

Supporting Figures to Applicant's Response to Environment Agency's Relevant Representation [REP1-016]

Appendix A: Maximum flood depth and Flood Hazard Rating maps under H++ climate change scenarios (to 2085 and 2115)

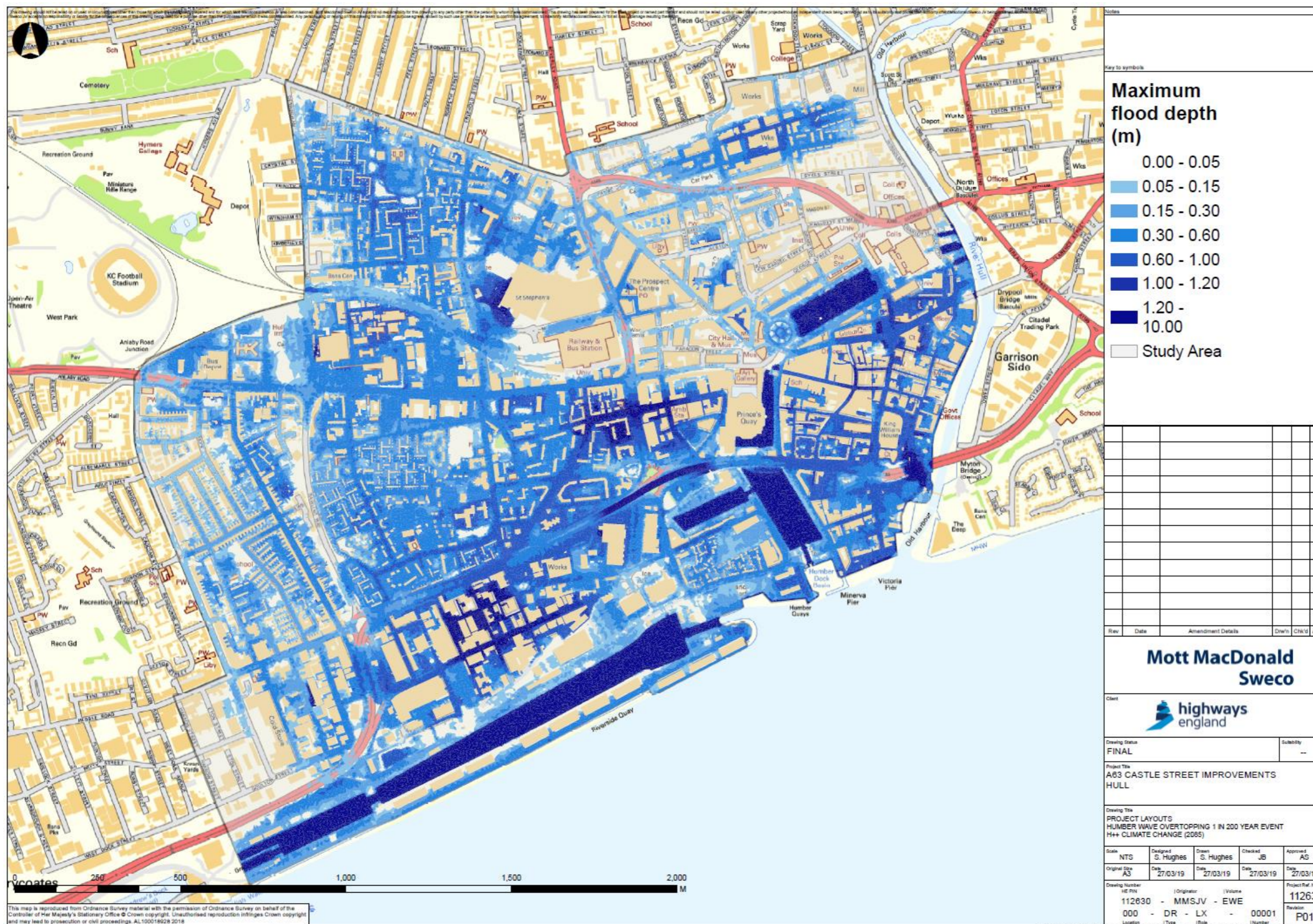


Figure A1: Plan of maximum modelled flood depth for the Scheme during a 1 in 200-year wave overtopping flood event from the Humber Estuary including H++ climate change allowance to 2085 for Scheme layout

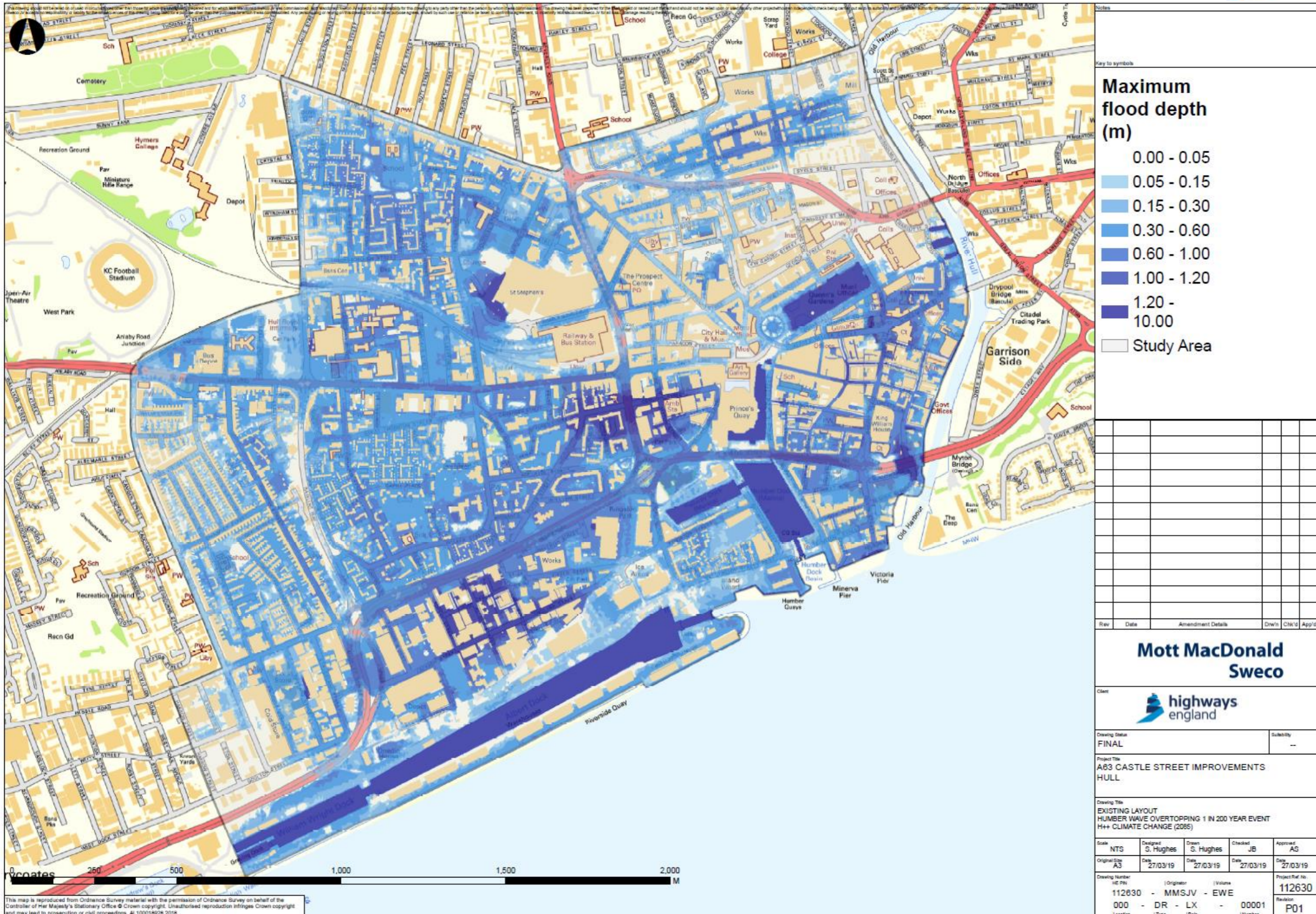


Figure A2: Plan of maximum modelled flood depth for the Scheme during a 1 in 200-year wave overtopping flood event from the Humber Estuary including H++ climate change allowance to 2085 for existing layout

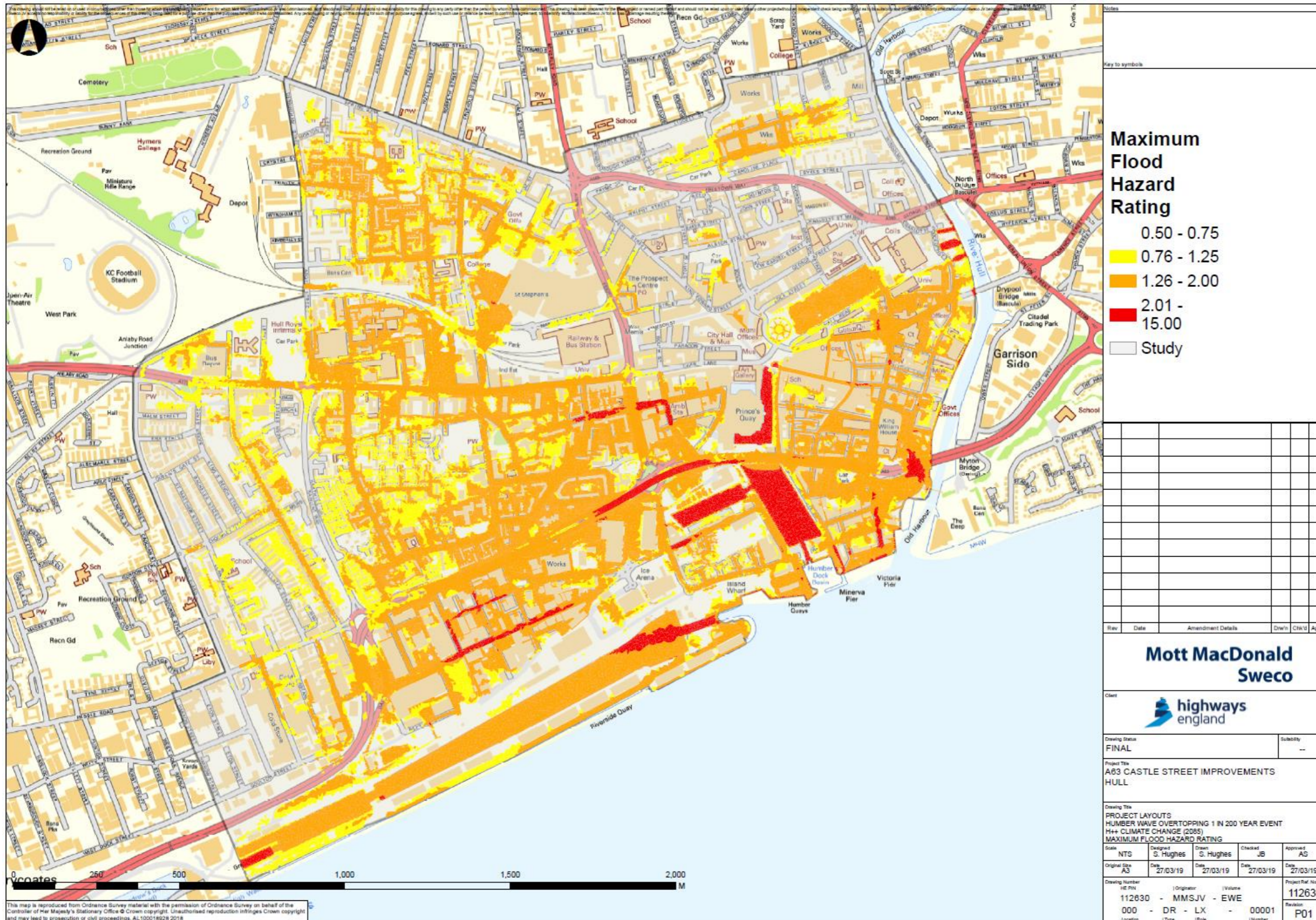


Figure A3: Plan of maximum modelled Flood Hazard Rating for the Scheme during a 1 in 200-year wave overtopping flood event from the Humber Estuary including H++ climate change allowance to 2085 for Scheme layout

