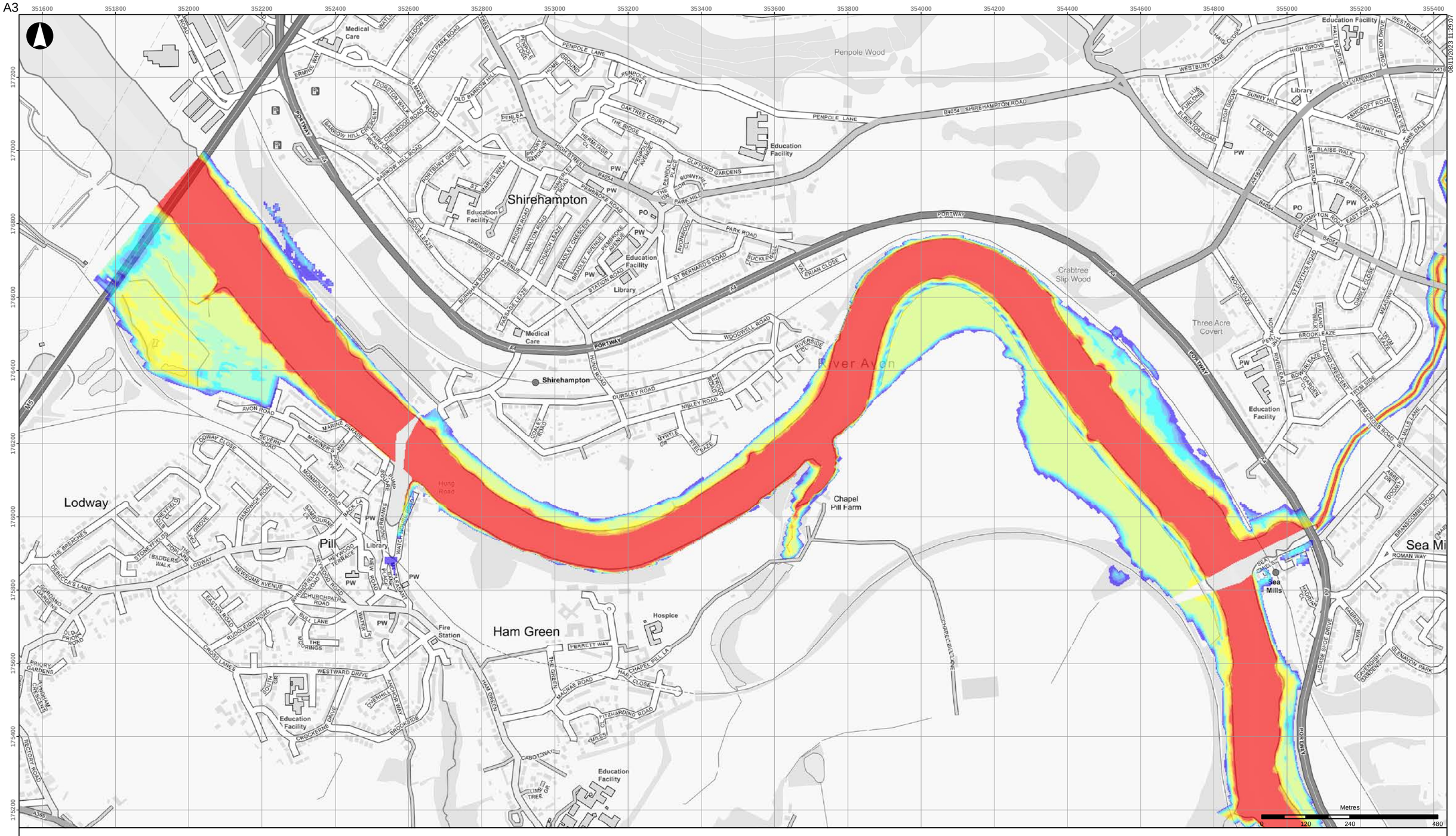
A3




08/11/2023 11:29:07

**Flood depth (m)**

| | |
|---|---|
| < 0.15 | 1.00 - 1.50 |
| 0.15 - 0.30 | 1.50 - 2.00 |
| 0.30 - 0.50 | 2.00 - 2.50 |
| 0.50 - 0.75 | 2.50 - 3.00 |
| 0.75 - 1.00 | > 3.00 |

Coordinate System: British National Grid

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Notes:

Based on the BAFS OBC model version v034_27.
Climate Change (CC) allowances:
- CE = Central Estimate
- HC = Higher Central
- UE = Upper End
Scheme design based on CE fluvial and HC tidal.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-11-08 | DvdL | DvdL | PS |

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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Baseline Do Minimum flood depths**
**2069 fluvial 1:100yr event**
**CC allowances: CE fluvial, HC tidal**
**Downstream areas**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

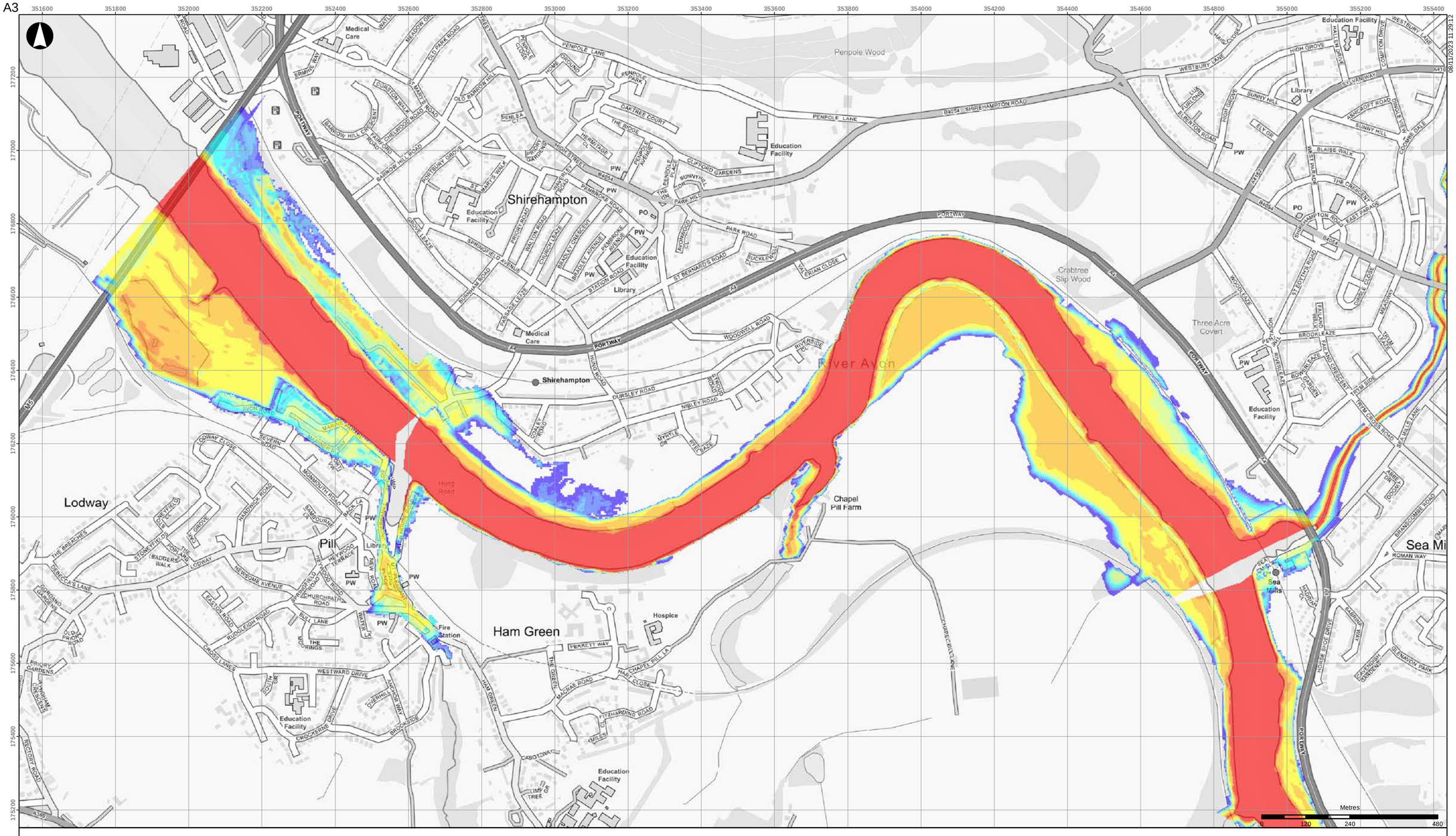
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-313**

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A3




08/11/2023 11:29:12

**Flood depth (m)**

| | |
|---|---|
| < 0.15 | 1.00 - 1.50 |
| 0.15 - 0.30 | 1.50 - 2.00 |
| 0.30 - 0.50 | 2.00 - 2.50 |
| 0.50 - 0.75 | 2.50 - 3.00 |
| 0.75 - 1.00 | > 3.00 |

Coordinate System: British National Grid

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Notes:

Based on the BAFS OBC model version v034_27.
Climate Change (CC) allowances:
- CE = Central Estimate
- HC = Higher Central
- UE = Upper End
Scheme design based on CE fluvial and HC tidal.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-11-08 | DvdL | DvdL | PS |

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Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Baseline Do Minimum flood depths**
**2069 tidal 1:200yr event**
**CC allowances: CE fluvial, HC tidal**
**Downstream areas**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

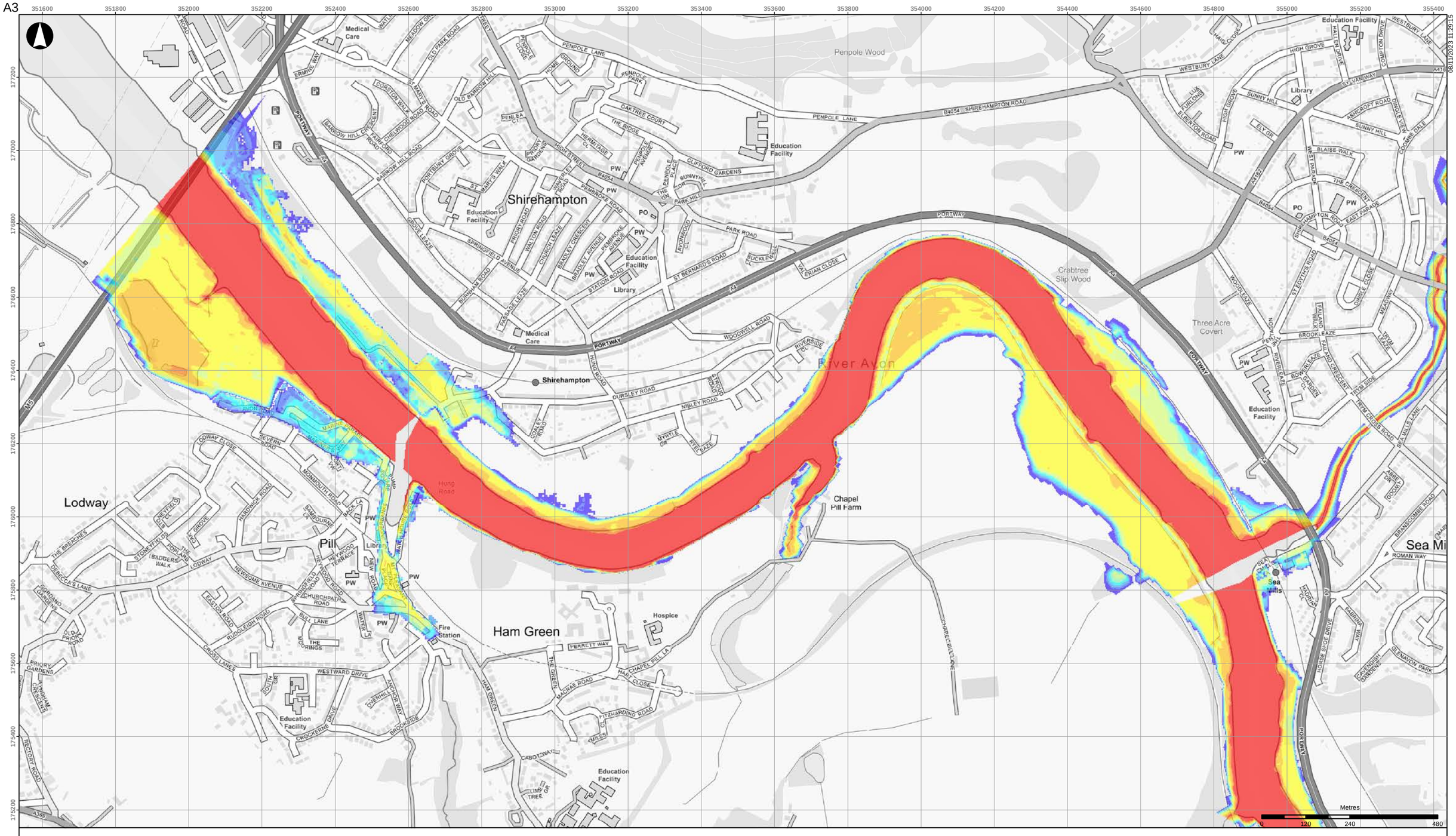
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08/11/2023 11:29:15




**Flood depth (m)**

| | |
|---|---|
| < 0.15 | 1.00 - 1.50 |
| 0.15 - 0.30 | 1.50 - 2.00 |
| 0.30 - 0.50 | 2.00 - 2.50 |
| 0.50 - 0.75 | 2.50 - 3.00 |
| 0.75 - 1.00 | > 3.00 |

Coordinate System: British National Grid

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Notes:

Based on the BAFS OBC model version v034_27.
Climate Change (CC) allowances:
- CE = Central Estimate
- HC = Higher Central
- UE = Upper End

Scheme design based on CE fluvial and HC tidal.

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Project Title
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Drawing Title
**Baseline Do Minimum flood depths**
**2130 fluvial 1:100yr event**
**CC allowances: CE fluvial, HC tidal**
**Downstream areas**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
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Rev
**D1**

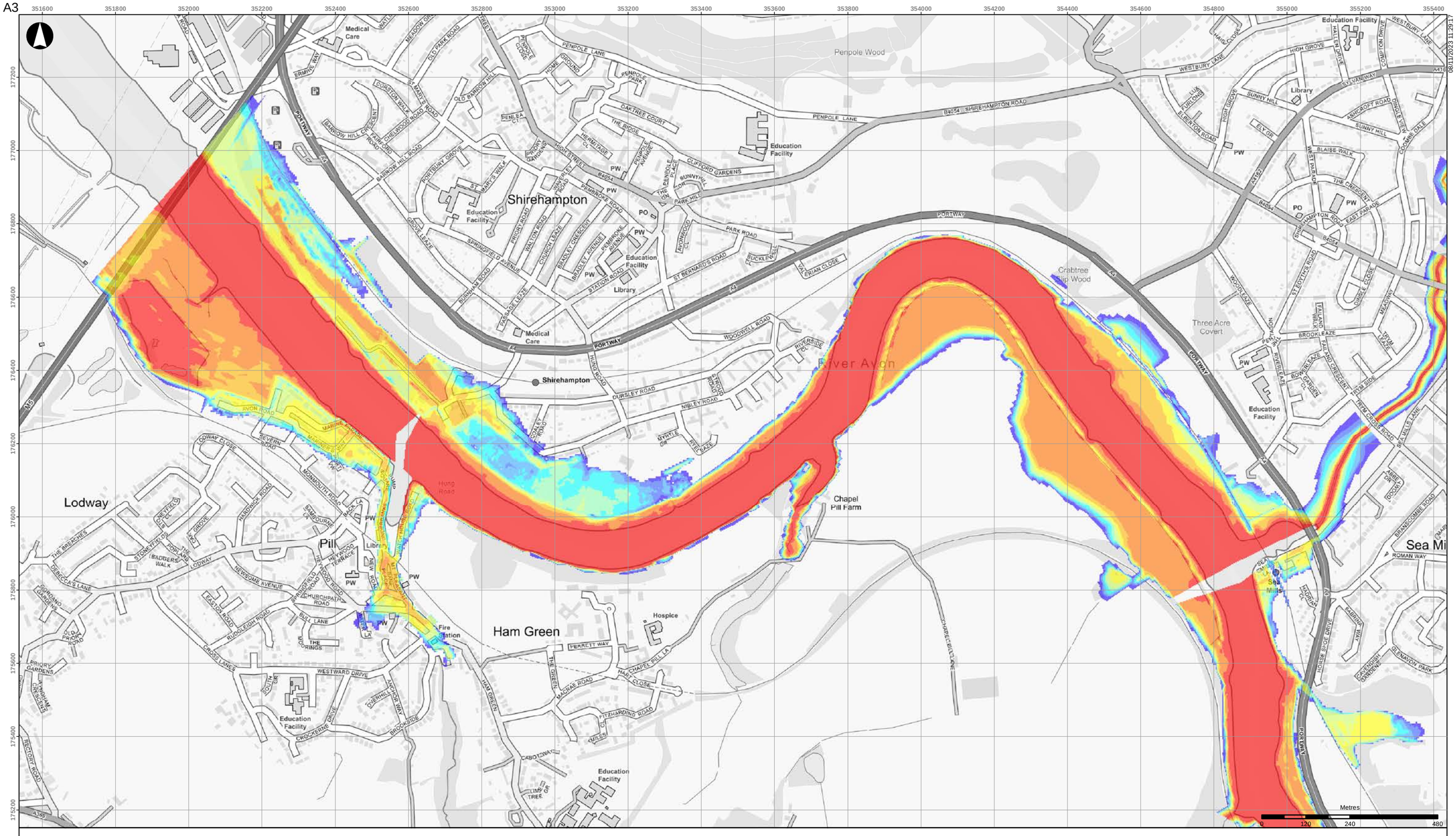
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**285982-ARP-XX-DR-MOD-315**

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**Flood depth (m)**

- < 0.15
- 0.15 - 0.30
- 0.30 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- > 3.00

Coordinate System: British National Grid

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Notes:

Based on the BAFS OBC model version v034_27.
Climate Change (CC) allowances:
- CE = Central Estimate
- HC = Higher Central
- UE = Upper End

Scheme design based on CE fluvial and HC tidal.

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**Baseline Do Minimum flood depths**
**2130 tidal 1:200yr event**
**CC allowances: CE fluvial, HC tidal**
**Downstream areas**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

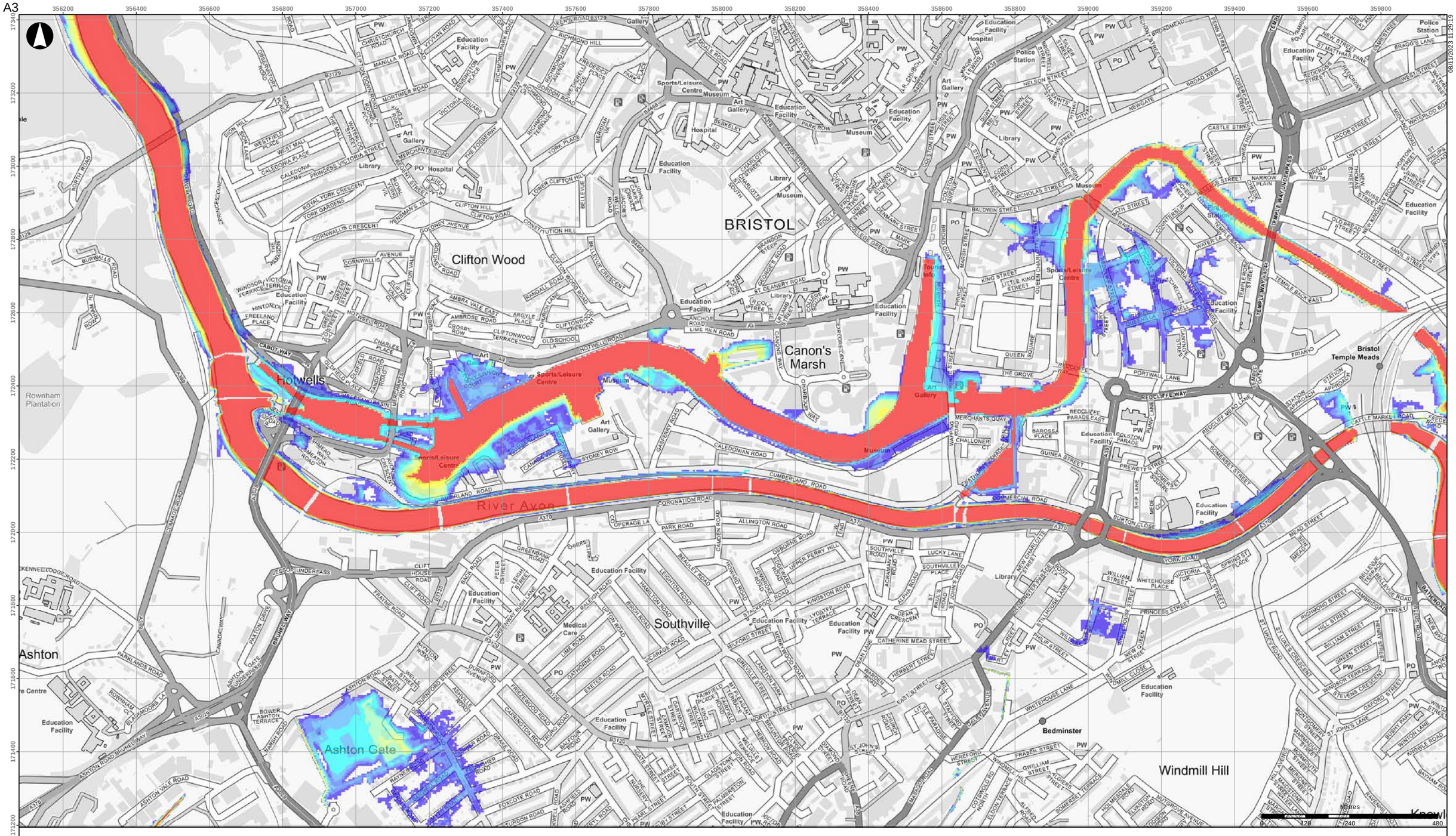
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-316**

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## Flood depth (m)

| | |
|---|---|
| < 0.15 | 1.00 - 1.50 |
| 0.15 - 0.30 | 1.50 - 2.00 |
| 0.30 - 0.50 | 2.00 - 2.50 |
| 0.50 - 0.75 | 2.50 - 3.00 |
| 0.75 - 1.00 | > 3.00 |

Coordinate System: British National Grid

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Notes:

Based on the BAFS OBC model version v034_27.
Climate Change (CC) allowances:
- CE = Central Estimate
- HC = Higher Central
- UE = Upper End

Scheme design based on CE fluvial and HC tidal.

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Drawing Title

**Baseline Do Minimum flood depths**
**2069 fluvial 1:100yr event**
**CC allowances: CE fluvial, HC tidal**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

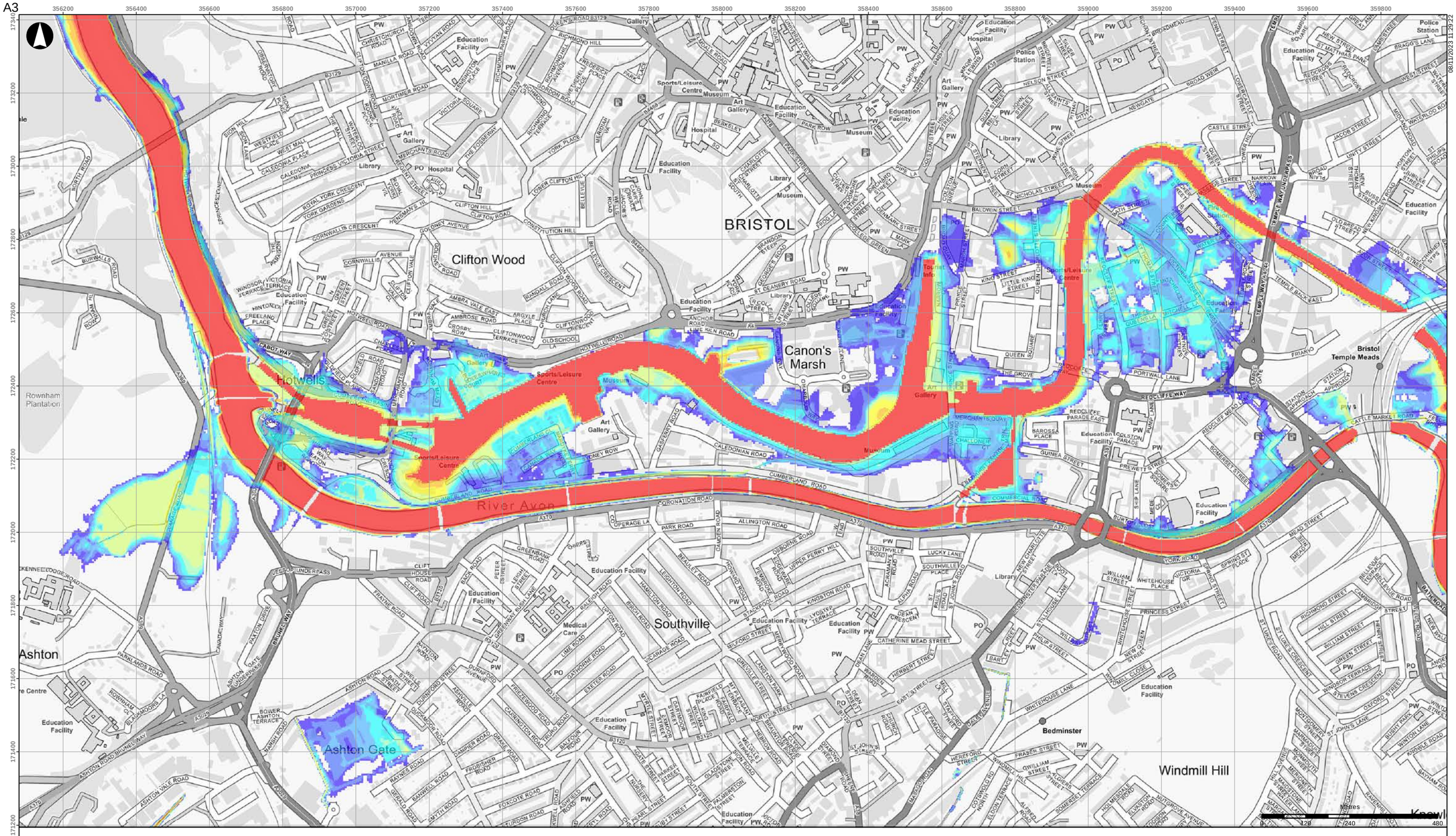
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**Flood depth (m)**

- < 0.15
- 0.15 - 0.30
- 0.30 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- > 3.00

Coordinate System: British National Grid

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Notes:

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Climate Change (CC) allowances:
- CE = Central Estimate
- HC = Higher Central
- UE = Upper End

Scheme design based on CE fluvial and HC tidal.

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**2069 tidal 1:200yr event**
**CC allowances: CE fluvial, HC tidal**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

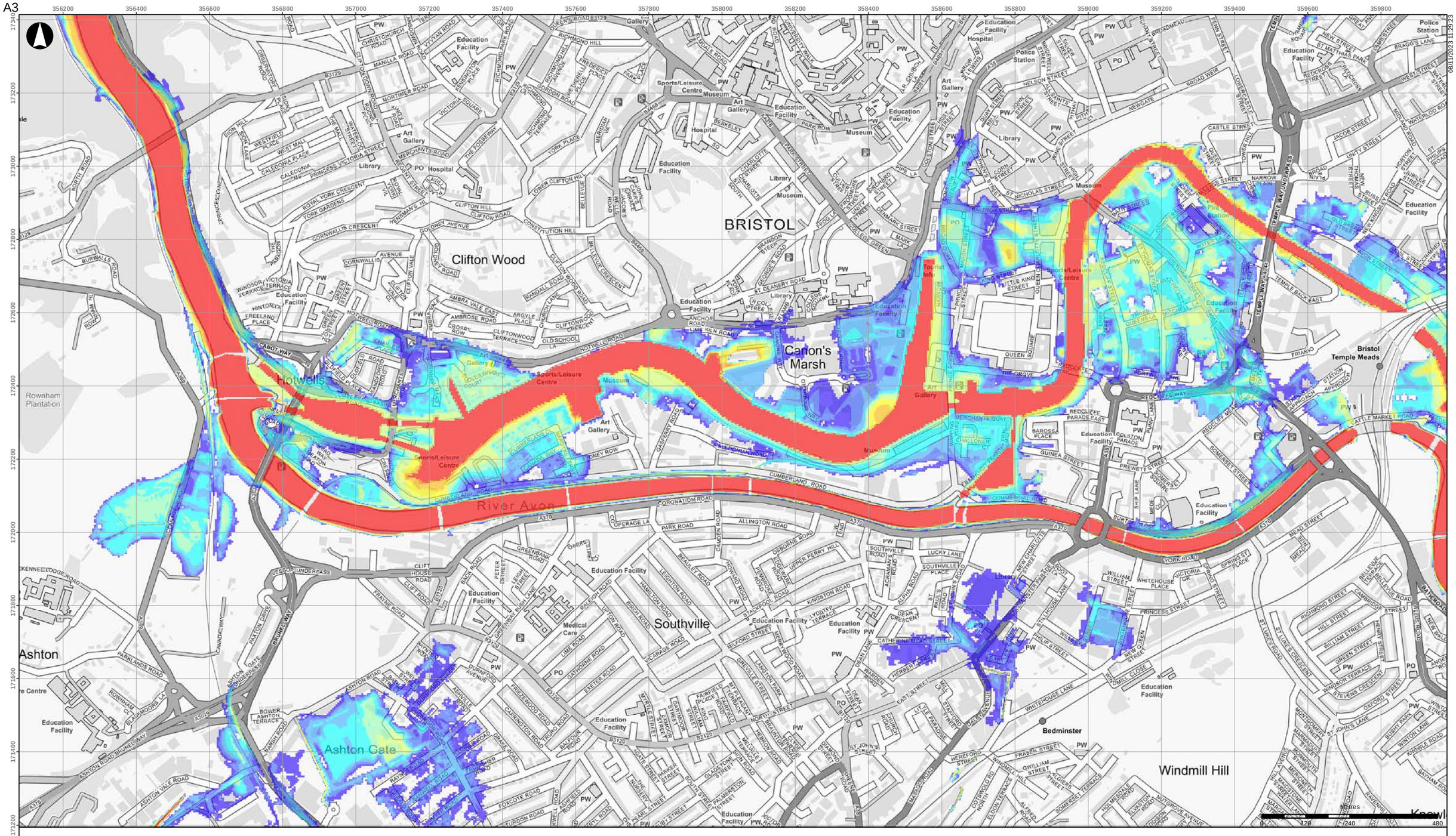
Name

**285982-ARP-XX-DR-MOD-318**

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**Flood depth (m)**

- < 0.15
- 0.15 - 0.30
- 0.30 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- > 3.00

Coordinate System: British National Grid

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Notes:

Based on the BAFS OBC model version v034_27.
Climate Change (CC) allowances:
- CE = Central Estimate
- HC = Higher Central
- UE = Upper End

Scheme design based on CE fluvial and HC tidal.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Baseline Do Minimum flood depths**
**2130 fluvial 1:100yr event**
**CC allowances: CE fluvial, HC tidal**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

**285982-ARP-XX-DR-MOD-319**

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**Flood depth (m)**

- < 0.15
- 0.15 - 0.30
- 0.30 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- > 3.00

Coordinate System: British National Grid

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Notes:

Based on the BAFS OBC model version v034_27.
Climate Change (CC) allowances:
- CE = Central Estimate
- HC = Higher Central
- UE = Upper End

Scheme design based on CE fluvial and HC tidal.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-11-08 | DvdL | DvdL | PS |

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Project Title

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Drawing Title

**Baseline Do Minimum flood depths**
**2130 tidal 1:200yr event**
**CC allowances: CE fluvial, HC tidal**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

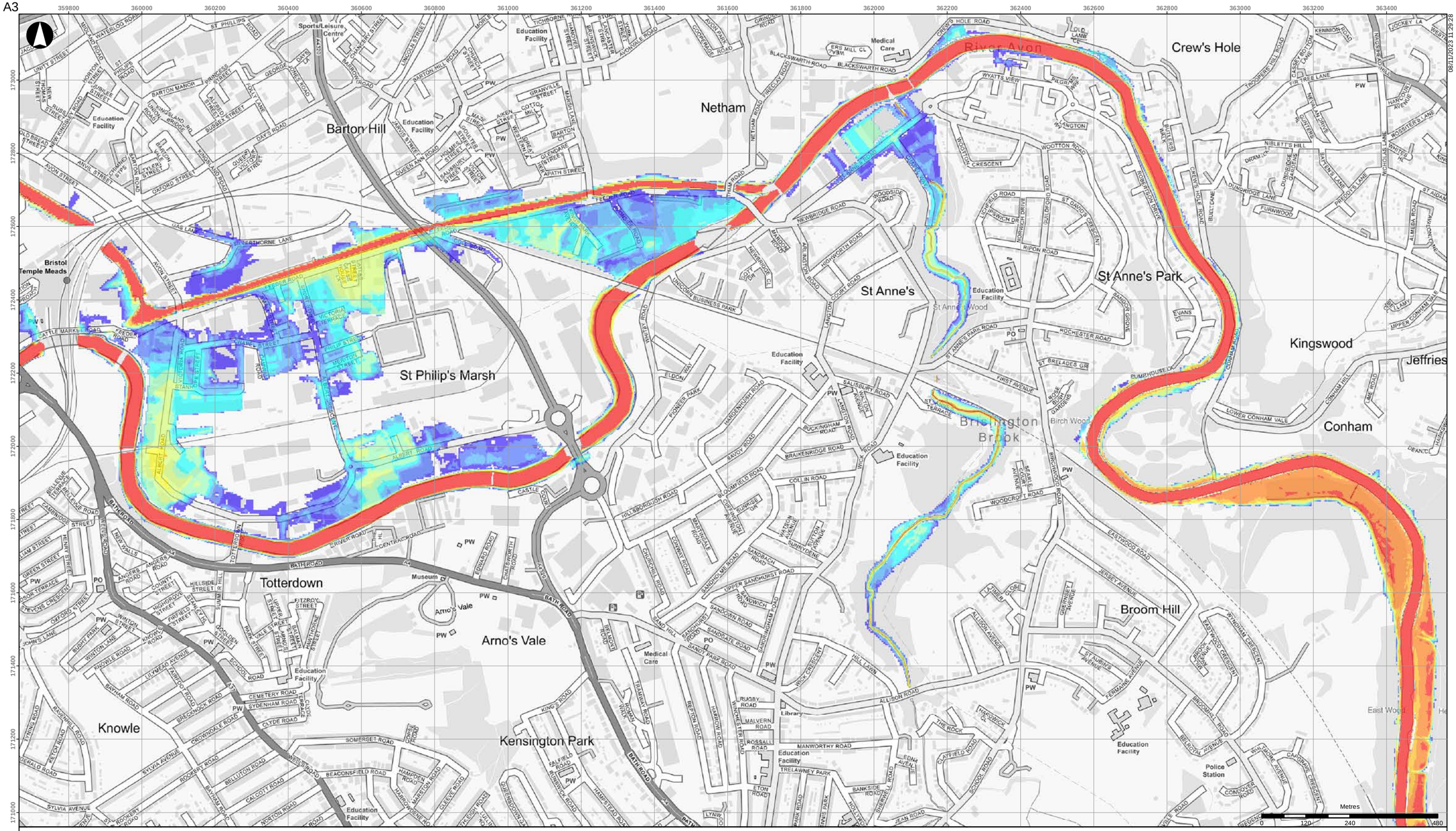
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08/11/2023 11:29:28




## Flood depth (m)

| | |
|---|---|
| < 0.15 | 1.00 - 1.50 |
| 0.15 - 0.30 | 1.50 - 2.00 |
| 0.30 - 0.50 | 2.00 - 2.50 |
| 0.50 - 0.75 | 2.50 - 3.00 |
| 0.75 - 1.00 | > 3.00 |

Coordinate System: British National Grid

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Notes:

Based on the BAFS OBC model version v034_27.
Climate Change (CC) allowances:
- CE = Central Estimate
- HC = Higher Central
- UE = Upper End
Scheme design based on CE fluvial and HC tidal.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
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Project Title
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Drawing Title
**Baseline Do Minimum flood depths**
**2069 fluvial 1:100yr event**
**CC allowances: CE fluvial, HC tidal**
**Netham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

