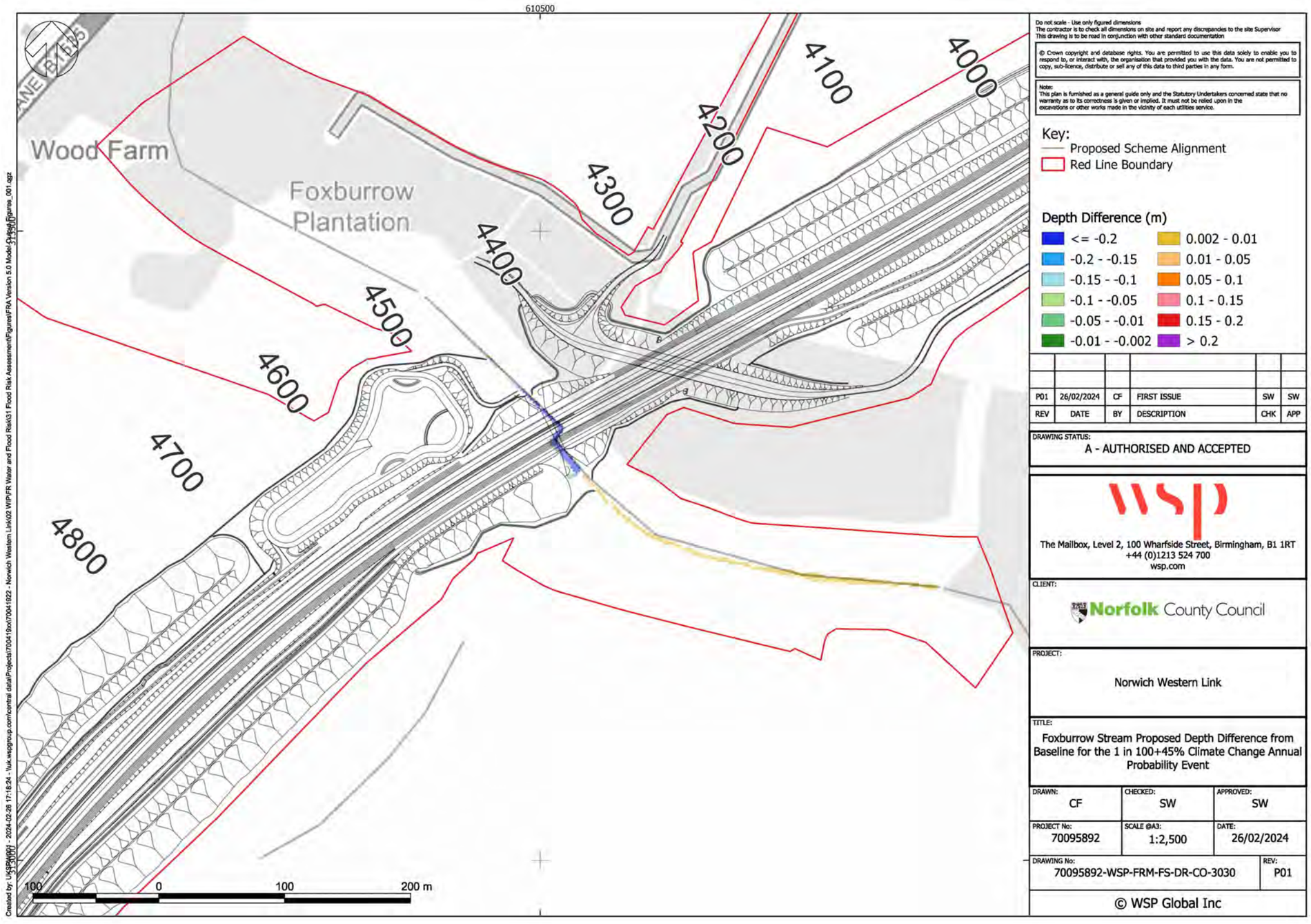
Foxburrow Stream proposed depth difference from baseline in the 1 in 1000 annual probability event



Foxburrow Stream proposed depth difference from baseline in the 1 in 30+45% annual probability event



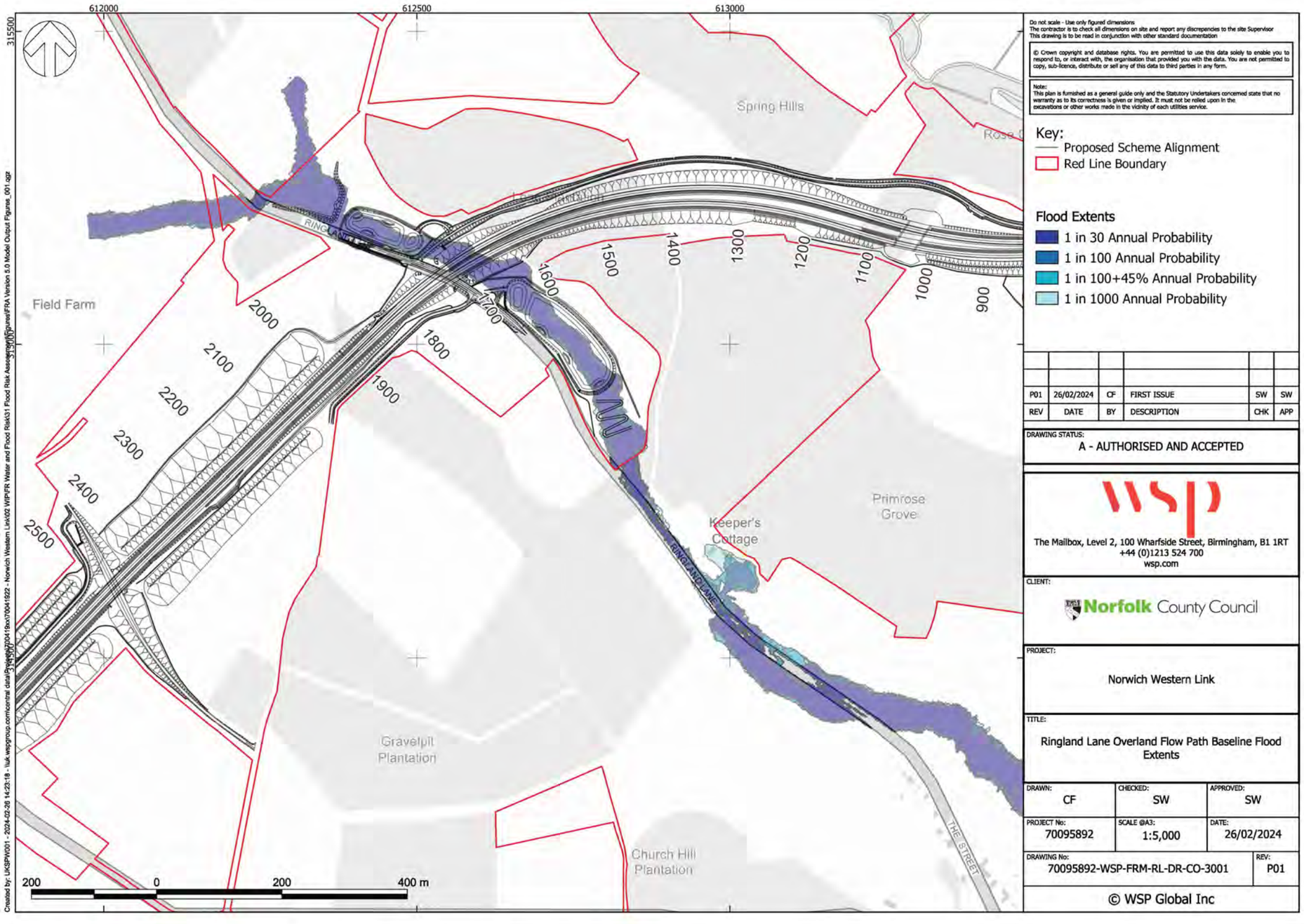