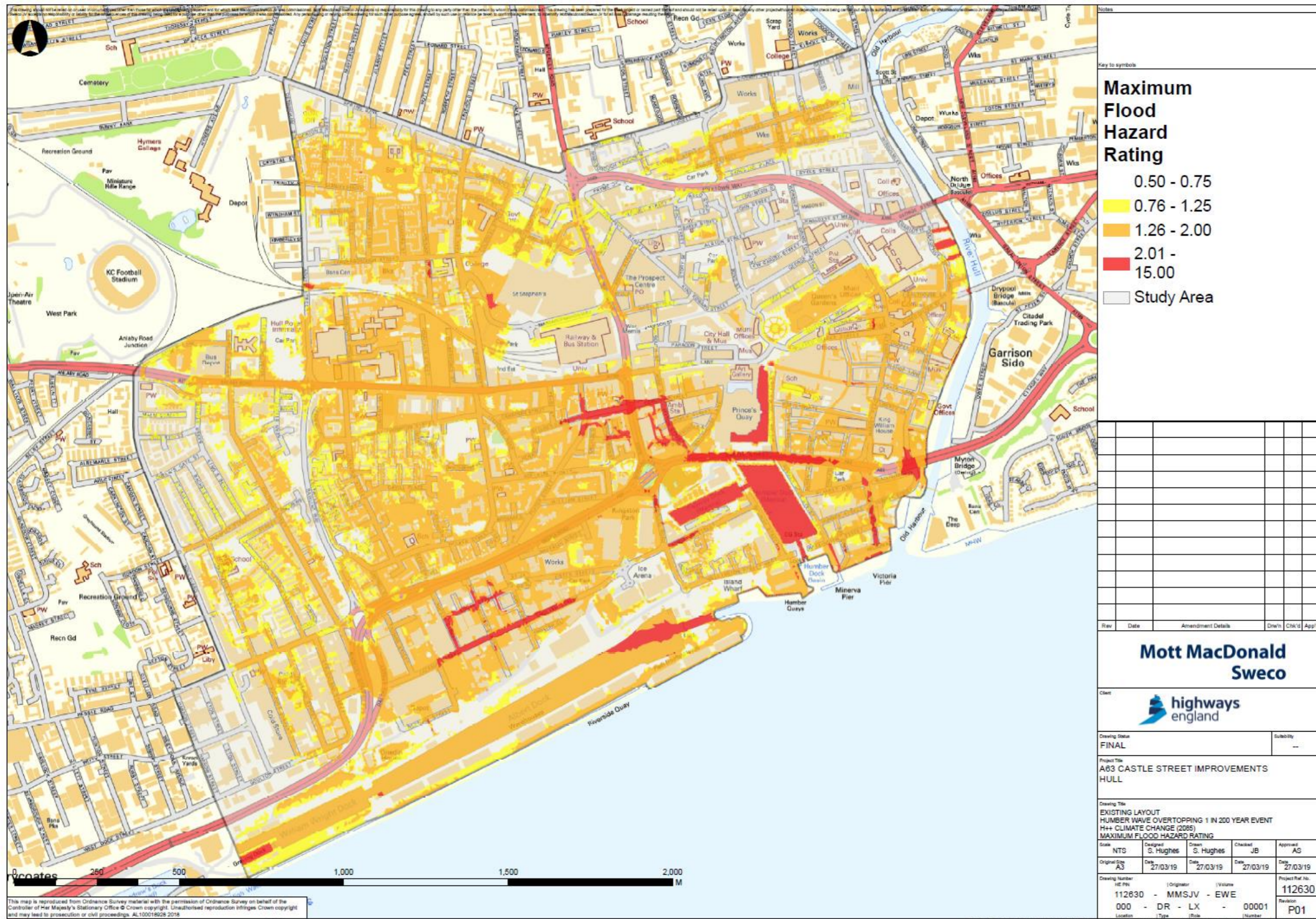


Figure A4: Plan of maximum modelled Flood Hazard Rating for the Scheme during a 1 in 200-year wave overtopping flood event from the Humber Estuary including H++ climate change allowance to 2085 for existing layout

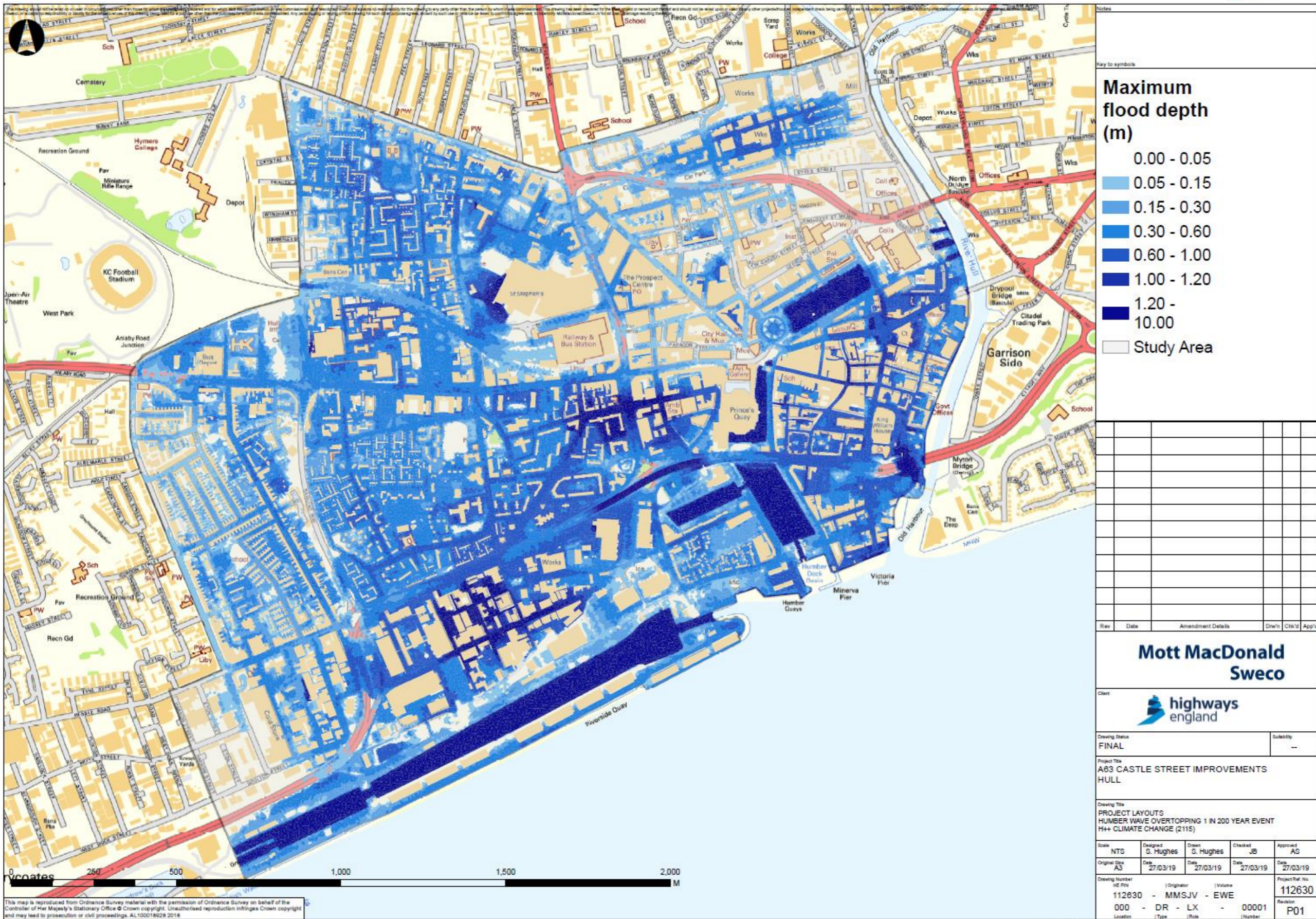


Figure A5: Plan of maximum modelled flood depth for the Scheme during a 1 in 200-year wave overtopping flood event from the Humber Estuary including H++ climate change allowance to 2115 for Scheme layout

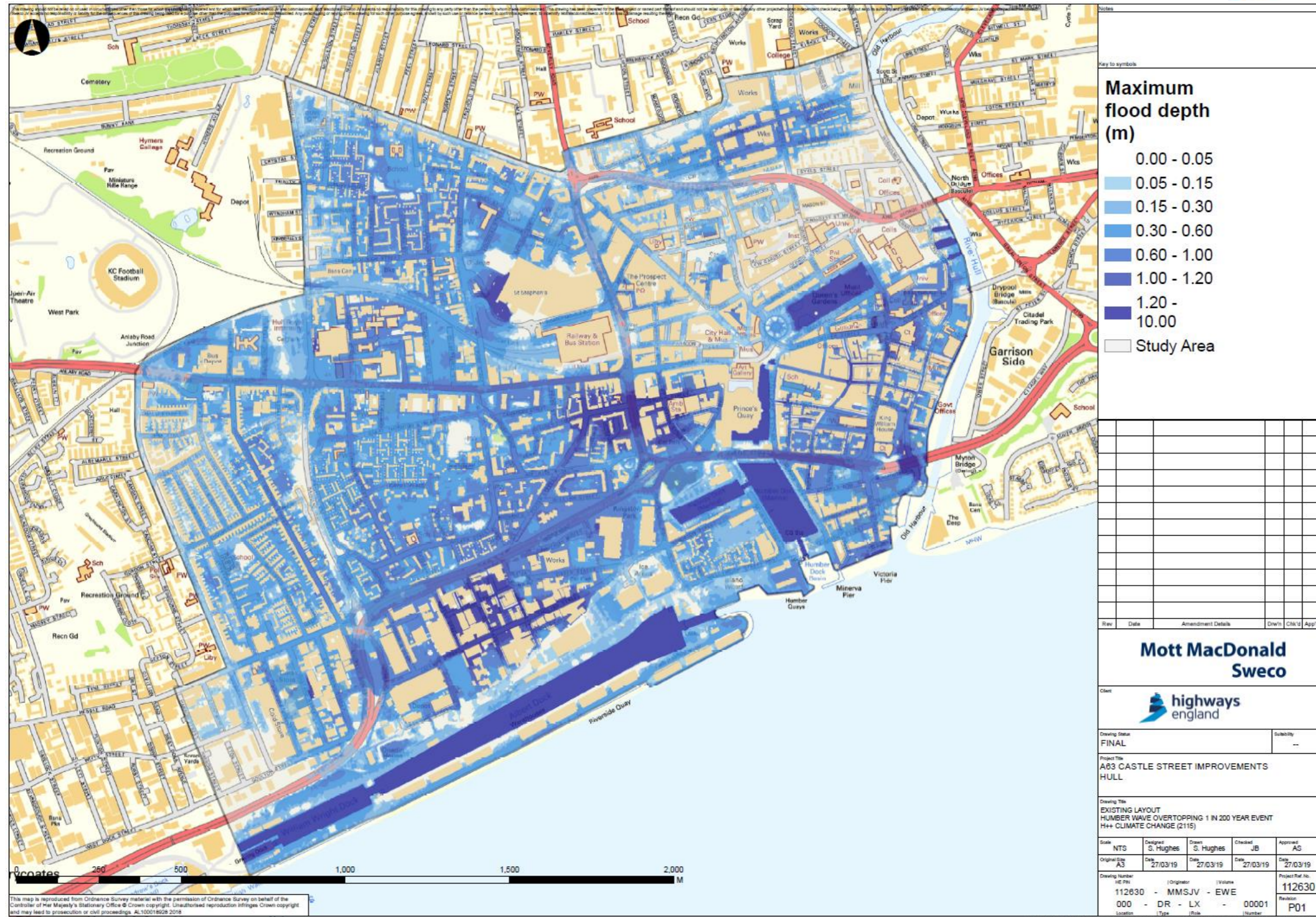


Figure A6: Plan of maximum modelled flood depth for the Scheme during a 1 in 200-year wave overtopping flood event from the Humber Estuary including H++ climate change allowance to 2115 for existing layout

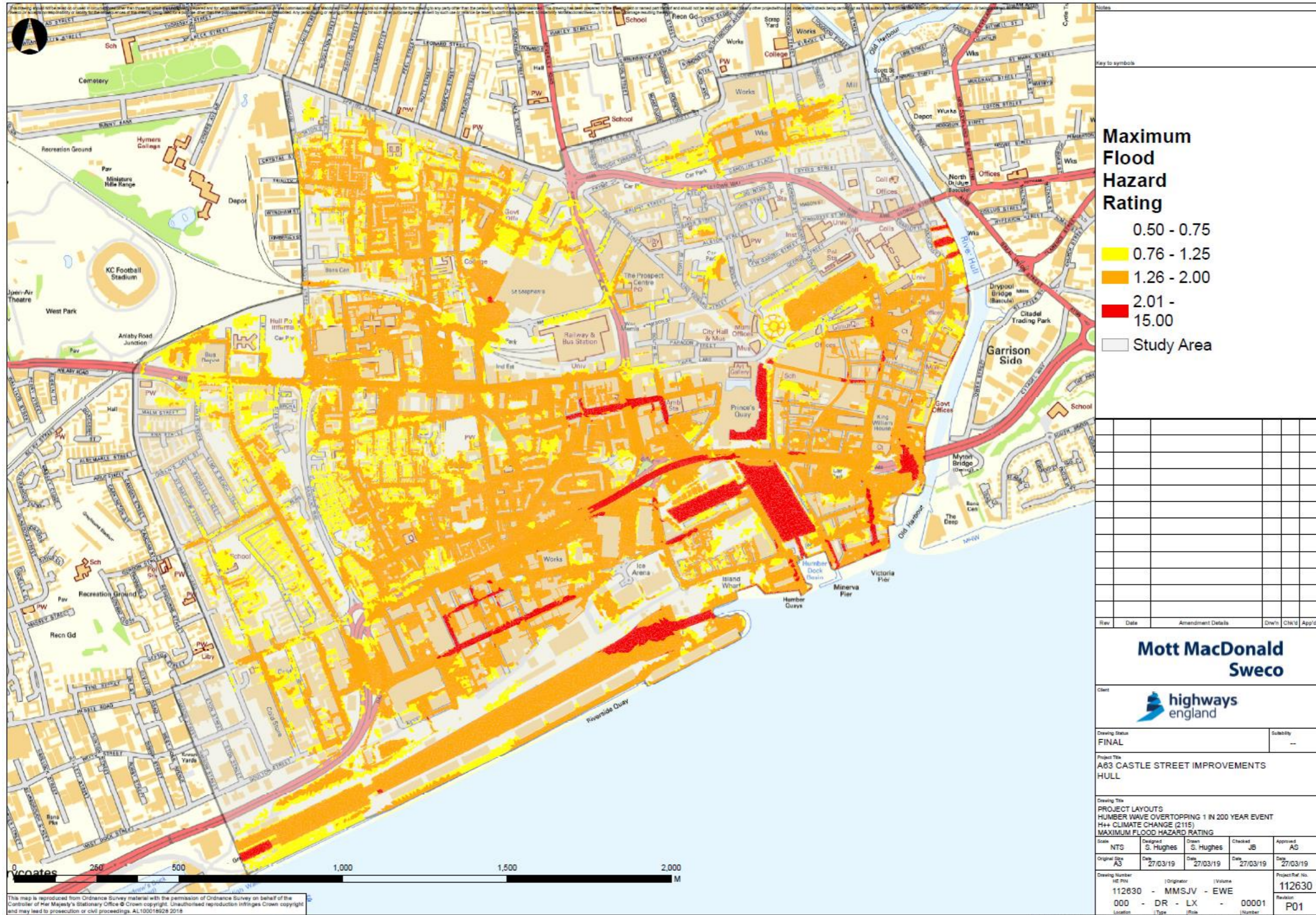


Figure A7: Plan of maximum modelled Flood Hazard Rating for the Scheme during a 1 in 200-year wave overtopping flood event from the Humber Estuary including H++ climate change allowance to 2115 for Scheme layout