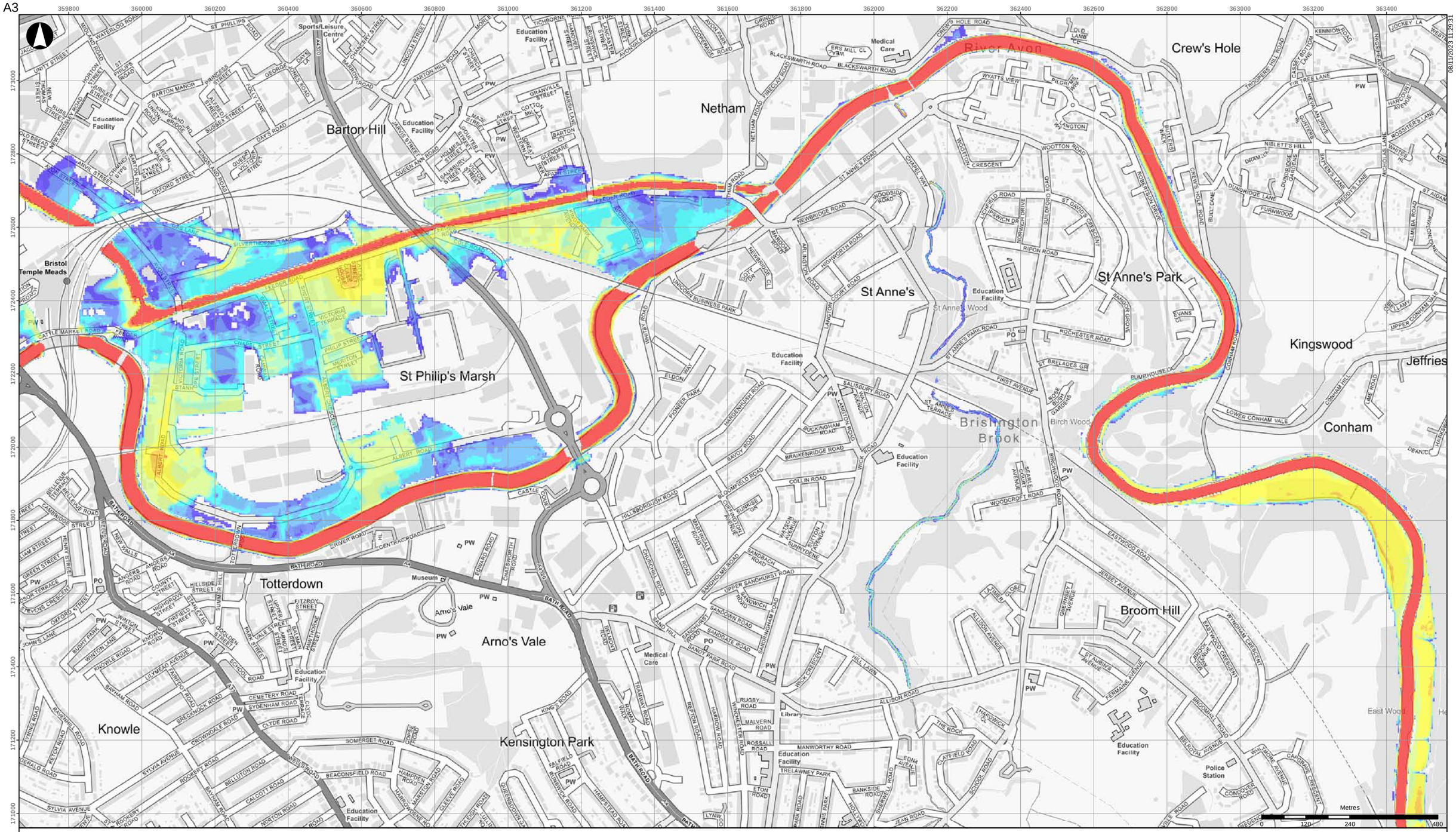
Name
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08/11/2023 11:29:31




## Flood depth (m)

| | |
|---|---|
| < 0.15 | 1.00 - 1.50 |
| 0.15 - 0.30 | 1.50 - 2.00 |
| 0.30 - 0.50 | 2.00 - 2.50 |
| 0.50 - 0.75 | 2.50 - 3.00 |
| 0.75 - 1.00 | > 3.00 |

Coordinate System: British National Grid

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Notes:

Based on the BAFS OBC model version v034_27.
Climate Change (CC) allowances:
- CE = Central Estimate
- HC = Higher Central
- UE = Upper End
Scheme design based on CE fluvial and HC tidal.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
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Drawing Title
**Baseline Do Minimum flood depths**
**2069 tidal 1:200yr event**
**CC allowances: CE fluvial, HC tidal**
**Netham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

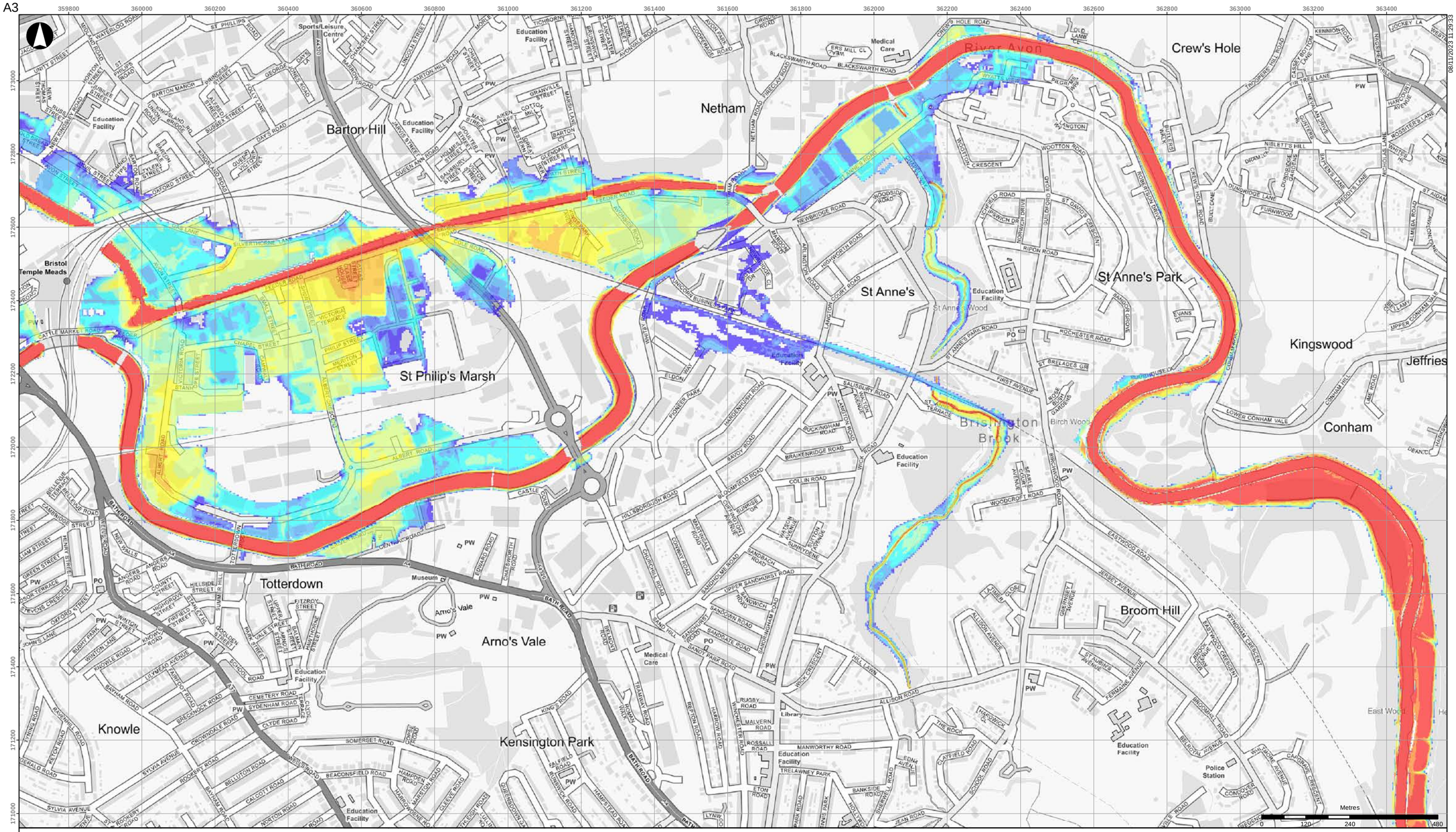
Name
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## Flood depth (m)

- < 0.15
- 0.15 - 0.30
- 0.30 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- > 3.00

Coordinate System: British National Grid

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Notes:

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Climate Change (CC) allowances:
- CE = Central Estimate
- HC = Higher Central
- UE = Upper End

Scheme design based on CE fluvial and HC tidal.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
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Drawing Title
**Baseline Do Minimum flood depths**
**2130 fluvial 1:100yr event**
**CC allowances: CE fluvial, HC tidal**
**Netham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

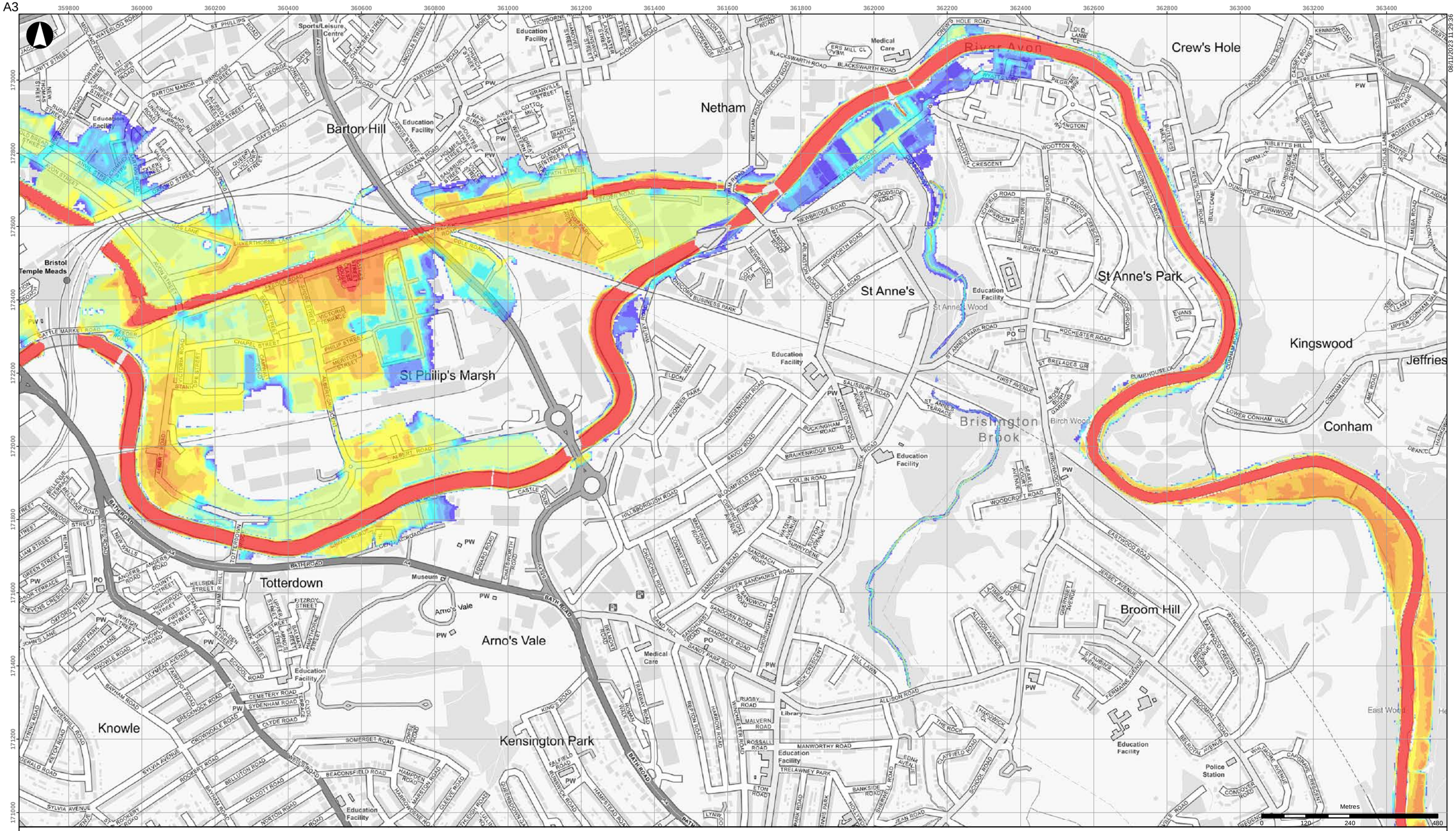
Name
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A3

08/11/2023 11:29:36




## Flood depth (m)

- < 0.15
- 0.15 - 0.30
- 0.30 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- > 3.00

Coordinate System: British National Grid

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Notes:

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Climate Change (CC) allowances:
- CE = Central Estimate
- HC = Higher Central
- UE = Upper End

Scheme design based on CE fluvial and HC tidal.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
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Drawing Title
**Baseline Do Minimum flood depths**
**2130 tidal 1:200yr event**
**CC allowances: CE fluvial, HC tidal**
**Netham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

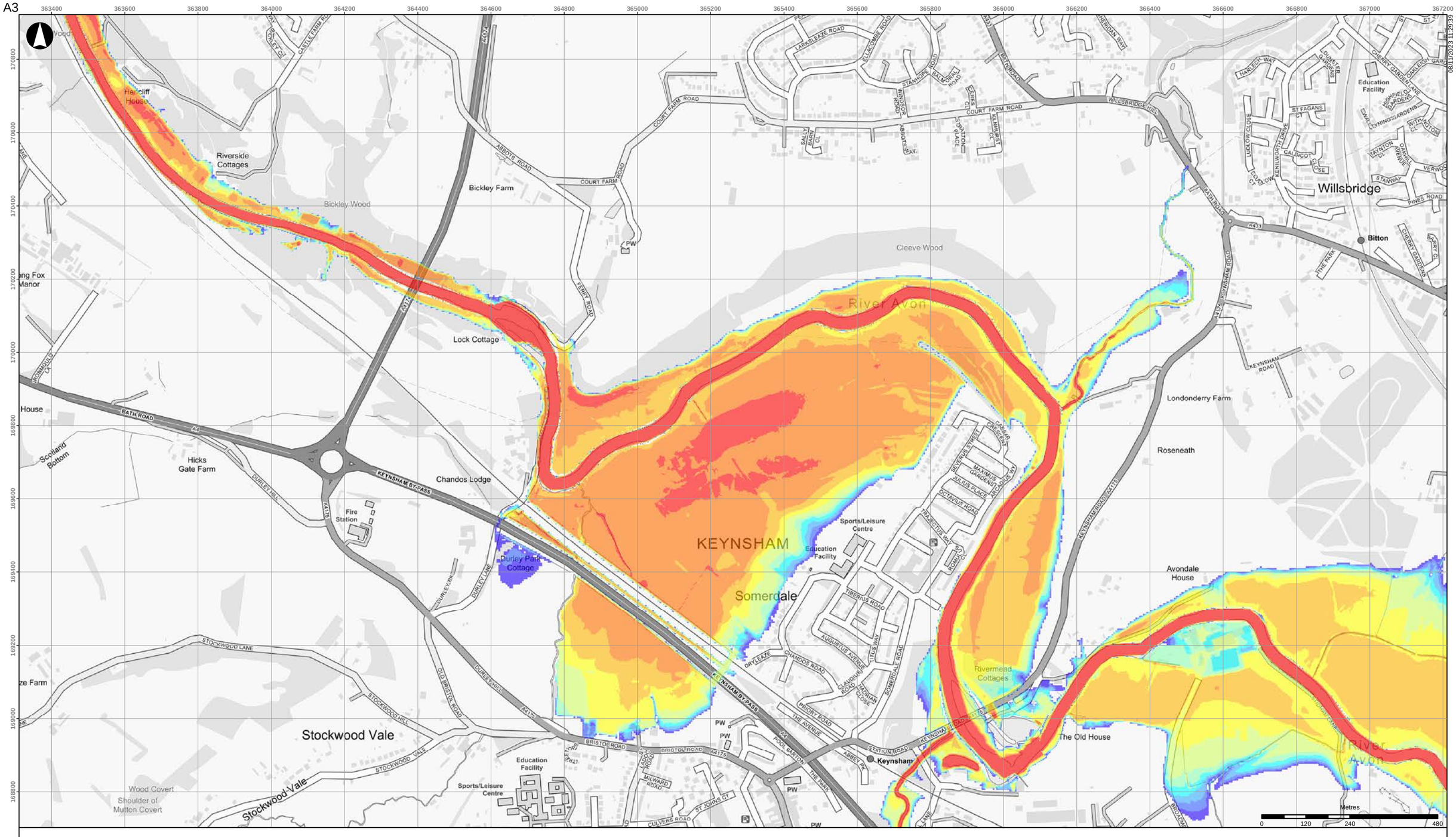
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-324**

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06/11/2023 11:29:39

**Flood depth (m)**

| | |
|---|---|
| < 0.15 | 1.00 - 1.50 |
| 0.15 - 0.30 | 1.50 - 2.00 |
| 0.30 - 0.50 | 2.00 - 2.50 |
| 0.50 - 0.75 | 2.50 - 3.00 |
| 0.75 - 1.00 | > 3.00 |

Coordinate System: British National Grid

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Notes:

Based on the BAFS OBC model version v034_27.
Climate Change (CC) allowances:
- CE = Central Estimate
- HC = Higher Central
- UE = Upper End
Scheme design based on CE fluvial and HC tidal.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
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Project Title
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Drawing Title
**Baseline Do Minimum flood depths**
**2069 fluvial 1:100yr event**
**CC allowances: CE fluvial, HC tidal**
**Keynsham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

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**285982-00**

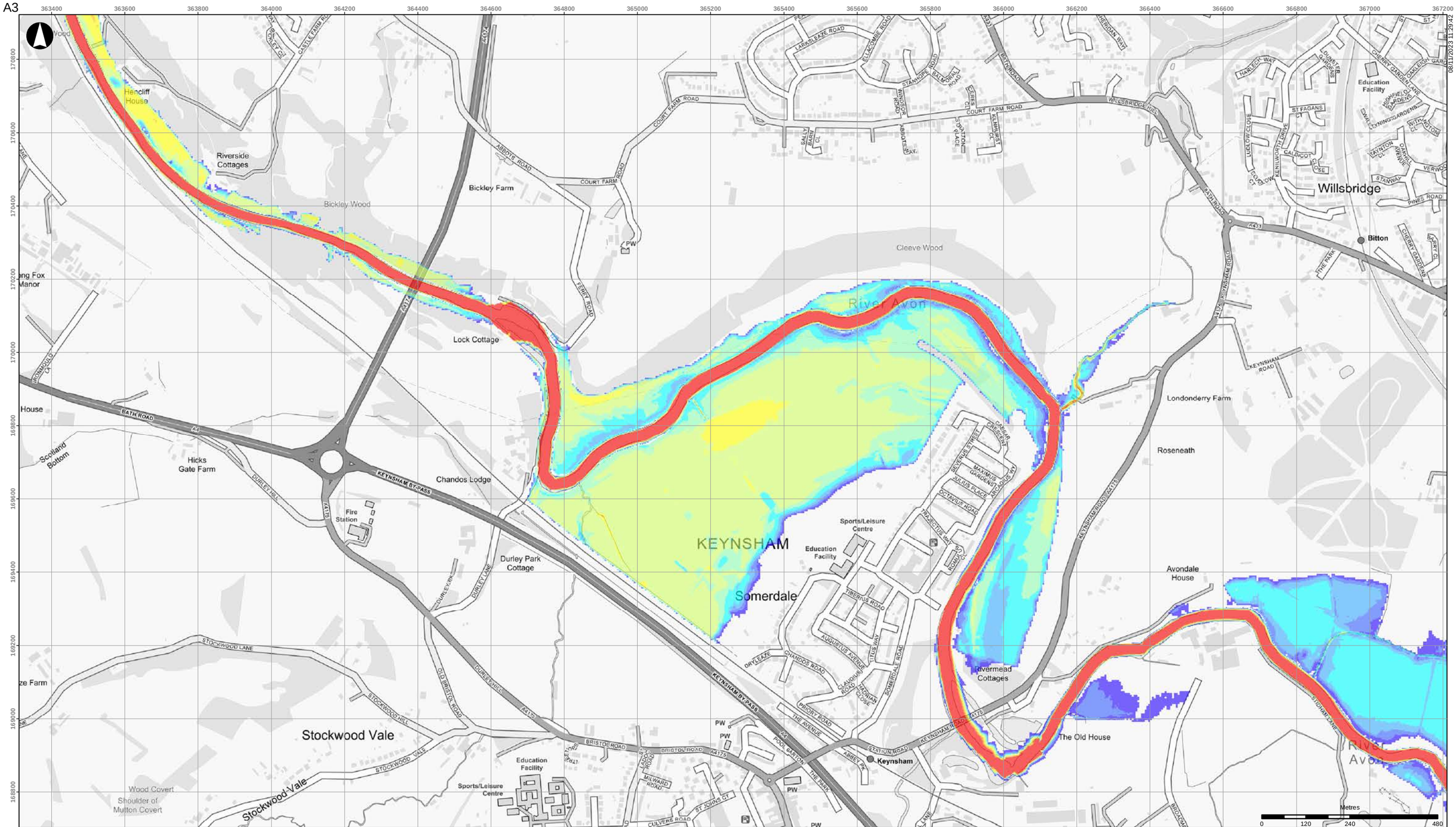
Rev
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Name
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## Flood depth (m)

- < 0.15
- 0.15 - 0.30
- 0.30 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- > 3.00

Coordinate System: British National Grid

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Notes:

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Climate Change (CC) allowances:
- CE = Central Estimate
- HC = Higher Central
- UE = Upper End

Scheme design based on CE fluvial and HC tidal.

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Project Title
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Drawing Title
**Baseline Do Minimum flood depths**
**2069 tidal 1:200yr event**
**CC allowances: CE fluvial, HC tidal**
**Keynsham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

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Rev
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**Flood depth (m)**

| | |
|---|---|
| < 0.15 | 1.00 - 1.50 |
| 0.15 - 0.30 | 1.50 - 2.00 |
| 0.30 - 0.50 | 2.00 - 2.50 |
| 0.50 - 0.75 | 2.50 - 3.00 |
| 0.75 - 1.00 | > 3.00 |

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- UE = Upper End
Scheme design based on CE fluvial and HC tidal.

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Drawing Title
**Baseline Do Minimum flood depths**
**2130 fluvial 1:100yr event**
**CC allowances: CE fluvial, HC tidal**
**Keynsham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

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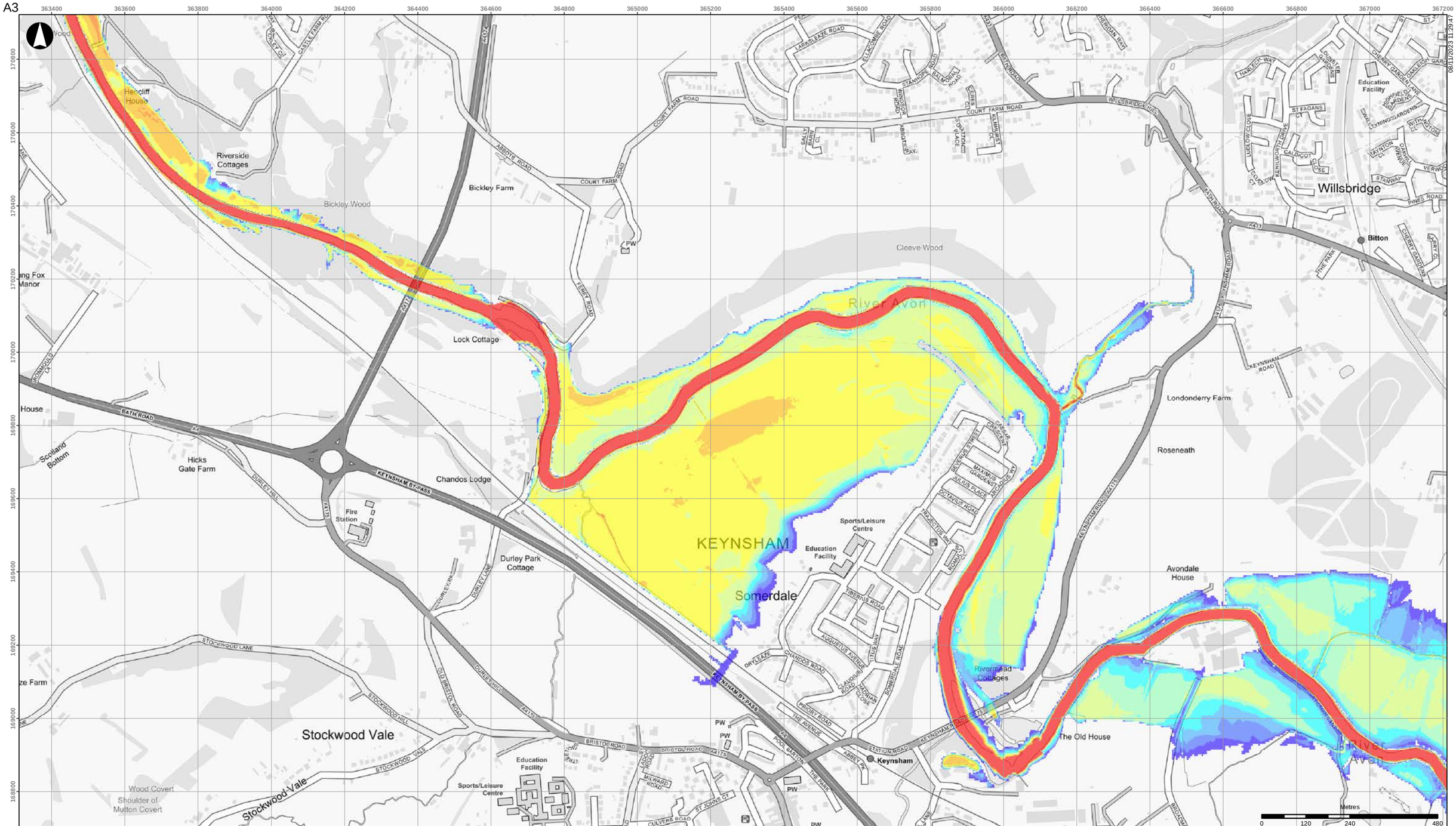
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**Flood depth (m)**

- < 0.15
- 0.15 - 0.30
- 0.30 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- > 3.00

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Climate Change (CC) allowances:
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Scheme design based on CE fluvial and HC tidal.

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**Baseline Do Minimum flood depths**
**2130 tidal 1:200yr event**
**CC allowances: CE fluvial, HC tidal**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

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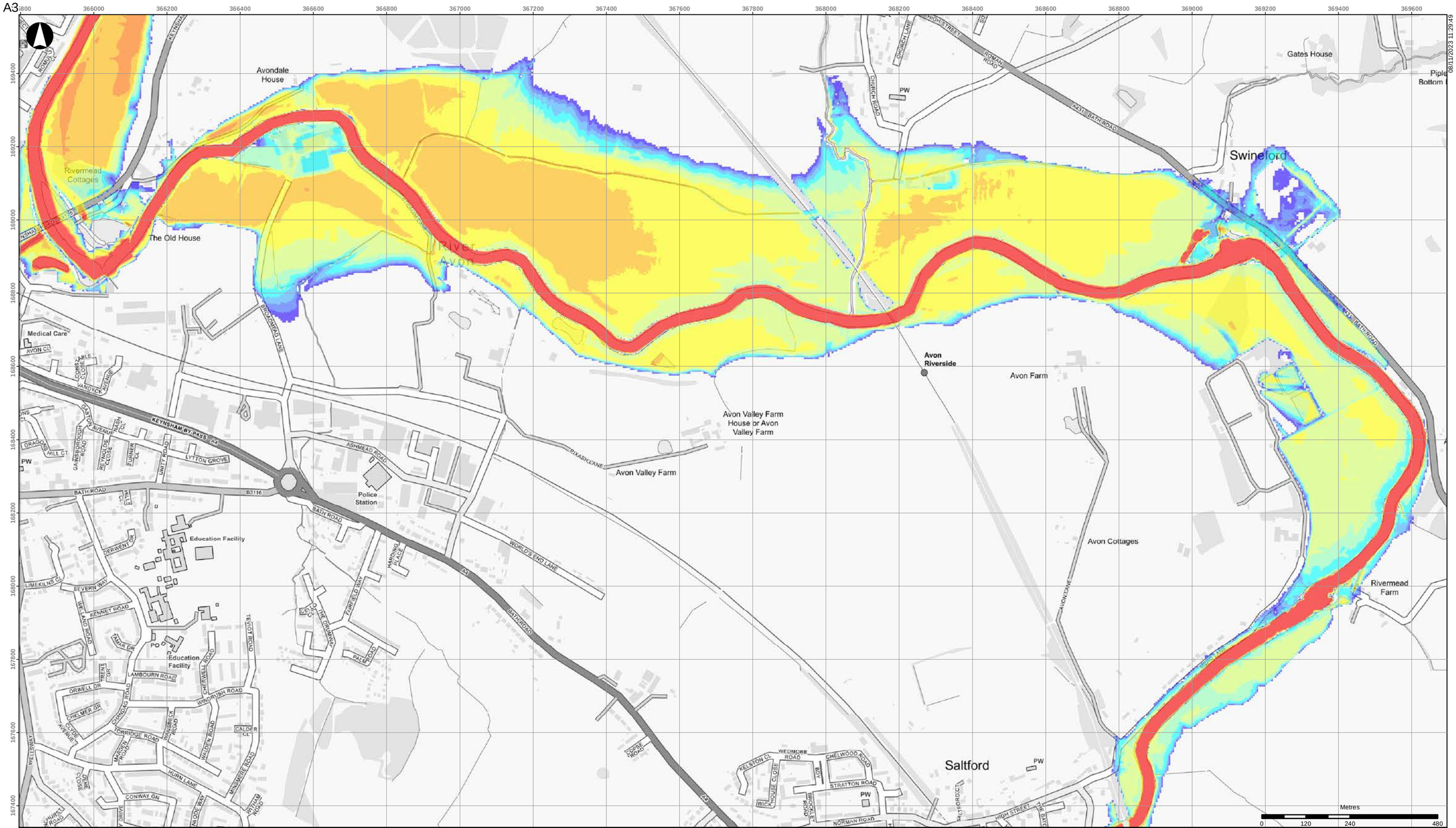
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## Flood depth (m)

- < 0.15
- 0.15 - 0.30
- 0.30 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- > 3.00

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- UE = Upper End

Scheme design based on CE fluvial and HC tidal.

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|---|---|---|---|---|
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Project Title
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Drawing Title
**Baseline Do Minimum flood depths**
**2069 fluvial 1:100yr event**
**CC allowances: CE fluvial, HC tidal**
**Swineford area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
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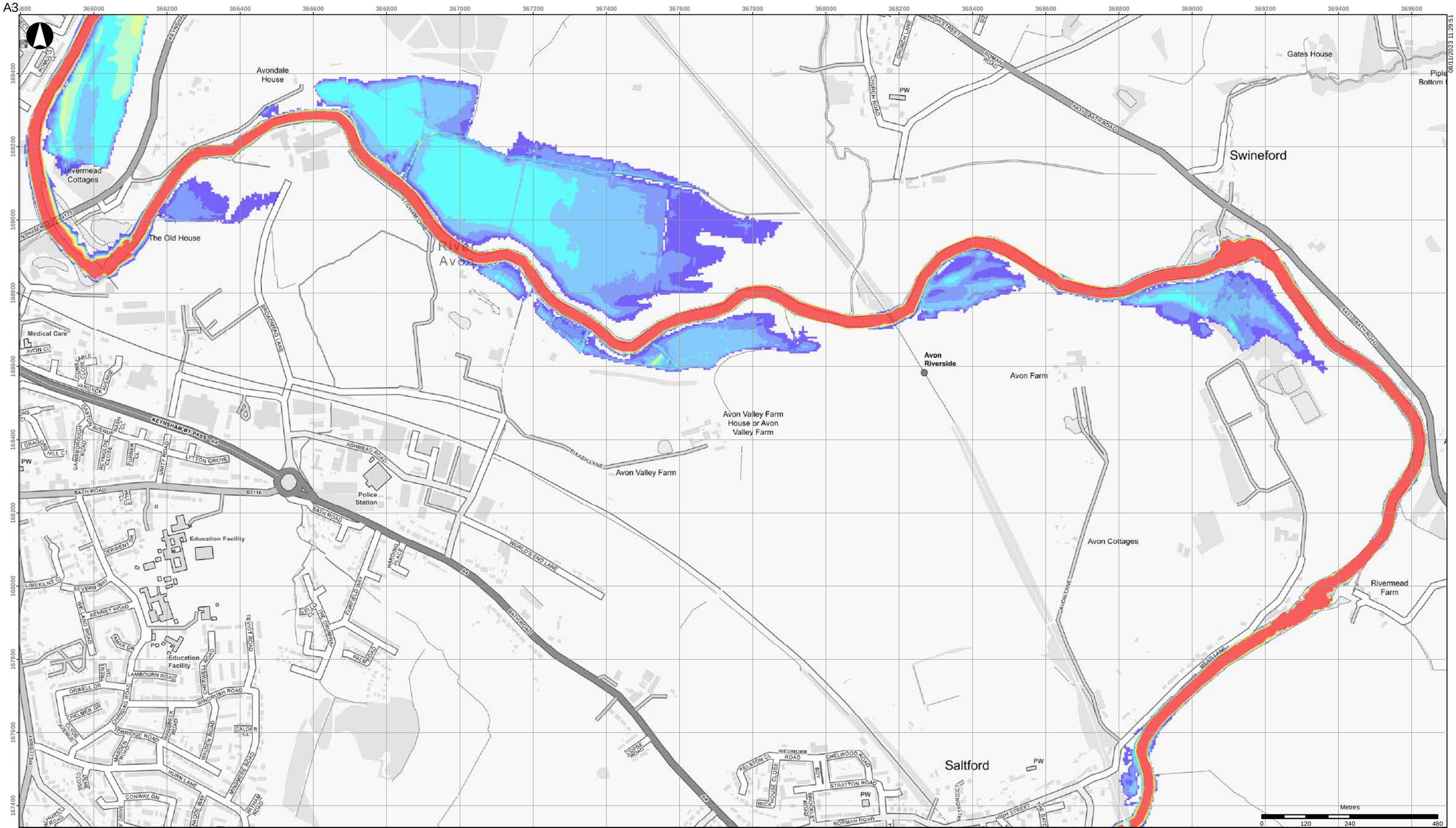
Rev
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Name
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**Flood depth (m)**

| | |
|---|---|
| < 0.15 | 1.00 - 1.50 |
| 0.15 - 0.30 | 1.50 - 2.00 |
| 0.30 - 0.50 | 2.00 - 2.50 |
| 0.50 - 0.75 | 2.50 - 3.00 |
| 0.75 - 1.00 | > 3.00 |

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|---|---|---|---|---|
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Drawing Title
**Baseline Do Minimum flood depths**
**2069 tidal 1:200yr event**
**CC allowances: CE fluvial, HC tidal**
**Swineford area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
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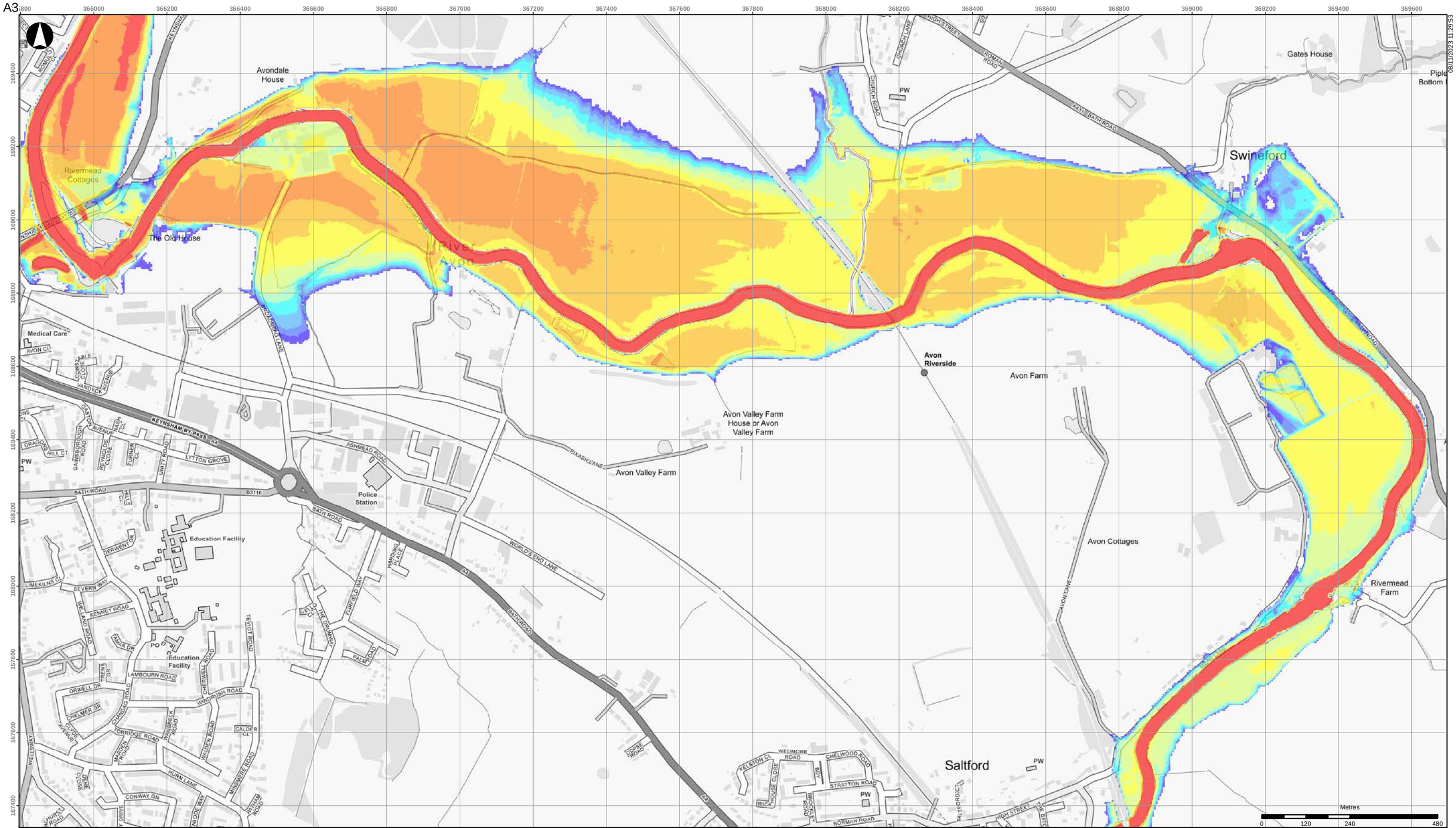
Rev
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Name
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**Flood depth (m)**

- < 0.15
- 0.15 - 0.30
- 0.30 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- > 3.00

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Notes:

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Climate Change (CC) allowances:
- CE = Central Estimate
- HC = Higher Central
- UE = Upper End

Scheme design based on CE fluvial and HC tidal.

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|---|---|---|---|---|
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**Baseline Do Minimum flood depths**
**2130 fluvial 1:100yr event**
**CC allowances: CE fluvial, HC tidal**
**Swineford area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

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Avondale House
Rivermead Cottages
The Old House
River Avon
Gates House
Swineford
Avon Riverside
Avon Farm
Avon Valley Farm House or Avon Valley Farm
Avon Valley Farm
Police Station
Education Facility
Avon Cottages
Rivermead Farm
Saltford
Medical Care
KEYNSHAM BY-PASS A4
BATH ROAD B3116
A431 BATH ROAD
A3 BATHROAD
WORLD'S END LANE
BROADMEAD LANE
ASHMEAD ROAD
RIXASH LANE
CHURCH LANE
CHURCH ROAD
HIGH STREET
ROMAN ROAD
AVON LANE
HEAD LANE
WEDMORE ROAD
CHELWOOD ROAD
STRATTON ROAD
NORMAN ROAD
HIGH STREET
PW

Metres
0 120 240 480

## Flood depth (m)

- < 0.15
- 0.15 - 0.30
- 0.30 - 0.50
- 0.50 - 0.75
- 0.75 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- 2.00 - 2.50
- 2.50 - 3.00
- > 3.00

Coordinate System: British National Grid

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Notes:

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- CE = Central Estimate
- HC = Higher Central
- UE = Upper End

Scheme design based on CE fluvial and HC tidal.