Foxburrow Stream proposed depth difference from baseline in the 1 in 100+45% annual probability event



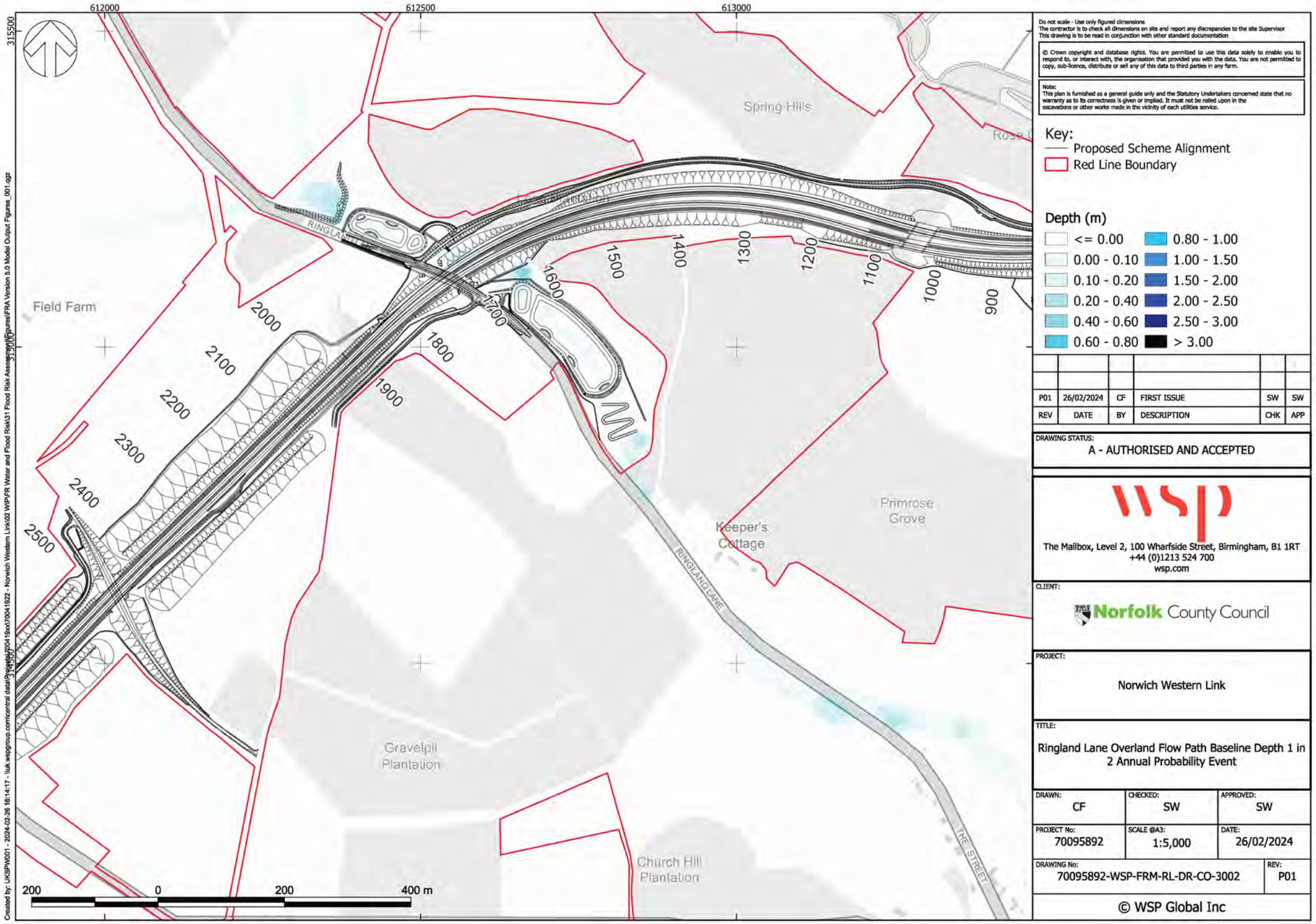
Ringland Lane

The following figures present the flood risk associated with the Ringland Lane overland flow path. They present the results of the detailed hydraulic modelling undertaken as part of the Flood Risk Assessment. The modelling results presented include depths, velocity and hazard mapping in the existing case and with the proposed scheme in place. Maps are presented for the 1 in 2, 5, 30, 50, 100, 1000, 30+45% and 100+45% annual probability events. The differences in depth and velocity between the proposed and baseline are also presented.