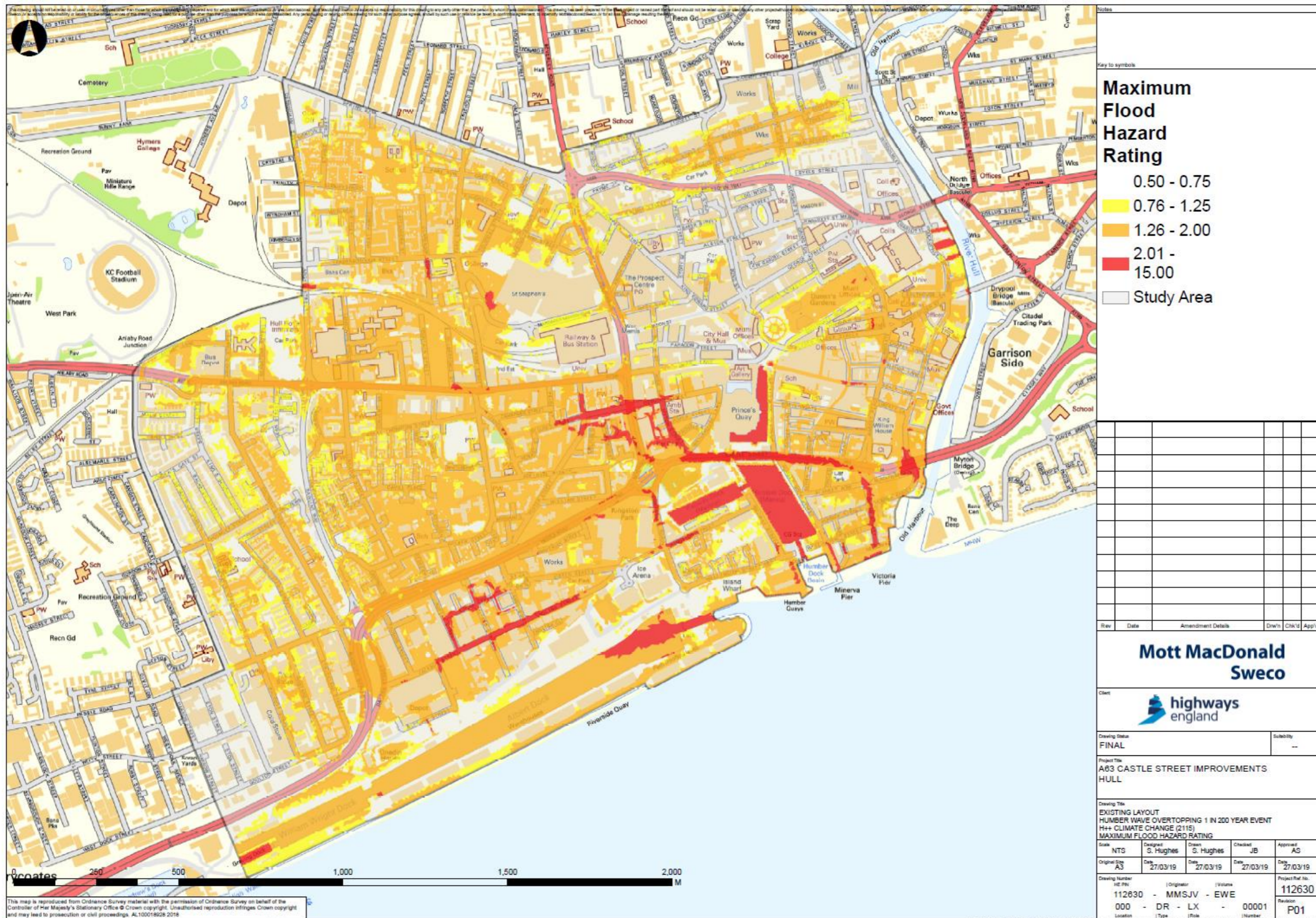
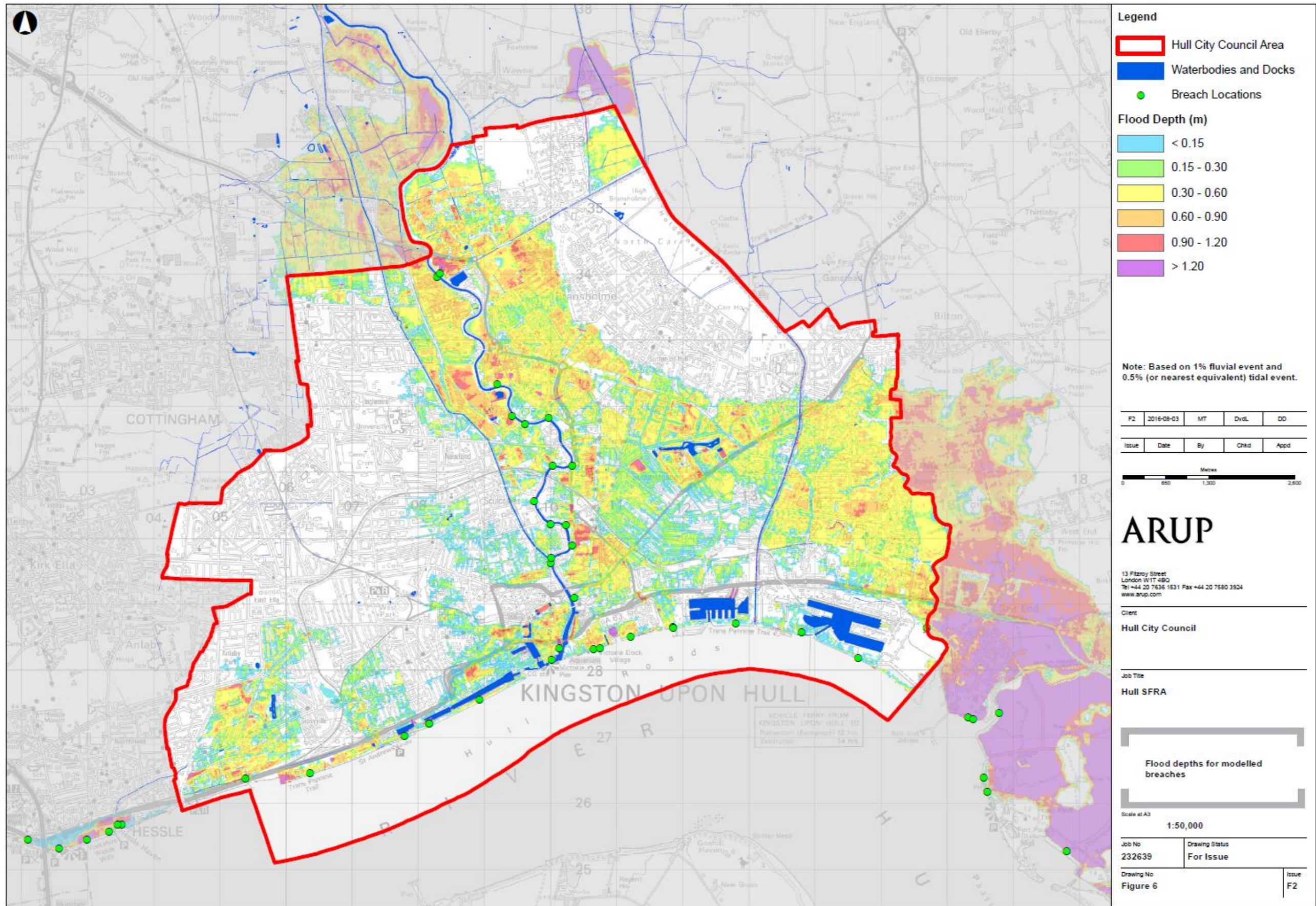
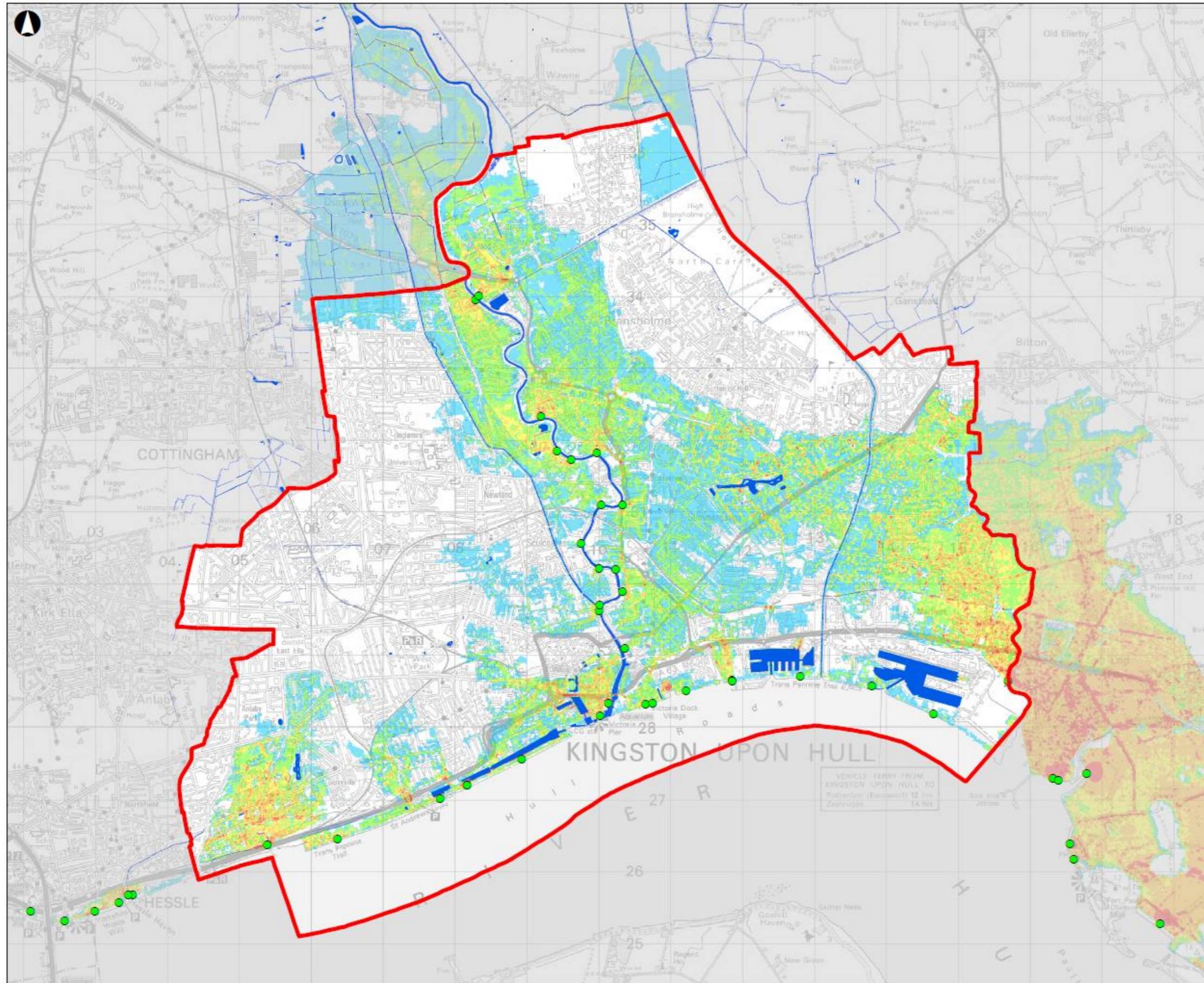


Figure A8: Plan of maximum modelled Flood Hazard Rating for the Scheme during a 1 in 200-year wave overtopping flood event from the Humber Estuary including H++ climate change allowance to 2115 for existing layout

Appendix B: Extract of plans from Hull City Council Strategic Flood Risk Assessment showing depths, velocities and Flood Hazard Rating for flood defence breach scenarios



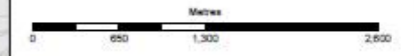


- Legend**
- Hull City Council Area
 - Waterbodies and Docks
 - Breach Locations

- Flow Velocity (m/s)**
- <math>< 0.10</math>
 - 0.10 - 0.30
 - 0.30 - 0.50
 - 0.50 - 1.00
 - > 1.00

Note: Based on 1% fluvial event and 0.5% (or nearest equivalent) tidal event.