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|---|---|---|---|---|
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Project Title
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Drawing Title
**Baseline Do Minimum flood depths**
**2130 tidal 1:200yr event**
**CC allowances: CE fluvial, HC tidal**
**Swineford area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

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Rev
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Name
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| Defence location | Section reference | Wave Surcharge Allowance | Super-elevation allowance | Physical Processes Allowance | River Water Level Uncertainty Allowance | Total Freeboard excluding settlement allowance * | Flood level (2069) | Nominal Defence level (2069) excluding settlement allowance * |
|---|---|---|---|---|---|---|---|---|
| | | m | m | m | m | m | mAOD | mAOD |
| Crews Hall Rd | AV_CRH_01 | 0.11 | 0.00 | 0.11 | 0.60 | 0.71 | 10.67 | 11.38 |
| Crews Hall Rd | AV_CRH_02 | 0.15 | 0.00 | 0.15 | 0.58 | 0.73 | 10.56 | 11.29 |
| Crews Hall Rd | AV_CRH_03 | 0.18 | 0.00 | 0.18 | 0.57 | 0.76 | 10.52 | 11.28 |
| Crews Hall Rd | AV_CRH_04 | 0.15 | 0.00 | 0.15 | 0.57 | 0.72 | 10.47 | 11.19 |
| St Annes | AV_STA_01 | 0.12 | 0.00 | 0.12 | 0.58 | 0.70 | 10.55 | 11.25 |
| St Annes | AV_STA_02 | 0.14 | 0.00 | 0.14 | 0.57 | 0.71 | 10.47 | 11.18 |
| St Annes | AV_STA_03 | 0.06 | 0.00 | 0.06 | 0.55 | 0.61 | 10.40 | 11.01 |
| St Annes | AV_STA_04 | 0.06 | 0.00 | 0.06 | 0.55 | 0.61 | 10.40 | 11.01 |
| St Annes | AV_STA_05 | 0.06 | 0.00 | 0.06 | 0.55 | 0.61 | 10.37 | 10.98 |
| St Annes | AV_STA_06 | 0.05 | 0.00 | 0.05 | 0.55 | 0.60 | 10.29 | 10.89 |
| Netham Weir | AV_NET_01 | 0.07 | 0.00 | 0.07 | 0.55 | 0.62 | 10.29 | 10.91 |
| Netham Weir | AV_NET_02 | 0.08 | 0.00 | 0.08 | 0.49 | 0.57 | 9.93 | 10.50 |
| Netham Weir | AV_NET_03 | 0.08 | 0.00 | 0.08 | 0.34 | 0.42 | 9.92 | 10.34 |
| Whitby Road | AV_WHT_01 | 0.04 | 0.00 | 0.04 | 0.31 | 0.35 | 9.91 | 10.26 |
| Paintworks | AV_PNT_01 | 0.09 | 0.00 | 0.09 | 0.20 | 0.29 | 9.90 | 10.19 |
| Sparke Evans Park | AV_SEP_01 | 0.10 | 0.00 | 0.10 | 0.20 | 0.30 | 9.90 | 10.20 |
| St Philips Marsh | AV_SPM_01 | 0.09 | 0.00 | 0.09 | 0.20 | 0.29 | 9.90 | 10.19 |
| St Philips Marsh | AV_SPM_02 | 0.08 | 0.00 | 0.08 | 0.20 | 0.28 | 9.88 | 10.16 |
| St Philips Marsh | AV_SPM_03 | 0.07 | 0.00 | 0.07 | 0.20 | 0.27 | 9.87 | 10.14 |
| St Philips Marsh | AV_SPM_04 | 0.12 | 0.07 | 0.19 | 0.21 | 0.40 | 9.85 | 10.25 |
| Temple Meads | AV_TEM_01 | 0.06 | 0.00 | 0.06 | 0.21 | 0.27 | 9.85 | 10.12 |
| Clarence Rd | AV_CLA_01 | 0.08 | 0.00 | 0.08 | 0.21 | 0.29 | 9.84 | 10.13 |
| Clarence Rd | AV_CLA_02 | 0.09 | 0.00 | 0.09 | 0.22 | 0.31 | 9.83 | 10.14 |
| Commercial Rd | AV_COM_01 | 0.20 | 0.00 | 0.20 | 0.23 | 0.43 | 9.78 | 10.21 |
| Bathurst Dam | AV_BAT_01 | 0.08 | 0.00 | 0.08 | 0.24 | 0.32 | 9.77 | 10.09 |
| Coronation Rd | AV_COR_01 | 0.07 | 0.00 | 0.07 | 0.23 | 0.30 | 9.78 | 10.08 |
| Cumberland Rd | AV_CUM_01 | 0.11 | 0.00 | 0.11 | 0.24 | 0.35 | 9.75 | 10.11 |
| Cumberland Rd | AV_CUM_02 | 0.13 | 0.00 | 0.13 | 0.25 | 0.39 | 9.74 | 10.12 |
| Bristol Metal Spraying | AV_BMS_01 | 0.08 | 0.00 | 0.08 | 0.25 | 0.34 | 9.73 | 10.06 |
| Chocolate Path | AV_CHO_01 | 0.10 | 0.00 | 0.10 | 0.25 | 0.35 | 9.72 | 10.07 |
| Chocolate Path | AV_CHO_02 | 0.19 | 0.00 | 0.19 | 0.24 | 0.44 | 9.71 | 10.15 |
| Brunel Dam | AV_BRU_01 | 0.12 | 0.00 | 0.12 | 0.25 | 0.37 | 9.71 | 10.07 |
| Entrance Lock bank | AV_ENB_01 | 0.11 | 0.00 | 0.11 | 0.25 | 0.36 | 9.71 | 10.06 |
| Entrance Lock Gate | AV_ENT_01 | 0.13 | 0.00 | 0.13 | 0.24 | 0.37 | 9.70 | 10.08 |
| Hotwell Rd south | AV_HTS_01 | 0.10 | 0.00 | 0.10 | 0.24 | 0.34 | 9.70 | 10.05 |
| Freeland Place | AV_FRL_01 | 0.16 | 0.00 | 0.16 | 0.24 | 0.40 | 9.70 | 10.11 |
| Hotwell Rd north | AV_HTN_01 | 0.10 | 0.00 | 0.10 | 0.25 | 0.35 | 9.69 | 10.05 |
| Ashton | AV_ASH_01 | 0.06 | 0.05 | 0.11 | 0.25 | 0.36 | 9.72 | 10.08 |
| Ashton | AV_ASH_02 | 0.16 | 0.08 | 0.24 | 0.24 | 0.49 | 9.71 | 10.20 |
| Ashton | AV_ASH_03 | 0.08 | 0.00 | 0.08 | 0.24 | 0.33 | 9.71 | 10.03 |
| Ashton | AV_ASH_04 | 0.09 | 0.00 | 0.09 | 0.25 | 0.34 | 9.70 | 10.04 |
| Sea Mills Lane | AV_SML_01 | 0.17 | 0.00 | 0.17 | 0.24 | 0.41 | 9.65 | 10.06 |
| Sea Mills Lane | AV_SML_02 | 0.25 | 0.00 | 0.25 | 0.24 | 0.49 | 9.65 | 10.14 |
| Sea Mills sports pitch | AV_SMS_01 | 0.13 | 0.00 | 0.13 | 0.24 | 0.37 | 9.65 | 10.02 |
| Sea Mills rail line north | AV_SMR_01 | 0.20 | 0.00 | 0.20 | 0.24 | 0.44 | 9.65 | 10.09 |
| Shirehampton east bank | AV_SHE_01 | 0.12 | 0.00 | 0.12 | 0.25 | 0.37 | 9.58 | 9.95 |
| Shirehampton east bank | AV_SHE_02 | 0.14 | 0.00 | 0.14 | 0.25 | 0.39 | 9.58 | 9.97 |
| Shirehampton east bank | AV_SHE_03 | 0.15 | 0.00 | 0.15 | 0.25 | 0.40 | 9.57 | 9.97 |
| Shirehampton Station Rd | AV_SHS_01 | 0.18 | 0.00 | 0.18 | 0.25 | 0.43 | 9.56 | 9.99 |
| Shirehampton west bank | AV_SHW_01 | 0.13 | 0.00 | 0.13 | 0.25 | 0.38 | 9.55 | 9.93 |
| Shirehampton west bank | AV_SHW_02 | 0.27 | 0.00 | 0.27 | 0.25 | 0.52 | 9.55 | 10.07 |
| Pill hard defence | AV_PLH_01 | 0.16 | 0.00 | 0.16 | 0.25 | 0.41 | 9.57 | 9.97 |
| Pill bank | AV_PLB_01 | 0.18 | 0.00 | 0.18 | 0.25 | 0.43 | 9.55 | 9.98 |
| Pill bank | AV_PLB_02 | 0.19 | 0.00 | 0.19 | 0.25 | 0.44 | 9.55 | 9.98 |
| Feeder Road | FC_FRD_01 | 0.05 | 0.00 | 0.05 | 0.36 | 0.41 | 8.33 | 8.74 |
| Feeder Road | FC_FRD_02 | 0.07 | 0.00 | 0.07 | 0.36 | 0.43 | 8.33 | 8.76 |

* Note values presented are rounded to 2 decimal places. In some cases this may result in an apparent discrepency of 0.01m.

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| | |
|---|---|
| **Job number** | 285982-00 |
| **Date** | 15 August 2023 |

# Technical Note

| | |
|---|---|
| **Project title** | Bristol Avon Flood Strategy OBC |
| **Job number** | 285982-00 |
| **File reference** | 285982-ARP-XX-RP-TN-001 |
| **cc** | |
| **Prepared by** | Daniel van der Leer |
| **Date** | 15 August 2023 |
| **Subject** | Residual uncertainty assessment |

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## 1. Introduction

The Bristol Avon Flood Strategy (BAFS) Outline Business Case (OBC) is proposing to construct new flood defences, and in some areas raising of existing flood defence structures, on the River Avon to provide a Standard of Protection (SoP) of 1:100yr for fluvial and 1:200 for tidal flood risk from the River Avon, with allowance for climate change. The proposed flood defence structures include linear raised defences along the river and new flood gates on the Floating Harbour at Entrance Lock and Netham Lock. The initial phase of construction ('Phase 1') is assumed for the 2020s. The Phase 1 flood defences will be constructed sufficiently high to prevent overtopping until the 2060s based on current climate change allowances. For the purposes of modelling, it is assumed that the 2060s corresponds to the epoch year 2069 as the current climate change guidance specifies a step change in fluvial flow allowances at 2069/2070. A subsequent phase ('Phase 2') of constructing additional defences and raising defences is assumed for the 2060s such that Phase 2 construction is completed by 2070. The Phase 2 works are intended to sustain the SoP up to 2130.

At the time of writing (July 2023) the OBC includes proposed flood defences from Crews Hall Road to Pill / Shirehampton (Figure 1). Some additional works are currently being identified for areas upstream of Crew's Hall Road to reduce / offset impacts on flood risk from the scheme.

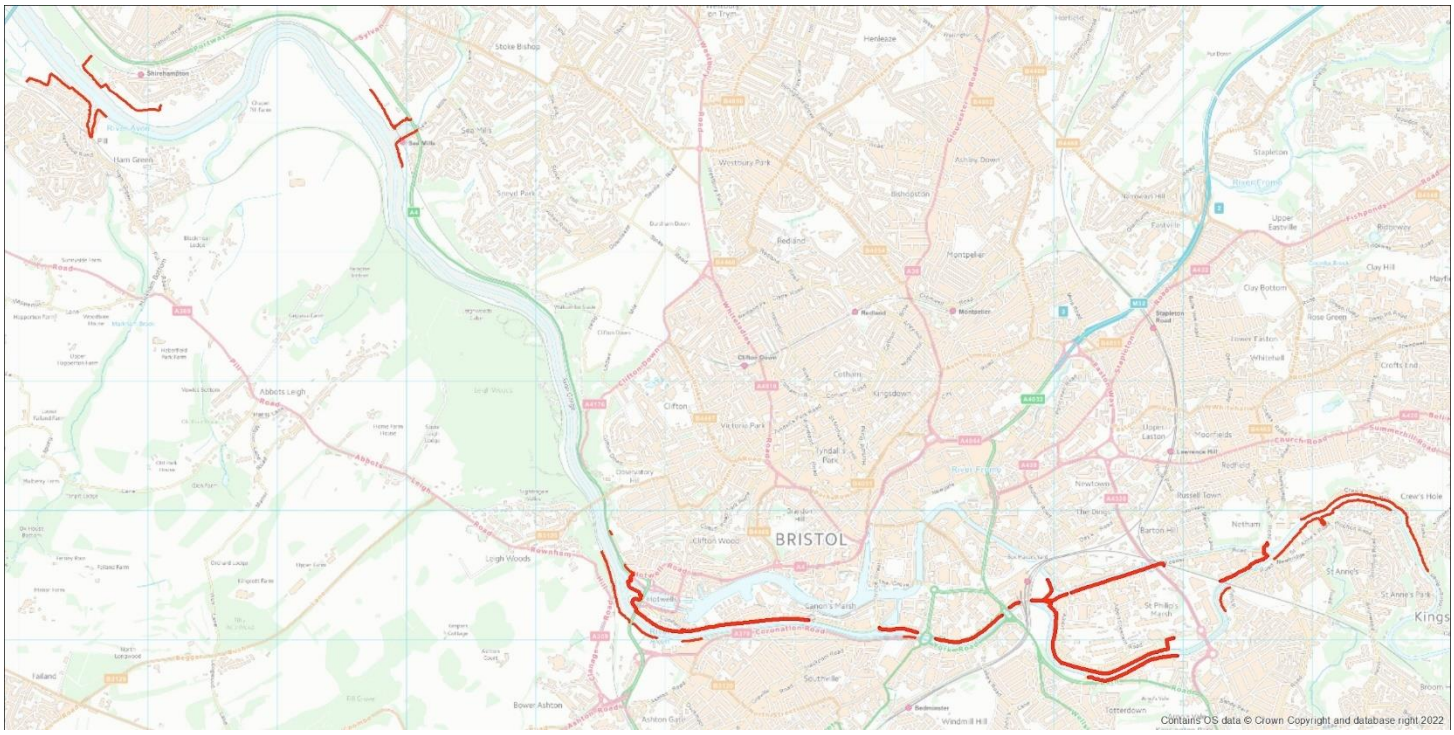



**Figure 1: Proposed alignment of new / raised flood defences between Crews Hall Road and Pill / Shirehampton.**

Hydraulic modelling has been used to determine the required flood defence levels for Phase 1 of the proposed BAFS scheme based on modelled river water levels. The raw outputs from the modelling do not account for any residual uncertainties such as uncertainties within the modelling and physical processes that are not captured in the modelling. Residual uncertainties must be considered in the design. The response / measures to be considered for managing residual uncertainties for the BAFS OBC scheme is:

1. Adjusting the estimated defence levels by adding a "freeboard" allowance to account for residual uncertainties.
2. Routine maintenance of the channel and water retaining assets.

This document describes the derivation of freeboard allowances for the proposed Phase 1 flood defences which are to be added to the flood defence levels estimated from the hydraulic modelling to define design crest levels for the proposed defences. The freeboard allowances are based on an identification and estimation of residual uncertainties including physical processes but excluding settlement allowance. Settlement allowance is not included; this should be calculated separately by a qualified geotechnical engineer.

Residual uncertainty allowance has been estimated using the methodology outlined in the current Environment Agency guidance on uncertainty estimation[1] which will be referred to as the 'guidance' from this point onwards.

[1] Accounting for residual uncertainty: updating the freeboard guide" (EA FCERM R&D programme, report SC120014, Environment Agency, February 2017).

In accordance with the guidance, residual uncertainty allowance has only been estimated for present day conditions. The guidance states *"Future uncertainties are better addressed through precautionary allowances, for example, for climate change. The appraisal process is the point at which to agree the amount of adaptive capacity that should be embedded into the present-day actions to account for future risks and uncertainties."*

## 2. Defence sections

The residual uncertainty assessment and corresponding derivation of freeboard values has been undertaken for all proposed flood defences. For the purposes of this assessment, many of the proposed flood defences have been subdivided into shorter sections to account for the variation in one or more of the following:

1. Required defence level excluding freeboard: Where the required defence level excluding freeboard varies by more than 0.1m, the flood defence has been divided into sections.
2. Proposed defence type: The defence type influences the wave allowance.
3. Orientation: The orientation influences the wave allowance, e.g. when it results in a large difference in fetch.

The resultant flood defence sections used for this assessment are summarised in Table 1 and shown in Figure 2 to Figure 4.

**Table 1: Flood defence sections.**

| Defence location | Ref | Bank | No. of sections used for assessment | Type |
|---|---|---|---|---|
| Crews Hall Road | AV_CRH | R | 1 | Wall |
| St Annes | AV_STA | L | 6 | Wall |
| Netham Weir | AV_NET | R | 3 | Wall |
| Whitby Road | AV_WHT | L | 1 | Wall |
| Paintworks | AV_PNT | L | 1 | Wall |
| Sparke Evans Park | AV_SEP | R | 1 | Embankment |
| St Philips Marsh | AV_SPM | R | 4 | Wall |
| Temple Meads | AV_TEM | R | 1 | Wall |
| Clarence Road | AV_CLA | R | 2 | Wall |
| Commercial Road | AV_COM | R | 1 | Wall |
| Bathurst Dam | AV_BAT | R | 1 | Embankment |
| Coronation Road | AV_COR | L | 1 | Wall |
| Cumberland Road | AV_CUM | R | 2 | Wall |
| Chocolate Path | AV_CHO | R | 2 | Wall |
| Bristol Metal Spraying | AV_BMS | L | 1 | Wall |
| Brunel Dam | AV_BRU | R | 1 | Wall |
| Entrance Lock bank | AV_ENB | R | 1 | Wall |
| Entrance Lock gate | AV_ENT | R | 1 | Gate |
| Hotwell Road south | AV_HTS | R | 1 | Wall |
| Freeland Place | AV_FRL | R | 1 | Wall |
| Hotwell Road north | AV_HTN | R | 1 | Wall |
| Ashton | AV_ASH | L | 4 | Embankment |
| Sea Mills Lane | AV_SML | R | 2 | Wall |

| Defence location | Ref | Bank | No. of sections used for assessment | Type |
|---|---|---|---|---|
| Sea Mills sports pitch | AV_SMS | R | 1 | Wall |
| Sea Mills rail line north | AV_SMR | R | 1 | Embankment |
| Shirehampton east bank | AV_SHE | R | 3 | Embankment |
| Shirehampton Station Rd | AV_SHS | R | 1 | Wall |
| Shirehampton west bank | AV_SHW | R | 2 | Embankment |
| Pill hard defences | AV_PLB | L | 2 | Wall |
| Pill bank | AV_PLB | L | 2 | Embankment |
| Feeder Road | FC_FRD | - | 2 | Wall |

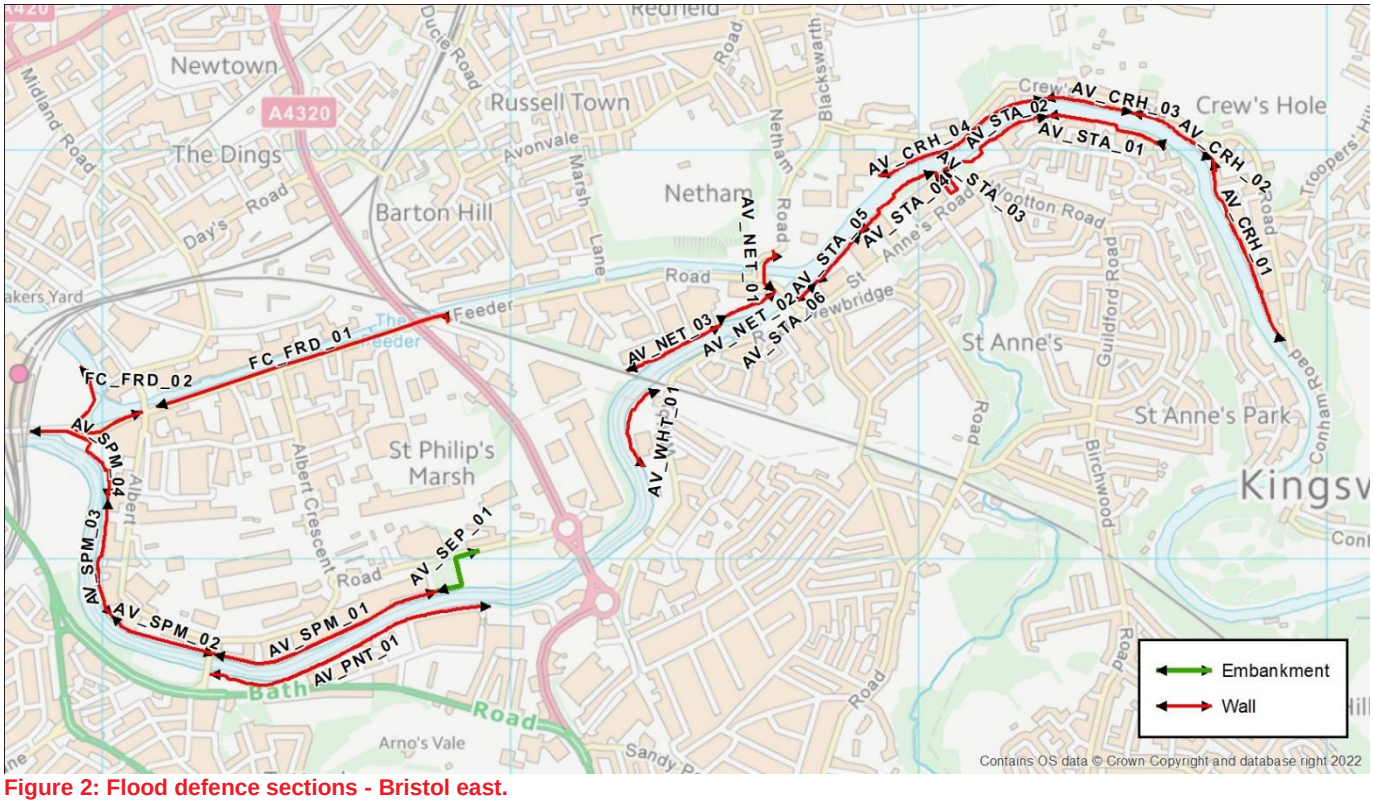



**Figure 2: Flood defence sections - Bristol east.**

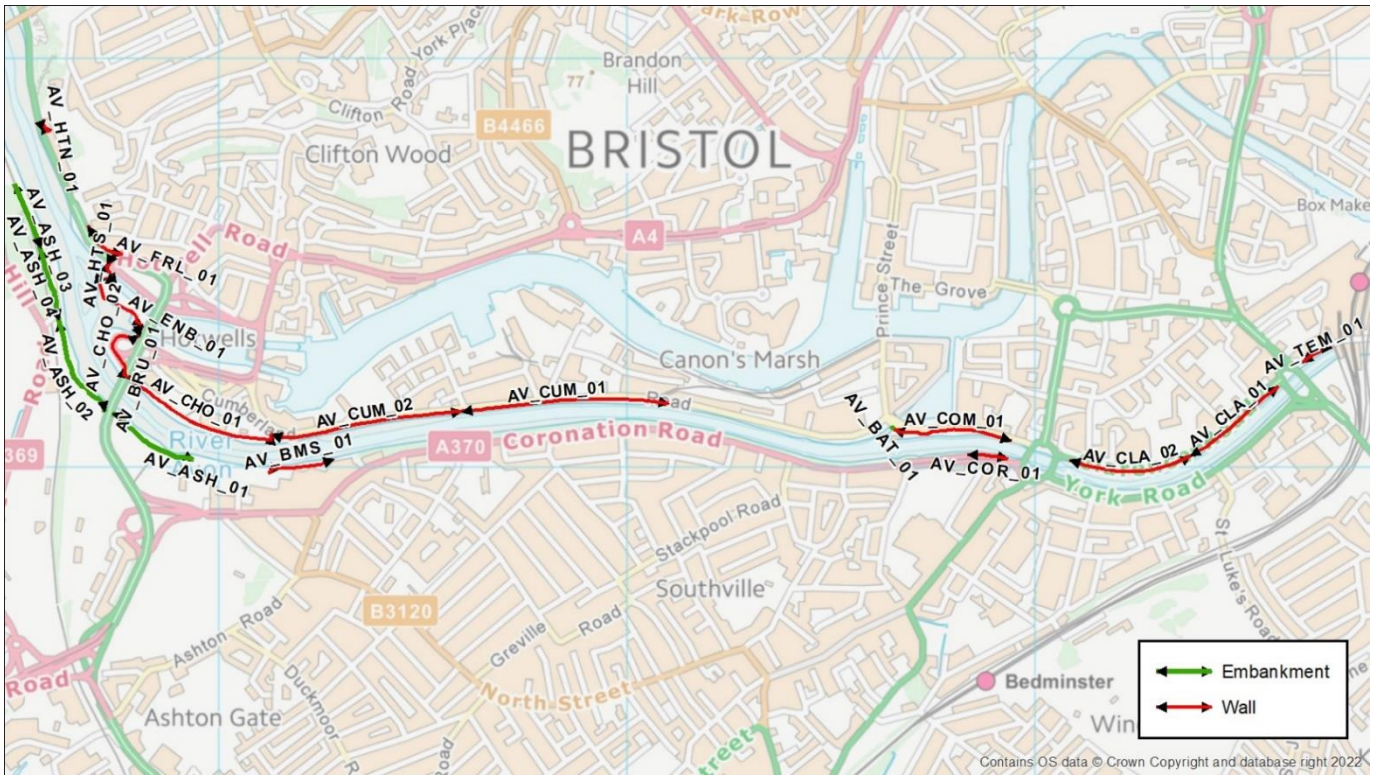



**Figure 3: Flood defence sections - Bristol west.**

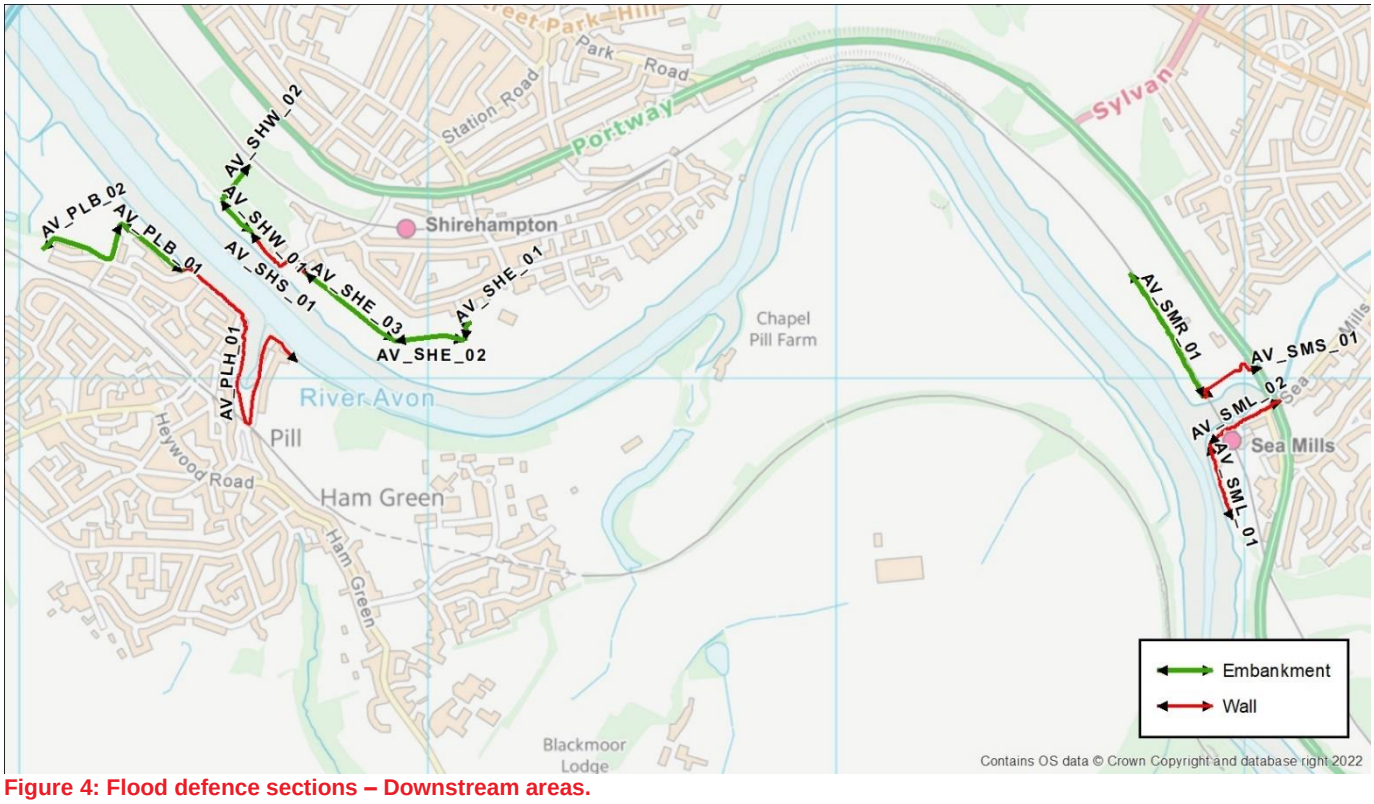



**Figure 4: Flood defence sections – Downstream areas.**

# 3. Residual uncertainty guidance

## 3.1 Overview

The Environment Agency's latest guidance seeks to move away from only considering freeboard; it seeks to consider uncertainty in the design and assessment process, to effectively manage this uncertainty and determine the most effective solution.

Residual uncertainty analysis aims to address the sources of uncertainty that are not already accounted for in the analytical and design processes undertaken. The guidance identifies three points at which residual uncertainty can be identified and managed:

Source: e.g. River Avon flows and water levels.

Pathway: e.g. Proposed flood defences and the landward floodplain.

Receptor: e.g. People, Property and Infrastructure.

Interventions to address the residual risk may comprise a combination of measures such as modifying and/or raising the flood defence. For the purposes of the uncertainty analysis described here, the interventions are assumed to comprise:

1. An increase in the design defence crest levels to manage the residual uncertainties ("freeboard").
2. Routine maintenance of the channel and water retaining assets.

This technical note focusses on derivation of the freeboard allowance.

## 3.2 Principles

The guidance outlines five principles which are to be adopted for addressing residual uncertainty, with each discussed in more detail in the following sections:

Principle 1: Challenge the credibility of system components: Uncertainty in data and analysis, and design decisions.

Principle 2: Consider the reality of the present-day system: The impact of climate change and defence deterioration should be excluded from the analysis.

Principle 3: Explore a range of measures to manage uncertainty: The guidance emphasises that raising crest levels is only one of several ways of managing uncertainty, e.g. different defence types/geometries should be considered.

Principle 4: Ensure the response is proportionate.: Respond to residual uncertainties in one of these four ways:

1. Conduct further analysis to refine the supporting knowledge and therefore reduce the uncertainty.
2. Accept the uncertainty as a residual uncertainty and its associated costs, but act to reduce its impact via adding to the final project.
3. Accept the uncertainty as a residual uncertainty. Record it, but choose not to act to reduce its impact.
4. Go back to the appraisal of other options.

Principle 5: Effective management of uncertainty is a continuous process: Uncertainties should be identified and managed progressively across all stages in the project life cycle.

### 3.3 Stages

The guidance outlines the following four stages to determine residual uncertainty allowances for appraisal and design of new flood risk management strategies or schemes:

Stage 1: Identify and record all primary sources of uncertainty.

Stage 2: Identify the uncertainties that have been accounted for.

Stage 3: Estimate the scale of residual uncertainty.

Stage 4: Determine the appropriate response.

# 4. Identification of primary uncertainties

## 4.1 Introduction

Stages 1 and 2 of the guidance are used to apply Principle 1: Challenging the credibility of the system components and Principle 2: Considering the reality of the present-day system.

Principle 1 states: "Uncertainty is pervasive in all data and information. To make well-informed choices about how best to respond to this uncertainty, it must first be understood. This includes considering how uncertainty may be generated and, in particular, the uncertainty introduced through the following.

- Data and models – reflecting the uncertainties in the input data and models used.
- Analysis completeness (or lack of) – reflecting the potential uncertainties that may be introduced by making simplifying assumptions of excluding important physical processes.
- Design and decision choices – reflecting the choices made regarding the approach to the design or decision making."

In accordance with this, an assessment has been undertaken to identify the primary sources of uncertainty, the category and the size of the uncertainties, whether they have been dealt with and a summary of the approach to dealing with residual uncertainty. This is summarised in Table 2 to Table 4 and is based on the pro forma assessment template found in Appendix C of the guidance. Further commentary, to which the tables refer, is given in the sub-sections below.

## 4.2 River water levels

River water level is a primary source of uncertainty and this has a direct impact on uncertainty in required flood defence level. River water levels are calculated using a hydraulic model of the River Avon, its tributaries and the floodplain. The river water level results from the model are influenced by secondary variables such as the geometry, flows and tidal conditions applied in the model and parameters used in the model. Uncertainty in these secondary variables contributes to uncertainty in the river water level.

Uncertainty in river water levels have been considered as part of a Tier 1 method outlined in the guidance to determine residual uncertainty in the required defence levels. This is described in Chapter 6.

## 4.3 Physical processes

### 4.3.1 Super-elevation

Super-elevation is the influence on water level due to the centrifugal force associated with flow around a river bend. Super-elevation results in a higher water level on the outside of a bend and a lower water level on the inside of a bend. Super-elevation is influenced by the flow velocity and the sharpness of the bend (based on the ratio of the river channel width vs the bend radius). The hydraulic modelling is based on a 1-dimensional model for the channel and a 2-dimensional model for the floodplain and overland flows. The 1d channel model provides a single peak water level at each cross-section in the model - it does not include any variation in water level between the inside and outside of a bend. Therefore, the flood defence levels derived directly from the modelled water level results do not include any allowance for super-elevation. As such, there is uncertainty

associated with super-elevation given this has not yet been considered prior to this uncertainty analysis. For the purpose of this uncertainty analysis, the uncertainty due to super-elevation is assumed to be equal to the calculated superelevation allowance described in Section 5.1.

#### 4.3.2 Wind generated waves

Wind generated waves have the potential to occur on the River Avon and these have the potential to cause water to overtop the proposed flood defences. Hydraulic modelling has been used to assess river water levels for the proposed scheme. The hydraulic modelling represents 'static' water levels, i.e. not including any wave action. Therefore, the flood defence levels derived directly from the modelled water level results do not include any allowance for wave action. As such, there is uncertainty associated with waves given they have not yet been considered prior to this uncertainty analysis. For the purpose of this uncertainty analysis, the uncertainty due to waves is assumed to be equal to the calculated wave allowance, considering defence type, geometry and possible wind directions and fetch. Residual uncertainty beyond these calculated values is considered negligible. The wave allowance derivation is given in Section 5.2.

### 4.4 Other comments

Principle 2 in the guidance emphasises that residual uncertainty allowances should only address the current day situation, and that future uncertainties, such as climate change or asset deterioration, should be addressed through the inclusion of appropriate climate change allowances etc.

The proposed BAFS scheme seeks to provide a SoP of 1:100yr fluvial and 1:200yr tidal with allowance for climate change. Phase 1 of the scheme is intended to sustain this SoP up to 2069 based on current climate change guidance. As the modelling accounts for climate change, this means that the SoP being provided between completion of construction of Phase 1 and 2069 is currently predicted to be better than the design SoP based on climate change allowances used in the analysis.