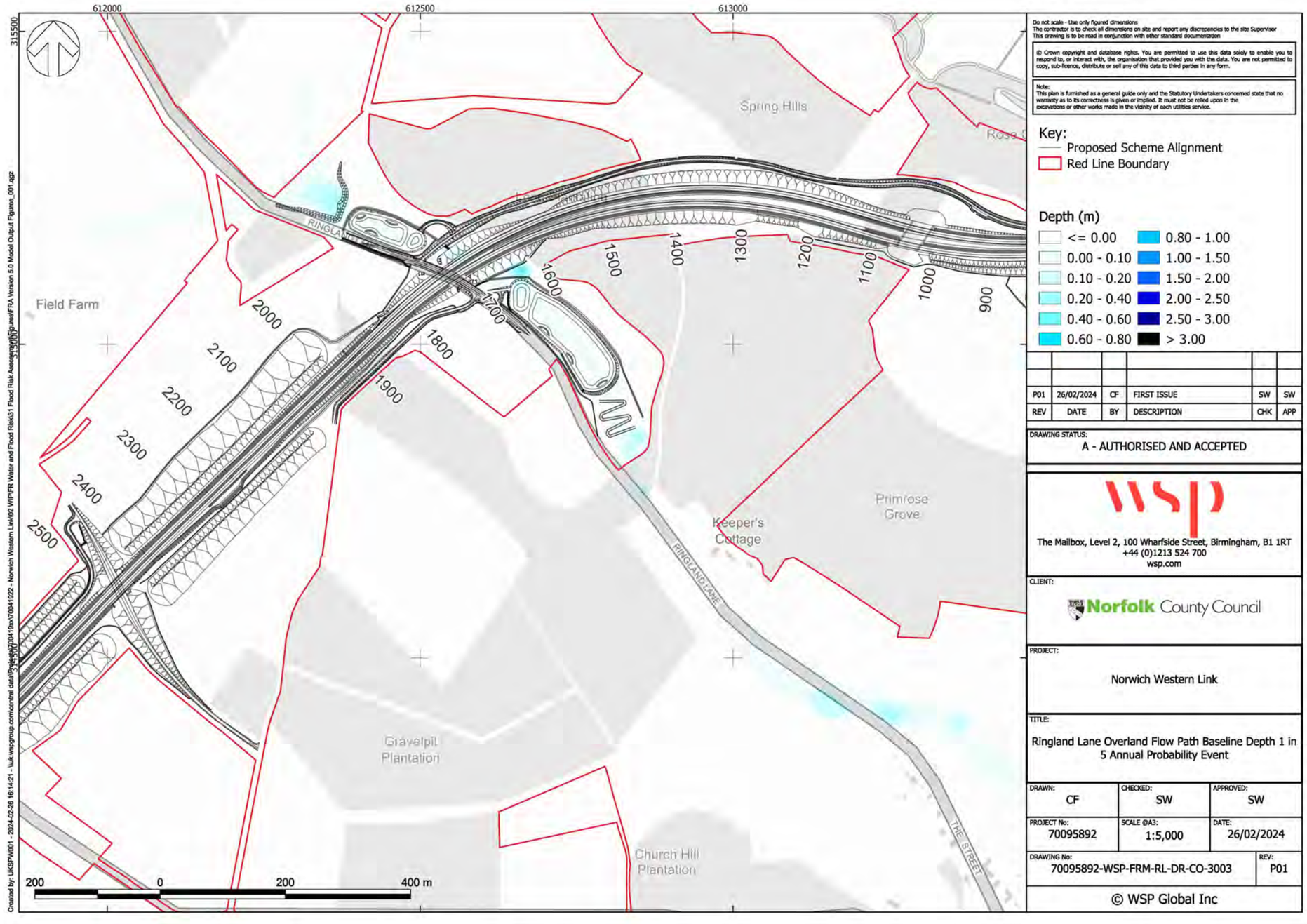
Ringland Lane overland flow path baseline flood extents



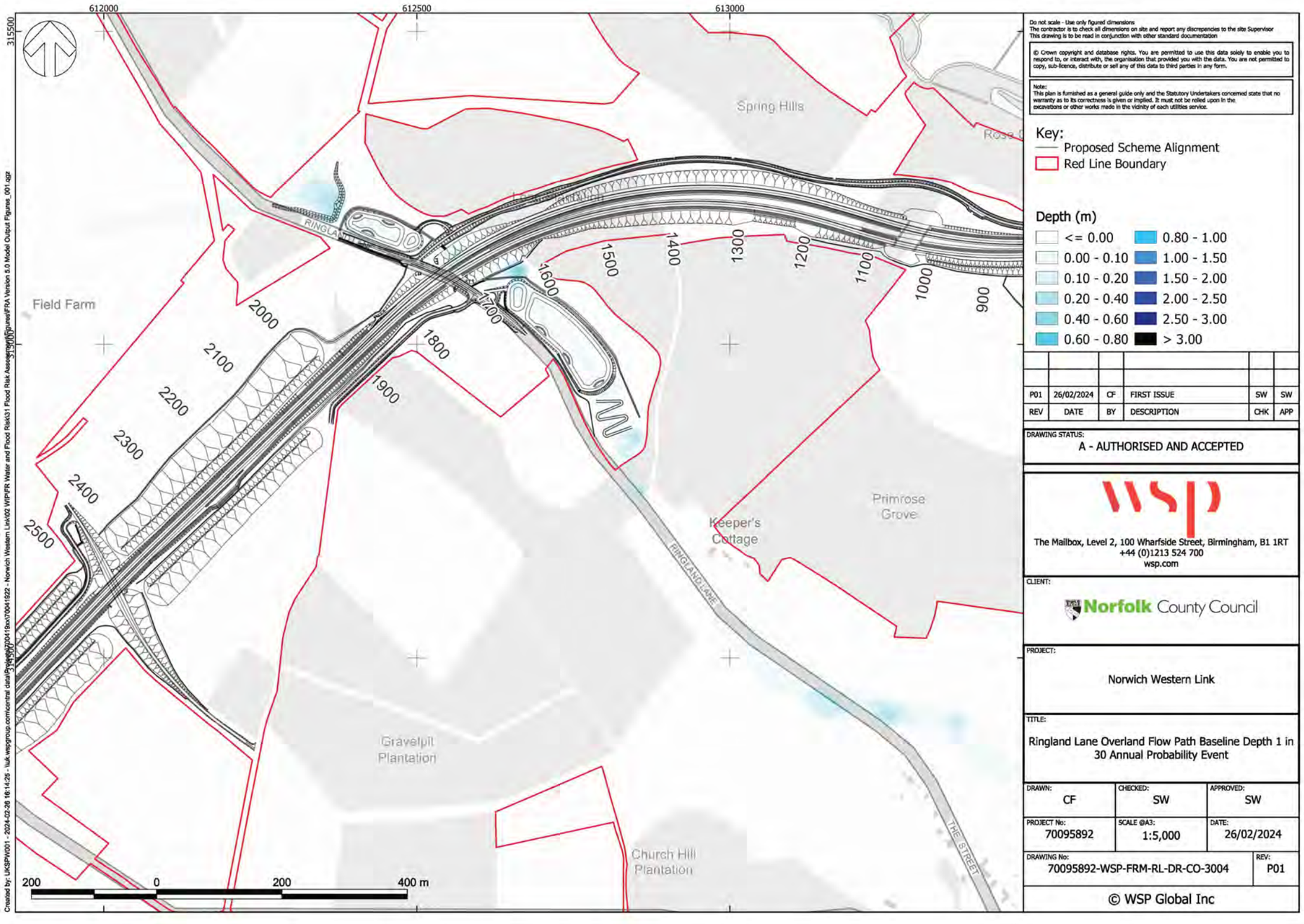
Ringland Lane overland flow path baseline