F2	2016-08-03	MT	DvdL	DD
Issue	Date	By	Chkd	Appd



ARUP

13 Fitzroy Street
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www.arup.com

Client
Hull City Council

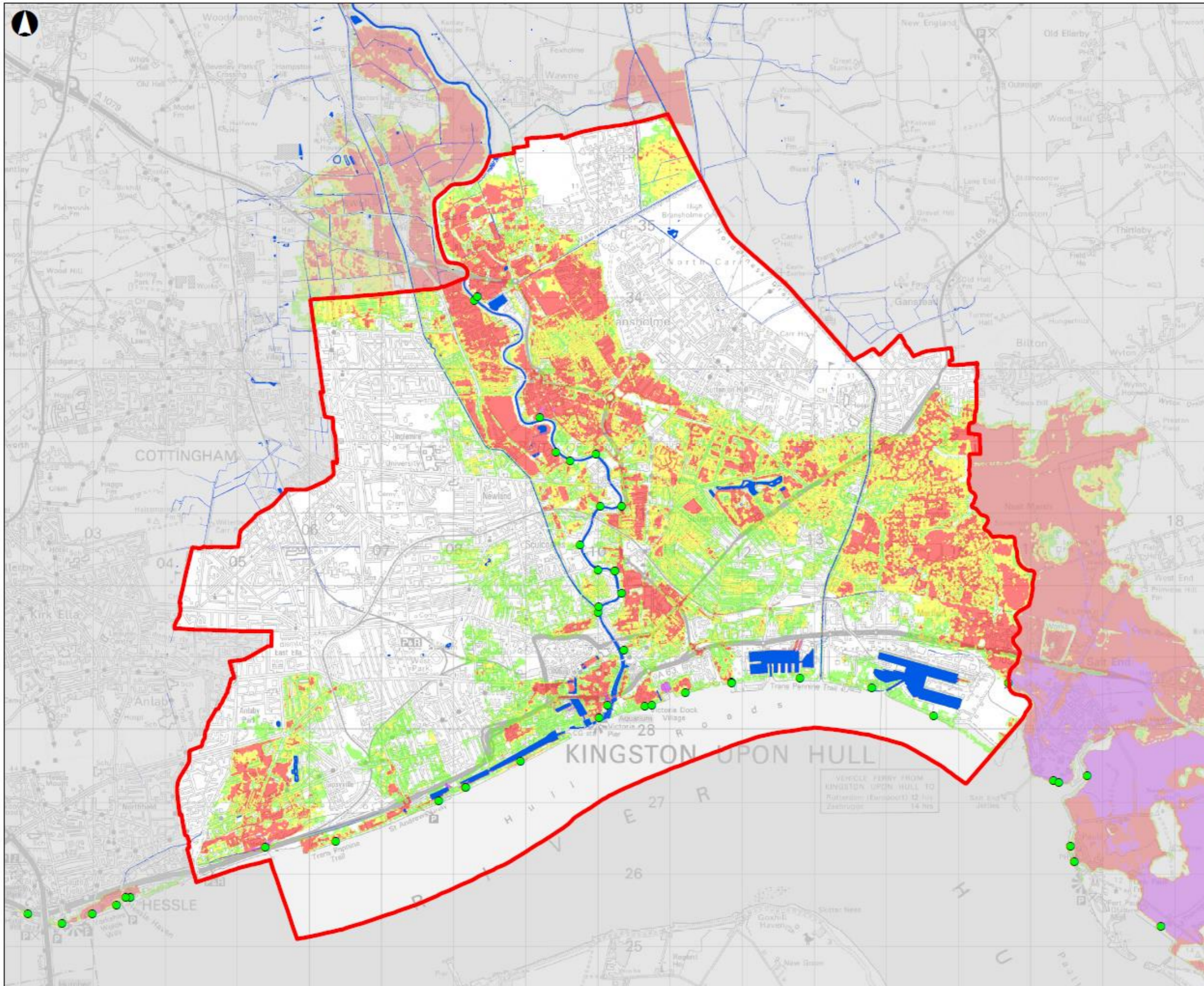
Job Title
Hull SFRA

Flood velocity for modelled breaches

Scale at A3
1:50,000

Job No 232639	Drawing Status For Issue
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Drawing No Figure 7	Issue F2
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Legend

- Hull City Council Area
- Waterbodies and Docks
- Breach Locations

Flood Hazard

- Low
- Moderate
- Significant
- Extreme

Note: Based on 1% fluvial event and 0.5% (or nearest equivalent) tidal event.

F2	2016-08-03	MT	DvdL	DD
Issue	Date	By	Chkd	Appd



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Client
Hull City Council

Job Title
Hull SFRA

Flood hazard for modelled breaches

Scale at A3
1:50,000

Job No 232639	Drawing Status For Issue
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Drawing No Figure 8	Issue F2
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Appendix C: Maximum flood depth and Flood Hazard Rating maps under Humber defence breach scenarios

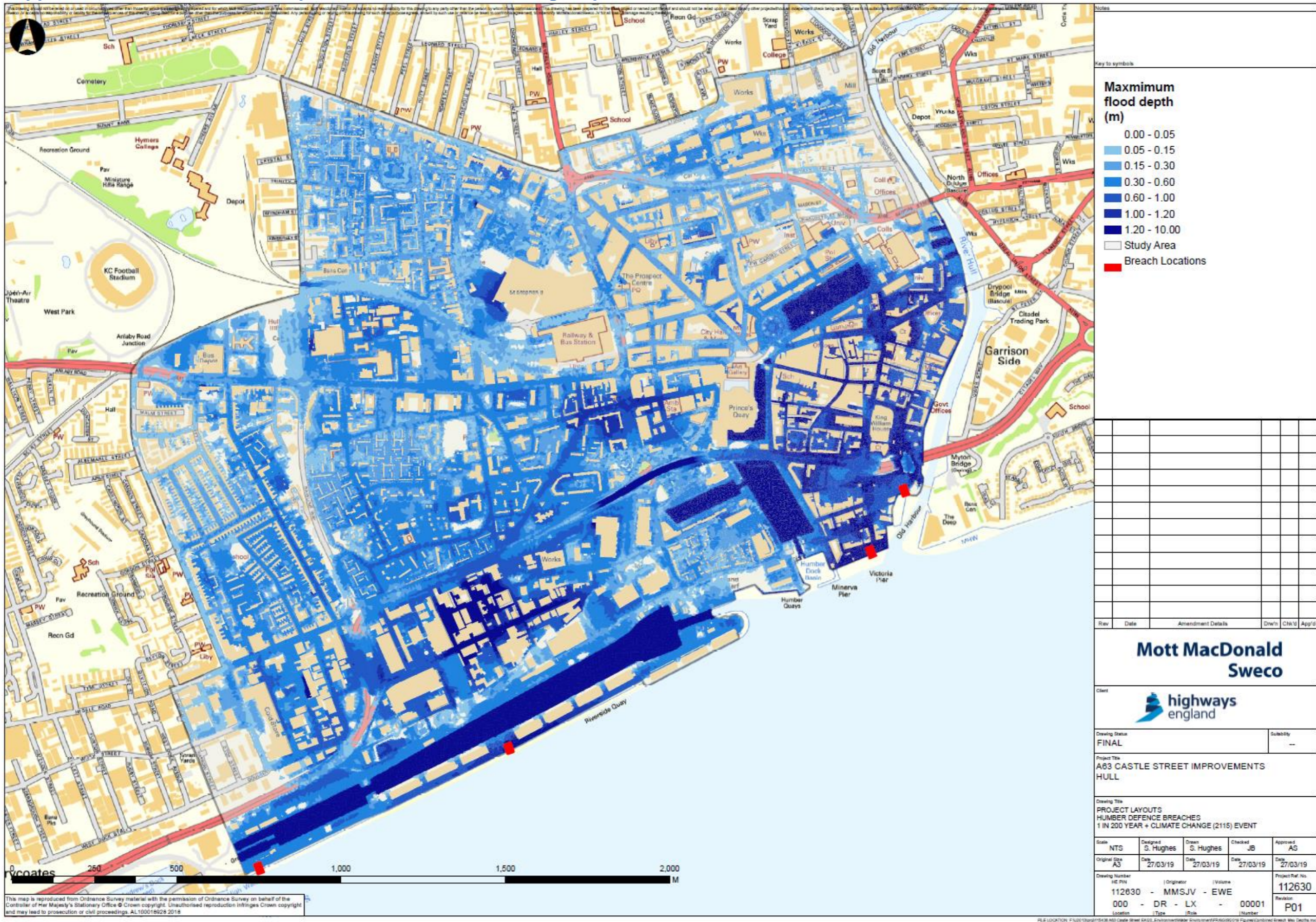


Figure C1: Plan of maximum modelled flood depth for the Scheme during a 1 in 200-year plus climate change Humber defence breach scenario for Scheme layout

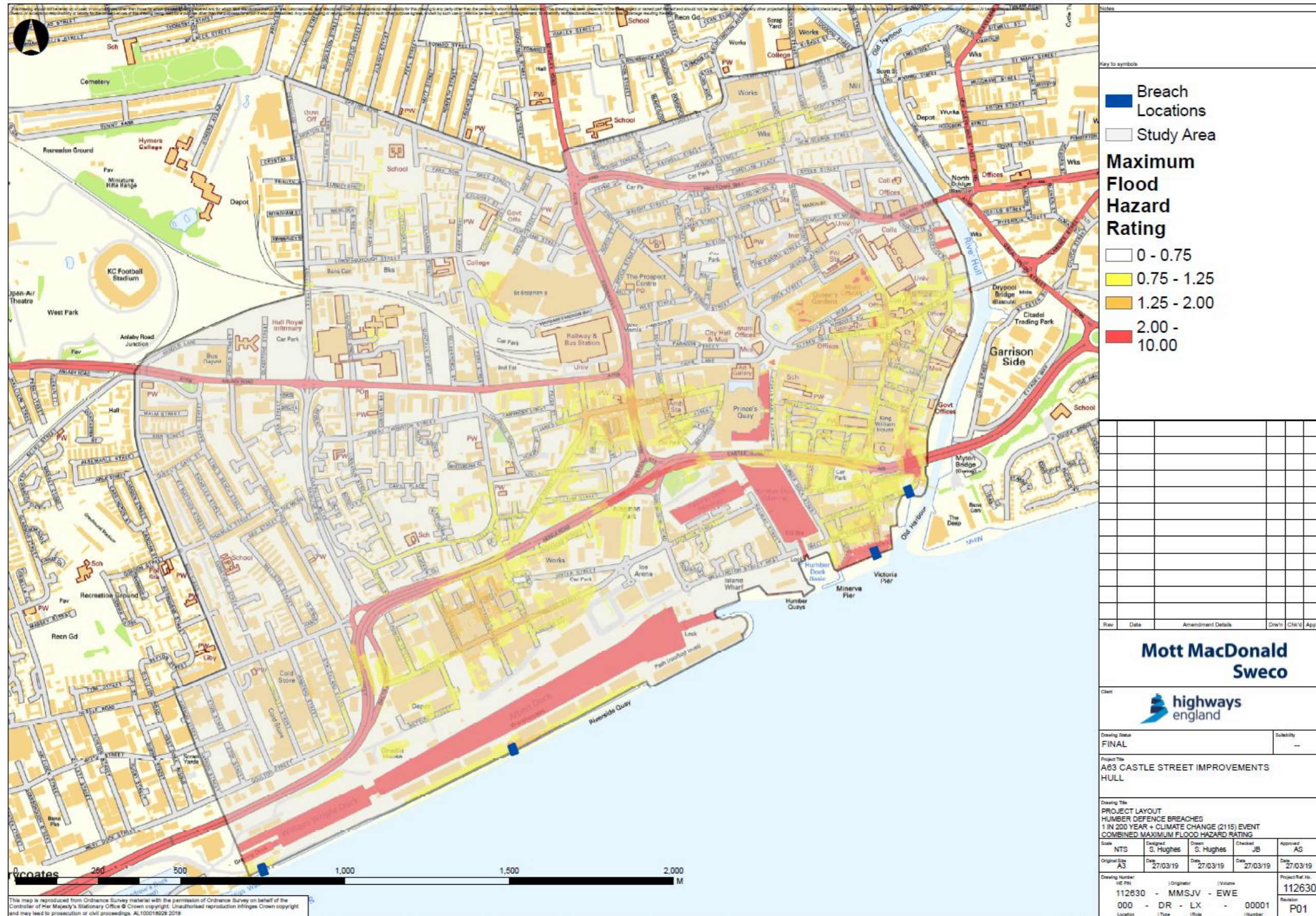


Figure C2: Plan of maximum modelled Flood Hazard Rating for the Scheme during a 1 in 200-year plus climate change Humber defence breach scenario for Scheme layout

Appendix D: Plan of Hull City Council allocated development sites for residential and employment use