**Table 2: Identification of uncertainties in sources applicable to the BAFS scheme.**

| Variable and components | Type of uncertainty category | Uncertainty (quantitative ± error or qualitative) | Unit | Dealt with as part of … | | | Comments | Summary of approach to dealing with residual uncertainty | Status of action |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Strategy (Y/N) | Appraisal (Y/N) | Design (Y/N) | | | |
| **Flows**<br>Storm duration<br>Gauge error<br>Method | Data/model | Avon: 12<br>Frome: 15 | % | N | Y | Y | Complex catchment with many rivers and many possible combinations of events and timings. Pragmatic approach – generally considered conservative.<br>Hydrology for Avon recently reviewed and updated using latest gauge data. Non-stationarity assessment also undertaken.<br>Uncertainty in 100yr fluvial flows estimated at 12% for Avon and 15% for Frome (90% Confidence Interval). | Uncertainty in flows is dealt with within the assessment of residual uncertainty associated with river water level.<br>Sensitivity testing results incorporated into freeboard calc. | Closed |
| **Estuarine Water level** | Data/model | 0.25 | m | N | Y | Y | Appendix F of the Coastal Boundary Conditions 2018 Update technical report includes the 90% confidence interval in the plots provided for each gauge – this shows 90% confidence interval upper bound for Avonmouth to be 0.25m higher than the central value.<br>There is also uncertainty associated with the tidal profile, including the levels of the preceding low and high tides. | Uncertainty in estuarine water level and tidal profile is dealt with within the assessment of residual uncertainty associated with river water level.<br>Sensitivity testing results incorporated into freeboard calc. | Closed |

| Variable and components | Type of uncertainty category | Uncertainty (quantitative ± error or qualitative) | Unit | Dealt with as part of … | | | Comments | Summary of approach to dealing with residual uncertainty | Status of action |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Strategy (Y/N) | Appraisal (Y/N) | Design (Y/N) | | | |
| **River water level**<br>D/S boundary<br>Roughness<br>Structures<br>Blockages<br>Bed levels | Data/model | This is calculated in Chapter6. | m | N | Y | Y | See Section 4.2. | See Section 4.2. | Closed |
| **Wind generated waves** | Analysis | Variable | m | N | N | Y | See Section 4.3. | See Section 4.3. | Closed |
| **Joint probability** | Analysis | Chi 0.018 vs 0.11 | - | N | Y | Y | Fluvial-Tidal JPA accounted for using FD2308 desktop method.<br>Worst-case coincidence of Avon fluvial and tidal peaks and Avon and tributary peaks.<br>Design return period applied on all watercourses - conservative approach.<br>Avon, Frome and most other watercourses peak at same time as peak tide level - conservative.<br>Refinement of phasing of Brislington Brook and Malago peaks based on review of gauge data and associated JPA justified. | Uncertainty in JPA is dealt with within the assessment of residual uncertainty associated with river water level.<br>JPA sensitivity tests for Fluvial-Tidal undertaken using 90% confidence interval upper bound dependency measure from FD230815. Results incorporated into freeboard calc. | Closed |

| Variable and components | Type of uncertainty category | Uncertainty (quantitative ± error or qualitative) | Unit | Dealt with as part of … | | | Comments | Summary of approach to dealing with residual uncertainty | Status of action |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Strategy (Y/N) | Appraisal (Y/N) | Design (Y/N) | | | |
| | | | | | | | The 90% confidence interval upper bound dependency measure from FD230815 for fluvial-tidal JPA is 0.18 compared to base value of 0.11. | | |

**Table 3: Identification of uncertainties in pathways applicable to the BAFS scheme.**

| Variable or model parameter | Type of uncertainty category | Uncertainty (quantitative ± error or qualitative) | Unit | Dealt with as part of … | | | Comments | Summary of approach to dealing with residual uncertainty | Status of action |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Strategy (Y/N) | Appraisal (Y/N) | Design (Y/N) | | | |
| Channel geometry | Data/model | 0.1 – 0.3 | m | N | Y | Y | Model based on topographic surveys of cross-sections of the river channels (including the portion below the water surface) from 2006 to 2012. Temporal variation in sediment levels. | Uncertainty in channel geometry is dealt with within the assessment of residual uncertainty associated with river water level.<br>Sensitivity test results incorporated into the freeboard calc. | Closed |
| Floodplain topography | Data/model | 0.15 | m | N | Y | Y | Recent Environment Agency LIDAR DTM data is used in the flood modelling; this has a quoted RMS error of 0.15m. Even this error applies to individual points – the averaged error is much lower. | Low uncertainty. Residual uncertainty not considered any further. | Closed |

| Variable or model parameter | Type of uncertainty category | Uncertainty (quantitative ± error or qualitative) | Unit | Dealt with as part of … | | | Comments | Summary of approach to dealing with residual uncertainty | Status of action |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Strategy (Y/N) | Appraisal (Y/N) | Design (Y/N) | | | |
| | | | | | | | Impact on river water levels for the 'glass-wall' scheme model is considered low given flows are contained within channel through Bristol. | | |
| Geometry of linear assets | Data/model | Low | m | N | Y | Y | Few formal linear defences. The crest levels of existing walls and bunds in the study area is from recent topographic survey. | Design crest levels are considered insensitive to existing wall and bund levels.<br>Low uncertainty. Residual uncertainty not considered any further. | Closed |
| Condition of linear assets | Data | Fairly low | - | N | Y | Y | Paintworks flood defence is recent and assumed to be in good condition. | Asset condition to be assessed periodically. | **Live** |
| Geometry of point assets | Data/model | Fairly low | - | N | Y | Y | Original model includes point assets based on topographic survey, though some residual uncertainty associated with original source of dimensions.<br>Geometry of key structures reviewed (and where necessary, updated in the model) using survey and design information provided by BCC and EA.<br>Recent topographic survey of Netham Weir incorporated into model at SOC stage. Testing of weir representation undertaken at | Uncertainty in hydraulics at Netham Weir is dealt with within the assessment of residual uncertainty associated with river water level.<br>It is recommended that more topographic survey is collected in future to further reduce uncertainty associated with Underfall sluices and Brislington Boat screen. | **Live** |

| Variable or model parameter | Type of uncertainty category | Uncertainty (quantitative ± error or qualitative) | Unit | Dealt with as part of … | | | Comments | Summary of approach to dealing with residual uncertainty | Status of action |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Strategy (Y/N) | Appraisal (Y/N) | Design (Y/N) | | | |
| | | | | | | | SOC stage to support adopted representation, however, results upstream of weir are sensitive to modular limit formulation.<br>Survey / design data is old or not detailed for Underfall sluices and Brislington Boat screen and therefore there remains some residual uncertainty associated with these. Minimal impact anticipated on Avon water levels. | | |
| Operation of point assets | Data/model | Fairly low | | N | Y | Y | Operation of structures extracted from model and reviewed / accepted by BCC.<br>Anticipated to have very little impact on River Avon water levels but potential non-material impact on harbour and Feeder Canal water levels. | Sensitivity test run with lead time increased by 30 minutes for operation of proposed operation structures for discharging fluvial flows from harbour - incorporated into freeboard calc for Feeder Road defence.<br>Management of residual uncertainty regarding operation of Underfall Yard and proposed flow control structures to be agreed. | **Live** |
| Inflow into floodplain (from overtopping of linear assets) | Analysis | Low | l/s/m | N | N | Y | 1D-2D linked hydrodynamic model of river and floodplain is used, which is the most accurate type currently used for flood modelling. Low uncertainty for overtopping from static water levels. | Inflow from static water levels - low uncertainty. Residual uncertainty not considered any further. | Closed |

| Variable or model parameter | Type of uncertainty category | Uncertainty (quantitative ± error or qualitative) | Unit | Dealt with as part of … | | | Comments | Summary of approach to dealing with residual uncertainty | Status of action |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Strategy (Y/N) | Appraisal (Y/N) | Design (Y/N) | | | |
| | | | | | | | Some residual inflow into floodplain will occur from wind generated waves, which is not represented in the model. Wave allowance is being considered separately (see Section 4.3). | Inflow from waves – separate wave allowance is considered (see Section 4.3). | |
| Inflow into floodplain (from point assets) | Analysis | Low | m3/s | N | Y | Y | It is assumed any outfalls will be maintained and will not collapse. It is assumed outfalls will limit backflow during flood events. | It is assumed the outfalls are maintained and do not fail. Residual uncertainty not considered any further. | Closed |
| Inundation depths and velocities | Analysis | Low | m/s | Y | Y | Y | TUFLOW 2D inundation model output. | Residual uncertainty not considered any further. | Closed |

**Table 4: Identification of uncertainties in receptors applicable to the BAFS scheme.**

| Variable or model parameter | Type of uncertainty category | Uncertainty (quantitative ± error or qualitative) | Unit | Dealt with as part of … | | | Comments | Summary of approach to dealing with residual uncertainty | Status of action |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Strategy (Y/N) | Appraisal (Y/N) | Design (Y/N) | | | |
| Location of buildings/ critical infrastructure | Data/model | Low | | N | Y | Y | National Receptor Database (NRD) used in appraisal. | Residual uncertainty not considered any further. | Closed |
| Threshold Levels | Data/model | Low/Medium | m | N | Y | N | Threshold levels for properties in areas of potential impact have been surveyed and incorporated into the model. Elsewhere, thresholds not incorporated into model. No material impact on defence levels. | Residual uncertainty not considered any further. | Closed |
| Ground Levels | Data/model | Low | M | N | Y | N | Ground levels based on LIDAR. | Best available data. Low uncertainty. | Closed |
| Property damage estimation | Analysis | Medium | | N | Y | Y | Multi-coloured manual approach. | Best available technique. | Closed |
| Design overtopping flow | Decision | Low / Medium | m3/s | N | N | Y | Assumed as 1 l/s/m for all defences except Crews Hall Road and upstream part of St Annes where 0.1 l/s/m has been assumed given very close proximity of receptors and lack of floodplain storage here. | It is recommended the permissible overtopping flow is reviewed and potentially tested / refined as the scheme design progresses. | **Live** |

# 5. Physical processes

## 5.1 Super-elevation

Super-elevation is the influence on water level due to the centrifugal force associated with flow around a river bend. Super-elevation results in a higher water level on the outside of a bend and a lower water level on the inside of a bend, and is influenced by the flow velocity and the sharpness of the bend (based on the ratio of the river channel width vs the bend radius). As the hydraulic modelling does not account for super-elevation, its effects have been considered separately as part of the freeboard calculation.

Super-elevation has been considered at each section of defence using the approach described in the Fluvial Freeboard Guidance Note[2] as follows:

1. Identify whether defence section is on the outside of a bend based on direction of flow. If it is not on the outside of a bend, then super-elevation allowance is zero. If it is on the outside of a bend, then proceed to the next step.
2. Measure width, B of the river channel, taken to be the water surface width in flood conditions. Estimate the radius, R, of the river bend, taken to be the distance from the origin to the centreline of the channel. Determine the peak flow velocity around the peak of the flood event, V. Determine whether super-elevation is significant by checking if $V > 1.0036*(B/R)^{-0.496}$. If super-elevation is not significant then super-elevation allowance is zero. If super-elevation is significant then super-elevation allowance is calculated as: V2b/2gR.

Following the above process, only three sections of defence were identified as having significant super-elevation. These defence sections and the associated super-elevation allowances are at:

- St Philips Marsh AV_SPM_04: 0.07m
- Ashton AV_ASH_01: 0.05m
- Ashton AV_ASH_02: 0.08m

## 5.2 Wave allowance

### 5.2.1 Introduction

This Chapter presents the derivation of wave allowance for use in the design. These wave allowances have been added to the super-elevation allowance and the river water level residual uncertainty allowance to give a ‘freeboard’ allowance to be added to the defence level estimated from the hydraulic modelling to give a final design level excluding any required settlement allowance. Settlement allowance should be calculated by a geotechnical engineer.

Wave allowance for the proposed defences is determined by the following factors:

- Proposed defence type and geometry: This influences the magnitude of flow that overtops the defence. This also influences the maximum permissible overtopping flow that the defence can withstand (ultimate limit state). A range of permissible overtopping flow values are given in Table 5.
- Receptors on / behind the defence: This influences the maximum permissible overtopping flow that can be withstood by the receptors behind the defence from the context of flood risk, health

[2] Fluvial Freeboard Guidance Note, R&D Technical Report W187, Environment Agency, 2000.

& safety and damage to property and infrastructure. A range of permissible overtopping flow values are given in Table 5.

- Wave conditions at the defence

**Table 5: Typical permissible overtopping flow values expressed in terms of mean discharge (l/s/m) - taken from EurOtop.**

| Hazard Type and Reason | | Mean Discharge (l/s/m) |
|---|---|---|
| Pedestrians | Trained staff, well shod and protected, expecting to get wet, overtopping flows at lower levels only, no falling jet, low danger of fall from walkway | 1 – 10 |
| | Aware pedestrian, clear view of the sea, not easily upset or frightened, able to tolerate getting wet, wider walkway | 0.1 |
| Vehicles | Driving at low speed, overtopping by pulsating flows at low depths, no falling jets, vehicle not immersed | 10 – 50 |
| | Driving at moderate or high speed, impulsive overtopping giving falling or high velocity jets | 0.01 – 0.05 |
| Property behind the defence | Significant damage or sinking of larger yachts | 50 |
| | Sinking smaller boats set 5-10m from wall | 10 |
| | Building structure elements | 1 |
| | Damage to equipment set back 5-10m | 0.4 |
| Embankment seawalls/dikes | No damage if crest and rear slope are well protected | 50 – 200 |
| | No damage to crest and rear face of grass covered embankment of clay | 1 – 10 |
| | No damage to crest and rear face of embankment if not protected | 0.1 |
| Promenade or revetment seawalls | Damage to paved or armoured promenade behind seawall | 200 |
| | Damage to grassed or lightly protected promenade or reclamation cover | 50 |

Wave allowance can be defined as: the amount that needs to be added on to the defence level (excluding uncertainty allowance) to limit the overtopping flow to the permissible overtopping flow that has been agreed and justified by the project team.

### 5.2.2 Defence type and geometry

The defence type for each section of flood defence assessed is shown in Chapter 2. The appropriate range of permissible overtopping based solely on defence type are given in Table 6.

**Table 6: Assumed permissible overtopping based on flood defence type.**

| General type of flood defence | Assumed nature of defence | Permissible overtopping flow based on defence type (l/s/m) |
|---|---|---|
| Embankments | Grass-covered bund with sloping face. | 1 - 10 |
| Walls | Vertical wall with well protected crest. | 50 - 200 |

### 5.2.3 Receptors

The receptors and associated permissible overtopping flows from Table 5 have been identified for the proposed flood defences.

**Table 7: Assumed permissible overtopping flow based on receptors.**

| Flood defence sections | Receptors | Permissible overtopping flow based on receptors (l/s/m) |
|---|---|---|
| Crew's Hall Road (AV_CRH01 to 04) and the upstream part of St Anne's (AV_STA_01 to 02) | • Given this is a residential area, there is potential for pedestrian access to be needed to be retained (0.1 l/s/m).<br>• It is assumed that trained staff may be present (1 – 10 l/s/m).<br>• Buildings immediately behind proposed defences (1 l/s/m). Many of these are residential.<br>• Vehicles driving at low speed (10 – 50l/s/m).<br>• In addition to the above, there is very little to no floodplain storage volume behind these sections to be able to absorb residual overtopping without causing flooding to properties. | 0.1 |
| All other section of flood defence | • It is assumed that pedestrian access is either sufficiently set back from the defence line to enable residual overtopping flows from the waves to fall to the ground before hitting pedestrians or pedestrian access can be temporarily limited. It is assumed that trained staff may be present (1 – 10 l/s/m).<br>• Buildings immediately behind proposed defences (1 l/s/m) for the majority of flood defence sections.<br>• Vehicles driving at low speed (10 – 50l/s/m). | 1 |

### 5.2.4 Permissible overtopping flow

A permissible overtopping flow of 0.1 l/s/m has been adopted for Crew's Hall Road (AV_CRH01 to 04) and the upstream part of St Anne's (AV_STA_01 to 02) and a value of 1 l/s/m has been adopted for all other sections of flood defence based on the lower limits in Table 7.

### 5.2.5 Derivation of wave allowance

Wave allowances can be derived from wave overtopping analysis. The following types of analysis are available:

- Computational wave modelling and wave overtopping modelling.

- Physical wave modelling and wave overtopping modelling.
- Empirical methods such as EurOtop[3] and the method presented in the ICE Floods and Reservoir Safety guidance[4].

For this study, wave allowance has been calculated for each section of flood defence based on EurOtop 2018, incorporating Corrigenda 2019. The process for calculating wave overtopping flow, which is used to determine the required wave allowance, for each section of flood defence is summarised below:

1. Select a wind direction: Several wind directions were considered for each section of defence. The 'banana' fetch method presented in the Floods and Reservoir Safety guidance has not been used as it is more intended for reservoirs within curved valleys and so is not considered applicable for this study. Wind directions resulting in very oblique wave direction relative to the defence alignment were not considered.
2. Estimate wind speed: For the Bristol area, a 50-year hourly wind speed of 20.5m/s was taken from Figure 5.2 in the Floods and Reservoir Safety guidance. This is then reduced to a mean annual maximum value and adjusted based direction and fetch length.
3. Estimate fetch length: A representative fetch length was measured in GIS for each wind direction assessed.
4. Calculate significant wave height.
5. Calculate wave period and nominal deepwater wavelength
6. Calculate wave breaking parameters.
7. Calculate overtopping flow for the defence type: An equation is given for each of the three main types of defence:
    a. Sloping face with small vertical wall
    b. Sloping upstream face: This type has been selected for embankments. The upstream slope of the embankment has been assumed to be 1:3 for the purposes of the wave calculation.
    c. Vertical face in deep water: This type has been selected for flood defence walls.
8. Adjust the wave overtopping allowance until the resultant overtopping flow is less than the permissible overtopping flow for the section of flood defence being considered.

The wave allowance allowances are presented for each section of flood defence in Appendix A. The average allowance is 0.12m and the range is 0.04 to 0.27m.

[3] EurOtop, Manual on wave overtopping of sea defences and related structures, Second Edition, 2018.

[4] Floods and Reservoir Safety Fourth Edition, Institute of Civil Engineers, 2015.

# 6. Estimate magnitude of residual uncertainties in river water level

## 6.1 Introduction

This Chapter quantifies the residual uncertainty (the uncertainties not yet accounted for) associated with river water levels. This will be added to the physical processes allowances derived in Chapter 5 to give a 'freeboard' allowance to be added to the defence level estimated from the hydraulic modelling to give a final design level excluding settlement allowance. Settlement allowance should be calculated by a geotechnical engineer.

A "Tier 1 – first order error analysis" method, as described in section 3.3.4 of the guidance has been applied to estimate the residual uncertainty associated with the river water level. The guidance states that "a first order error analysis is used to quantify the primary uncertainty (for example, in in-river water level) by a simple weighted summation of the contributory uncertainties (for example, channel roughness and hydrological record)." This involves:

1. Identifying the secondary variables that contribute to the primary variable of interest.
2. Estimate the change in the primary variable (river level) for a small change in each secondary variable.
3. Estimate the uncertainty in the secondary variables.
4. Estimate the total uncertainty in the primary variable (river level) through a simple weighted summation of independent contributions.

Although Principle 3 of the guidance states: *"The raising of crest levels is only one of several available ways to manage uncertainty. In some situations, crest raising may not be appropriate…."*, this assessment has focussed on the increase to be applied to the design crest levels to manage the residual uncertainty associated with the River Avon and Feeder Canal water levels as required by the scheme.

The assessment estimates the required increase in design crest levels.

For completeness, the Tier 1 first order analysis has been applied to each defence section.

## 6.2 Identification of secondary variables

The secondary variables (components) that contribute to the uncertainty in river water level are considered to be:

1. Model type and construction: The model is a 1d-2d linked hydrodynamic model, which is considered to be the most accurate type of model currently used for flood modelling. The construction of the model is appropriate with the 1d-2d interface along the existing and proposed defences.
2. Software version: This component of uncertainty is considered to be small, in the region of 25mm.
3. Fluvial flow: Although the hydrology is based on the available gauge data, which covers much of the River Avon and Frome catchments, there remains residual uncertainty in fluvial flows. The River Avon upstream of Netham Weir is more affected by fluvial events than tidal events.

4. Downstream water level boundary: The downstream water level boundary condition represents the Severn Estuary tidal levels at Avonmouth. Peak tidal levels and the tidal profile, including preceding low and high tide levels, influences the river water levels in Bristol.
5. River channel geometry. The model uses topographic survey of the channel and structures from 2006 to 2012. There is likely to be temporal variation in the level of silt within the river channel but there is no available data for this study to assess the magnitude or variability of this.
6. River channel roughness: This is currently specified in the model using Manning's *n* roughness coefficient values – typically 0.03 for the channel and 0.06 for the banks. These have been reviewed against photographs of the channel and found to be appropriate, though they won't capture fine scale spatial variations in roughness or the influence of seasonality. The channel roughness values in the model have been adopted from the CAFRA modelling study[5] which undertook calibration and validation of the model against observed fluvial and tidal flood events. The BAFS OBC ran a validation event on the updated baseline model based on the largest recent flood in Bristol (March 2020), which was tidally dominated. The validation model results showed acceptable match to observations; at Netham Weir the modelled water level was 0.16m higher than the gauged water level while upstream at Keynsham the modelled water level was 0.12m lower than the gauged water level.
7. Floodplain geometry: This is represented using the TUFLOW 2d component of the model, which defines the topography using 5m by 5m grid cells. EA LIDAR DTM data is used in the flood modelling to set the elevations of all elevation points. The LIDAR data has a quoted RMS error of 0.15m. Impact on river water levels for the 'glass-wall' scheme model is considered very low given flows are contained within channel through Bristol.
8. Floodplain roughness: This is specified in the model using Manning's *n* roughness coefficients which are varied spatially based on land use. This is a standard and accepted approach in 2D hydraulic models and the roughness values are in the typical modelling range but there is still uncertainty over how representative these values are. Impact on river water levels for the 'glass-wall' scheme model is considered very low given flows are contained within channel through Bristol.
9. Blockage of structures: Bridges over the River Avon are clear span or minimal piers - risk of significant blockage is anticipated to be very low.
10. Representation of Netham Weir: The CAFRA modelling study undertook calibration and validation of the model against observed fluvial and tidal flood events and this included testing alternative representations of Netham Weir. The BAFS Strategic Outline Case (SOC) study incorporated recent topographic survey of Netham Weir into the model, investigated hydraulics at the weir, including influence of sluice gates, and tested the impact of weir representation on calibration performance to identify and support the adopted representation in the model. However, there remains significant uncertainty associated with the hydraulics at Netham Weir, particularly the modular limit formulation. The default ISIS formulation was adopted in the SOC model as it resulted in overall better match of results to gauged water levels but there remained significant over-estimation for some events and under-estimation for other events.

[5] Bristol City Council Central Area Flood Risk Assessment, Modelling Report (Workstream 3), December 2012.

11. Uncertainty relating to the JPA dependency between fluvial and tidal. The model currently uses fluvial and tidal combinations derived using the FD2308 desktop method (Chi dependency measure of 0.11). FD2308 also provides a 90% confidence interval upper bound dependency measure of 0.18.
12. Operation of harbour gates for releasing fluvial flows: Unlikely to materially affect River Avon water levels but may affect water levels in the Floating Harbour including Feeder Canal where a flood defence is currently proposed.

### 6.3 Impact of secondary variable on river water level

Sensitivity analysis has been undertaken using the hydraulic model to determine the influence of the most significant secondary variables on river water levels. Sensitivity testing has been undertaken on a 'glass-wall' version of the model, i.e. with all proposed defences set artificially high to prevent overtopping, for the design events, i.e. the fluvial 1:100yr and tidal 1:200yr events with allowance for climate change up to 2065. Note that 2065 was used instead of 2069 as the sensitivity test modelling was completed after the decision was made to change the epoch year from 2065 to 2069 – the fluvial flow allowance is the same for both years but there is approximately 0.05m additional sea level rise between 2065 and 2069 – given this difference is small and that sensitivity test impacts are based on comparison to baseline 'glass-wall' scheme model results from 2065 epoch simulations, the sensitivity testing is still considered valid.

The following sensitivity analyses have been undertaken:

1. Fluvial flows increased by 20%.
2. Tidal levels (Avonmouth downstream boundary) increased by 0.25m.
3. Tidal profile (tidal curve water level vs time data) adjusted to be consistent with the profile used in the BAFS SOC study (but with correct peak water level). The profile used in the BAFS SOC study has higher water levels for the low and high tides that precede the highest (design) tidal peak because the surge residual is timed to peak at the preceding low tide, which is more representative of a worst case.
4. River Avon bed level increased by 0.3m between the Feeder Road Bridge and Entrance Lock. This includes an approximately 200m reach upstream of Netham Weir (but no changes to the crest level of Netham Weir). No changes in bed level have been applied upstream of this point as this modelled test is already considered very conservative.
5. River channel roughness increased by 20%.
6. Fluvial-Tidal pairs adjusted to represent JPA dependency measure being increased from 0.11 to 0.18 as follows:
    a. 1:100yr fluvial combined with 1:3yr tidal (compared to 1:100yr fluvial combined with 1:1yr tidal).
    b. 1:200yr tidal combined with 1:7yr fluvial (compared to 1:200yr tidal combined with 1:2yr fluvial).
7. Operation of harbour gates for releasing fluvial flows: operation lead time increased from 30 minutes to 60 minutes.

Representation of Netham Weir has not been included in the sensitivity testing undertaken specifically for the residual uncertainty analysis but it was undertaken during the SOC to support the selected representation of the weir in the model. The results from the testing undertaken at SOC suggest the uncertainty in water levels upstream of Netham Weir as a result of representation of the weir are 0.14m based on one standard deviation.

Water level results were extracted from the model at each flood defence section.

The sensitivity test results for the River Avon are shown in Figure 5 for all tests except the JPA, tidal profile and harbour operation tests. This shows River Avon water levels are sensitive to fluvial flow and channel roughness upstream of Netham Weir (at high chainages) but not downstream of this location. Downstream of Netham Weir, water levels are more sensitive to tidal levels. The results of the JPA test are shown in Figure 6 – this shows the river water levels are relatively insensitive to JPA. The results from the harbour operation test shows no material impact on River Avon water levels but an increase in water level in the Floating Harbour of 0.08m.

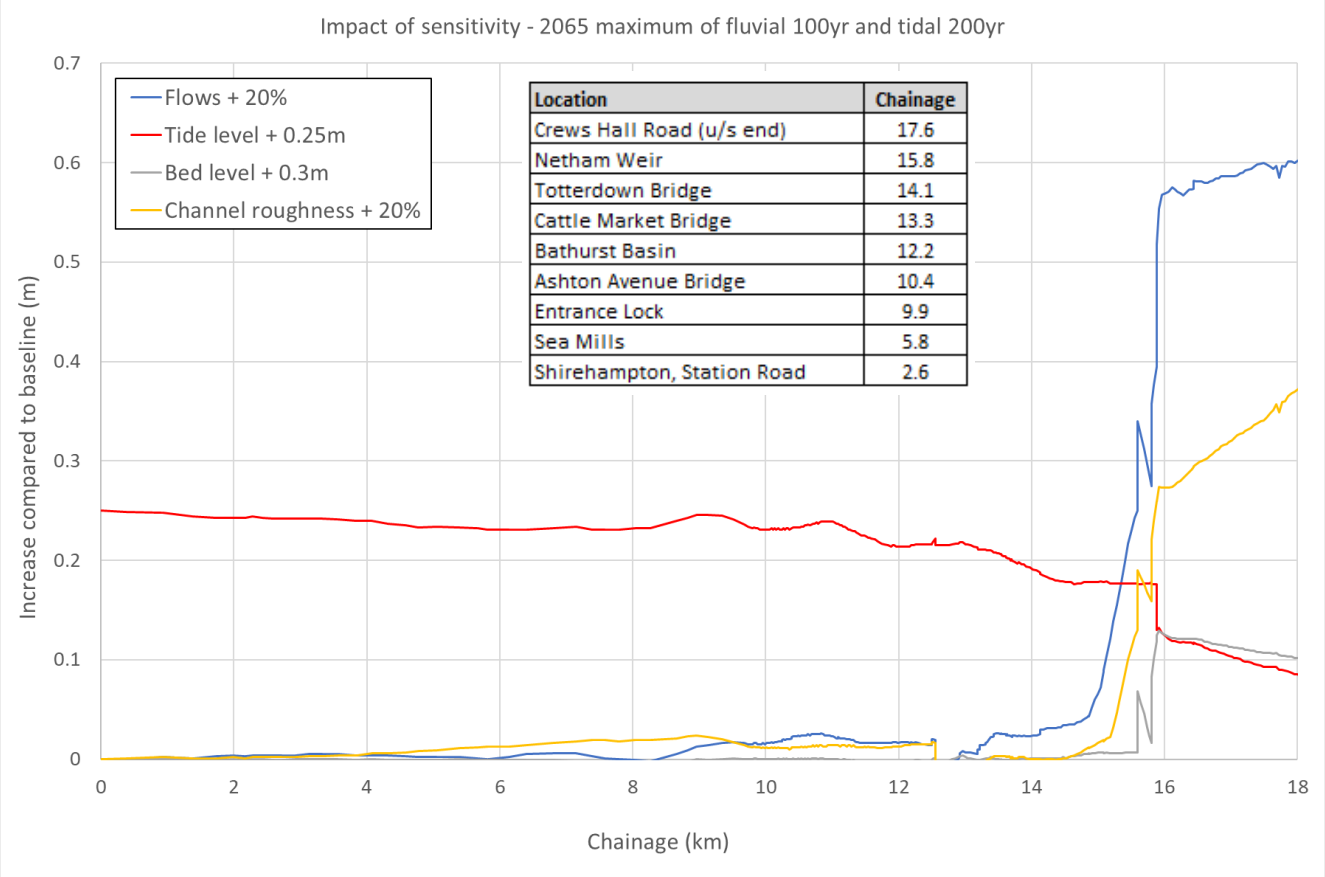



**Figure 5: Sensitivity test results for River Avon (excluding JPA and harbour operation).**

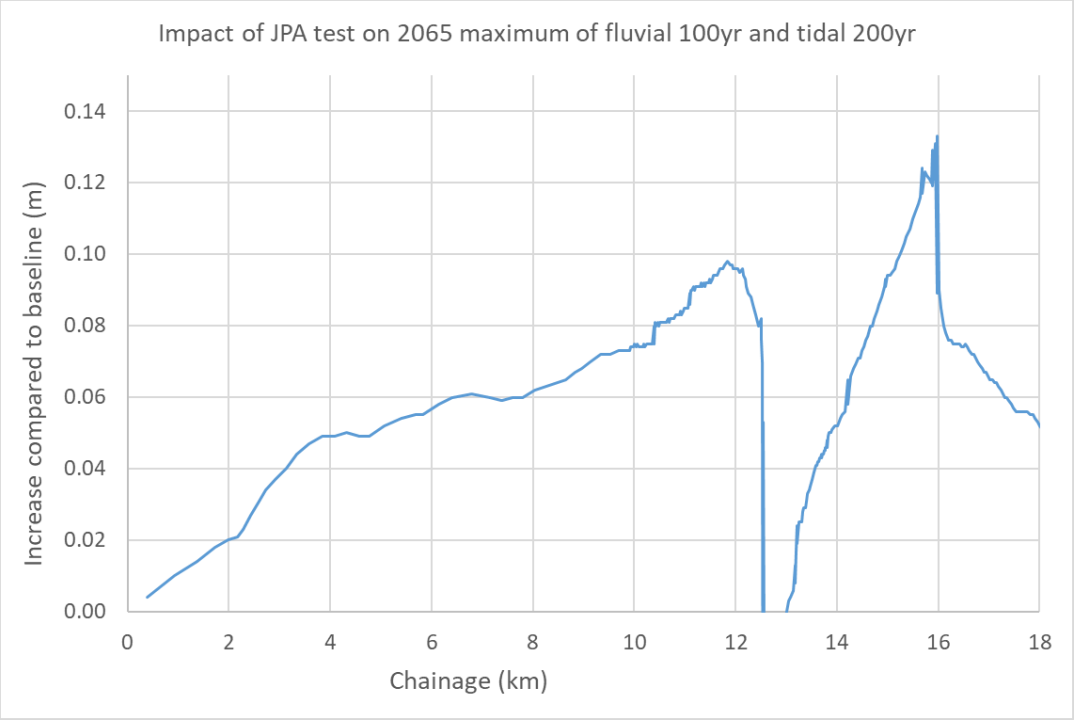



**Figure 6: JPA sensitivity test results for River Avon.**

The sensitivity test results for the tidal profile showed very marginal impact on the peak River Avon water levels – the maximum impact at key locations was +/-0.02m but generally less than this and in some locations the test resulted in a slight decrease in River Avon water levels. However, the results did show a significant increase in peak water level in the Floating Harbour and Feeder Canal of 0.138m - this occurs in the fluvial 1:100yr event and appears to be due to the increased length of time that the harbour is tide locked leading up to the flood peak which causes a higher initial water level in the harbour immediately before the peak of the flood event due to the preceding low tide being higher in the sensitivity test.

## 6.4 Uncertainty in secondary variables

The plausible upper bound of the uncertainty in each secondary variable (in native units) is estimated below. Note that in some cases these estimations are the same as what has been applied in the sensitivity testing. A 90% confidence interval has been applied for the secondary variables associated with boundary conditions (flows, tidal level, JPA) in the calculation of uncertainty. However, it is recognised that providing a 90% confidence for boundary condition variables such as flow may be impractical at an individual scheme level or parts of an individual scheme and that relaxing the confidence level to 67% (one standard deviation) may significantly improve feasibility of the scheme (and that collectively this may provide close to 90% confidence across the portfolio of flood management schemes regionally). Discussion of the contribution of uncertainties in secondary variables to the overall uncertainty in river water level is provided in Section 6.5.

- Fluvial flow: The 90% Confidence Interval upper bound values for the 1:100yr peak fluvial flows at the flow gauges have been estimated by a hydrologist in line with the FEH guidelines

for uncertainty estimation. These have then been compared against the baseline values to determine the % increase. The results (Table 8) show uncertainty of 13.2% in River Avon flows and 16.1% in River Frome flows at the respective gauges. The Avon @ Bathford gauge captures most of the Avon catchment upstream of Bristol. The Chew and Boyd enter the Avon downstream of Bathford – these tributaries peak before the main Avon peak and combined these tributaries have similar level of uncertainty as the Avon @ Bathford.

- Tidal level (downstream boundary): Appendix F of the Coastal Boundary Conditions 2018 Update technical report[6] includes the 90% confidence interval in the plots provided for each gauge – this shows 90% confidence interval upper bound for Avonmouth to be 0.25m higher than the central value.
- Tidal profile: The plausible upper bound associated with tidal profile is that the surge residual is timed to peak at the preceding low tide as has been applied in the sensitivity test discussed in the previous section.
- Channel roughness: 23% increase in roughness: This is based on 1 standard deviation (67% Confidence Interval upper bound) from the estimated Manning's *n* value used for the channel (0.03) based on US Army Corps of Engineers technical reference.
- Channel bed level: 0.3m increase in bed level for full reach where this is applied is considered to be conservative as in reality variations will vary spatially with decrease in bed level likely in some areas and increases in others. The adopted uncertainty in bed level, while considered conservative, has only a small impact on uncertainty upstream of Netham Weir (0.01 to 0.02m) and no discernible impact downstream of Netham Weir.
- Representation of Netham Weir: The results from the testing undertaken at SOC suggest the uncertainty in water levels upstream of Netham Weir as a result of representation of the weir are 0.14m based on one standard deviation.
- JPA: The 90% Confidence Interval upper bound for the Chi dependency measure is 0.18 compared to a base value of 0.11 (see Section 6.2). This corresponds to the fluvial-tidal return period pairs of:
  - 1:100yr fluvial combined with 1:3yr tidal (compared to 1:100yr fluvial combined with 1:1yr tidal).
  - 1:200yr tidal combined with 1:7yr fluvial (compared to 1:200yr tidal combined with 1:2yr fluvial).
- Operation of harbour gates for releasing fluvial flows: Assume the uncertainty in mobilisation time is 30 minutes as modelled.
- Software version: 0.025m. This has been estimated based on previous modelling experience.

[6] Coastal flood boundary conditions for the UK: update 2018, Technical summary report, Environment Agency, 2019.

Table 8: Uncertainty in fluvial flows.

| Gauge | 100yr estimate | 90% CI upper estimate | Increase in flows between 100yr estimate and 90% CI upper estimate |
|---|---|---|---|
| Avon @ Bathford | 313.95 | 355.26 | 13.2% |
| Frome @ Frenchay | 66.73 | 77.5 | 16.1% |
| Chew @ Compton Dando | 101.8 | 111 | 9.0% |
| Boyd @ Bitton | 36.41 | 42.7 | 17.3% |

## 6.5 Estimation of the total uncertainty in river water level

Quantification of the residual uncertainty in river water level was carried out following the approach outlined in the guidance, which is to apply Equation 1.

Equation 1 Total uncertainty based on individual parameter sensitivity tests.

$$R_{unc} = \sqrt{\left[\left(\frac{\partial R}{\partial x}\right) x_{unc}\right]^2 + \left[\left(\frac{\partial R}{\partial y}\right) y_{unc}\right]^2 + \left[\left(\frac{\partial R}{\partial z}\right) z_{unc}\right]^2}$$

Where:

- $R_{unc}$ = the total residual uncertainty in the primary source of interest (river water level).
- $\partial$x,y,z = Change in parameter x, y, z applied in the sensitivity test. These are given in Section 6.3.
- $\partial$R = Change in river water level due to change in parameter. These are the taken from the results of the sensitivity tests – the results are described in Section 6.3.
- x,y,zunc = Uncertainty in parameter x, y, z. These are the estimated values in Section 6.4.
- $\partial$R/$\partial$x,y,z are partial derivatives that represent the relationship between a small change in components and the resulting change in the primary uncertainty; the relative size of the partial derivative 'weights' the contribution for each component.

The total residual uncertainty in river water level from Equation 1 is presented in Appendix A for each flood defence section. These show the uncertainty is greatest upstream of Netham Weir. This is primarily due to this location being much more sensitive to increases in fluvial flow and channel roughness. Fluvial flow and roughness have a small influence downstream of Netham Weir where the peak water levels are highly influenced by the tide.

The contribution of uncertainties in secondary variables to the total uncertainty in river water level is summarised below with discussion on how the level of uncertainty may affect the largest components of uncertainty.

- Fluvial flow: The long-section of sensitivity test impacts (Figure 5) shows a large increase in sensitivity to flow upstream of Netham Weir – this is consistent with the switch point between fluvially fluvial dominated events and tidally dominated events. This suggests that the influence of Netham Weir significantly increases uncertainty in upstream water levels. Relaxing the confidence level for fluvial flows from 90% to 68% (one standard deviation) would reduce uncertainty upstream of Netham Weir by 0.09m.

  The BAFS SOC explored several options for managing flood risk in isolation and in combination; these options included replacing Netham Weir with a movable weir structure that could be kept in the raised position to maintain water levels upstream for navigation during normal conditions and then lowered to bed level during flood conditions. The model results for this particular option showed it could reduce upstream water levels by 0.06m but downstream water levels would increase by 0.04m based on 2065 climate. Given the large cost associated with replacing Netham Weir with a movable weir and the limited benefits, this option was not taken any further in the SOC. While such an option could reduce the uncertainty in water levels upstream of Netham Weir and therefore reduce freeboard for proposed flood defences upstream of the weir, it would result in higher defence levels downstream of the weir and likely greater uncertainty and freeboard requirements adjacent to St Philips Marsh. Furthermore, the crest levels for the proposed flood defences upstream of Netham Weir are also dictated by detriment mitigation criteria, which is to ensure no detriment from the Phase 1 flood defences in 2130 climate. This detriment mitigation criteria results in generally slightly higher flood defence levels as those calculated based on the freeboard allowance calculated here, which include a 90% confidence level for fluvial flows. As such, it is recommended that the 90% confidence levels for the fluvial flow component are adopted for the BAFS OBC study.