depth 1 in 2 annual probability event



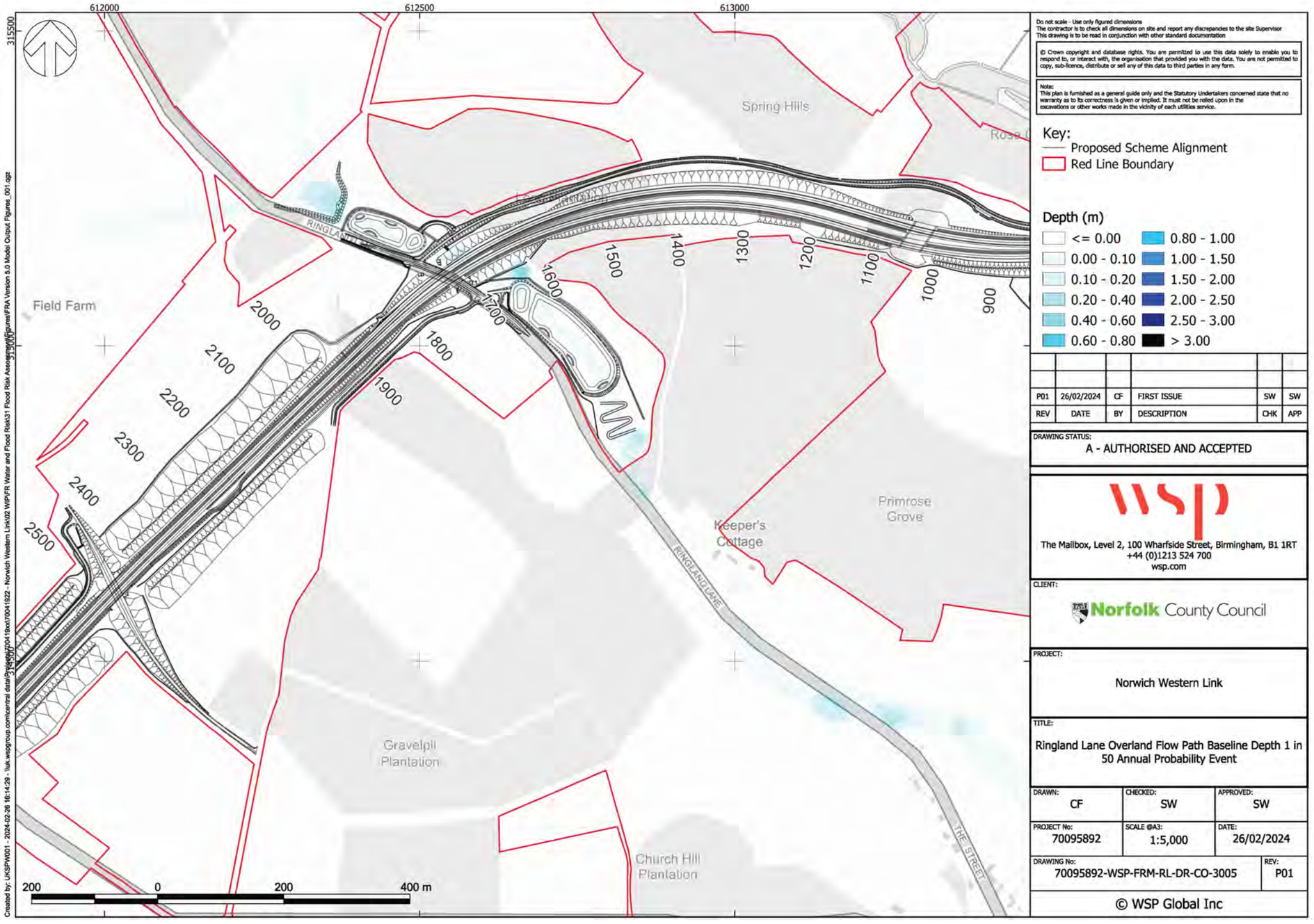
Ringland Lane overland flow path baseline depth 1 in 5 annual probability event