Figure D1: Location of allocated development sites

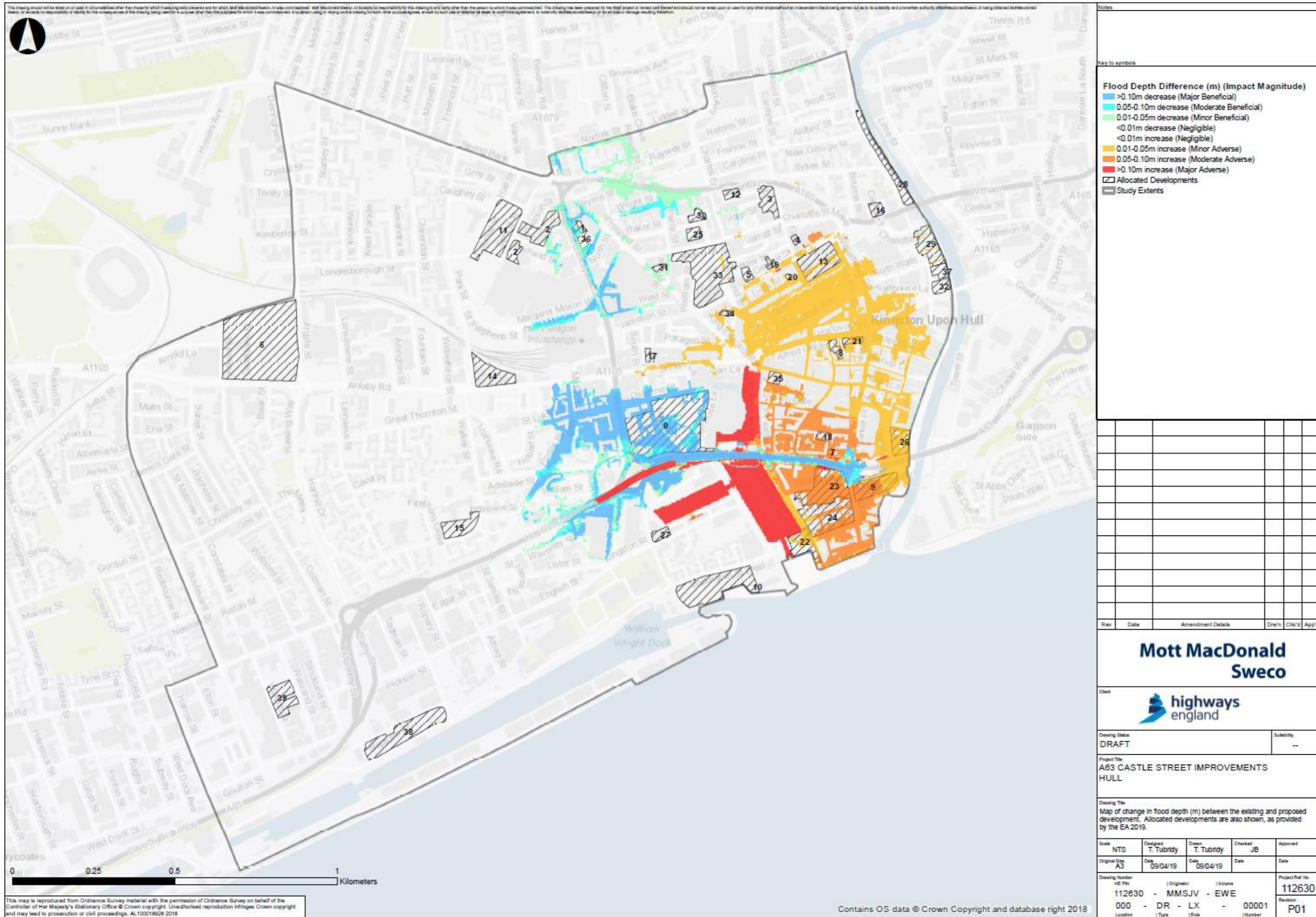
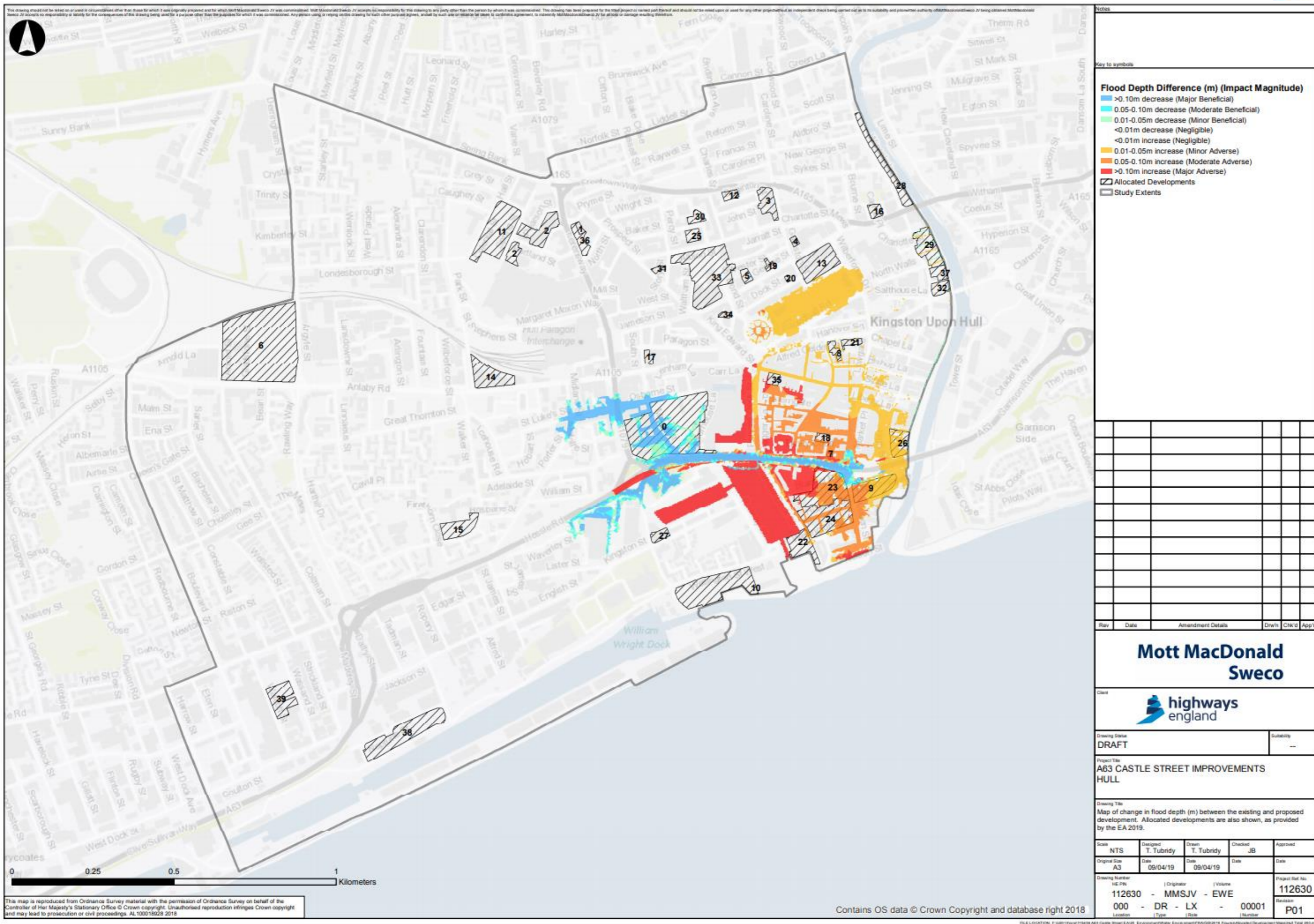


Figure D2: Change in maximum flood depths at allocated development sites during a 1 in 1000-year tidal flood event from the River Hull (with Hull Tidal Surge Barrier open)



Notes

Key to symbols

Flood Depth Difference (m) (Impact Magnitude)

>0.10m decrease (Major Beneficial)

0.05-0.10m decrease (Moderate Beneficial)

0.01-0.05m decrease (Minor Beneficial)

<0.01m decrease (Negligible)

<0.01m increase (Negligible)

0.01-0.05m increase (Minor Adverse)

0.05-0.10m increase (Moderate Adverse)

>0.10m increase (Major Adverse)

Allocated Developments

Study Extents

Rev	Date	Amendment Details	Drwn	Ck'd	App'd

**Mott MacDonald
Sweco**

Client
highways england

Drawing Status: **DRAFT** Submittal: ---

Project Title:
A63 CASTLE STREET IMPROVEMENTS HULL

Drawing Title:
Map of change in flood depth (m) between the existing and proposed development. Allocated developments are also shown, as provided by the EA 2019.

Scale	Designed	Drawn	Checked	Approved
NTS	T. Tubridy	T. Tubridy	JB	
Original Size	Date	Date	Date	Date
A3	09/04/19	09/04/19		

Drawing Number	Originator		Volume	Project Ref No.
112630	MMSJV		EWE	112630
000	DR	LX	00001	Revision
				P01

Figure D3: Change in maximum flood depths at allocated development sites during a 1 in 200-year tidal flood event from the River Hull (with Hull Tidal Surge Barrier open)

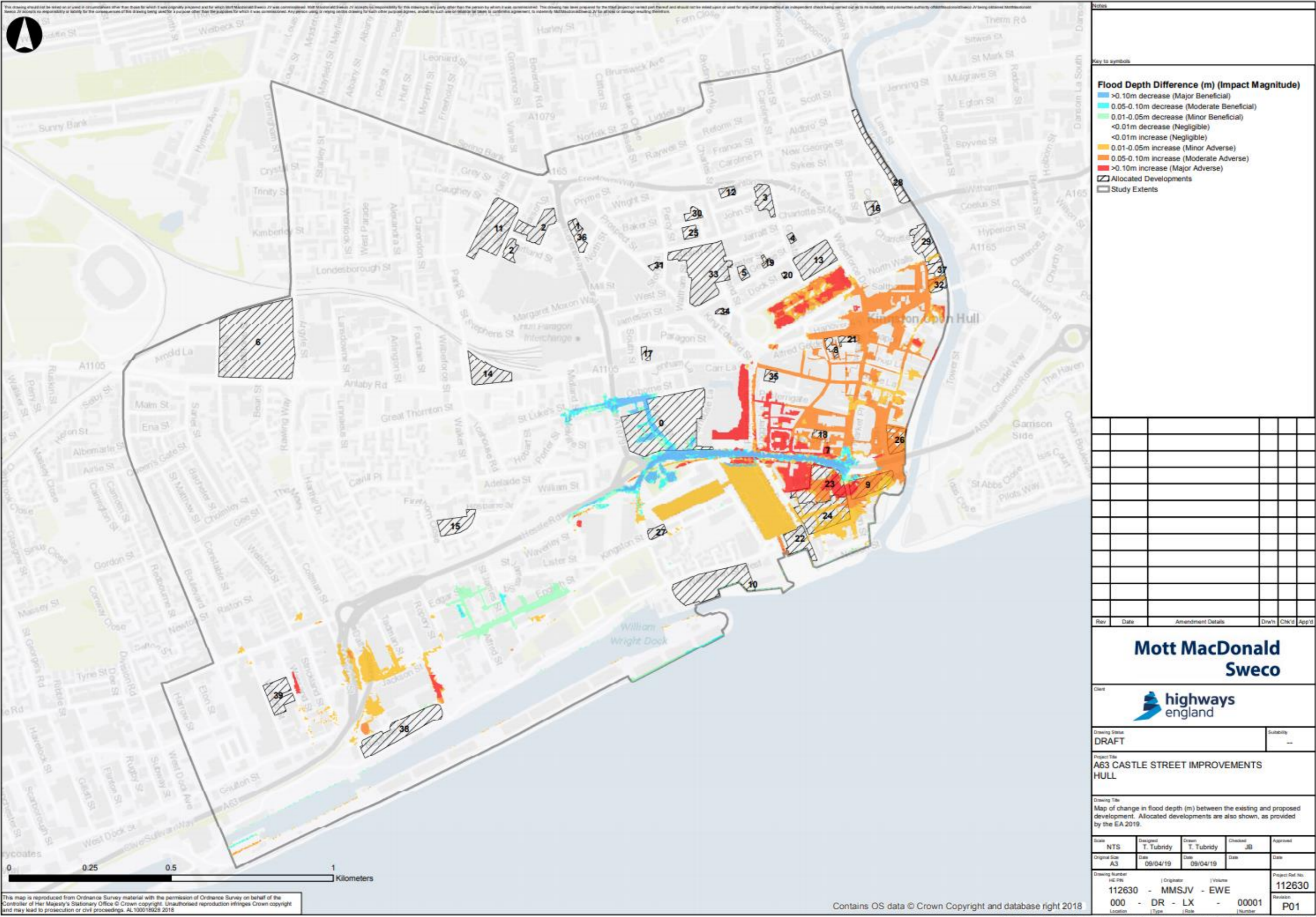


Figure D4: Change in maximum flood depths at allocated development sites during a 1 in 200-year wave overtopping event from the Humber Estuary

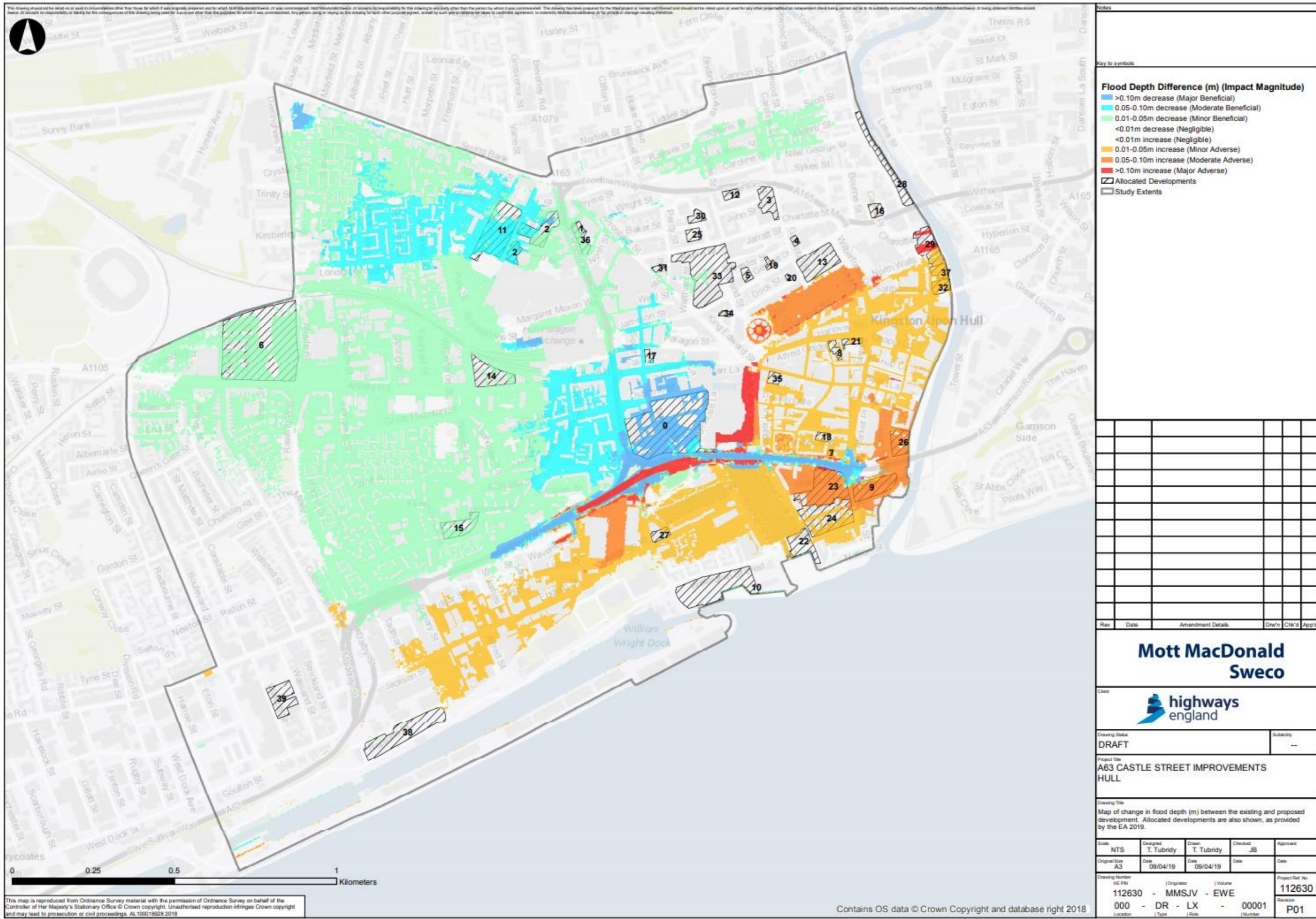


Figure D6: Change in maximum flood depths at allocated development sites during a 1 in 1000-year wave overtopping event from the Humber Estuary