- Tide level: The uncertainty for this component is based on a 90% confidence interval for 1:200yr return period peak tide levels at Avonmouth. The total uncertainty results show this component has a significant impact on uncertainty in water level downstream of St Philips Causeway (from 0.21m at Pill / Shirehampton to 0.06m at Whitby Road) but only a small impact upstream of here (0.01 to 0.02m). The Coastal Boundary Conditions 2018 Update technical report does not give any information on uncertainty for lower confidence levels. However, it is anticipated that if the confidence level was reduced to 68% (one standard deviation) the reduction in defence crest levels would by around 0.05 to 0.10m. It is recommended that the 90% confidence levels for the tide level component are adopted for the BAFS OBC study but that future phases of the scheme development consider if and whether this can be relaxed, particularly in locations that pose significant buildability constraints.

- Tidal profile: The base model assumes the surge residual peaks at the same time as the highest (design) tidal peak. While this is the standard approach given in the Coastal Flood Boundary Conditions guidance[6], Section 6.3.4 of the guidance does state "*Sensitivity tests for the peak surge occurring before or after the base of the peak astronomical tide may be appropriate*

*depending on the purpose of the study or assessment*", which is relevant to our study as the Feeder Road defence. The surge residual timing in the base model is considered least conservative while the surge residual timing used in the tidal profile sensitivity test (see Section 6.3) is considered the most conservative timing. It has been agreed that uncertainty in tidal profile and associated surge residual timing should be managed as follows:

  - No allowance required for River Avon water levels as these water levels are insensitive to surge residual timing.
  - Allowance to be added for Feeder Canal water levels and Feeder Road defence as results are sensitive to surge residual timing. The allowance is to be applied as follows: Interpolating the result from the sensitivity testing, implies a 50% confidence level (effectively a 'central estimate') would result in an increase in water level of (0.138 ÷ 2) = 0.07m and this should be directly added to the modelled water level outside of the uncertainty analysis. The remaining 0.07m is to be assumed as residual uncertainty and should be incorporated into the uncertainty analysis calculation, which would increase the total uncertainty by 0.005m at Feeder Road. Therefore, the net impact of accounting for the uncertainty in tidal profile is to increase the Feeder Road defence level by a total of 0.07 + 0.005 = 0.075m.

- Channel roughness: Significant impact on uncertainty upstream of St Philips Causeway (from 0.17m at the upstream end of Crews Hall Road to 0.04m at Whitby Road) but no material impact downstream of here. If the level of confidence in roughness was increased from 68% (as used in the calculation) to 90% then the total uncertainty in water level would increase by 0.25m at the upstream end of Crews Hall Road and 0.07m at Whitby Road.
- Channel bed level: Small impact on overall uncertainty (0.01 to 0.02m) upstream of Netham Weir and no material impact downstream of Netham Weir. This is in part due to the roughness and flow components dominating the total uncertainty.
- Representation of Netham Weir: This has a small impact on total uncertainty upstream of Netham Weir (0.02m) and assumed to be no impact downstream.
- JPA: This has a small impact on total uncertainty (0.01 to 0.02m).
- Operation of harbour gates for releasing fluvial flows: No material impact on overall uncertainty for River Avon. Very small impact (0.01m) on overall uncertainty for Feeder Canal.
- Software version: 0.025m. No material impact on overall uncertainty.

# 7. Determine response

## 7.1 Guidance

Stage 4 of the guidance is used to apply Principle 3: Exploring a range of measures to manage uncertainty and Principle 4: Ensuring the response is proportionate.

Principle 3 of the guidance states: "*The raising of crest levels is only one of several available ways to manage uncertainty. In some situations, crest raising may not be appropriate, for example, in coastal locations or where visual impacts place a constraint on defence thresholds. An appropriate way to manage residual uncertainty can be through intervention at source, pathway or receptor, or through a combination of measures".*

For the BAFS scheme, flood risk to people and property is managed by:

1. Reducing the risk of flooding due to overtopping by building the proposed flood defences.
2. An accepted level of residual overtopping due to wave action that has been assessed not to cause defence failure and / or unacceptable risk to property in the design events including allowance for climate change.

This assessment has focussed on the increase to be applied to the design crest levels, i.e. raising the flood defences, to manage the residual uncertainty associated with the river water levels. There are limited other options to manage the residual uncertainty based on the proposed scheme design given the proximity of receptors. It may be possible to accept a higher overtopping rate but provide greater protection to mitigate risk of asset failure. Note this would only be appropriate where overtopping of the defence does not contribute to significant hazards to receptors on or behind the defence line. It is anticipated that any resultant reduction in defence level would be marginal for the BAFS scheme given proximity of receptors.

Consideration is then given to how to best respond to the uncertainty in accordance with Principle 4 of the guidance, which states: *"Depending on the context in which the decision is being taken, some residual uncertainties may be easily addressed through reasoned argument and/or minor cost additions to the final project. In other cases, addressing the residual uncertainties may add significantly to the cost of the strategy, scheme or development and careful consideration of the most appropriate response is required.*

*You can choose to respond to these residual uncertainties in one of 4 ways:*

1. *Conduct further analysis to refine the supporting knowledge and therefore reduce the uncertainty.*
2. *Accept the uncertainty as a residual uncertainty and its associated costs, but act to reduce its impact via adding to the final project.*
3. *Accept the uncertainty as a residual uncertainty. Record it, but choose not to act to reduce its impact.*
4. *Go back to the appraisal of other options.*

*When deciding which of these 4 options to choose, we need to consider the significance of the risk associated with the uncertainty compared with the costs of managing that uncertainty. In making this choice, consider the following questions.*

*Is further analysis likely to significantly change the identification of the preferred option/preferred course of action or its cost?*

*Does choosing to manage the residual uncertainty by adding to the final scheme significantly change the cost benefit case for the preferred option?*

*If the answer to both these questions is 'no', then the residual uncertainty should be accepted and action taken to reduce its impact".*

### 7.2 Freeboard allowance

The freeboard excluding settlement allowance is calculated as the physical processes allowance + river water level uncertainty where the physical process allowance is the super-elevation allowance + wave allowance. This is shown in Table 9 with proposed final design levels for the Phase 1 flood defences at three example locations. Note these exclude any required settlement allowance. The equivalent results for all 55 defence sections are given in Appendix A.

It is emphasised that these freeboard allowance values and proposed design levels are those required to provide the design SoP of 1:100yr fluvial and 1:200yr tidal with allowance for climate change up to 2069. These are based on the assumptions and uncertainties discussed in this report. The performance of the design, including structural stability, has not been assessed for conditions more severe than the design standard. However, it is evident that if conditions are sufficiently more severe than the design standard, the overtopping that may result could exceed the permissible overtopping flows for the proposed flood defences which could result in damage and possible failure of flood defences. For context, the following should be considered:

The design standard is 1:100yr fluvial and 1:200yr tidal SoP with allowance for climate change up to 2069 based on the central allowance for fluvial flows for the '2050s' (2040 to 2069) and the higher central allowance for sea level rise. This provides a design standard better than 1:100yr fluvial and 1:200yr tidal SoP for present day climate.

It is recommended that during the lifetime of the proposed defences, the condition and performance of the defences are periodically reviewed against the latest gauge data, modelling data and climate change allowances, and that the risk of damage or failure to the defences are managed, e.g. through future raising and/or strengthening if needed.

**Table 9: Freeboard and proposed design levels excluding settlement allowance at three example locations.**

| | Crews Hall Rd AV_CRH_02 | St Philips Marsh AV_SPM_04 | Cumberland Rd AV_CUM_01 |
|---|---|---|---|
| Defence level (no freeboard) (m AOD) **[A]** | 10.56 | 9.85 | 9.75 |
| Wave allowance (m) **[B1]** | 0.15 | 0.12 | 0.11 |
| Super elevation allowance (m) **[B2]** | 0.00 | 0.07 | 0.00 |
| River water level uncertainty (m) **[C]** | 0.58 | 0.21 | 0.24 |
| Freeboard allowance (m) **[D = B1+B2+C]** | 0.73 | 0.40 | 0.35 |
| Proposed design level excluding settlement allowance (m AOD) **[A+D]** | 11.29 | 10.25 | 10.11 * |

* Note this is 10.11 to 2 decimal places not 10.10 due to rounding within the calculations.

## 8. Conclusions

Hydraulic modelling has been used to estimate the River Avon proposed flood defence levels for Phase 1 required to provide an SoP of 1:100yr fluvial and 1:200yr tidal with allowance for climate change up to 2069. Residual uncertainties in the hydraulic modelling, physical processes and assessment of risk must be considered in the design. It is assumed that residual uncertainties will be managed in the design by:

1. Adjusting the estimated defence levels by adding a "freeboard" allowance to account for residual uncertainties.
2. Routine maintenance of the channel and water retaining assets.

This report has focussed on the residual uncertainties in river water level with scheme in place.

Uncertainty in required defence levels due to the uncertainty in water level has been estimated using the methodology outlined in the current guidance on uncertainty estimation. The uncertainty in water level and physical processes allowances have been added to derive a freeboard allowance to provide a proposed design level for the flood defences to achieve the design standard. These values and the evidence used to derive these are to be used by the project team in the design. The allowances given in this document do not include settlement allowance; this will need to be calculated and incorporated into the design.

It is recommended that the permissible overtopping flow is limited to:

- 0.1 l/s for the sections of flood defence at Crews Hall Road and the upstream part of St Anne's as (a) there are properties immediately behind these sections, and (b) there is little to no floodplain storage volume behind these sections to be able to absorb residual overtopping without causing flooding to properties.
- 1 l/s/m for all other sections of flood defence given proximity of receptors.

If conditions are sufficiently more severe than the design standard, the overtopping that may result could exceed the permissible overtopping flows for the proposed flood defences which could result in damage and possible failure of defences in addition to flood risk / hazard to people, property and infrastructure behind the flood defences. It is recommended that during the lifetime of the proposed flood defences, the condition and performance of the flood defences are periodically reviewed against the latest river gauge data, modelling data and climate change allowances, and that the risk of damage or failure to the flood defences are managed, e.g. through future raising and/or strengthening if needed.

| Defence location | Section reference | Wave Surcharge Allowance | Super-elevation allowance | Physical Processes Allowance | River Water Level Uncertainty Allowance | Total Freeboard excluding settlement allowance * | Flood level (2069) | Nominal Defence level (2069) excluding settlement allowance * |
|---|---|---|---|---|---|---|---|---|
| | | m | m | m | m | m | mAOD | mAOD |
| Crews Hall Rd | AV_CRH_01 | 0.11 | 0.00 | 0.11 | 0.60 | 0.71 | 10.67 | 11.38 |
| Crews Hall Rd | AV_CRH_02 | 0.15 | 0.00 | 0.15 | 0.58 | 0.73 | 10.56 | 11.29 |
| Crews Hall Rd | AV_CRH_03 | 0.18 | 0.00 | 0.18 | 0.57 | 0.76 | 10.52 | 11.28 |
| Crews Hall Rd | AV_CRH_04 | 0.15 | 0.00 | 0.15 | 0.57 | 0.72 | 10.47 | 11.19 |
| St Annes | AV_STA_01 | 0.12 | 0.00 | 0.12 | 0.58 | 0.70 | 10.55 | 11.25 |
| St Annes | AV_STA_02 | 0.14 | 0.00 | 0.14 | 0.57 | 0.71 | 10.47 | 11.18 |
| St Annes | AV_STA_03 | 0.06 | 0.00 | 0.06 | 0.55 | 0.61 | 10.40 | 11.01 |
| St Annes | AV_STA_04 | 0.06 | 0.00 | 0.06 | 0.55 | 0.61 | 10.40 | 11.01 |
| St Annes | AV_STA_05 | 0.06 | 0.00 | 0.06 | 0.55 | 0.61 | 10.37 | 10.98 |
| St Annes | AV_STA_06 | 0.05 | 0.00 | 0.05 | 0.55 | 0.60 | 10.29 | 10.89 |
| Netham Weir | AV_NET_01 | 0.07 | 0.00 | 0.07 | 0.55 | 0.62 | 10.29 | 10.91 |
| Netham Weir | AV_NET_02 | 0.08 | 0.00 | 0.08 | 0.49 | 0.57 | 9.93 | 10.50 |
| Netham Weir | AV_NET_03 | 0.08 | 0.00 | 0.08 | 0.34 | 0.42 | 9.92 | 10.34 |
| Whitby Road | AV_WHT_01 | 0.04 | 0.00 | 0.04 | 0.31 | 0.35 | 9.91 | 10.26 |
| Paintworks | AV_PNT_01 | 0.09 | 0.00 | 0.09 | 0.20 | 0.29 | 9.90 | 10.19 |
| Sparke Evans Park | AV_SEP_01 | 0.10 | 0.00 | 0.10 | 0.20 | 0.30 | 9.90 | 10.20 |
| St Philips Marsh | AV_SPM_01 | 0.09 | 0.00 | 0.09 | 0.20 | 0.29 | 9.90 | 10.19 |
| St Philips Marsh | AV_SPM_02 | 0.08 | 0.00 | 0.08 | 0.20 | 0.28 | 9.88 | 10.16 |
| St Philips Marsh | AV_SPM_03 | 0.07 | 0.00 | 0.07 | 0.20 | 0.27 | 9.87 | 10.14 |
| St Philips Marsh | AV_SPM_04 | 0.12 | 0.07 | 0.19 | 0.21 | 0.40 | 9.85 | 10.25 |
| Temple Meads | AV_TEM_01 | 0.06 | 0.00 | 0.06 | 0.21 | 0.27 | 9.85 | 10.12 |
| Clarence Rd | AV_CLA_01 | 0.08 | 0.00 | 0.08 | 0.21 | 0.29 | 9.84 | 10.13 |
| Clarence Rd | AV_CLA_02 | 0.09 | 0.00 | 0.09 | 0.22 | 0.31 | 9.83 | 10.14 |
| Commercial Rd | AV_COM_01 | 0.20 | 0.00 | 0.20 | 0.23 | 0.43 | 9.78 | 10.21 |
| Bathurst Dam | AV_BAT_01 | 0.08 | 0.00 | 0.08 | 0.24 | 0.32 | 9.77 | 10.09 |
| Coronation Rd | AV_COR_01 | 0.07 | 0.00 | 0.07 | 0.23 | 0.30 | 9.78 | 10.08 |
| Cumberland Rd | AV_CUM_01 | 0.11 | 0.00 | 0.11 | 0.24 | 0.35 | 9.75 | 10.11 |
| Cumberland Rd | AV_CUM_02 | 0.13 | 0.00 | 0.13 | 0.25 | 0.39 | 9.74 | 10.12 |
| Bristol Metal Spraying | AV_BMS_01 | 0.08 | 0.00 | 0.08 | 0.25 | 0.34 | 9.73 | 10.06 |
| Chocolate Path | AV_CHO_01 | 0.10 | 0.00 | 0.10 | 0.25 | 0.35 | 9.72 | 10.07 |
| Chocolate Path | AV_CHO_02 | 0.19 | 0.00 | 0.19 | 0.24 | 0.44 | 9.71 | 10.15 |
| Brunel Dam | AV_BRU_01 | 0.12 | 0.00 | 0.12 | 0.25 | 0.37 | 9.71 | 10.07 |
| Entrance Lock bank | AV_ENB_01 | 0.11 | 0.00 | 0.11 | 0.25 | 0.36 | 9.71 | 10.06 |
| Entrance Lock Gate | AV_ENT_01 | 0.13 | 0.00 | 0.13 | 0.24 | 0.37 | 9.70 | 10.08 |
| Hotwell Rd south | AV_HTS_01 | 0.10 | 0.00 | 0.10 | 0.24 | 0.34 | 9.70 | 10.05 |
| Freeland Place | AV_FRL_01 | 0.16 | 0.00 | 0.16 | 0.24 | 0.40 | 9.70 | 10.11 |
| Hotwell Rd north | AV_HTN_01 | 0.10 | 0.00 | 0.10 | 0.25 | 0.35 | 9.69 | 10.05 |
| Ashton | AV_ASH_01 | 0.06 | 0.05 | 0.11 | 0.25 | 0.36 | 9.72 | 10.08 |
| Ashton | AV_ASH_02 | 0.16 | 0.08 | 0.24 | 0.24 | 0.49 | 9.71 | 10.20 |
| Ashton | AV_ASH_03 | 0.08 | 0.00 | 0.08 | 0.24 | 0.33 | 9.71 | 10.03 |
| Ashton | AV_ASH_04 | 0.09 | 0.00 | 0.09 | 0.25 | 0.34 | 9.70 | 10.04 |
| Sea Mills Lane | AV_SML_01 | 0.17 | 0.00 | 0.17 | 0.24 | 0.41 | 9.65 | 10.06 |
| Sea Mills Lane | AV_SML_02 | 0.25 | 0.00 | 0.25 | 0.24 | 0.49 | 9.65 | 10.14 |
| Sea Mills sports pitch | AV_SMS_01 | 0.13 | 0.00 | 0.13 | 0.24 | 0.37 | 9.65 | 10.02 |
| Sea Mills rail line north | AV_SMR_01 | 0.20 | 0.00 | 0.20 | 0.24 | 0.44 | 9.65 | 10.09 |
| Shirehampton east bank | AV_SHE_01 | 0.12 | 0.00 | 0.12 | 0.25 | 0.37 | 9.58 | 9.95 |
| Shirehampton east bank | AV_SHE_02 | 0.14 | 0.00 | 0.14 | 0.25 | 0.39 | 9.58 | 9.97 |
| Shirehampton east bank | AV_SHE_03 | 0.15 | 0.00 | 0.15 | 0.25 | 0.40 | 9.57 | 9.97 |
| Shirehampton Station Rd | AV_SHS_01 | 0.18 | 0.00 | 0.18 | 0.25 | 0.43 | 9.56 | 9.99 |
| Shirehampton west bank | AV_SHW_01 | 0.13 | 0.00 | 0.13 | 0.25 | 0.38 | 9.55 | 9.93 |
| Shirehampton west bank | AV_SHW_02 | 0.27 | 0.00 | 0.27 | 0.25 | 0.52 | 9.55 | 10.07 |
| Pill hard defence | AV_PLH_01 | 0.16 | 0.00 | 0.16 | 0.25 | 0.41 | 9.57 | 9.97 |
| Pill bank | AV_PLB_01 | 0.18 | 0.00 | 0.18 | 0.25 | 0.43 | 9.55 | 9.98 |
| Pill bank | AV_PLB_02 | 0.19 | 0.00 | 0.19 | 0.25 | 0.44 | 9.55 | 9.98 |
| Feeder Road | FC_FRD_01 | 0.05 | 0.00 | 0.05 | 0.36 | 0.41 | 8.33 | 8.74 |
| Feeder Road | FC_FRD_02 | 0.07 | 0.00 | 0.07 | 0.36 | 0.43 | 8.33 | 8.76 |

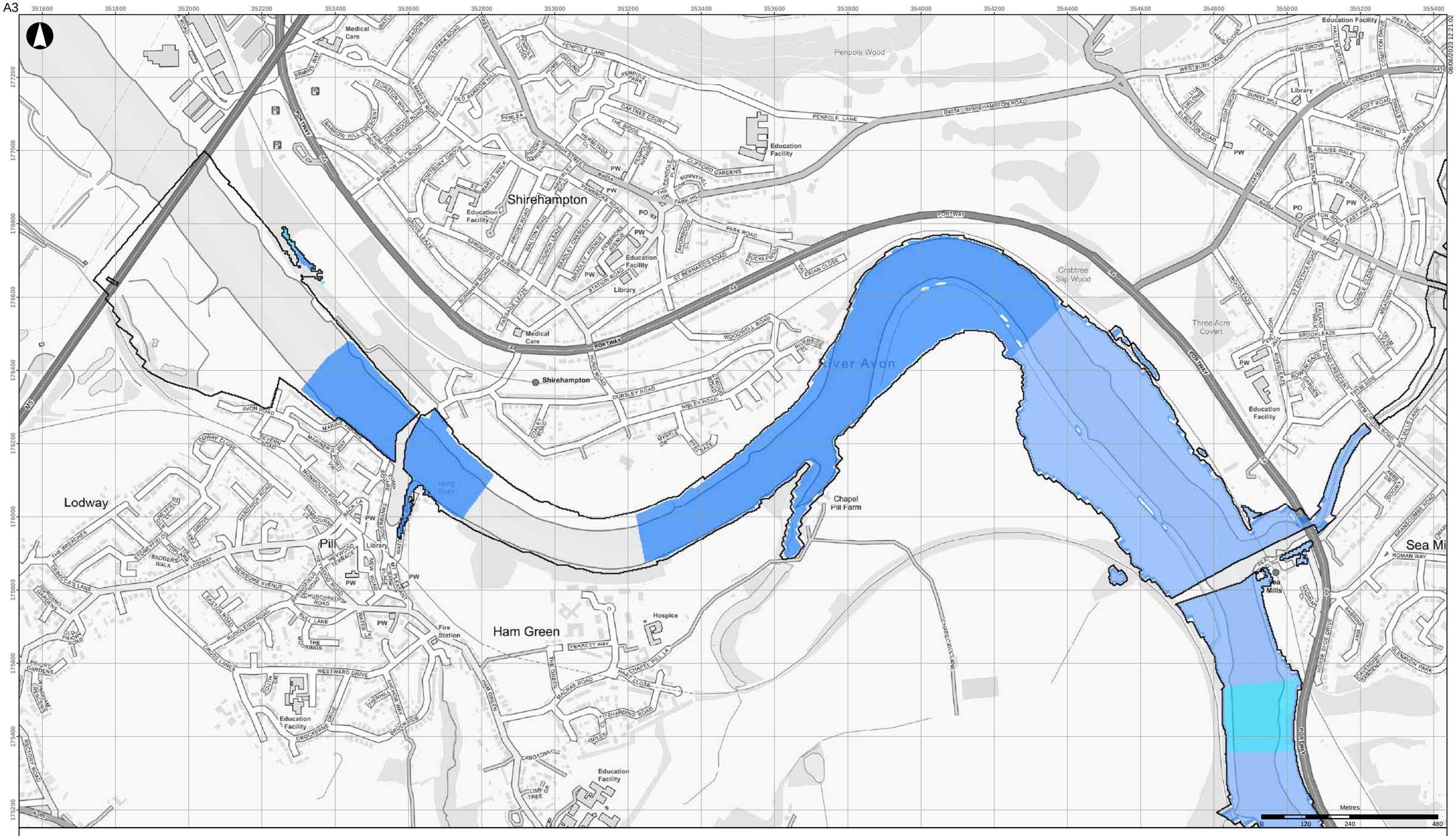
* Note values presented are rounded to 2 decimal places. In some cases this may result in an apparent discrepency of 0.01m.

| | | | Used in RUA report (9th August) | | | | | | | Oct 2023 updates | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Defence location | Section reference | Level to use for Phase 1 | Wave Surcharge Allowance | Super-elevation allowance | Physical Processes Allowance | River Water Level Uncertainty Allowance | Total Freeboard excluding settlement allowance * | Flood level (2069) - these values are superseded | Nominal Defence level (2069) excluding settlement allowance * - these values are superseded | Flood level (2069) | Nominal Defence level (2069) excluding settlement allowance * | Change in Nominal Defence Level (2069) since August | Flood level (2130) | Nominal Defence level (2130) excluding settlement allowance * |
| | | | m | m | m | m | m | mAOD | mAOD | mAOD | mAOD | m | mAOD | mAOD |
| Ashton | AV_ASH_01 | 2130 level without freeboard | 0.06 | 0.05 | 0.11 | 0.25 | 0.36 | 9.72 | 10.08 | 9.73 | 10.09 | 0.01 | 10.45 | 10.81 |
| Ashton | AV_ASH_02 | 2069 level with freeboard | 0.16 | 0.08 | 0.24 | 0.24 | 0.49 | 9.71 | 10.20 | 9.72 | 10.21 | 0.01 | 10.45 | 10.94 |
| Ashton | AV_ASH_03 | 2130 level without freeboard | 0.08 | 0.00 | 0.08 | 0.24 | 0.33 | 9.71 | 10.03 | 9.72 | 10.05 | 0.01 | 10.44 | 10.77 |
| Ashton | AV_ASH_04 | 2130 level without freeboard | 0.09 | 0.00 | 0.09 | 0.25 | 0.34 | 9.70 | 10.04 | 9.71 | 10.05 | 0.01 | 10.44 | 10.78 |
| Bathurst Dam | AV_BAT_01 | 2069 level with freeboard | 0.08 | 0.00 | 0.08 | 0.24 | 0.32 | 9.77 | 10.09 | 9.79 | 10.11 | 0.02 | 10.51 | 10.83 |
| Bristol Metal Spraying | AV_BMS_01 | 2130 level without freeboard | 0.08 | 0.00 | 0.08 | 0.25 | 0.34 | 9.73 | 10.06 | 9.74 | 10.08 | 0.02 | 10.46 | 10.80 |
| Brunel Dam | AV_BRU_01 | 2069 level with freeboard | 0.12 | 0.00 | 0.12 | 0.25 | 0.37 | 9.71 | 10.07 | 9.72 | 10.09 | 0.01 | 10.44 | 10.81 |
| Chocolate Path | AV_CHO_01 | 2069 level with freeboard with upstream part increased by 0.23m | 0.10 | 0.00 | 0.10 | 0.25 | 0.35 | 9.72 | 10.07 | 9.73 | 10.08 | 0.01 | 10.46 | 10.81 |
| Chocolate Path | AV_CHO_02 | 2069 level with freeboard | 0.19 | 0.00 | 0.19 | 0.24 | 0.44 | 9.71 | 10.15 | 9.72 | 10.16 | 0.01 | 10.45 | 10.89 |
| Clarence Rd | AV_CLA_01 | 2069 level with freeboard + 0.12m | 0.08 | 0.00 | 0.08 | 0.21 | 0.29 | 9.84 | 10.13 | 9.83 | 10.12 | -0.01 | 10.53 | 10.82 |
| Clarence Rd | AV_CLA_02 | 2069 level with freeboard + 0.11m | 0.09 | 0.00 | 0.09 | 0.22 | 0.31 | 9.83 | 10.14 | 9.81 | 10.12 | -0.02 | 10.52 | 10.83 |
| Commercial Rd | AV_COM_01 | 2069 level with freeboard | 0.20 | 0.00 | 0.20 | 0.23 | 0.43 | 9.78 | 10.21 | 9.80 | 10.23 | 0.02 | 10.52 | 10.95 |
| Coronation Rd | AV_COR_01 | 2069 level with freeboard | 0.07 | 0.00 | 0.07 | 0.23 | 0.30 | 9.78 | 10.08 | 9.80 | 10.10 | 0.02 | 10.52 | 10.82 |
| Crews Hall Rd | AV_CRH_01 | 2069 level with freeboard | 0.11 | 0.00 | 0.11 | 0.60 | 0.71 | 10.67 | 11.38 | 10.66 | 11.37 | -0.01 | 11.33 | 12.04 |
| Crews Hall Rd | AV_CRH_02 | 2069 level with freeboard | 0.15 | 0.00 | 0.15 | 0.58 | 0.73 | 10.56 | 11.29 | 10.56 | 11.29 | 0.00 | 11.25 | 11.98 |
| Crews Hall Rd | AV_CRH_03 | 2069 level with freeboard | 0.18 | 0.00 | 0.18 | 0.57 | 0.76 | 10.52 | 11.28 | 10.52 | 11.28 | 0.00 | 11.22 | 11.98 |
| Crews Hall Rd | AV_CRH_04 | 2069 level with freeboard | 0.15 | 0.00 | 0.15 | 0.57 | 0.72 | 10.47 | 11.19 | 10.46 | 11.18 | -0.01 | 11.18 | 11.90 |
| Cumberland Rd | AV_CUM_01 | 2069 level with freeboard with middle part increased by 0.18m | 0.11 | 0.00 | 0.11 | 0.24 | 0.35 | 9.75 | 10.11 | 9.77 | 10.12 | 0.02 | 10.48 | 10.83 |
| Cumberland Rd | AV_CUM_02 | 2069 level with freeboard | 0.13 | 0.00 | 0.13 | 0.25 | 0.39 | 9.74 | 10.12 | 9.75 | 10.14 | 0.01 | 10.47 | 10.86 |
| Entrance Lock bank | AV_ENB_01 | 2069 level with freeboard | 0.11 | 0.00 | 0.11 | 0.25 | 0.36 | 9.71 | 10.06 | 9.72 | 10.08 | 0.01 | 10.44 | 10.80 |
| Entrance Lock Gate | AV_ENT_01 | 2069 level with freeboard | 0.13 | 0.00 | 0.13 | 0.24 | 0.37 | 9.70 | 10.08 | 9.71 | 10.08 | 0.01 | 10.44 | 10.81 |
| Freeland Place | AV_FRL_01 | 2130 level without freeboard | 0.16 | 0.00 | 0.16 | 0.24 | 0.40 | 9.70 | 10.11 | 9.71 | 10.11 | 0.01 | 10.44 | 10.84 |
| Hotwell Rd north | AV_HTN_01 | 2130 level without freeboard | 0.10 | 0.00 | 0.10 | 0.25 | 0.35 | 9.69 | 10.05 | 9.70 | 10.05 | 0.01 | 10.44 | 10.79 |
| Hotwell Rd south | AV_HTS_01 | 2069 level with freeboard | 0.10 | 0.00 | 0.10 | 0.24 | 0.34 | 9.70 | 10.05 | 9.71 | 10.05 | 0.01 | 10.44 | 10.78 |
| Netham Weir | AV_NET_01 | 2069 level with freeboard | 0.07 | 0.00 | 0.07 | 0.55 | 0.62 | 10.29 | 10.91 | 10.30 | 10.92 | 0.01 | 11.06 | 11.68 |
| Netham Weir | AV_NET_02 | 2069 level with freeboard | 0.08 | 0.00 | 0.08 | 0.49 | 0.57 | 9.93 | 10.50 | 9.93 | 10.50 | 0.00 | 10.63 | 11.20 |
| Netham Weir | AV_NET_03 | 2069 level with freeboard | 0.08 | 0.00 | 0.08 | 0.34 | 0.42 | 9.92 | 10.34 | 9.93 | 10.35 | 0.01 | 10.59 | 11.01 |
| Pill bank | AV_PLB_01 | 2130 level without freeboard | 0.18 | 0.00 | 0.18 | 0.25 | 0.43 | 9.55 | 9.98 | 9.56 | 9.99 | 0.01 | 10.30 | 10.73 |
| Pill bank | AV_PLB_02 | 2130 level without freeboard | 0.19 | 0.00 | 0.19 | 0.25 | 0.44 | 9.55 | 9.98 | 9.55 | 9.99 | 0.00 | 10.30 | 10.74 |
| Pill hard defence | AV_PLH_01 | 2130 level without freeboard | 0.16 | 0.00 | 0.16 | 0.25 | 0.41 | 9.57 | 9.97 | 9.57 | 9.98 | 0.00 | 10.31 | 10.72 |
| Paintworks | AV_PNT_01 | 2069 level with freeboard and middle part increased by 0.06m | 0.09 | 0.00 | 0.09 | 0.20 | 0.29 | 9.90 | 10.19 | 9.90 | 10.19 | 0.00 | 10.55 | 10.84 |
| Sparke Evans Park | AV_SEP_01 | 2069 level with freeboard | 0.10 | 0.00 | 0.10 | 0.20 | 0.30 | 9.90 | 10.20 | 9.90 | 10.20 | 0.00 | 10.55 | 10.85 |
| Shirehampton east bank | AV_SHE_01 | 2130 level without freeboard | 0.12 | 0.00 | 0.12 | 0.25 | 0.37 | 9.58 | 9.95 | 9.59 | 9.96 | 0.01 | 10.33 | 10.70 |
| Shirehampton east bank | AV_SHE_02 | 2130 level without freeboard | 0.14 | 0.00 | 0.14 | 0.25 | 0.39 | 9.58 | 9.97 | 9.59 | 9.98 | 0.01 | 10.32 | 10.71 |

| | | | Used in RUA report (9th August) | | | | | | | Oct 2023 updates | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Defence location | Section reference | Level to use for Phase 1 | Wave Surcharge Allowance | Super-elevation allowance | Physical Processes Allowance | River Water Level Uncertainty Allowance | Total Freeboard excluding settlement allowance * | Flood level (2069) - these values are superseded | Nominal Defence level (2069) excluding settlement allowance * - these values are superseded | Flood level (2069) | Nominal Defence level (2069) excluding settlement allowance * | Change in Nominal Defence Level (2069) since August | Flood level (2130) | Nominal Defence level (2130) excluding settlement allowance * |
| | | | m | m | m | m | m | mAOD | mAOD | mAOD | mAOD | m | mAOD | mAOD |
| Shirehampton east bank | AV_SHE_03 | 2130 level without freeboard | 0.15 | 0.00 | 0.15 | 0.25 | 0.40 | 9.57 | 9.97 | 9.58 | 9.98 | 0.01 | 10.32 | 10.72 |
| Shirehampton Station Rd | AV_SHS_01 | 2130 level without freeboard | 0.18 | 0.00 | 0.18 | 0.25 | 0.43 | 9.56 | 9.99 | 9.57 | 10.00 | 0.01 | 10.31 | 10.74 |
| Shirehampton west bank | AV_SHW_01 | 2130 level without freeboard | 0.13 | 0.00 | 0.13 | 0.25 | 0.38 | 9.56 | 9.94 | 9.57 | 9.95 | 0.01 | 10.31 | 10.69 |
| Shirehampton west bank | AV_SHW_02 | 2130 level without freeboard | 0.27 | 0.00 | 0.27 | 0.25 | 0.52 | 9.55 | 10.07 | 9.56 | 10.08 | 0.01 | 10.30 | 10.82 |
| Sea Mills Lane | AV_SML_01 | 2069 level with freeboard | 0.17 | 0.00 | 0.17 | 0.24 | 0.41 | 9.65 | 10.06 | 9.66 | 10.07 | 0.01 | 10.39 | 10.80 |
| Sea Mills Lane | AV_SML_02 | 2130 level without freeboard | 0.25 | 0.00 | 0.25 | 0.24 | 0.49 | 9.65 | 10.14 | 9.65 | 10.14 | 0.00 | 10.39 | 10.88 |
| Sea Mills rail line north | AV_SMR_01 | 2130 level without freeboard | 0.20 | 0.00 | 0.20 | 0.24 | 0.44 | 9.65 | 10.09 | 9.65 | 10.09 | 0.00 | 10.39 | 10.83 |
| Sea Mills sports pitch | AV_SMS_01 | 2130 level without freeboard | 0.13 | 0.00 | 0.13 | 0.24 | 0.37 | 9.65 | 10.02 | 9.65 | 10.02 | 0.00 | 10.39 | 10.76 |
| St Philips Marsh | AV_SPM_01 | 2069 level with freeboard | 0.09 | 0.00 | 0.09 | 0.20 | 0.29 | 9.90 | 10.19 | 9.90 | 10.19 | 0.01 | 10.54 | 10.83 |
| St Philips Marsh | AV_SPM_02 | 2069 level with freeboard | 0.08 | 0.00 | 0.08 | 0.20 | 0.28 | 9.88 | 10.16 | 9.87 | 10.15 | -0.01 | 10.54 | 10.82 |
| St Philips Marsh | AV_SPM_03 | 2069 level with freeboard | 0.07 | 0.00 | 0.07 | 0.20 | 0.27 | 9.87 | 10.14 | 9.86 | 10.13 | -0.01 | 10.54 | 10.81 |
| St Philips Marsh | AV_SPM_04 | 2069 level with freeboard | 0.12 | 0.07 | 0.19 | 0.21 | 0.40 | 9.85 | 10.25 | 9.84 | 10.24 | -0.01 | 10.54 | 10.94 |
| St Annes | AV_STA_01 | 2069 level with freeboard | 0.12 | 0.00 | 0.12 | 0.58 | 0.70 | 10.55 | 11.25 | 10.54 | 11.24 | -0.01 | 11.24 | 11.94 |
| St Annes | AV_STA_02 | 2069 level with freeboard | 0.14 | 0.00 | 0.14 | 0.57 | 0.71 | 10.47 | 11.18 | 10.46 | 11.17 | -0.01 | 11.18 | 11.89 |
| St Annes | AV_STA_03 | 2069 level with freeboard | 0.06 | 0.00 | 0.06 | 0.55 | 0.61 | 10.40 | 11.01 | 10.39 | 11.00 | -0.01 | 11.12 | 11.73 |
| St Annes | AV_STA_04 | 2069 level with freeboard | 0.06 | 0.00 | 0.06 | 0.55 | 0.61 | 10.40 | 11.01 | 10.39 | 11.00 | -0.01 | 11.12 | 11.73 |
| St Annes | AV_STA_05 | 2069 level with freeboard | 0.06 | 0.00 | 0.06 | 0.55 | 0.61 | 10.37 | 10.98 | 10.37 | 10.98 | 0.00 | 11.10 | 11.71 |
| St Annes | AV_STA_06 | 2069 level with freeboard | 0.05 | 0.00 | 0.05 | 0.55 | 0.60 | 10.29 | 10.89 | 10.29 | 10.89 | 0.00 | 11.03 | 11.63 |
| Temple Meads | AV_TEM_01 | 2069 level with freeboard | 0.06 | 0.00 | 0.06 | 0.21 | 0.27 | 9.85 | 10.12 | 9.83 | 10.10 | -0.02 | 10.53 | 10.80 |
| Whitby Road | AV_WHT_01 | 2130 level without freeboard | 0.04 | 0.00 | 0.04 | 0.31 | 0.35 | 9.91 | 10.26 | 9.92 | 10.27 | 0.01 | 10.56 | 10.91 |
| Feeder Road | FC_FRD_01 | 2069 level with freeboard | 0.05 | 0.00 | 0.05 | 0.36 | 0.41 | 8.33 | 8.74 | 8.35 | 8.76 | 0.02 | 8.78 | 9.19 |
| Feeder Road | FC_FRD_02 | 2069 level with freeboard | 0.07 | 0.00 | 0.07 | 0.36 | 0.43 | 8.33 | 8.76 | 8.35 | 8.78 | 0.02 | 8.78 | 9.21 |

* Note values presented are rounded to 2 decimal places. In some cases this may result in an apparent discrepency of 0.01m.