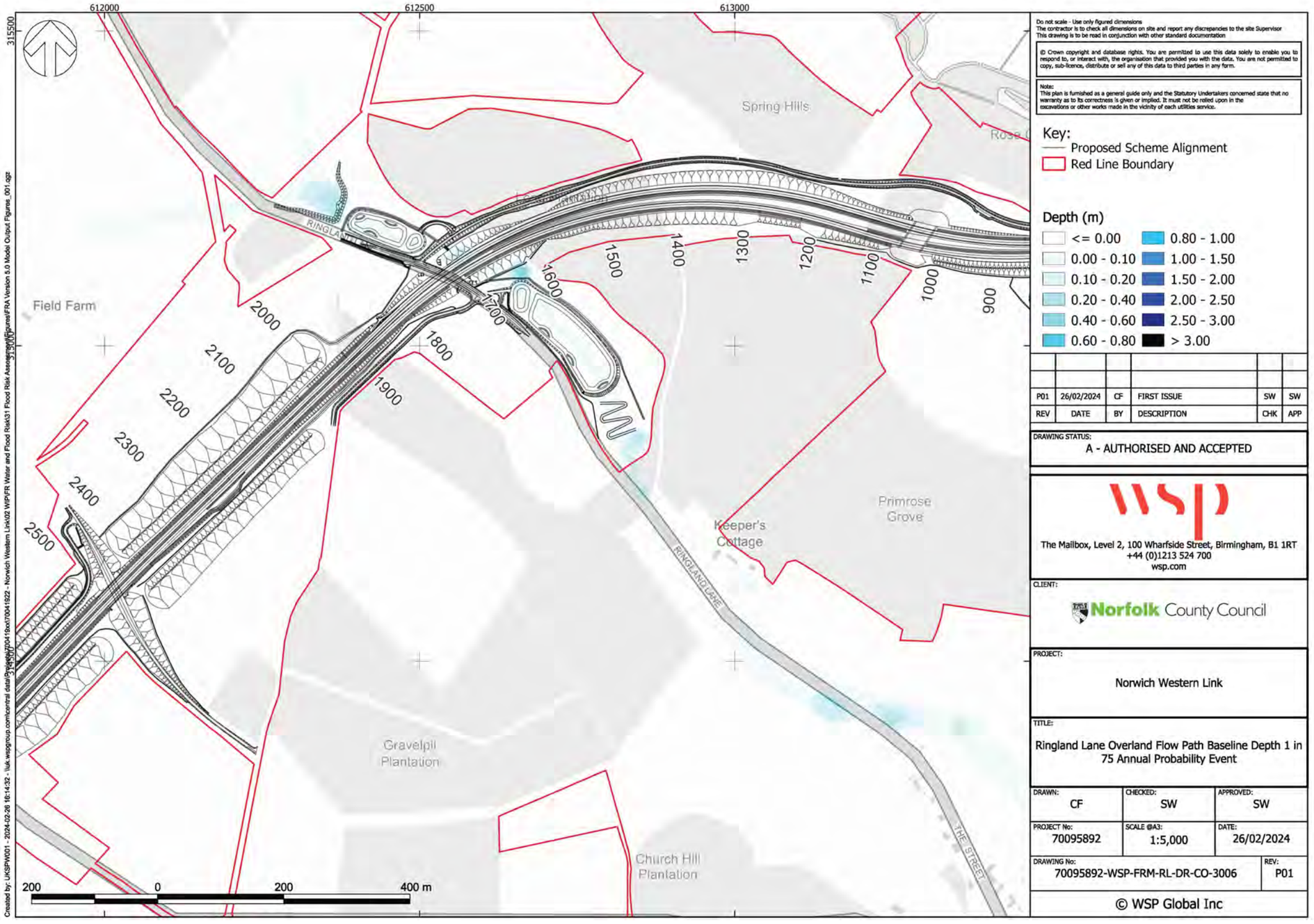
Ringland Lane overland flow path baseline depth 1 in 30 annual probability event



Ringland Lane overland flow path baseline depth 1 in 50 annual probability event



Ringland Lane overland flow path baseline depth 1 in 75 annual probability event



Ringland Lane overland flow path baseline depth 1 in 100 annual probability event