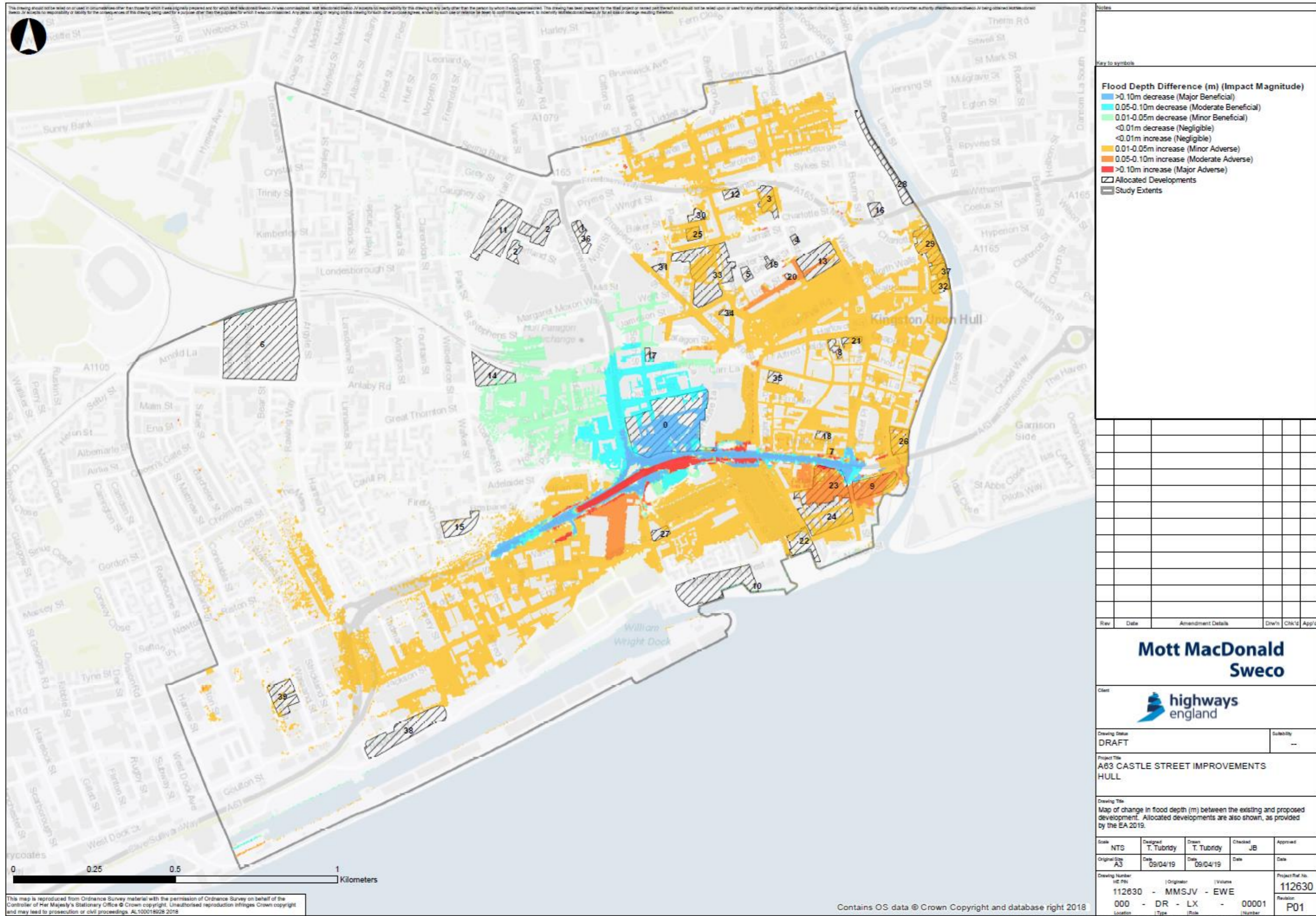
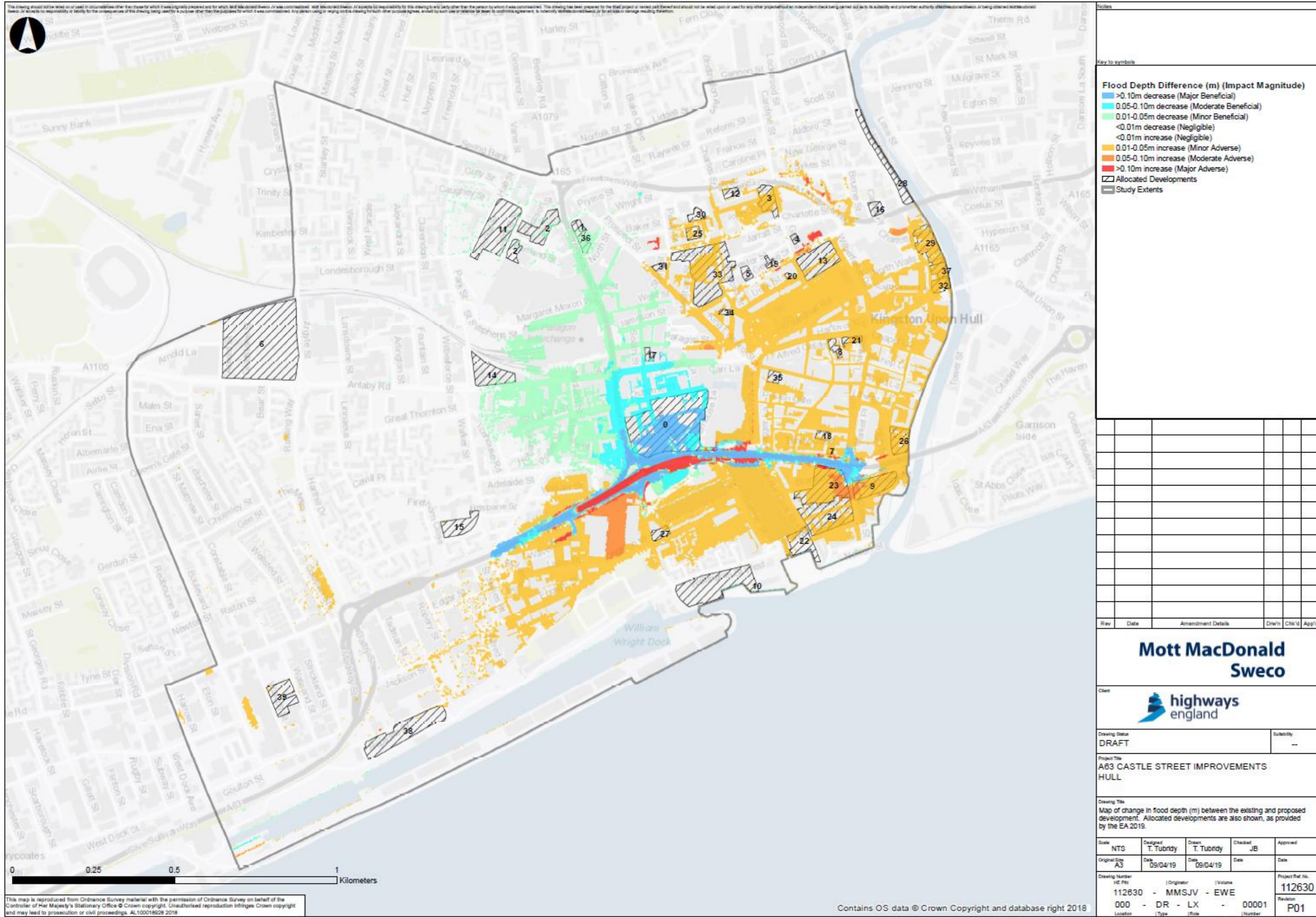


Figure D7: Change in maximum flood depths at allocated development sites during a 1 in 200-year (undefended) tidal flooding event from the Humber Estuary



Notes

Key to symbols

Flood Depth Difference (m) (Impact Magnitude)

- >0.10m decrease (Major Beneficial)
- 0.05-0.10m decrease (Moderate Beneficial)
- 0.01-0.05m decrease (Minor Beneficial)
- <0.01m decrease (Negligible)
- <0.01m increase (Negligible)
- 0.01-0.05m increase (Minor Adverse)
- 0.05-0.10m increase (Moderate Adverse)
- >0.10m increase (Major Adverse)
- Allocated Developments
- Study Extents

Rev	Date	Amendment Details	Dwn	Chk'd	App'd

Mott MacDonald Sweco

Client: highways england

Drawing Status: DRAFT Subtitle: --

Project Title: A63 CASTLE STREET IMPROVEMENTS HULL

Drawing Title: Map of change in flood depth (m) between the existing and proposed development. Allocated developments are also shown, as provided by the EA 2019.

Scale	Designed	Drawn	Checked	Approved
NTS	T. Tubridy	T. Tubridy	JB	
Original Size	Date	Date	Date	Date
A3	09/04/19	09/04/19		

Drawing Number	Originator	Volume	Project Ref. No.
112630	MMSJV	EWE	112630
000	DR	LX	00001
	Location	Type	Role
			Number
			PO1

Figure D8: Change in maximum flood depths at allocated development sites during a 1 in 200-year plus Climate Change (undefended) tidal flooding event from the Humber Estuary

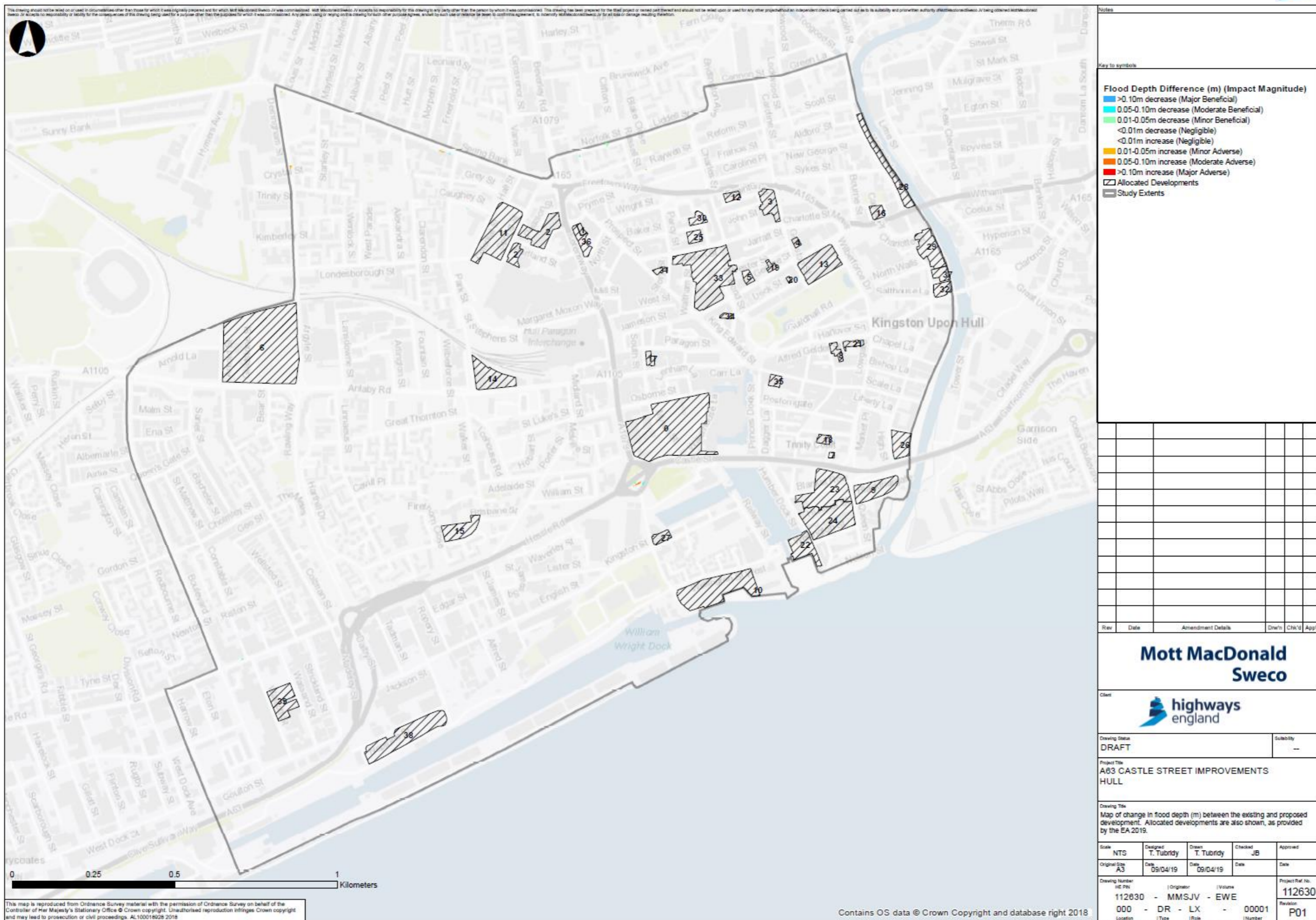


Figure D9: Change in maximum flood depths at allocated development sites during a 1 in 100-year plus 30% Climate Change pluvial flooding event