A3




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Scheme defences
Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

Contains OS data (C) Crown Copyright and database right 2023

Notes:

Based on the BAFS OBC model version v033_25.
Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Detriment for scheme without det mitigation**
**2065 fluvial 1:100yr event**
**Downstream areas**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

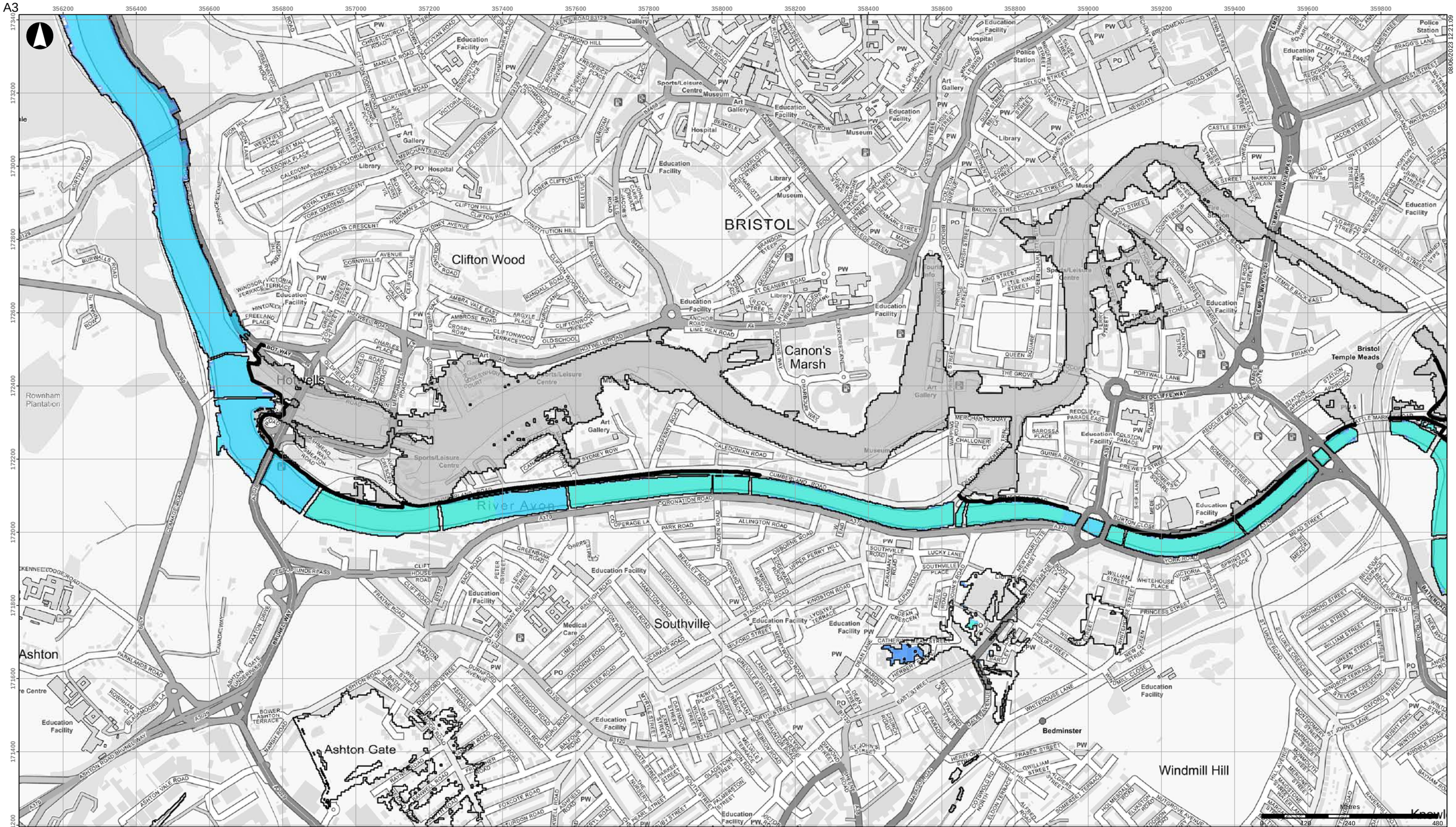
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-012**

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A3




08/06/2023 12:21:09

## Scheme defences

Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

Based on the BAFS OBC model version v033_25.
Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Detriment for scheme without det mitigation**
**2065 fluvial 1:100yr event**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

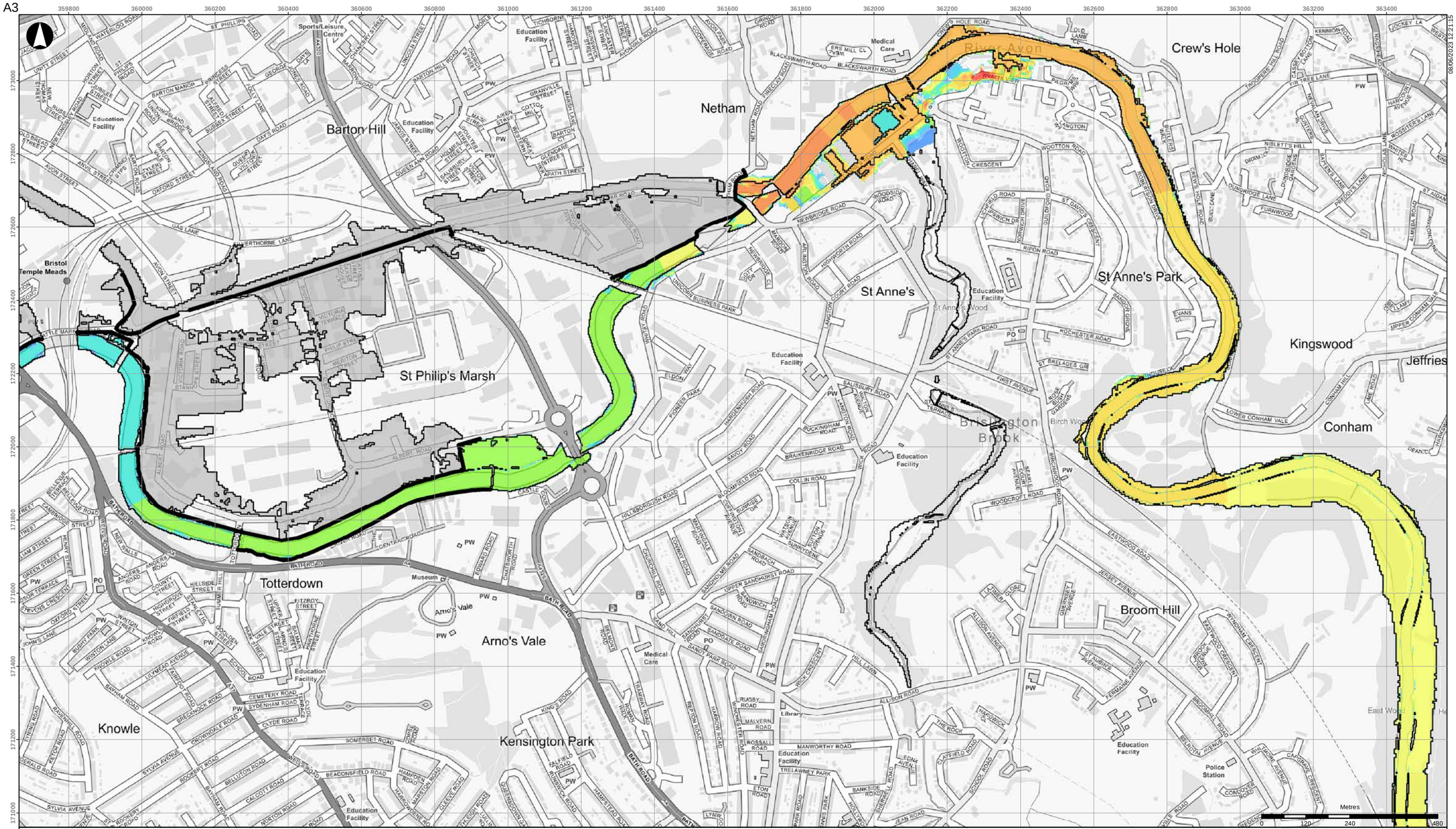
Name

**285982-ARP-XX-DR-MOD-013**

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A3




- Scheme defences
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

Based on the BAFS OBC model version v033_25.
Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Detriment for scheme without det mitigation**
**2065 fluvial 1:100yr event**
**Netham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

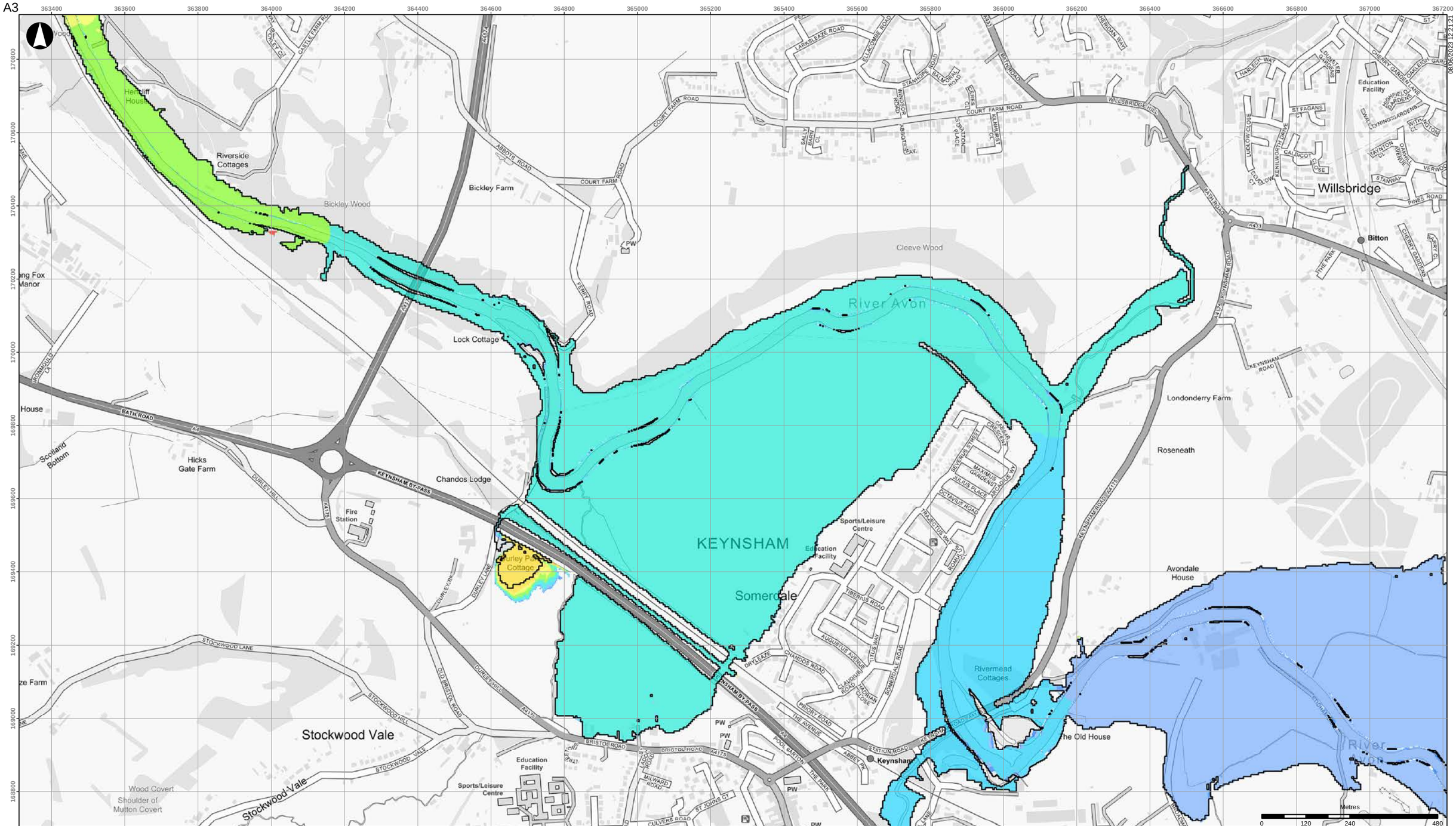
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-014**

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08/06/2023 12:21:21

- Scheme defences
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

Contains OS data (C) Crown Copyright and database right 2023

Notes:

Based on the BAFS OBC model version v033_25.
Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Detriment for scheme without det mitigation**
**2065 fluvial 1:100yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

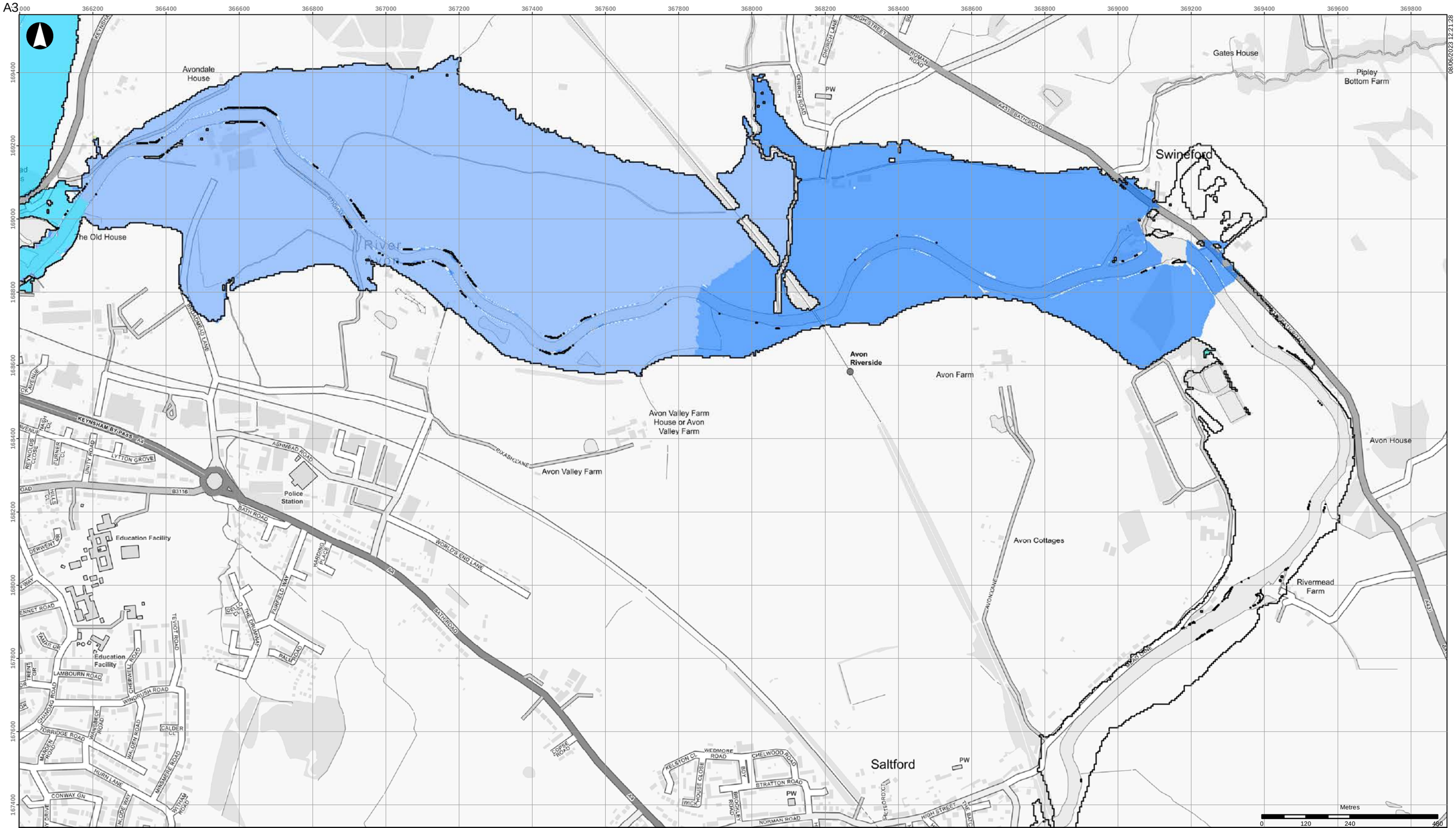
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Scheme defences

Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

Contains OS data (C) Crown Copyright and database right 2023

Notes:

Based on the BAFS OBC model version v033_25.
Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Project Title

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Drawing Title

**Detriment for scheme without det mitigation**
**2065 fluvial 1:100yr event**
**Swineford area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

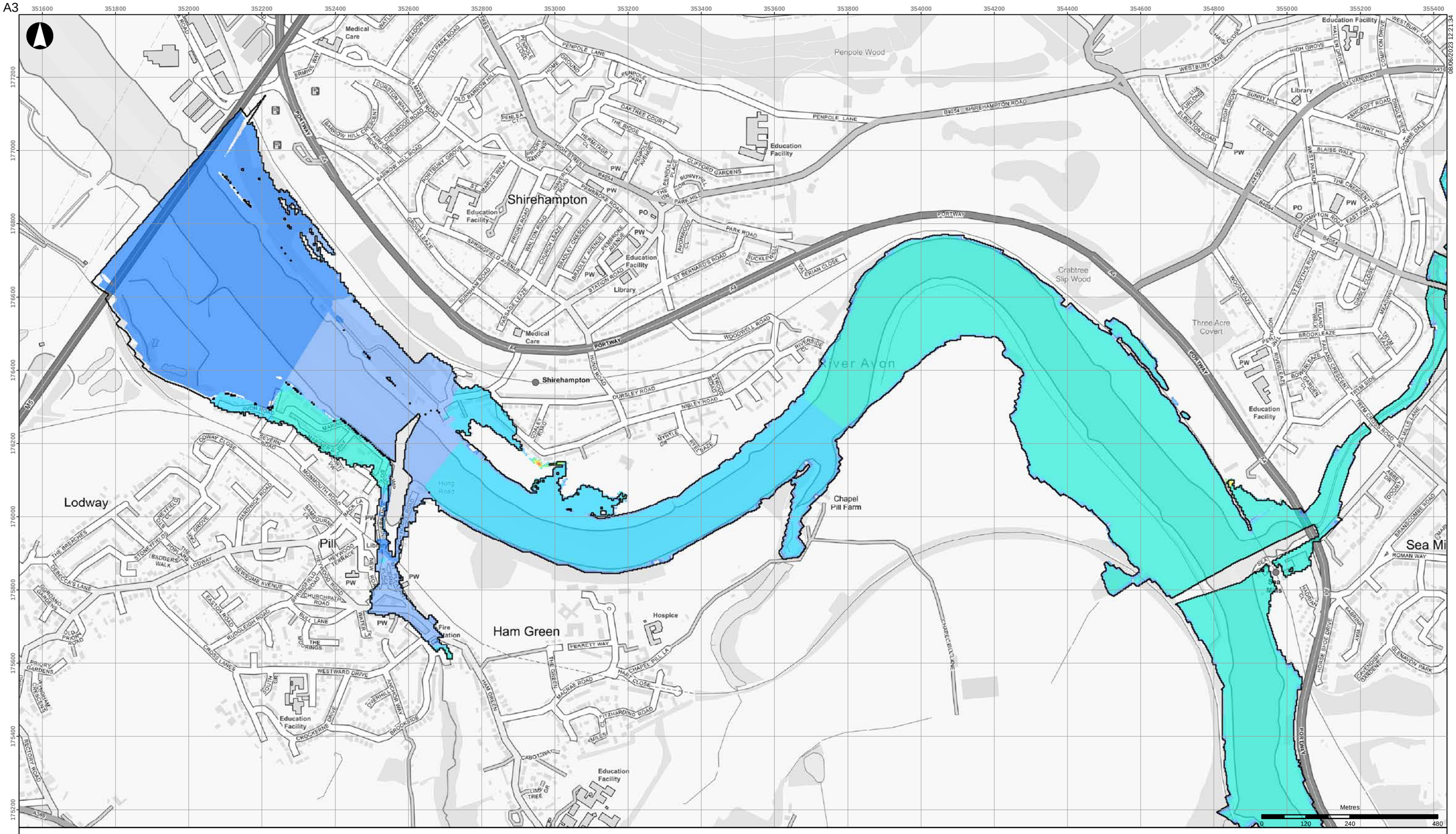
Name

**285982-ARP-XX-DR-MOD-016**

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- Scheme defences
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

Contains OS data (C) Crown Copyright and database right 2023

Notes:

Based on the BAFS OBC model version v033_25.
Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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**Bristol Avon Flood Strategy OBC**

Drawing Title
**Detriment for scheme without det mitigation**
**2065 tidal 1:200yr event**
**Downstream areas**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

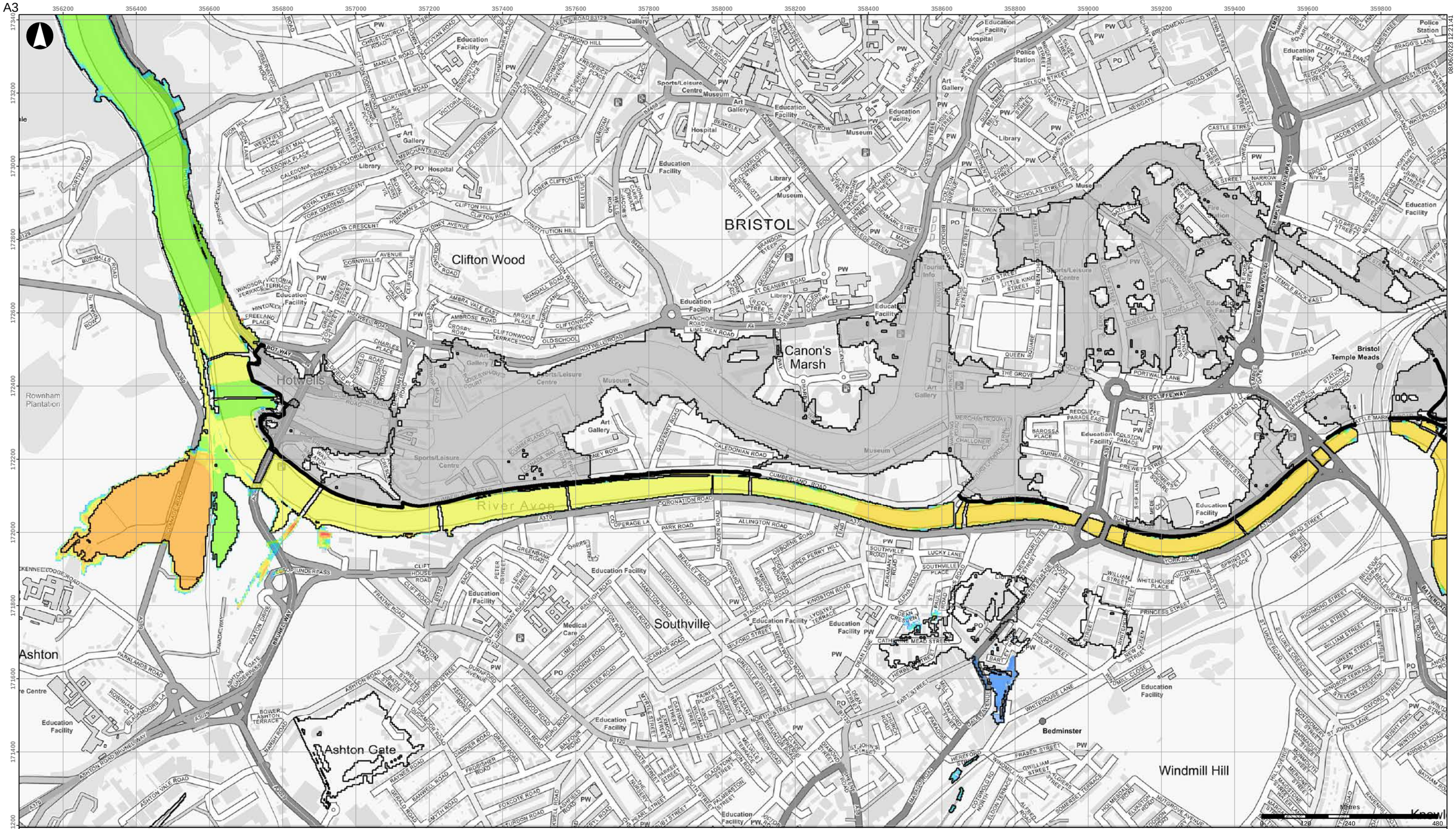
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-017**

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## Scheme defences

Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

Based on the BAFS OBC model version v033_25.
Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Drawing Title

**Detriment for scheme without det mitigation**
**2065 tidal 1:200yr event**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

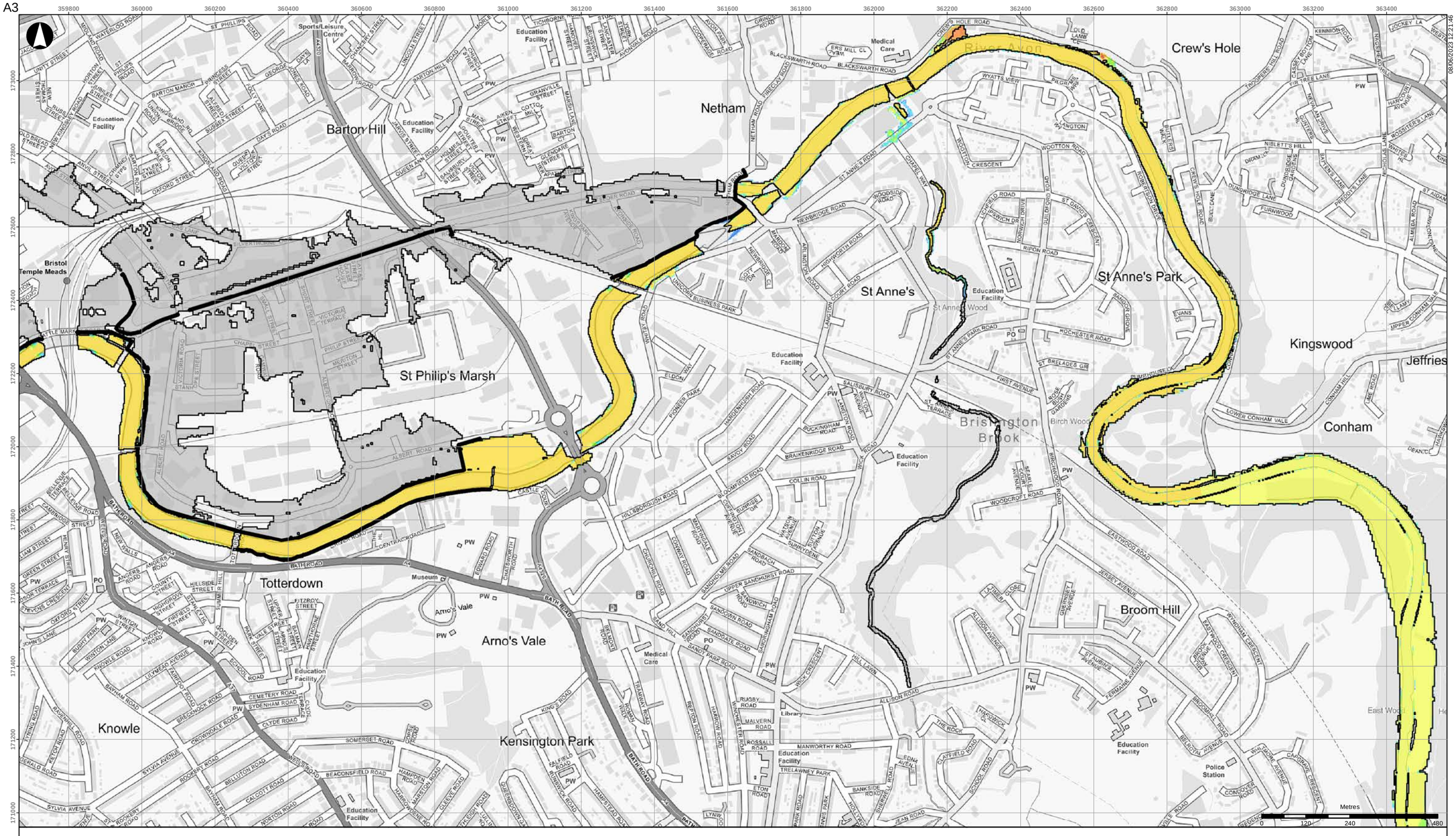
Name

**285982-ARP-XX-DR-MOD-018**

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- Scheme defences
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

Contains OS data (C) Crown Copyright and database right 2023

Notes:

Based on the BAFS OBC model version v033_25.
Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Drawing Title
**Detriment for scheme without det mitigation**
**2065 tidal 1:200yr event**
**Netham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

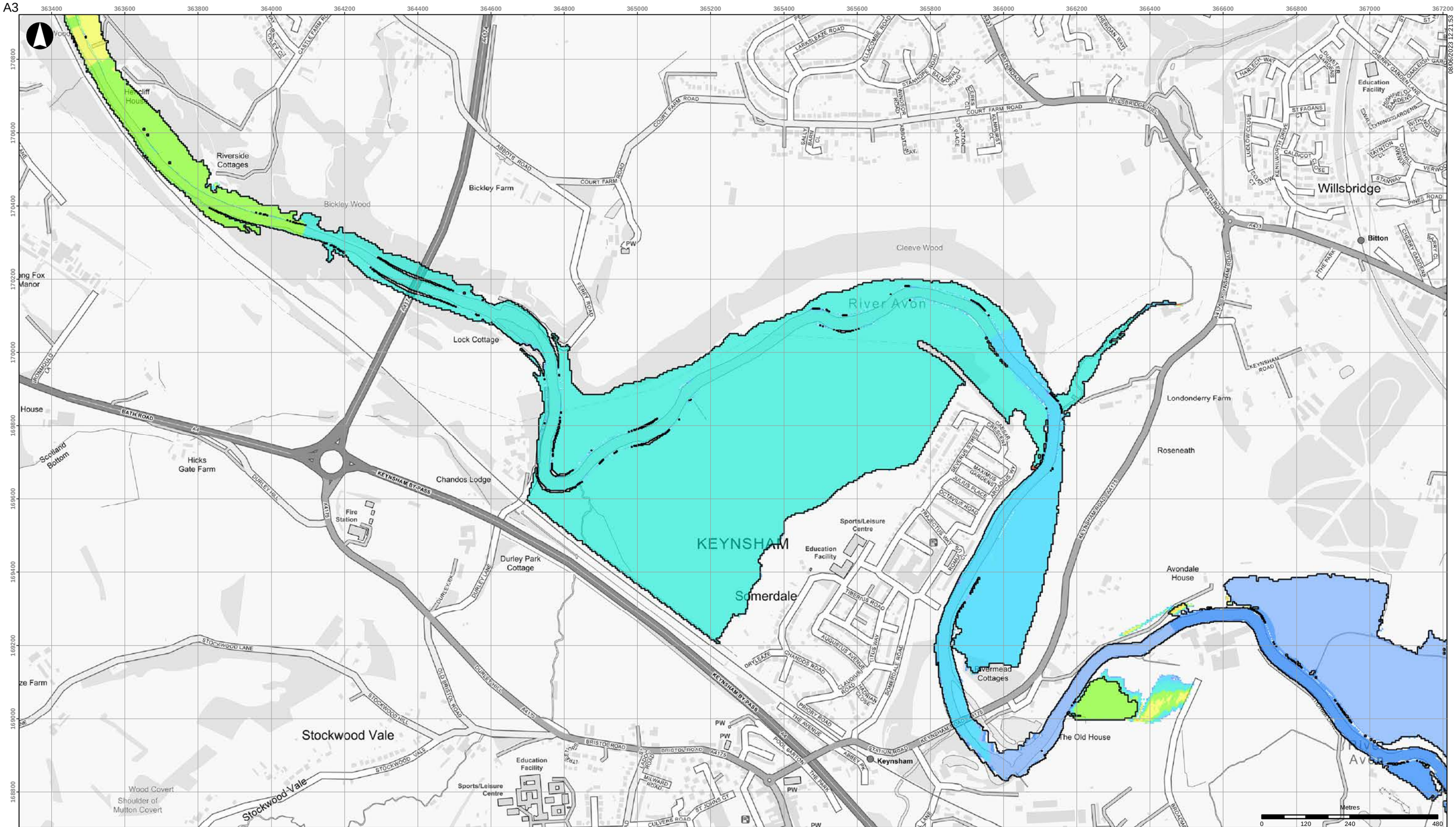
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-019**



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06/06/2023 12:21:53

Scheme defences
Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

Based on the BAFS OBC model version v033_25.
Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Drawing Title
**Detriment for scheme without det mitigation**
**2065 tidal 1:200yr event**
**Keynsham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

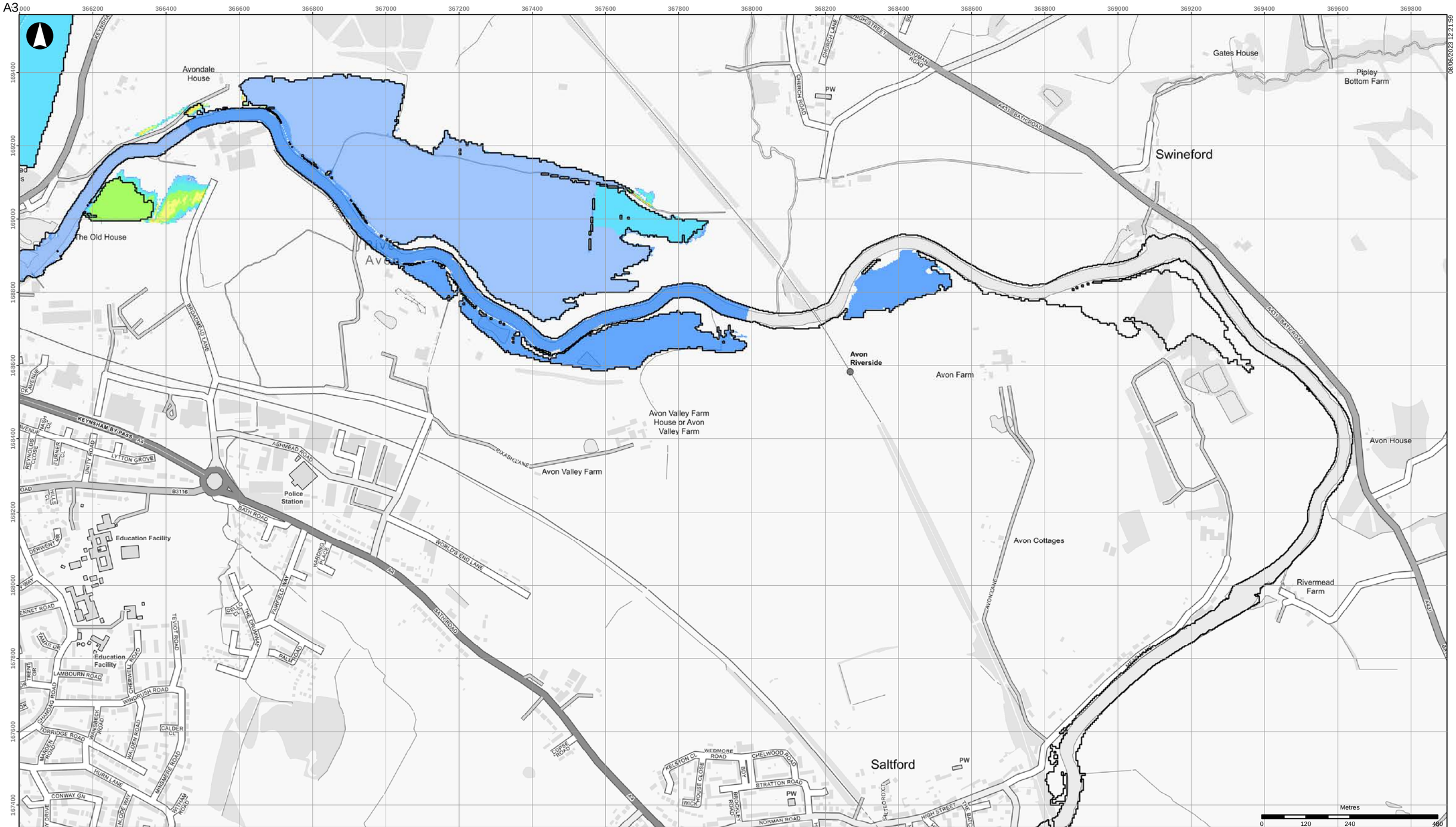
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-020**

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Scheme defences

Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Drawing Title

**Detriment for scheme without det mitigation**
**2065 tidal 1:200yr event**
**Swineford area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

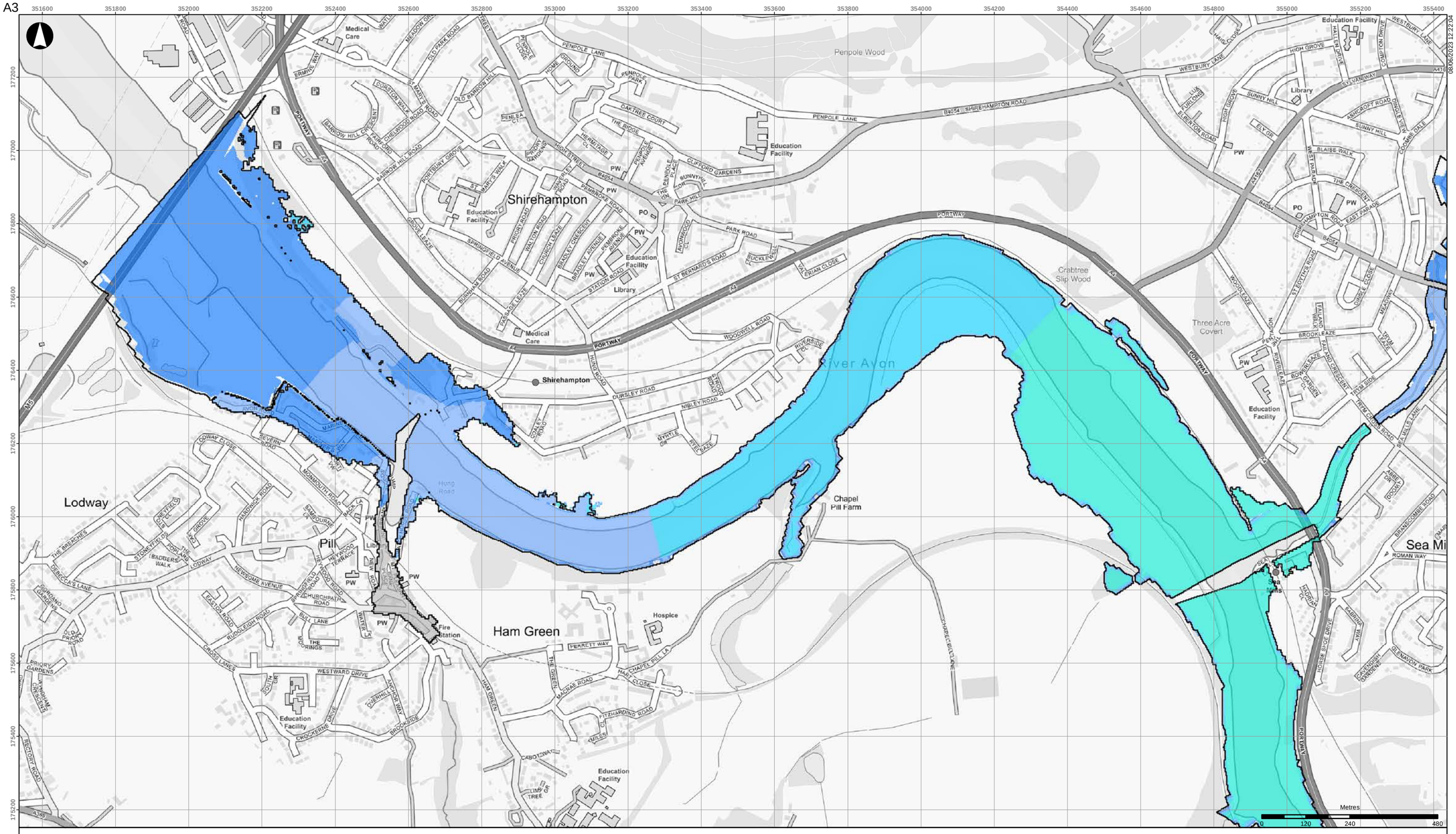
Name

**285982-ARP-XX-DR-MOD-021**

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- Scheme defences
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

Contains OS data (C) Crown Copyright and database right 2023

Notes:

Based on the BAFS OBC model version v033_25.
Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Client
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Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Detriment for scheme without det mitigation**
**2130 fluvial 1:100yr event**
**Downstream areas**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

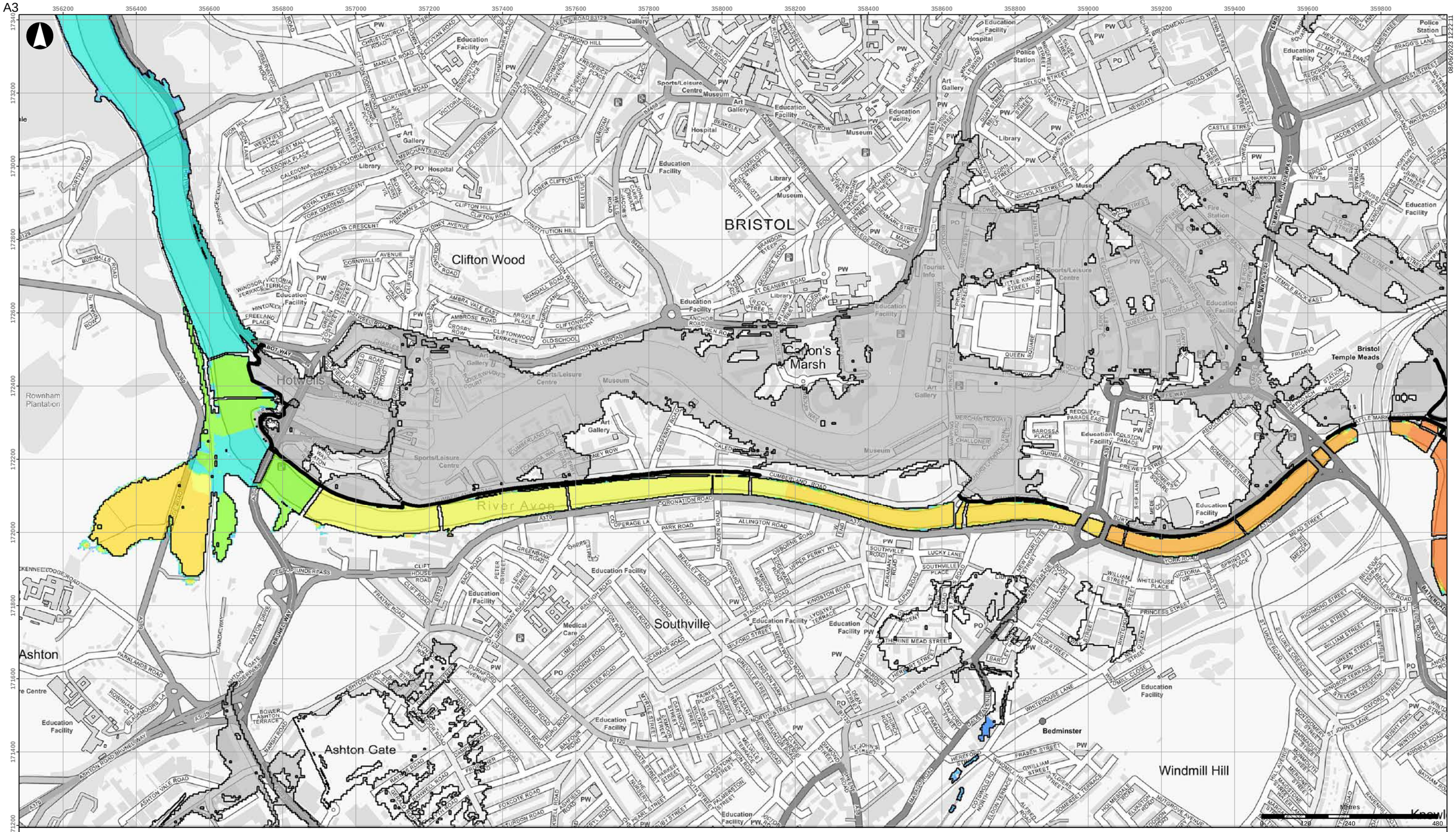
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Scheme defences

Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

Contains OS data (C) Crown Copyright and database right 2023

Notes:

Based on the BAFS OBC model version v033_25.
Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Detriment for scheme without det mitigation**
**2130 fluvial 1:100yr event**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

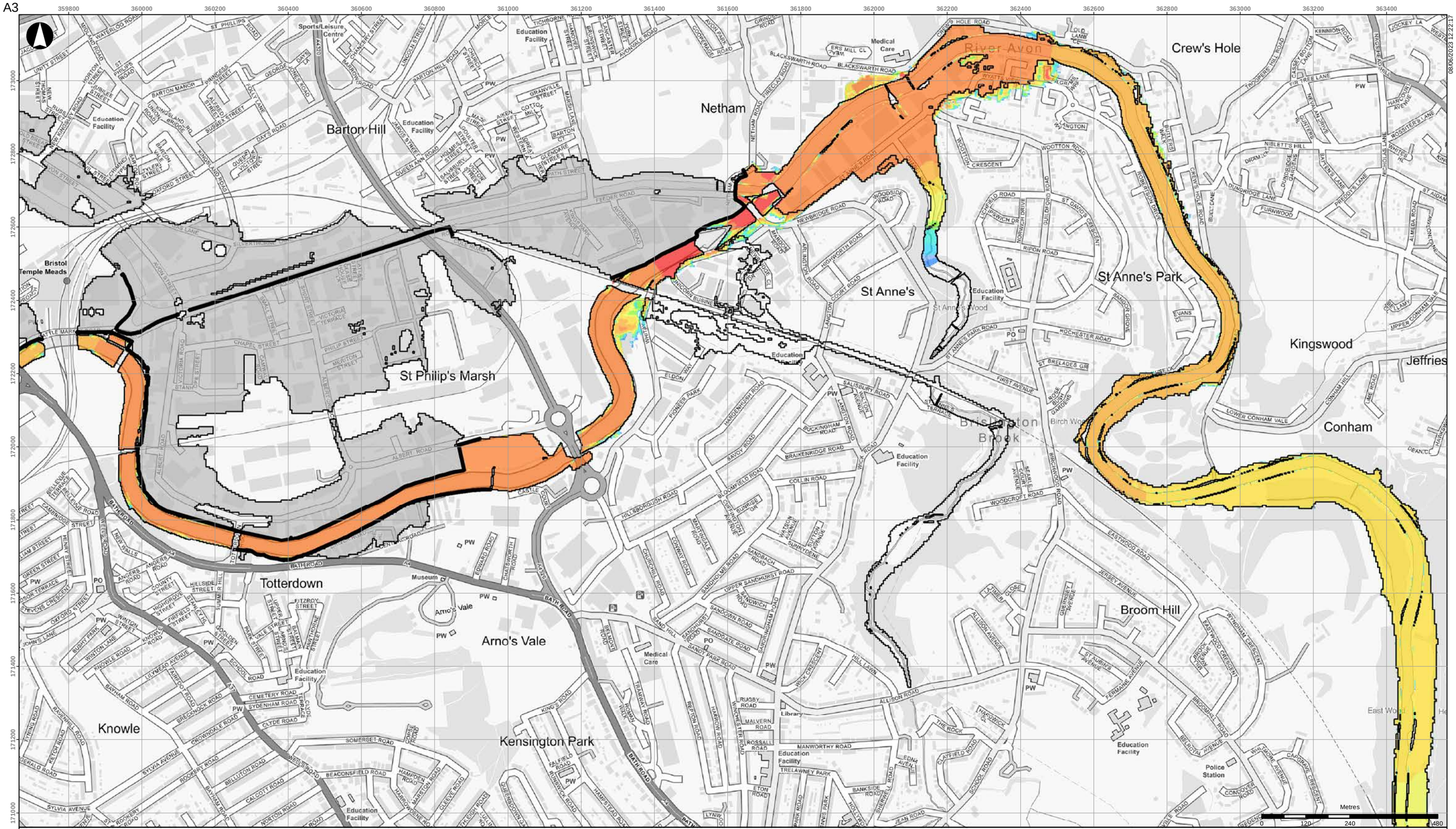
Name

**285982-ARP-XX-DR-MOD-023**

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- Scheme defences
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

Contains OS data (C) Crown Copyright and database right 2023

Notes:

Based on the BAFS OBC model version v033_25.
Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Client
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Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Detriment for scheme without det mitigation**
**2130 fluvial 1:100yr event**
**Netham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-024**

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- Scheme defences
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

Contains OS data (C) Crown Copyright and database right 2023

Notes:

Based on the BAFS OBC model version v033_25.
Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Project Title

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Drawing Title

**Detriment for scheme without det mitigation**
**2130 fluvial 1:100yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

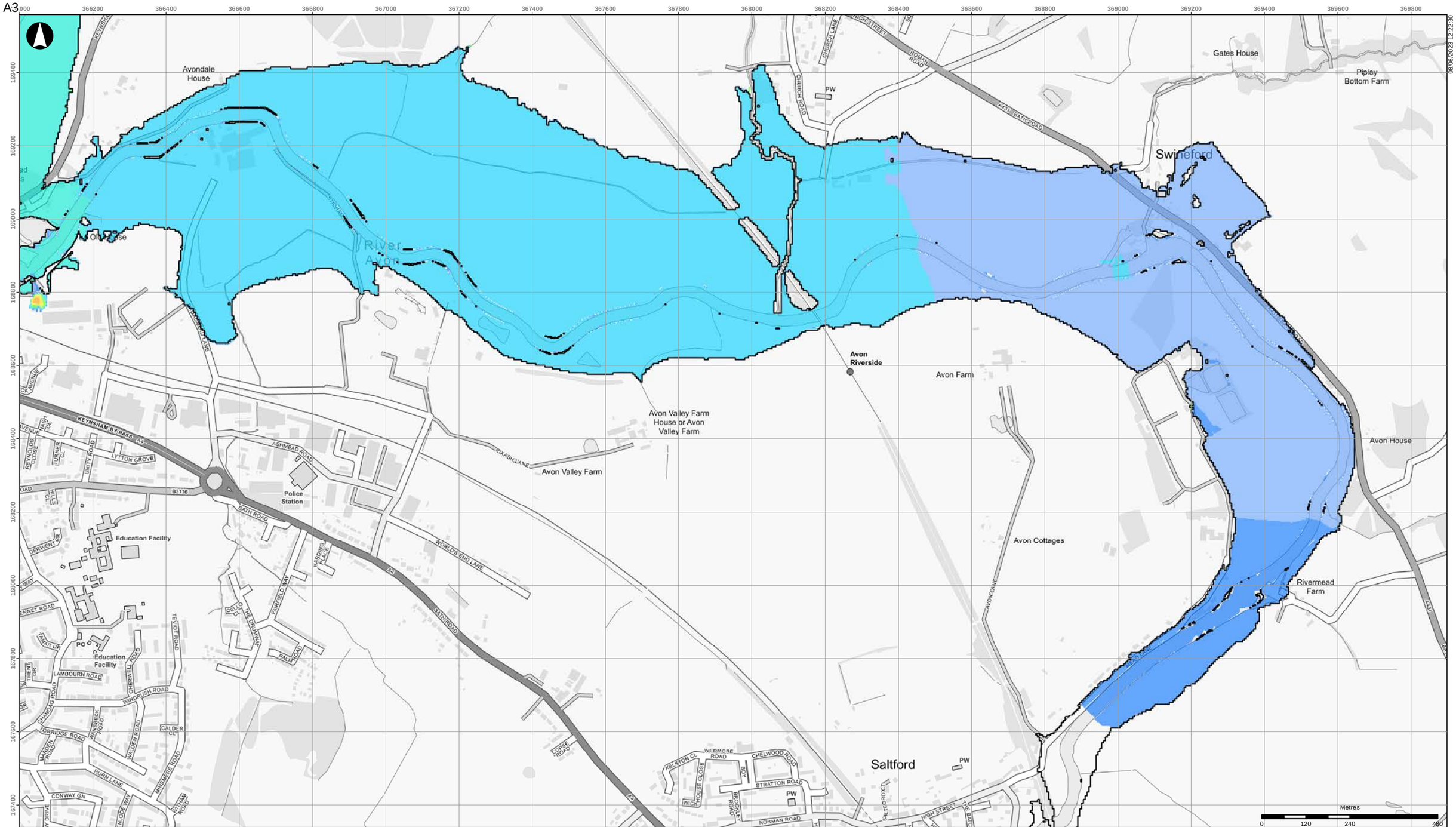
Name

**285982-ARP-XX-DR-MOD-025**

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- Scheme defences
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

Contains OS data (C) Crown Copyright and database right 2023

Notes:

Based on the BAFS OBC model version v033_25.
Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Detriment for scheme without det mitigation**
**2130 fluvial 1:100yr event**
**Swineford area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

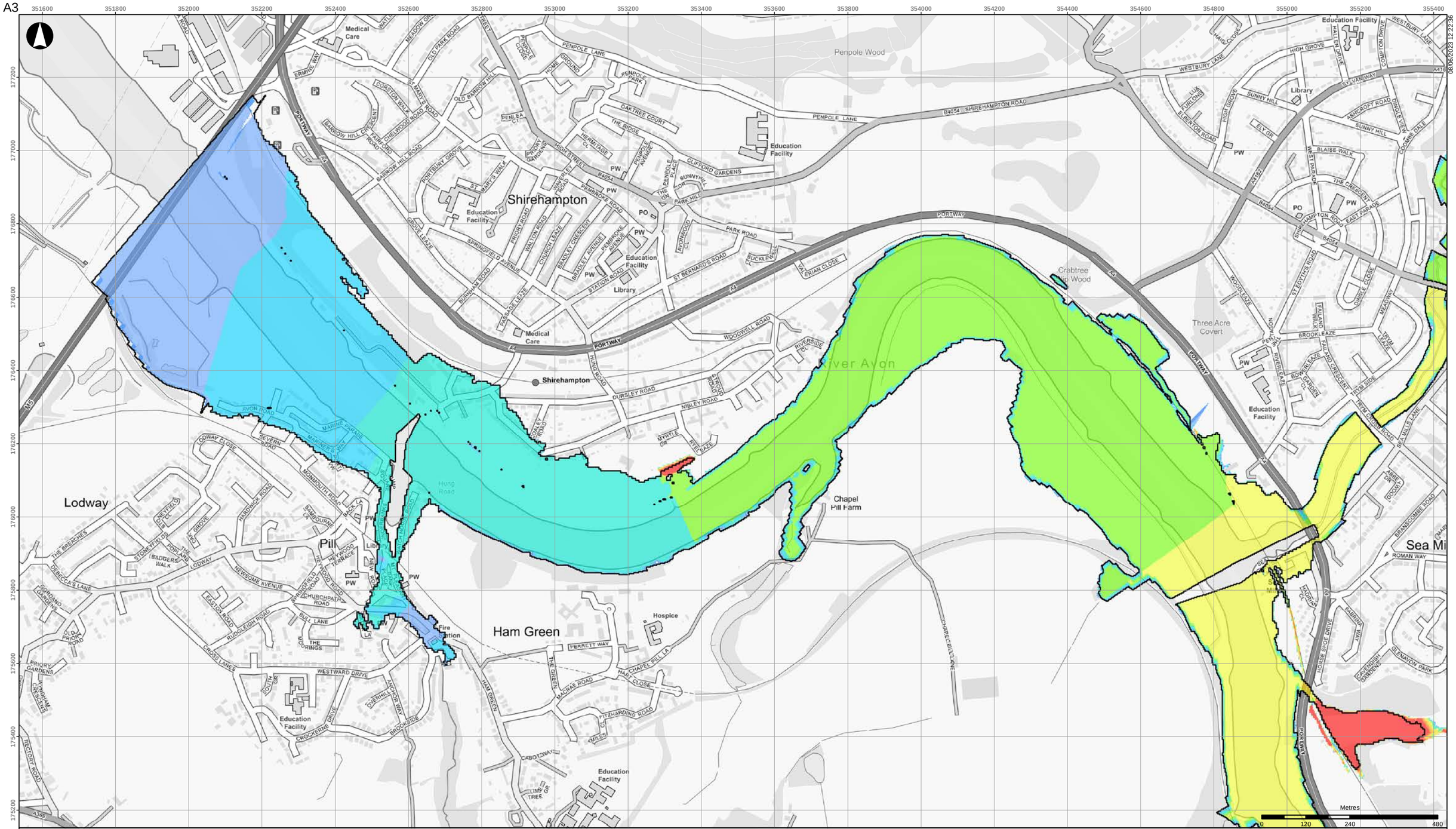
Name

**285982-ARP-XX-DR-MOD-026**

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- Scheme defences
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

Contains OS data (C) Crown Copyright and database right 2023

Notes:

Based on the BAFS OBC model version v033_25.
Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Client
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Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Detriment for scheme without det mitigation**
**2130 tidal 1:200yr event**
**Downstream areas**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

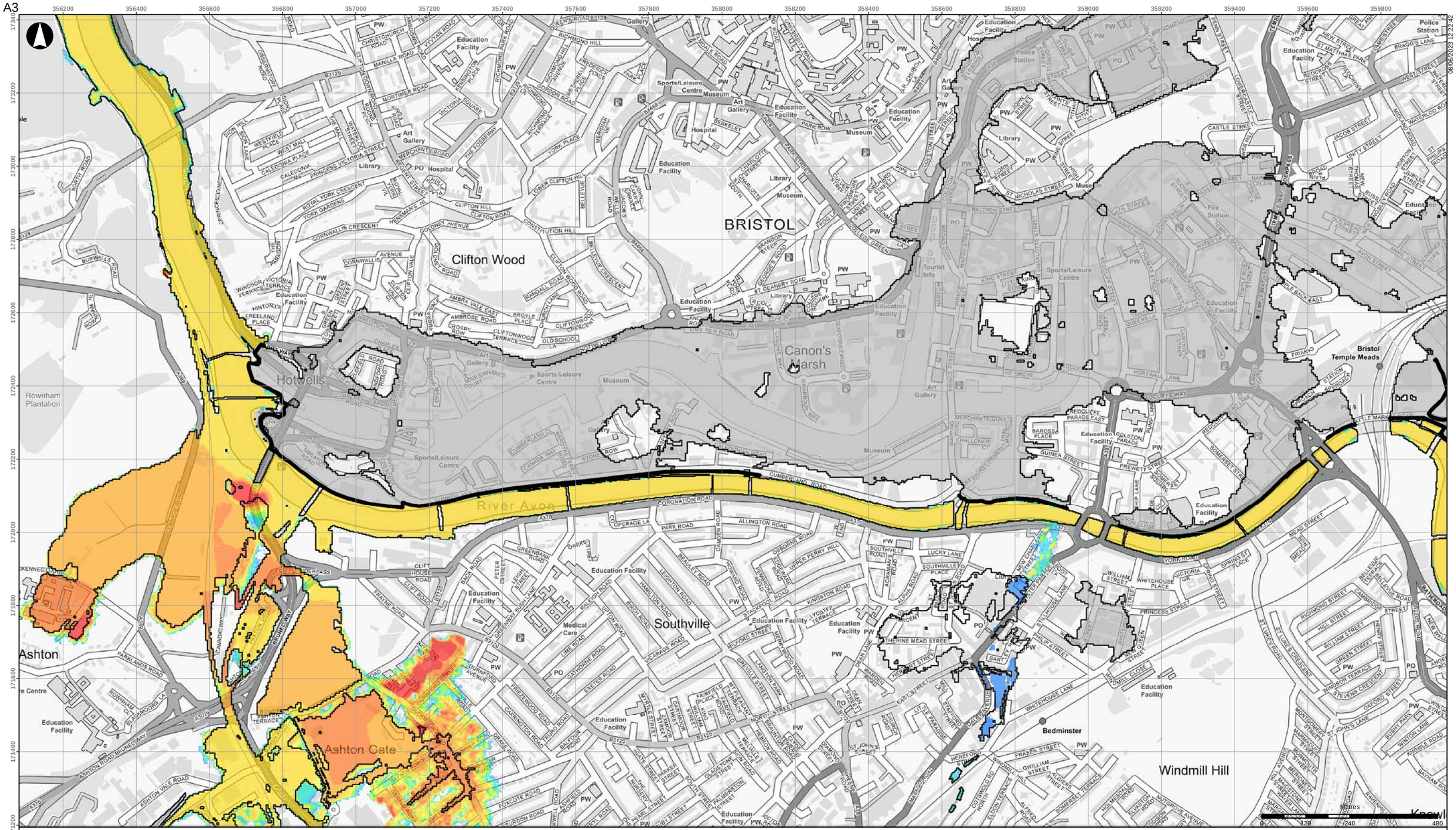
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-027**

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A3




- Scheme defences
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

Based on the BAFS OBC model version v033_25.
Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Detriment for scheme without det mitigation**
**2130 tidal 1:200yr event**
**Bristol area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

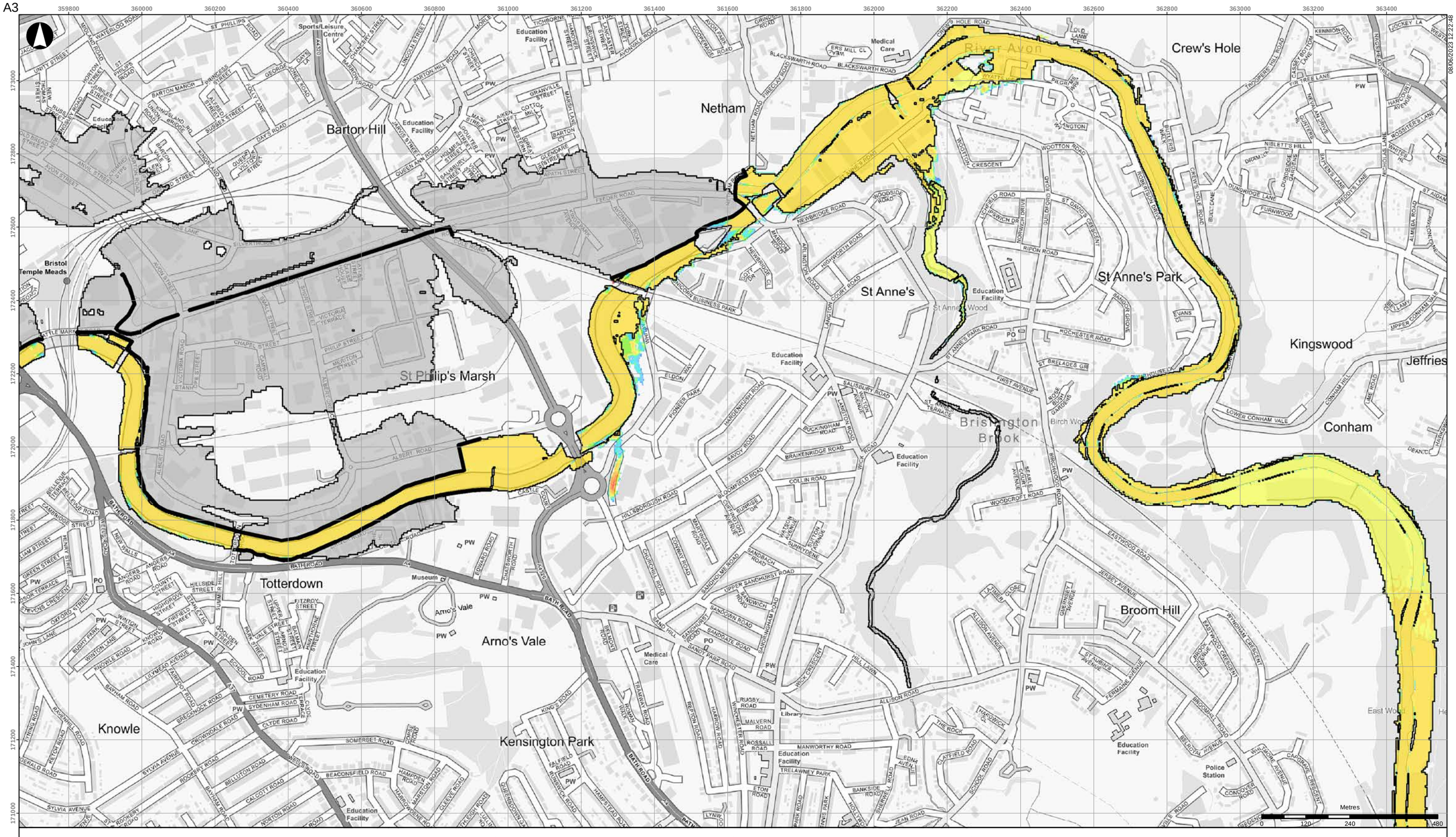
Name
**285982-ARP-XX-DR-MOD-028**

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A3

08/06/2023 12:22:48




- Scheme defences
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

Based on the BAFS OBC model version v033_25.
Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Client

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Detriment for scheme without det mitigation**
**2130 tidal 1:200yr event**
**Netham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

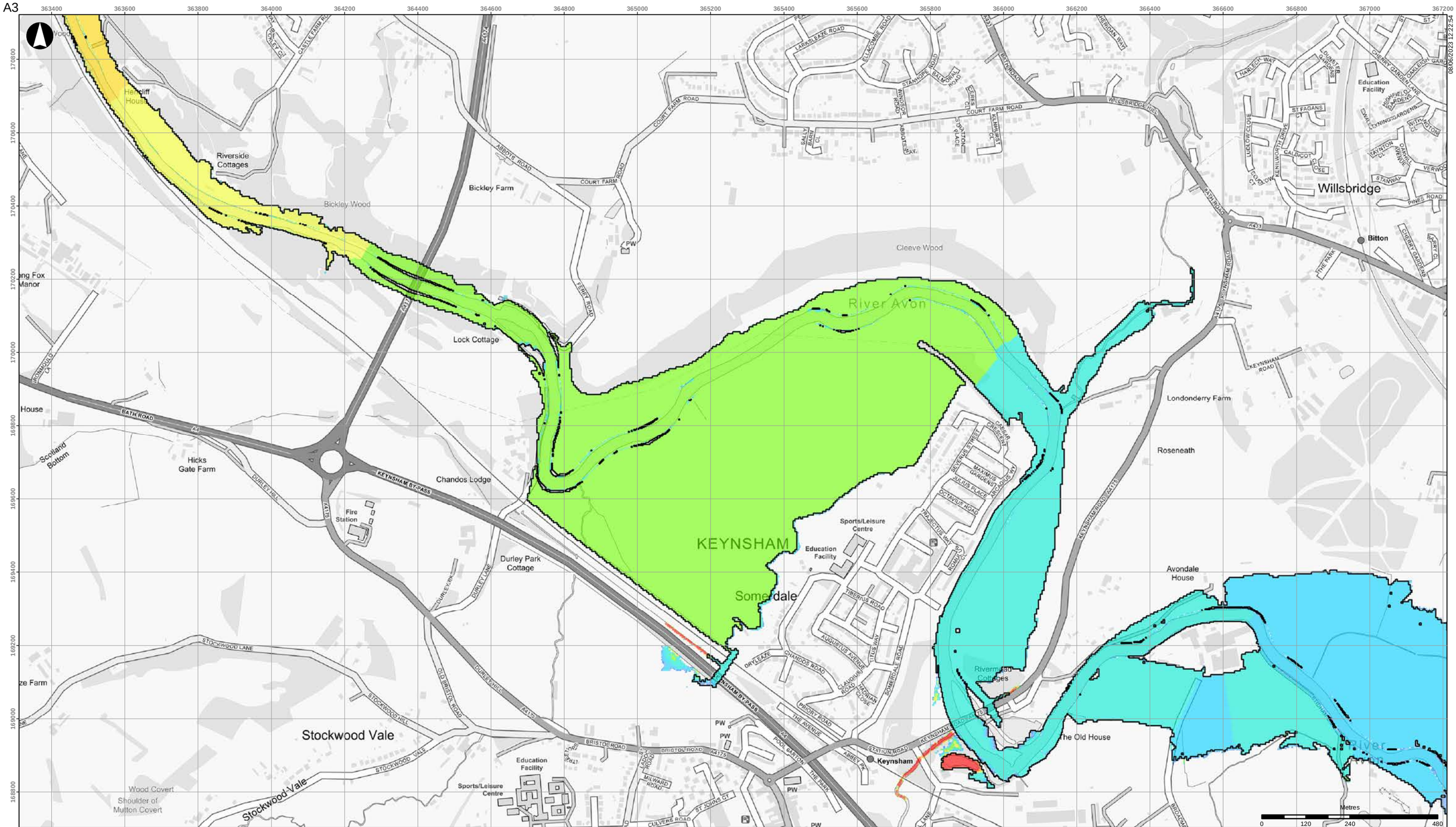
Name

**285982-ARP-XX-DR-MOD-029**

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- Scheme defences
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

Based on the BAFS OBC model version v033_25.
Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Detriment for scheme without det mitigation**
**2130 tidal 1:200yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

**285982-ARP-XX-DR-MOD-030**

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- Scheme defences
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Assumes glass-wall defences throughout.

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|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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**Bristol Avon Flood Strategy OBC**

Drawing Title
**Detriment for scheme without det mitigation**
**2130 tidal 1:200yr event**
**Swineford area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

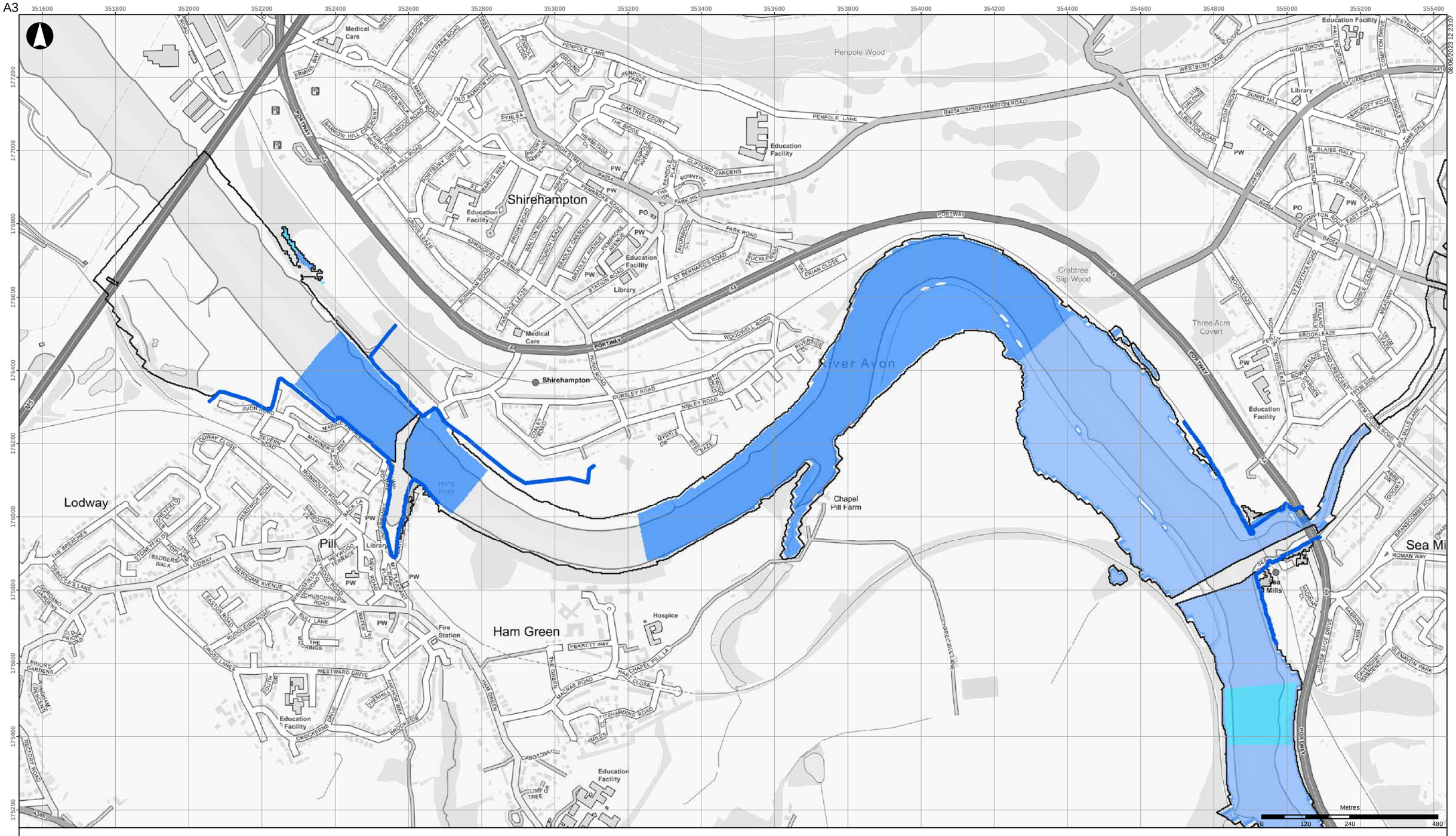
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-031**

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- Scheme defences
- Detriment mitigation defences
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Drawing Title
**Detriment for scheme incl. SOC det mitigation**
**2065 fluvial 1:100yr event**
**Downstream areas**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

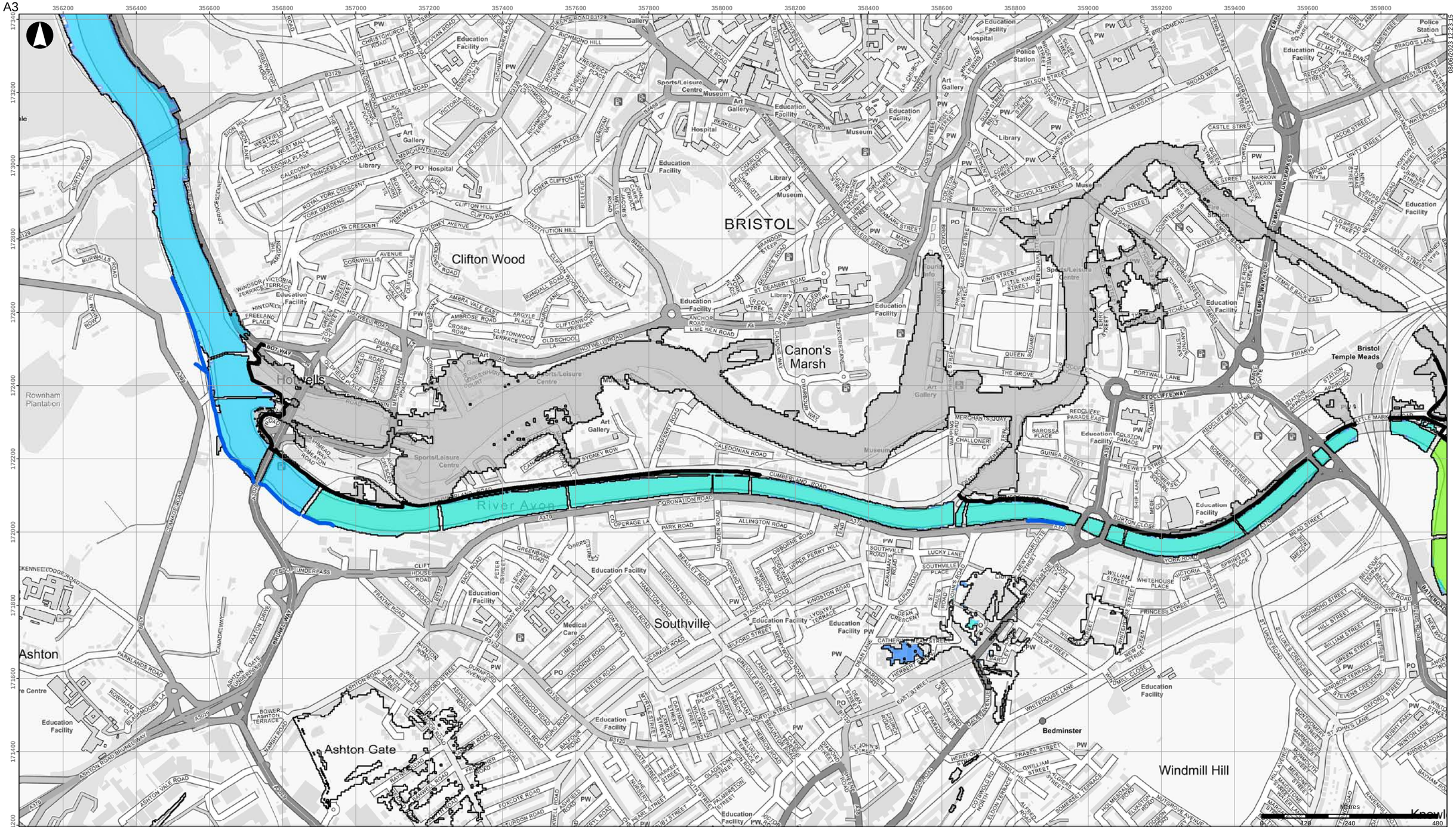
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**285982-ARP-XX-DR-MOD-032**