Appendix E: Plans showing change in Flood Hazard Rating along strategic diversion routes

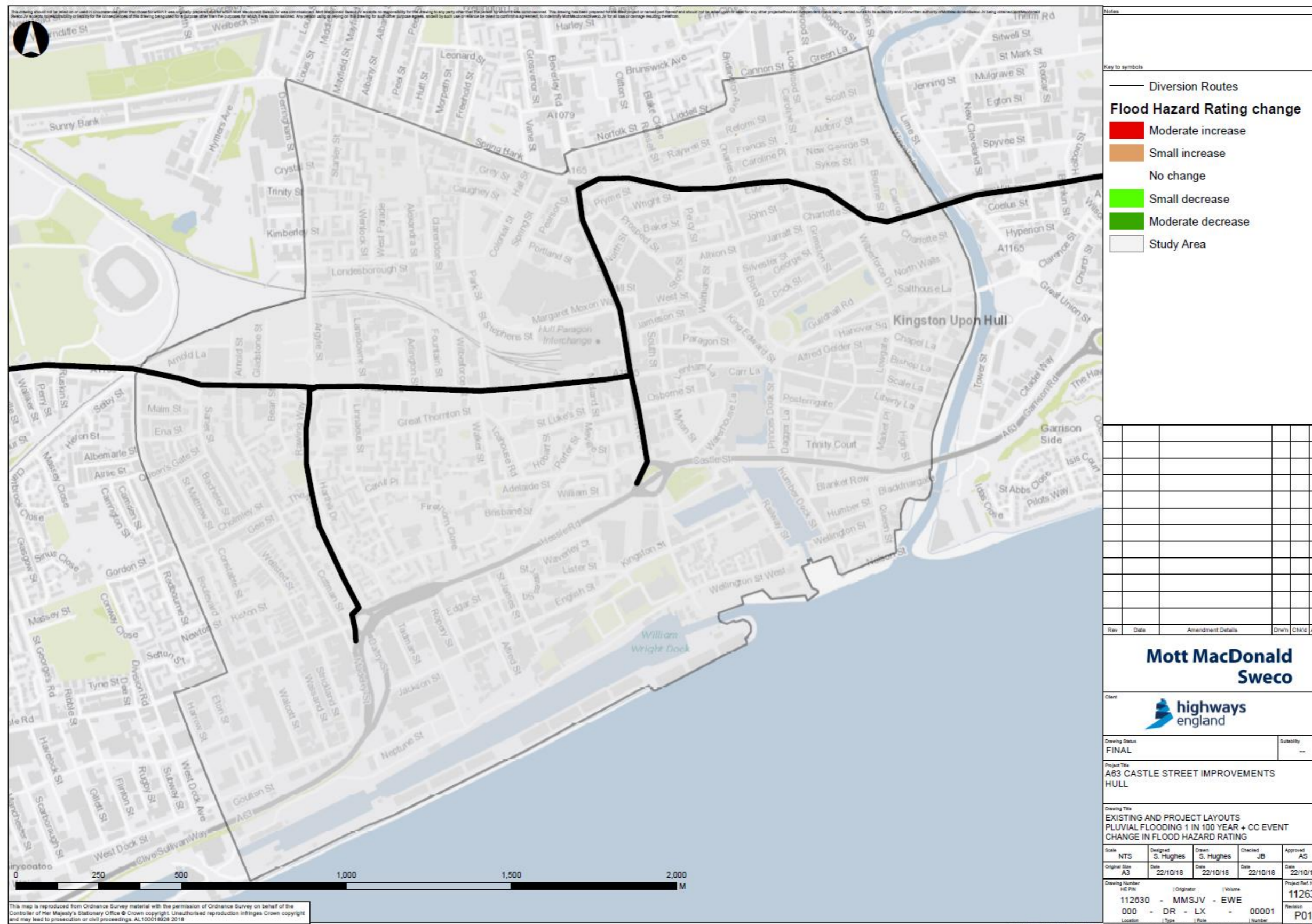


Figure E1: Change in Flood Hazard Rating during a 1 in 100-year plus 30% climate change pluvial flood event

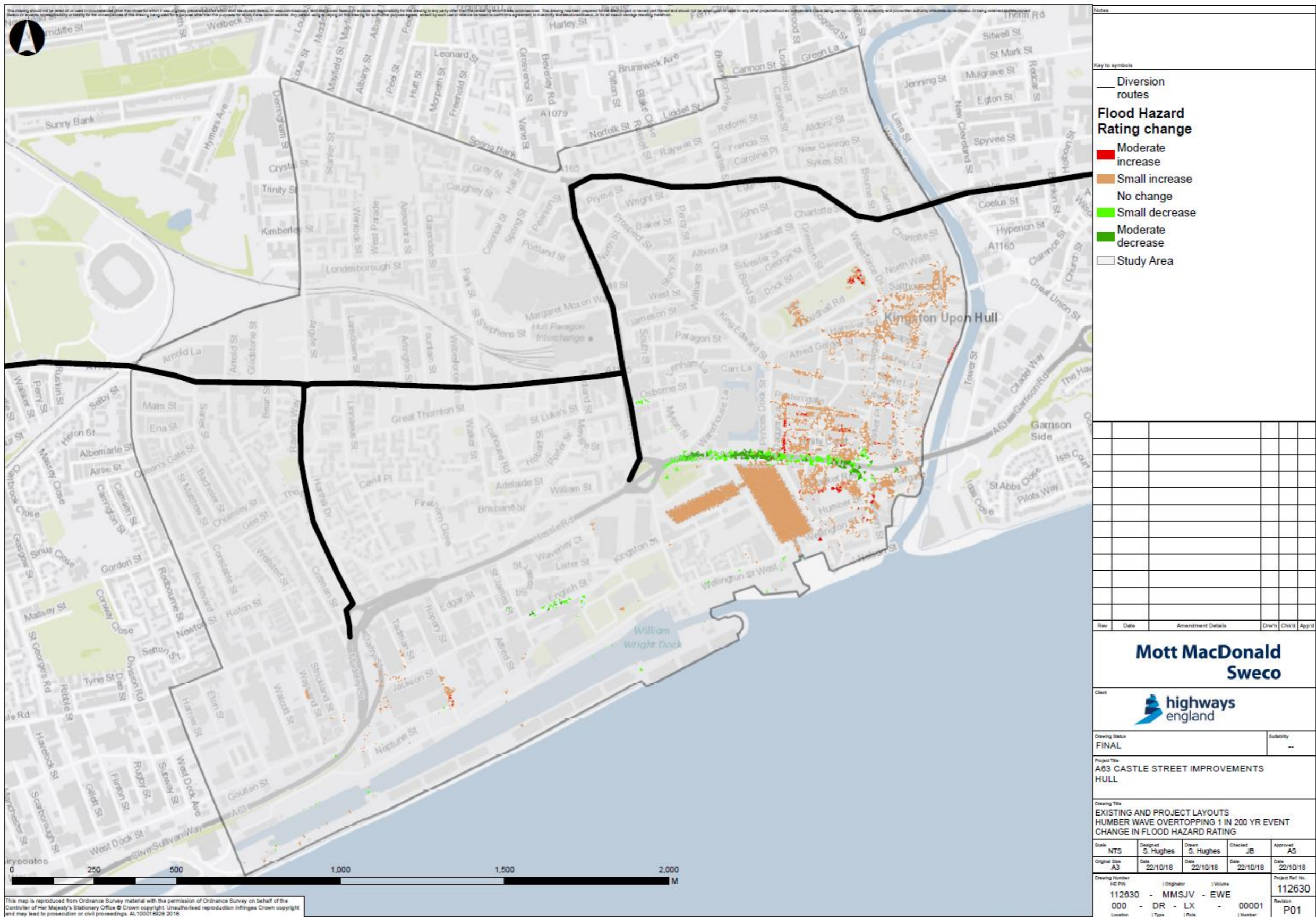


Figure E2: Change in Flood Hazard Rating during a 1 in 200-year defended Humber Estuary wave overtopping flood event

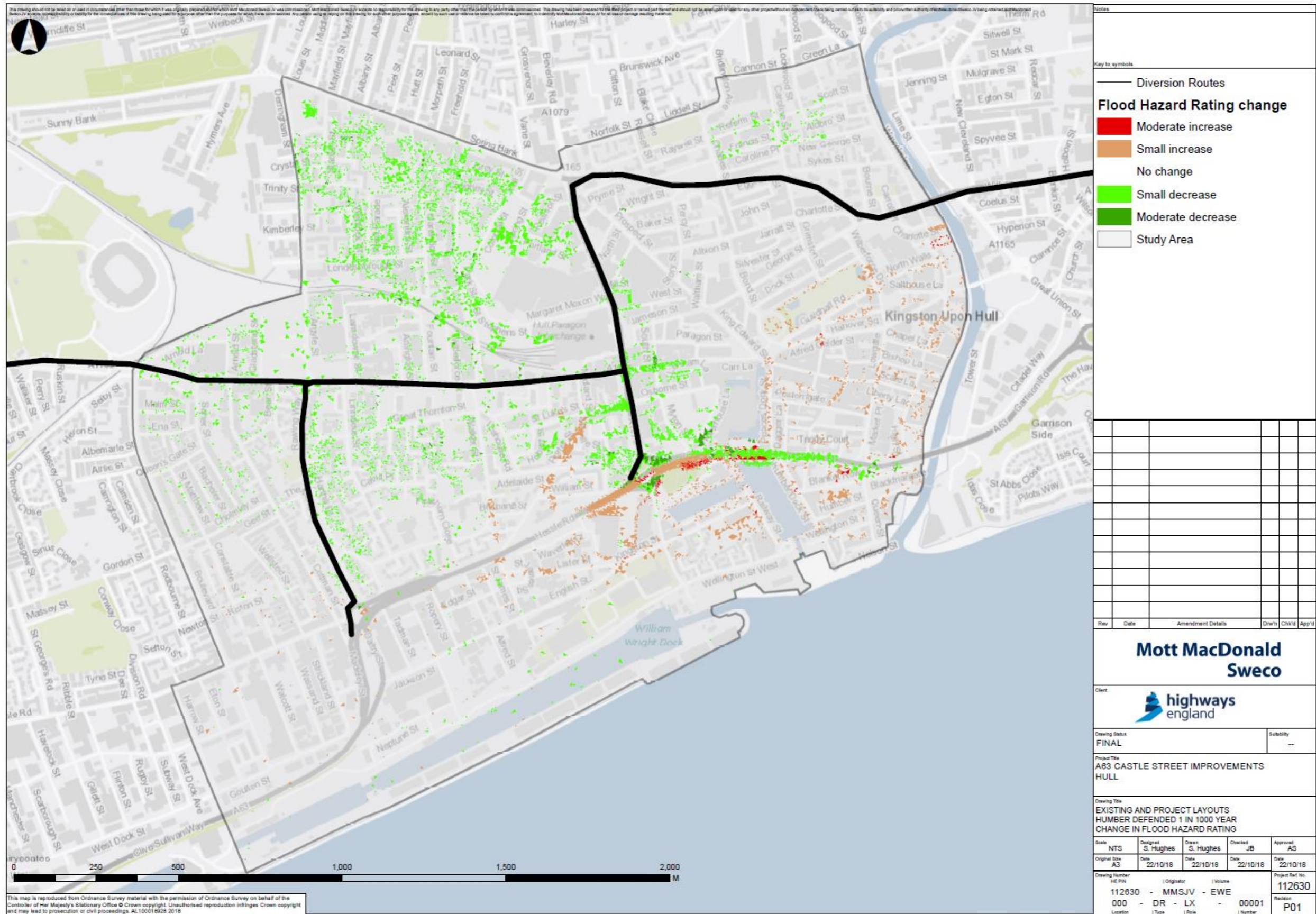


Figure E3: Change in Flood Hazard Rating during a 1 in 1000-year defended Humber Estuary wave overtopping flood event

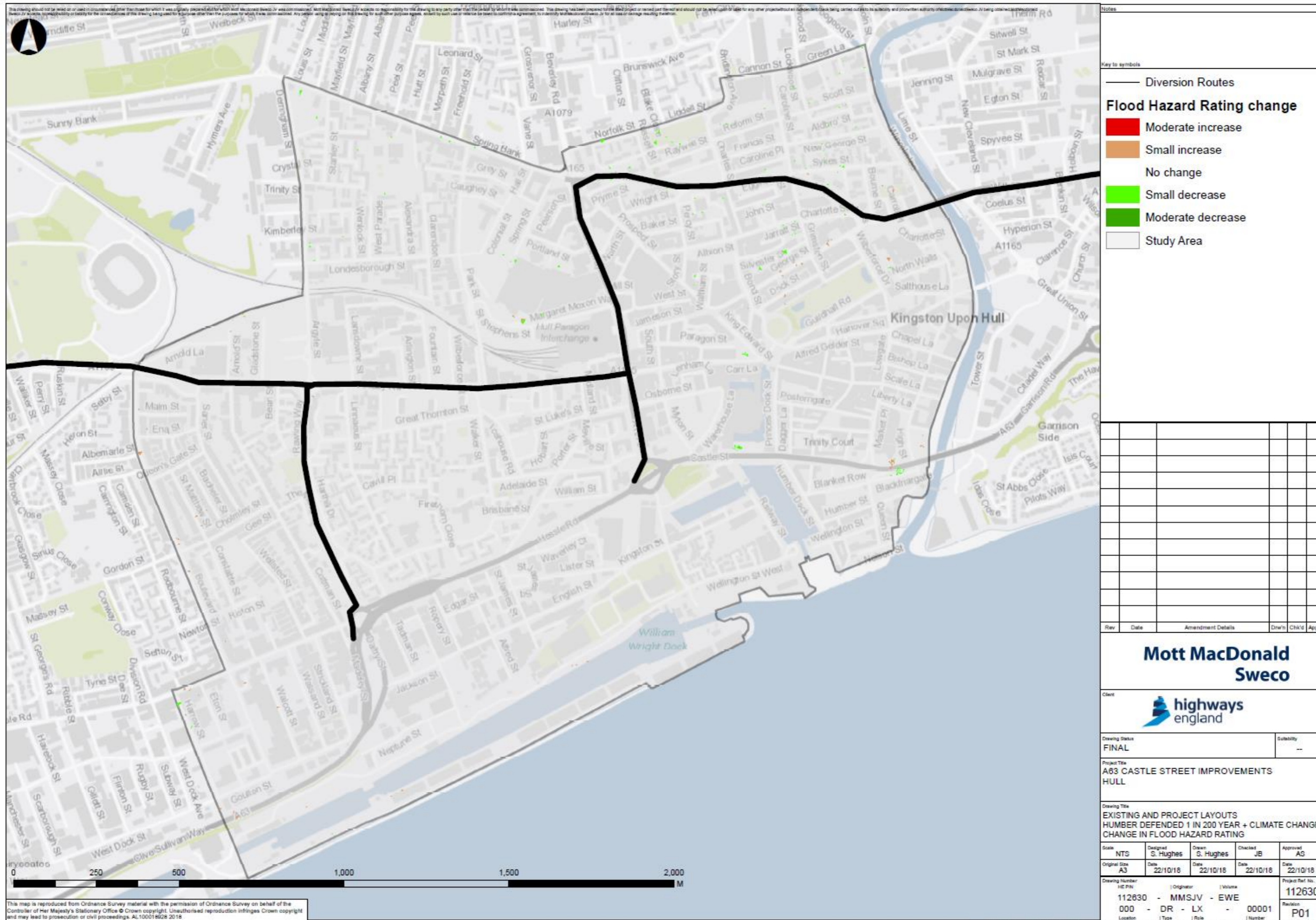


Figure E4: Change in Flood Hazard Rating during a 1 in 200-year plus climate change defended Humber Estuary wave overtopping flood event

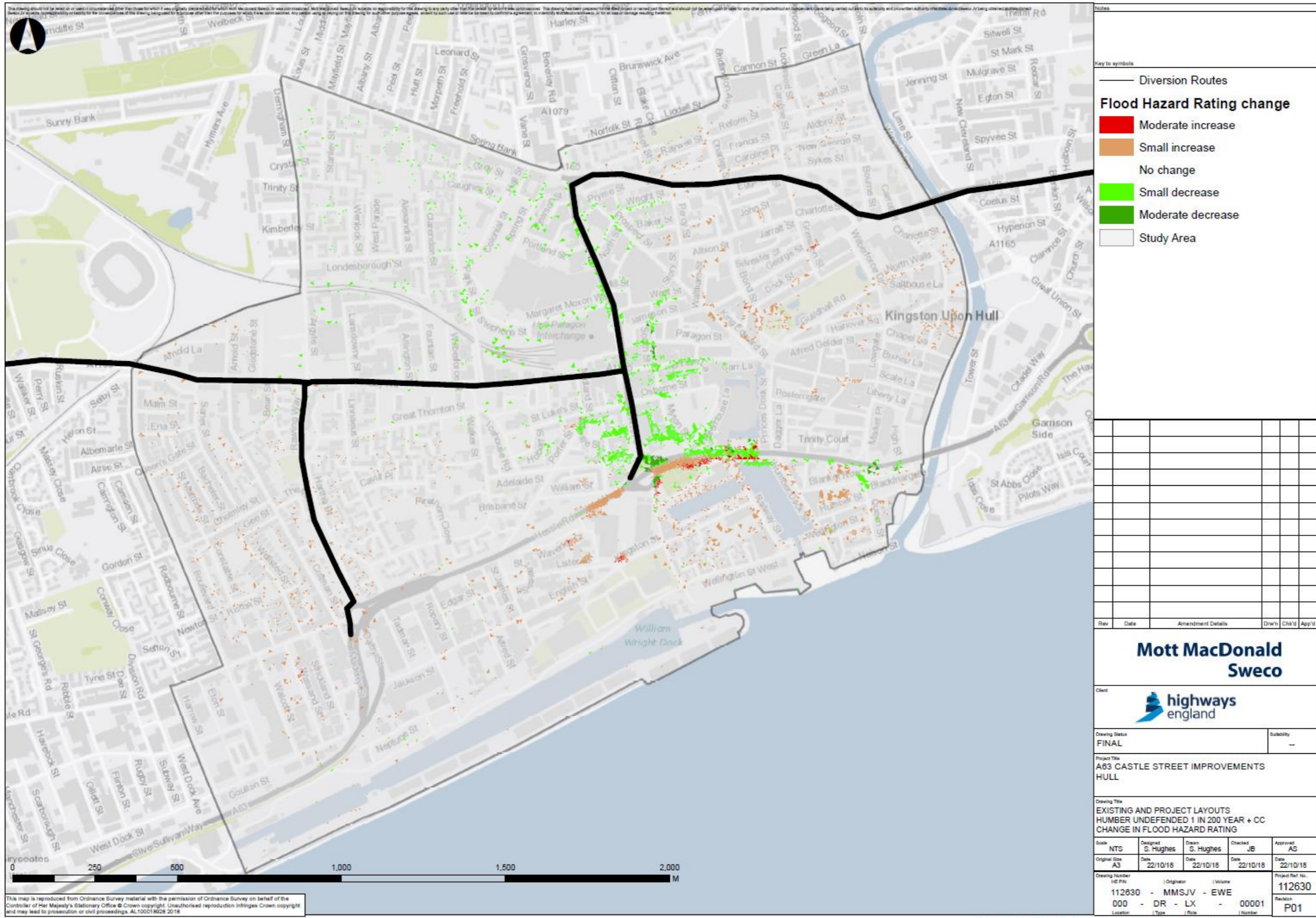


Figure E6: Change in Flood Hazard Rating during a 1 in 200-year plus climate change undefended Humber Estuary tidal flood event

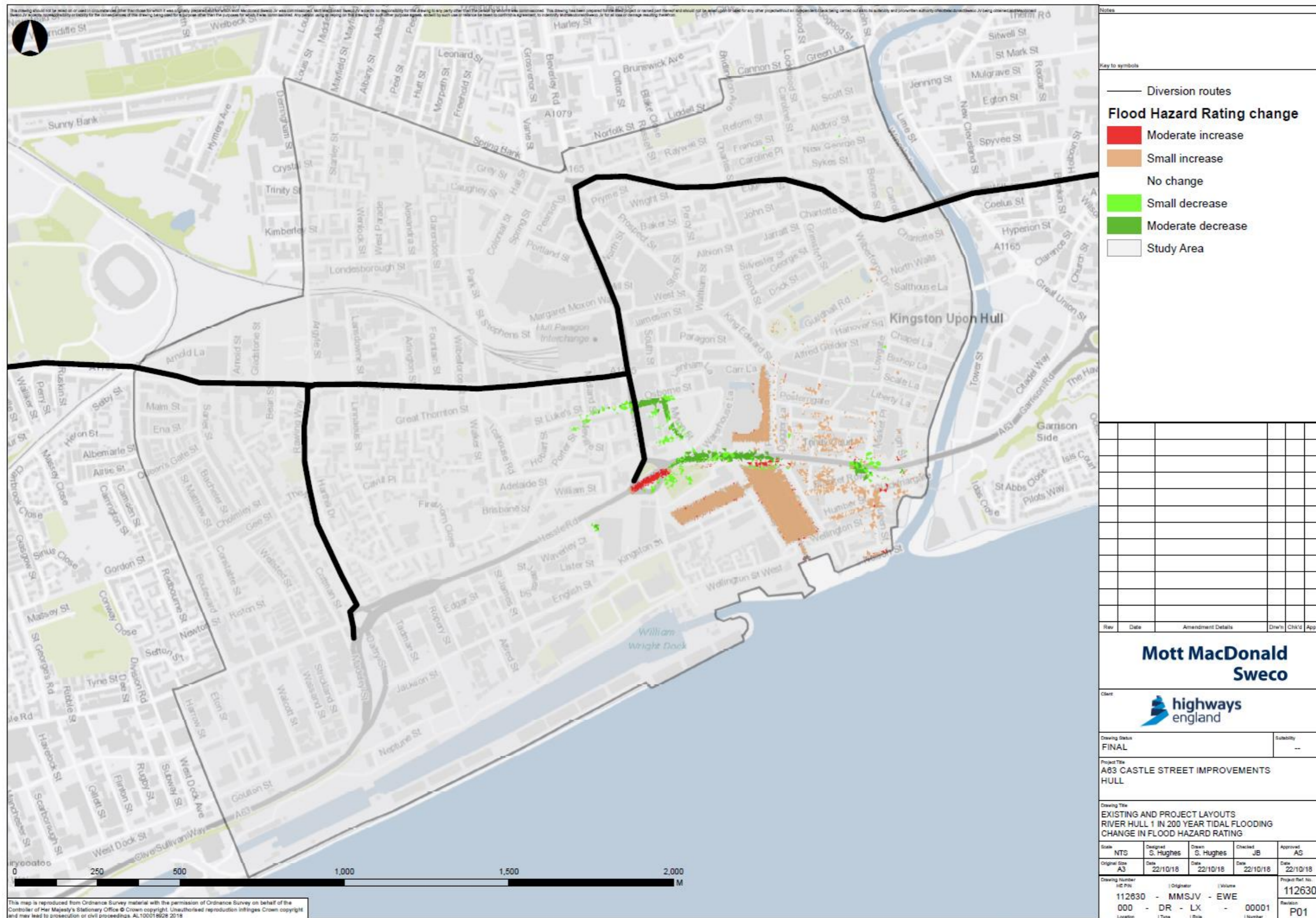


Figure E7: Change in Flood Hazard Rating during a 1 in 200-year River Hull tidal flood event (Hull Tidal Surge Barrier open)

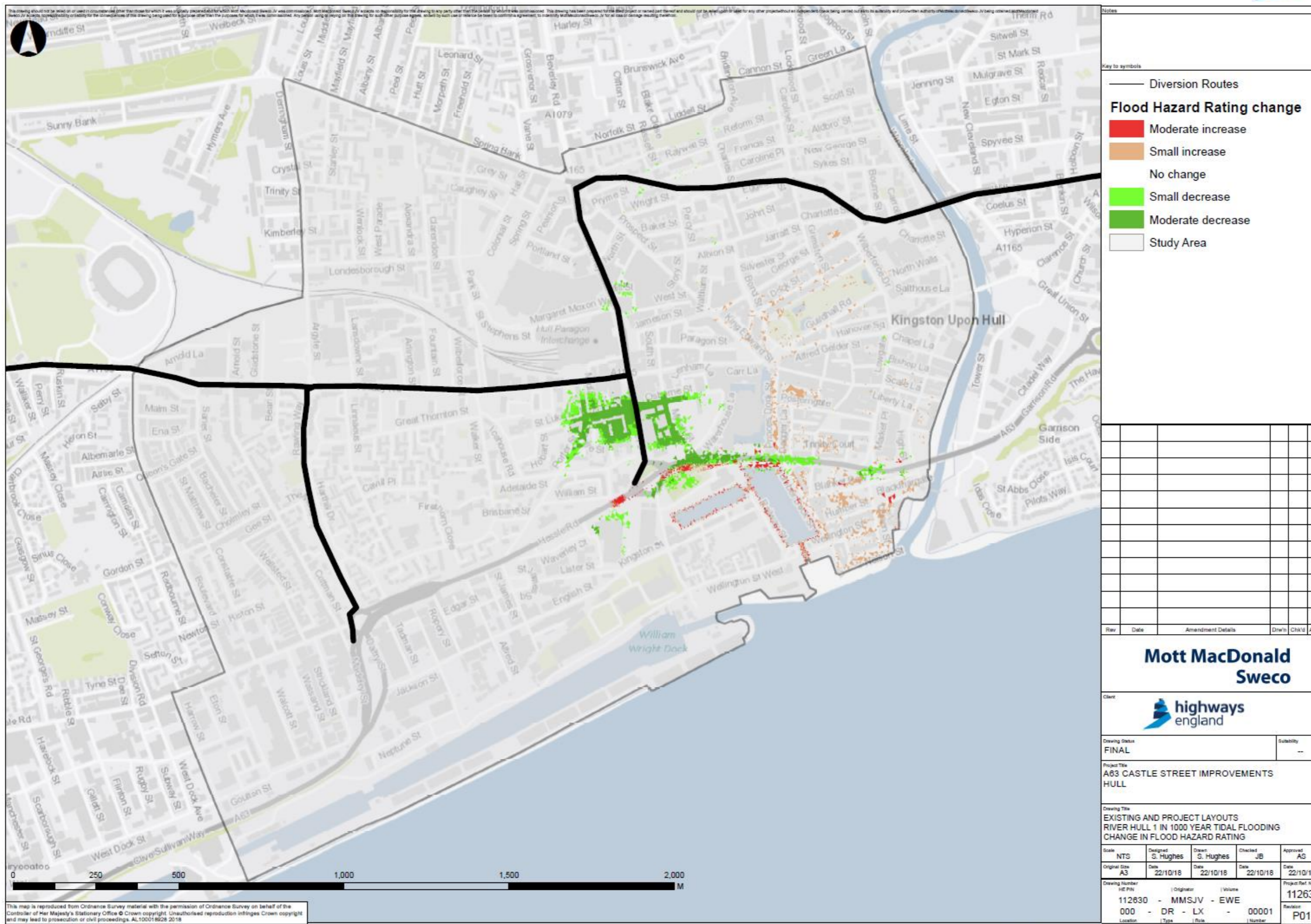


Figure E8: Change in Flood Hazard Rating during a 1 in 1000-year River Hull tidal flood event (Hull Tidal Surge Barrier open)