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- Scheme defences
- Detriment mitigation defences
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Drawing Title
**Detriment for scheme incl. SOC det mitigation**
**2065 fluvial 1:100yr event**
**Bristol area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

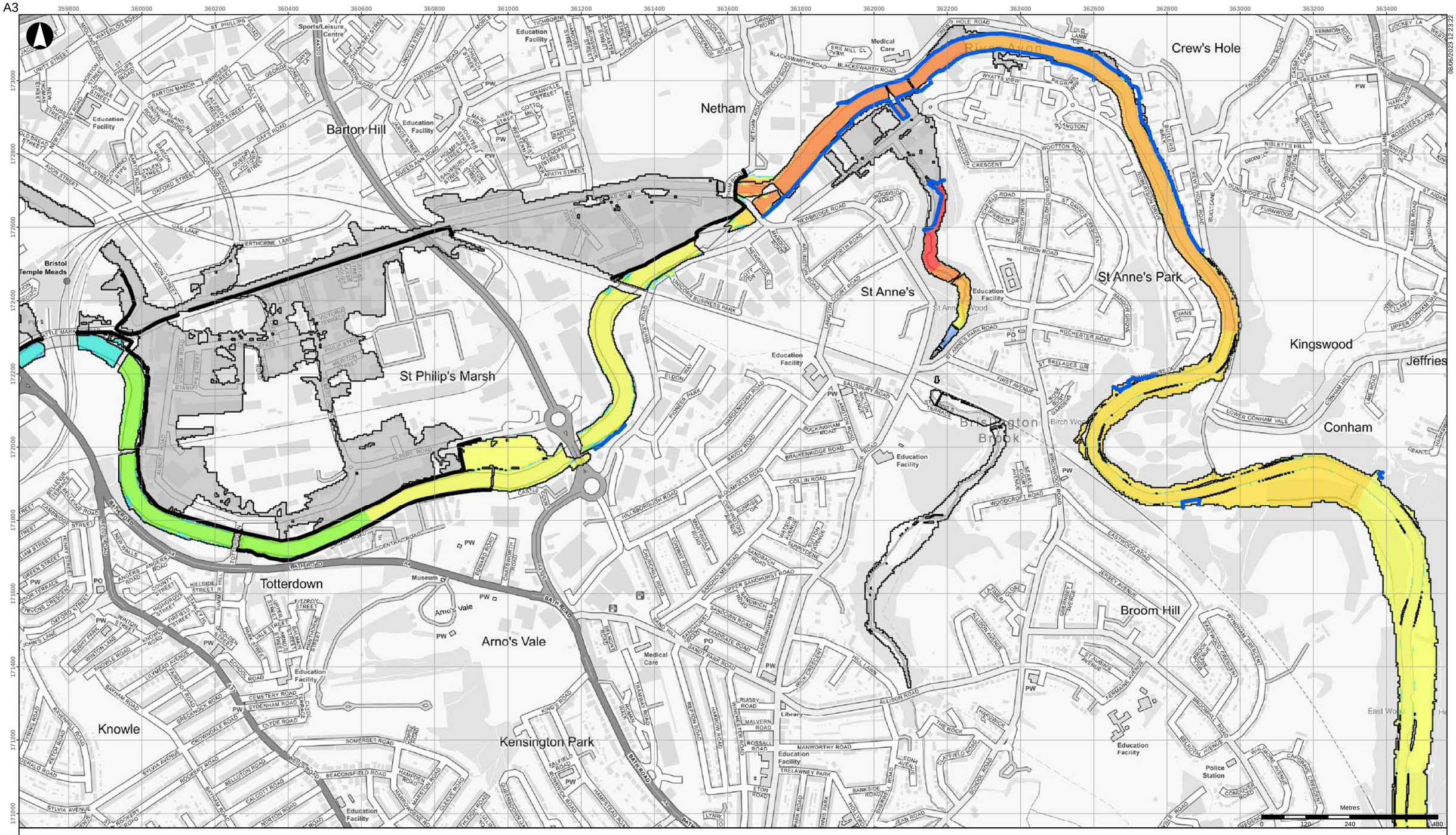
Rev
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Name
**285982-ARP-XX-DR-MOD-033**

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- Scheme defences
- Detriment mitigation defences
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| D1 | 2023-06-08 | DvdL | DvdL | PS |

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**Detriment for scheme incl. SOC det mitigation**
**2065 fluvial 1:100yr event**
**Netham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

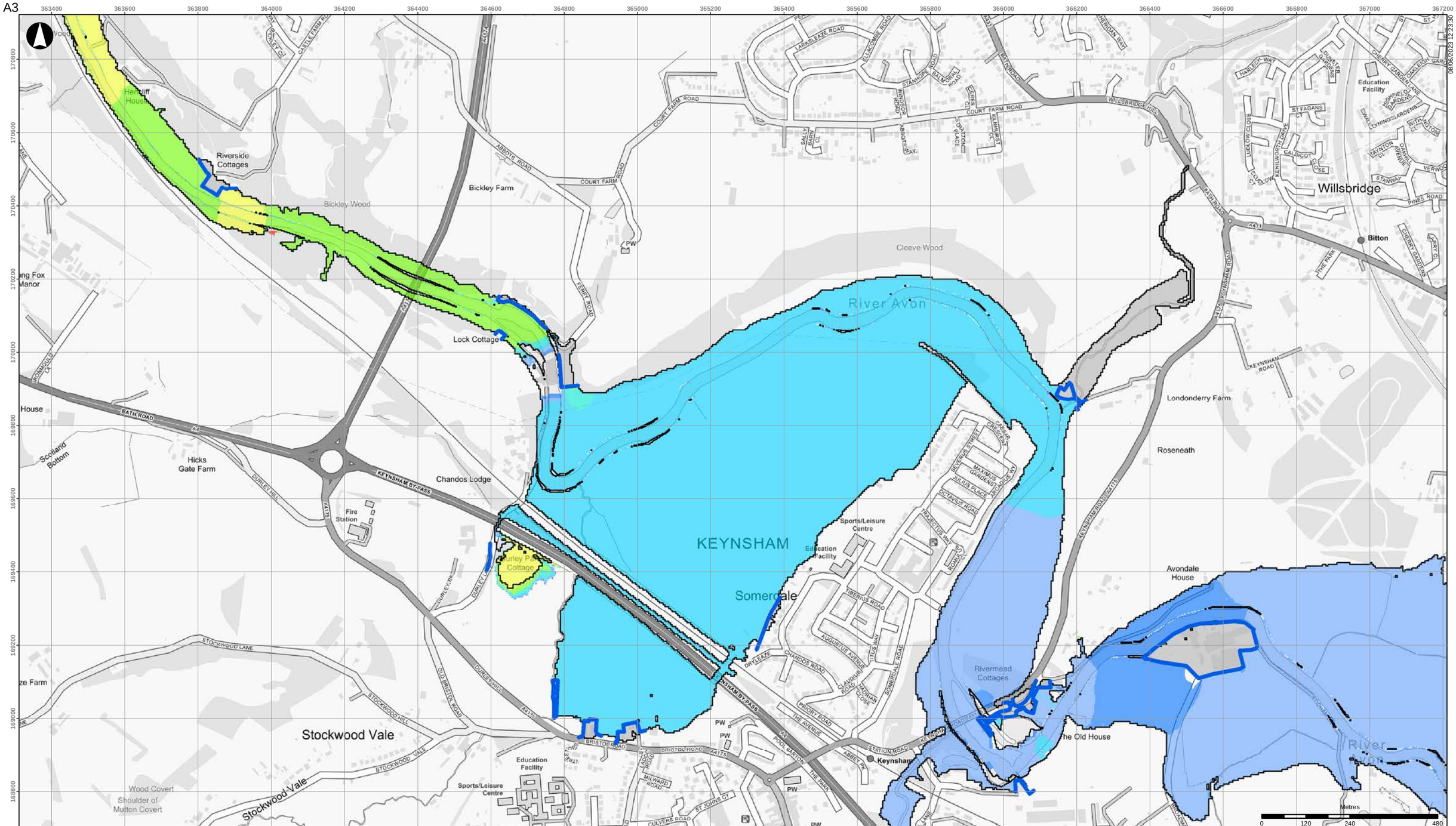
Name

**285982-ARP-XX-DR-MOD-034**

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- Scheme defences
- Detriment mitigation defences
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

Based on the BAFS OBC model version v033_25.
Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Client
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Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Detriment for scheme incl. SOC det mitigation**
**2065 fluvial 1:100yr event**
**Keynsham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

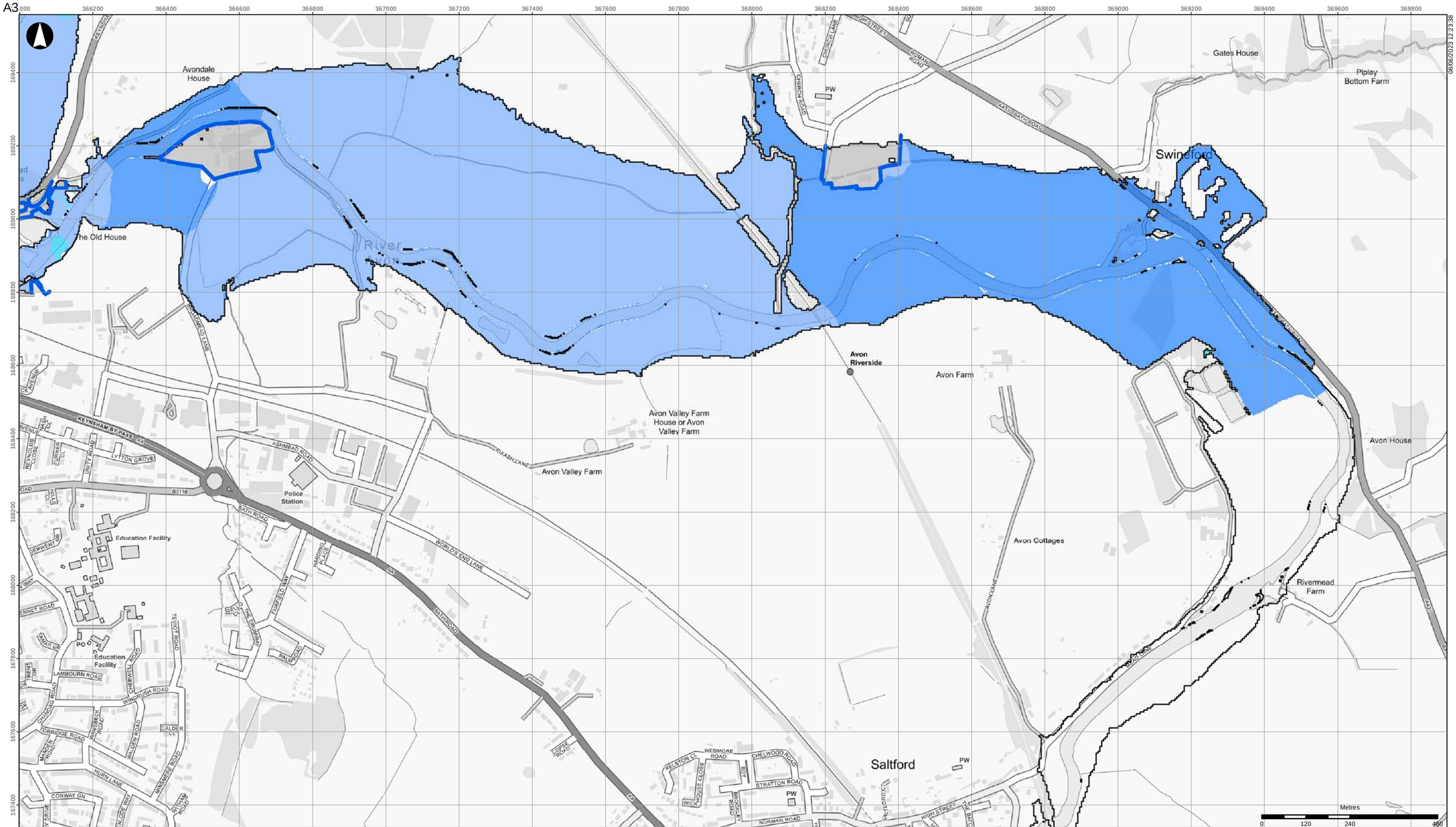
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-035**

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- Scheme defences
- Detriment mitigation defences
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Detriment for scheme incl. SOC det mitigation**
**2065 fluvial 1:100yr event**
**Swineford area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

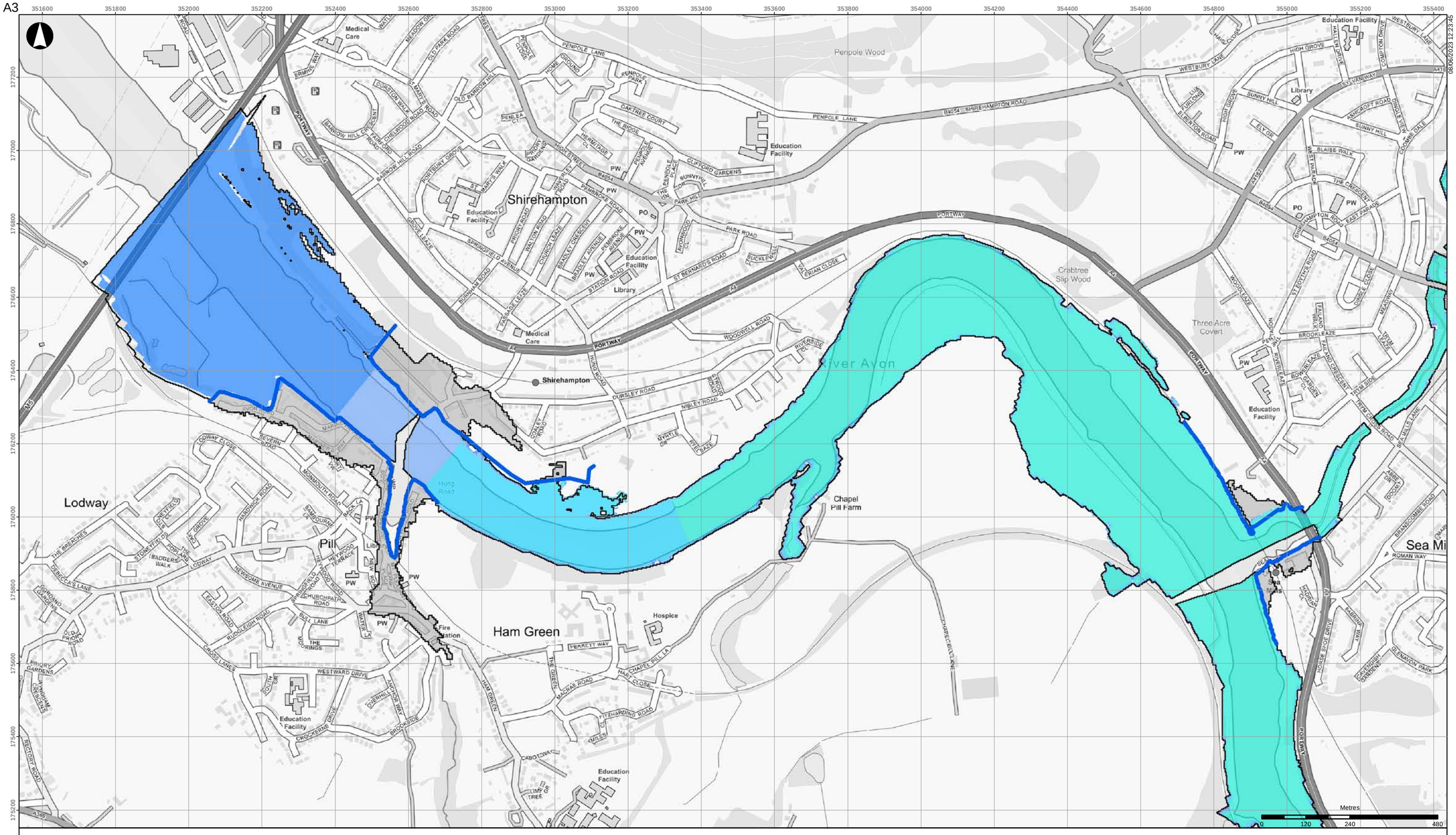
Name

**285982-ARP-XX-DR-MOD-036**

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- Scheme defences
- Detriment mitigation defences
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Client
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Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Detriment for scheme incl. SOC det mitigation**
**2065 tidal 1:200yr event**
**Downstream areas**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

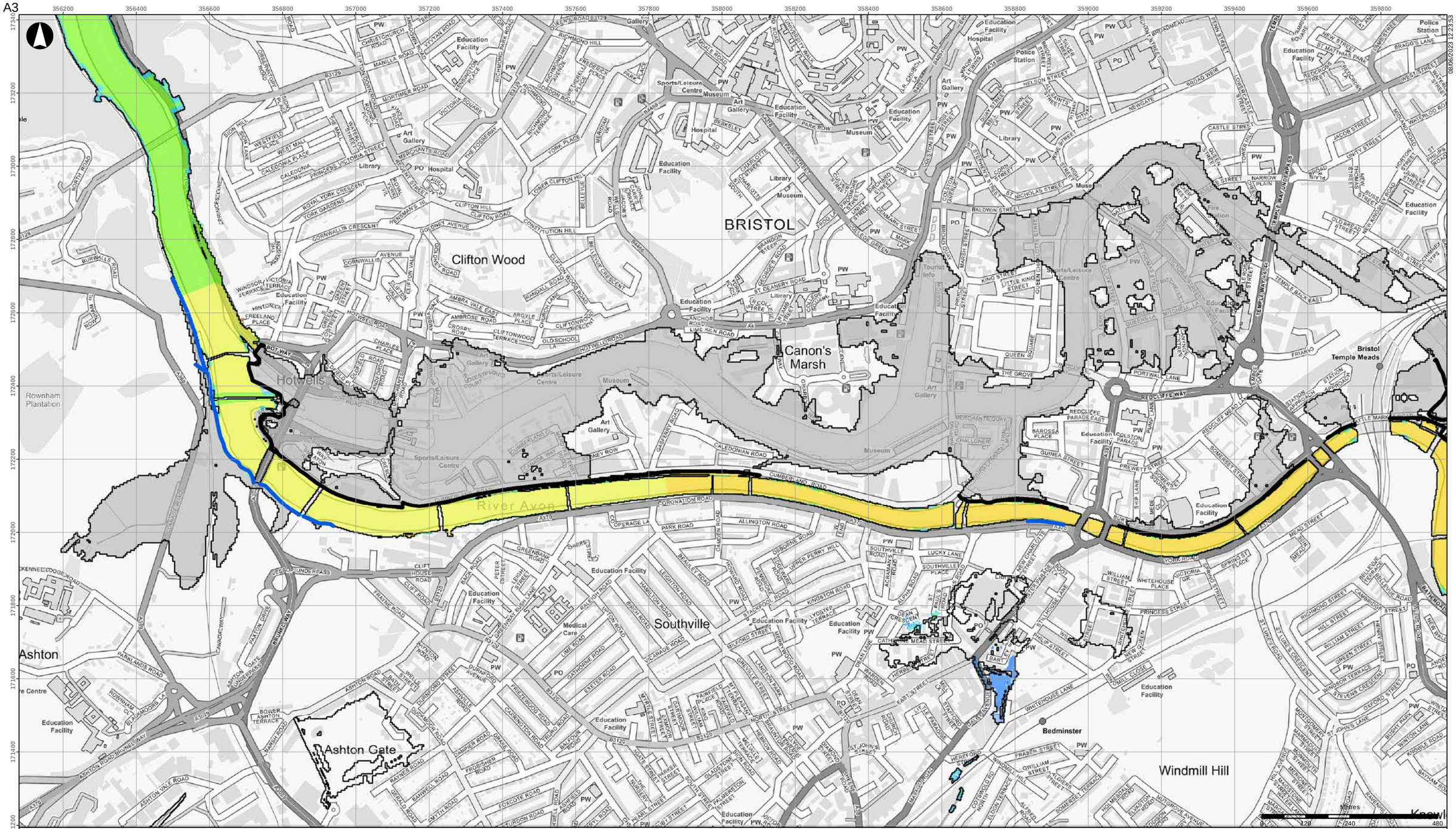
Name
**285982-ARP-XX-DR-MOD-037**

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- Scheme defences
- Detriment mitigation defences
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Client

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Detriment for scheme incl. SOC det mitigation**
**2065 tidal 1:200yr event**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

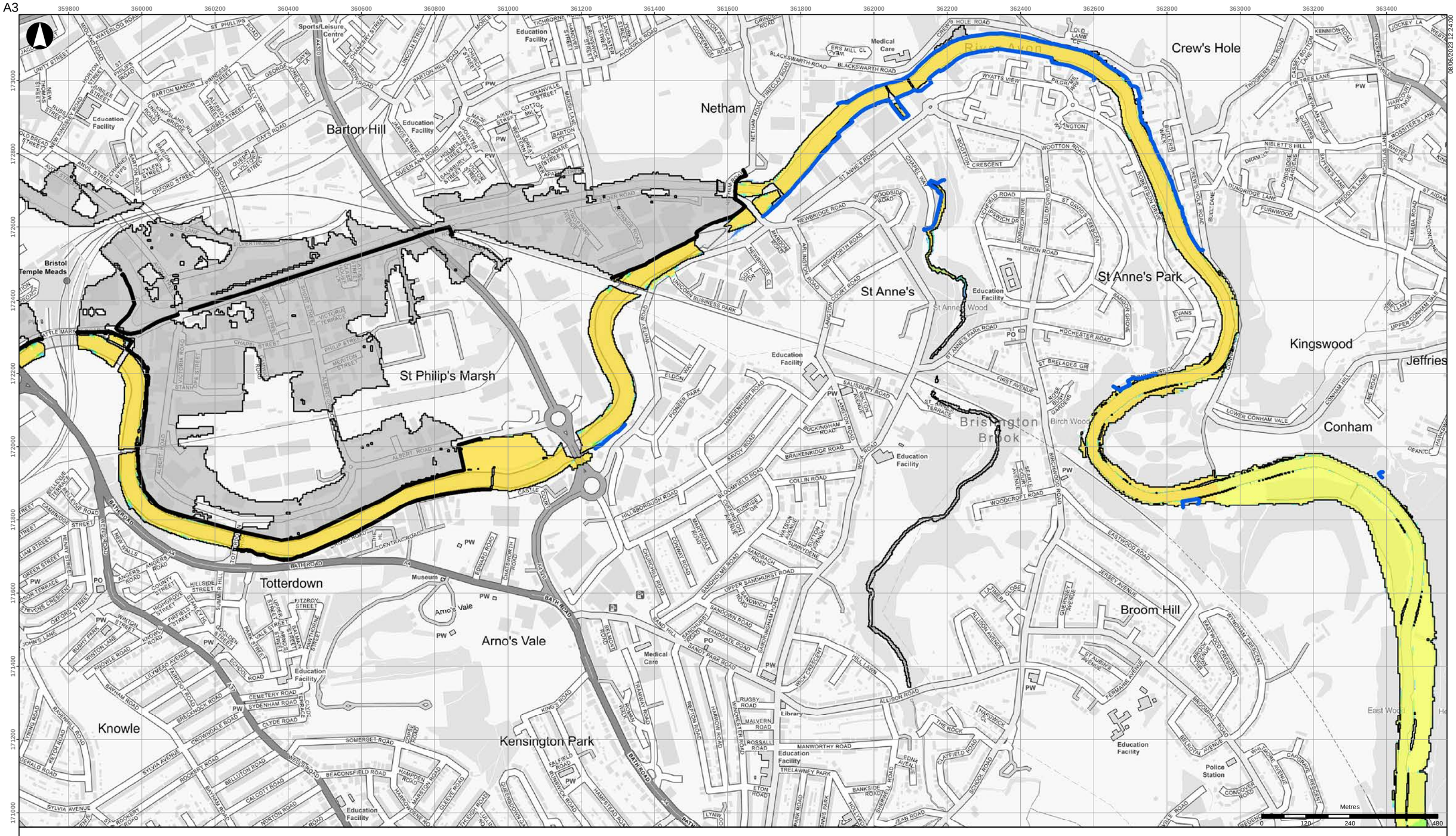
Name

**285982-ARP-XX-DR-MOD-038**

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- Scheme defences
- Detriment mitigation defences
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Drawing Title
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**2065 tidal 1:200yr event**
**Netham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

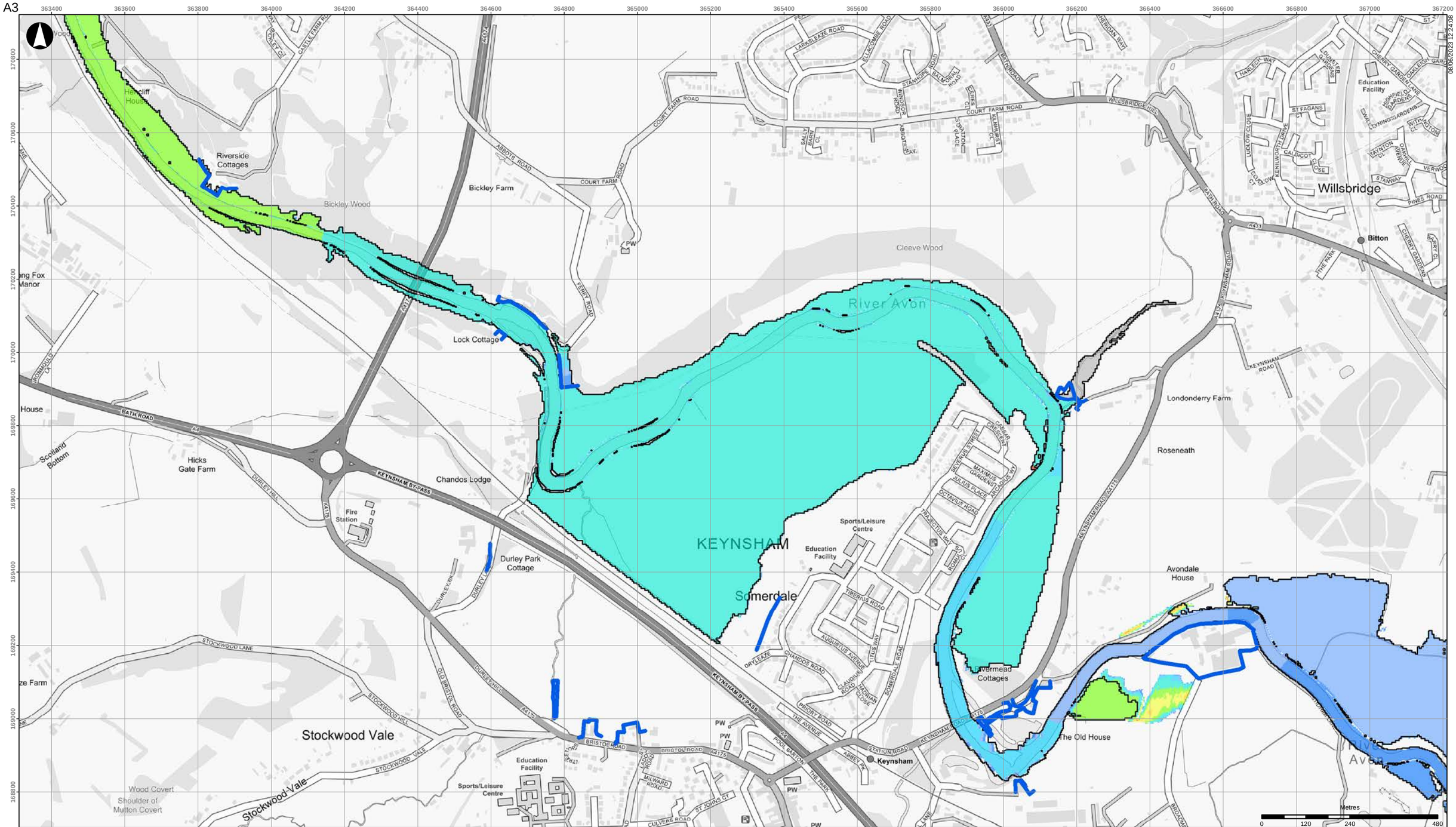
Name
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A3




- Scheme defences
- Detriment mitigation defences
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Project Title
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Drawing Title
**Detriment for scheme incl. SOC det mitigation**
**2065 tidal 1:200yr event**
**Keynsham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-040**

06/06/2023 12:24:08

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A3

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Avondale House
The Old House
Avon
Gates House
Pipley Bottom Farm
PW
CHURCH LANE
CHURCH ROAD
HIGH STREET
ROMAN ROAD
A431 BATH ROAD
Swineford
Avon Riverside
Avon Farm
Avon Valley Farm House or Avon Valley Farm
Avon Valley Farm
Avon House
Avon Cottages
Rivermead Farm
Saltford
PW
BROADMEAD LANE
KEYNSHAM BY-PASS A4
ASHMEAD ROAD
RIXASH LANE
LYTTON GROVE
REYNOLDS CLOSE
TURNER CL
UNITY ROAD
B3116
Police Station
BATH ROAD
Education Facility
DERWENT CR
WORLD'S END LANE
HARDING PLACE
PURFIELD WAY
GELD CL
ON THE DRUMMER
BALL ROAD
PO
Education Facility
TAMAR DR
LAMBOURN ROAD
CHERWELL ROAD
WINDRUSH ROAD
CHARAG ROAD
WINTERBECK ROAD
TORRIDGE ROAD
MARDON ROAD
WALDEN ROAD
CALDER CL
HURN LANE
CONWAY GN
MINSMERE ROAD
WITHAM ROAD
A431
AVONLANE
WESTONLANE
KELSTON CL
WEDMORE ROAD
CHELWOOD ROAD
WICK HOUSE CLOSE
BDY
STRATTON ROAD
BROCKLEY ROAD
NORMAN ROAD
SALTFORD CT
HIGH STREET
CORSE ROAD
Metres
0 120 240 480

- Scheme defences
- Detriment mitigation defences
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

Based on the BAFS OBC model version v033_25.
Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

ARUP

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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Detriment for scheme incl. SOC det mitigation**
**2065 tidal 1:200yr event**
**Swineford area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

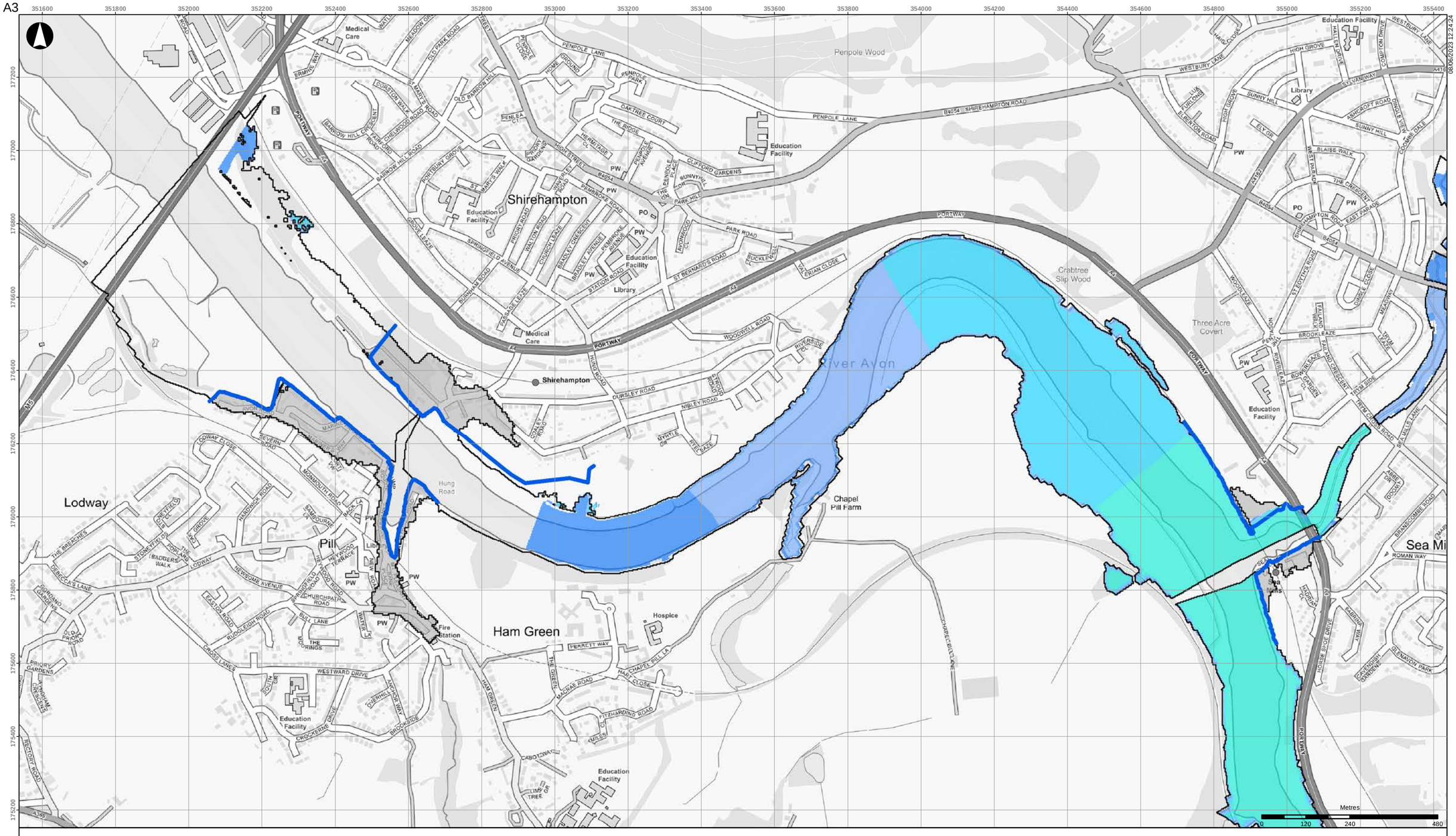
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-041**

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A3




08/06/2023 12:24:24

Scheme defences
Detriment mitigation defences
Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

Based on the BAFS OBC model version v033_25.
Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Detriment for scheme incl. SOC det mitigation**
**2130 fluvial 1:100yr event**
**Downstream areas**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

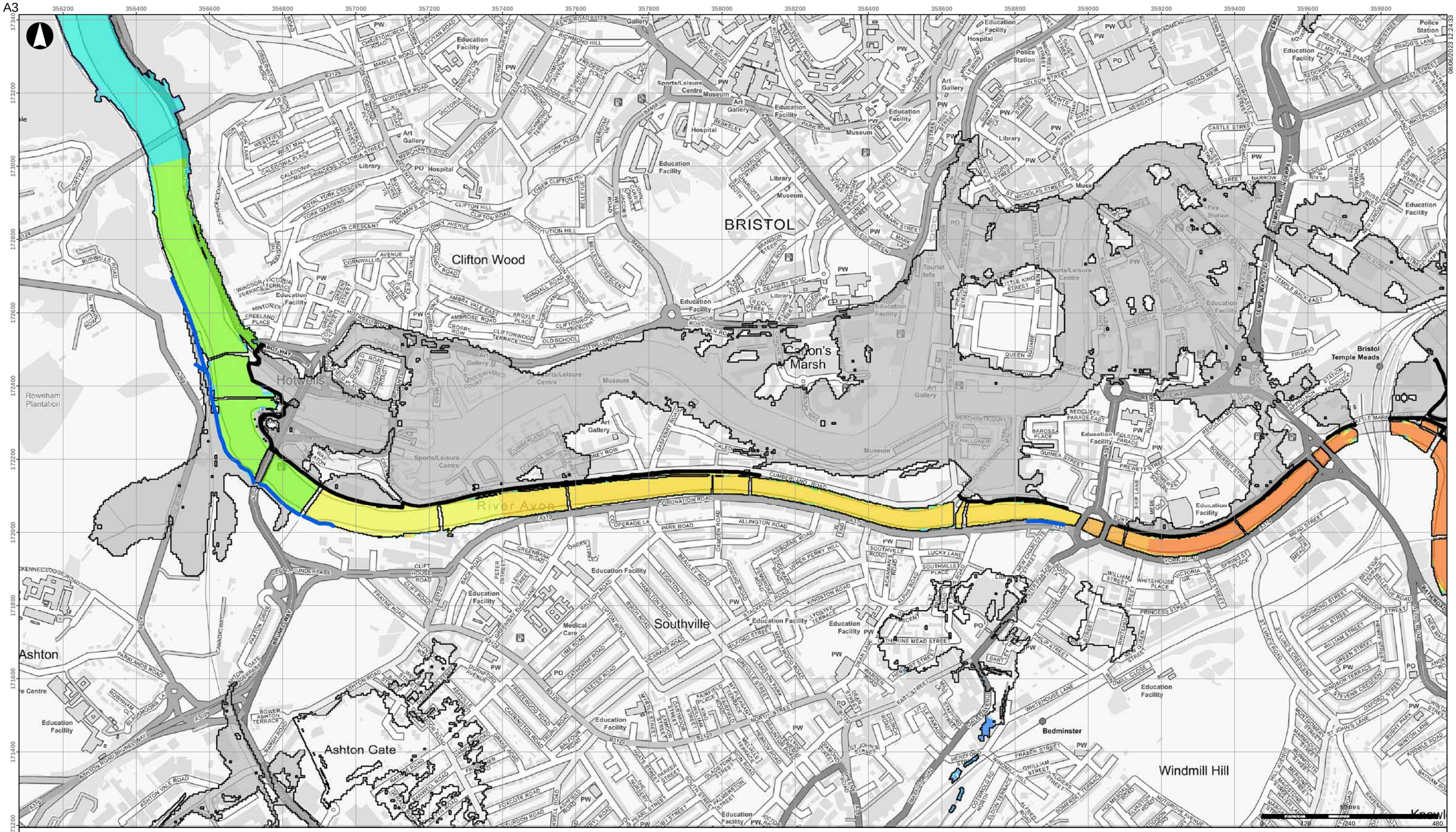
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-042**

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- Scheme defences
- Detriment mitigation defences
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

Based on the BAFS OBC model version v033_25.
Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Client
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Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Detriment for scheme incl. SOC det mitigation**
**2130 fluvial 1:100yr event**
**Bristol area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

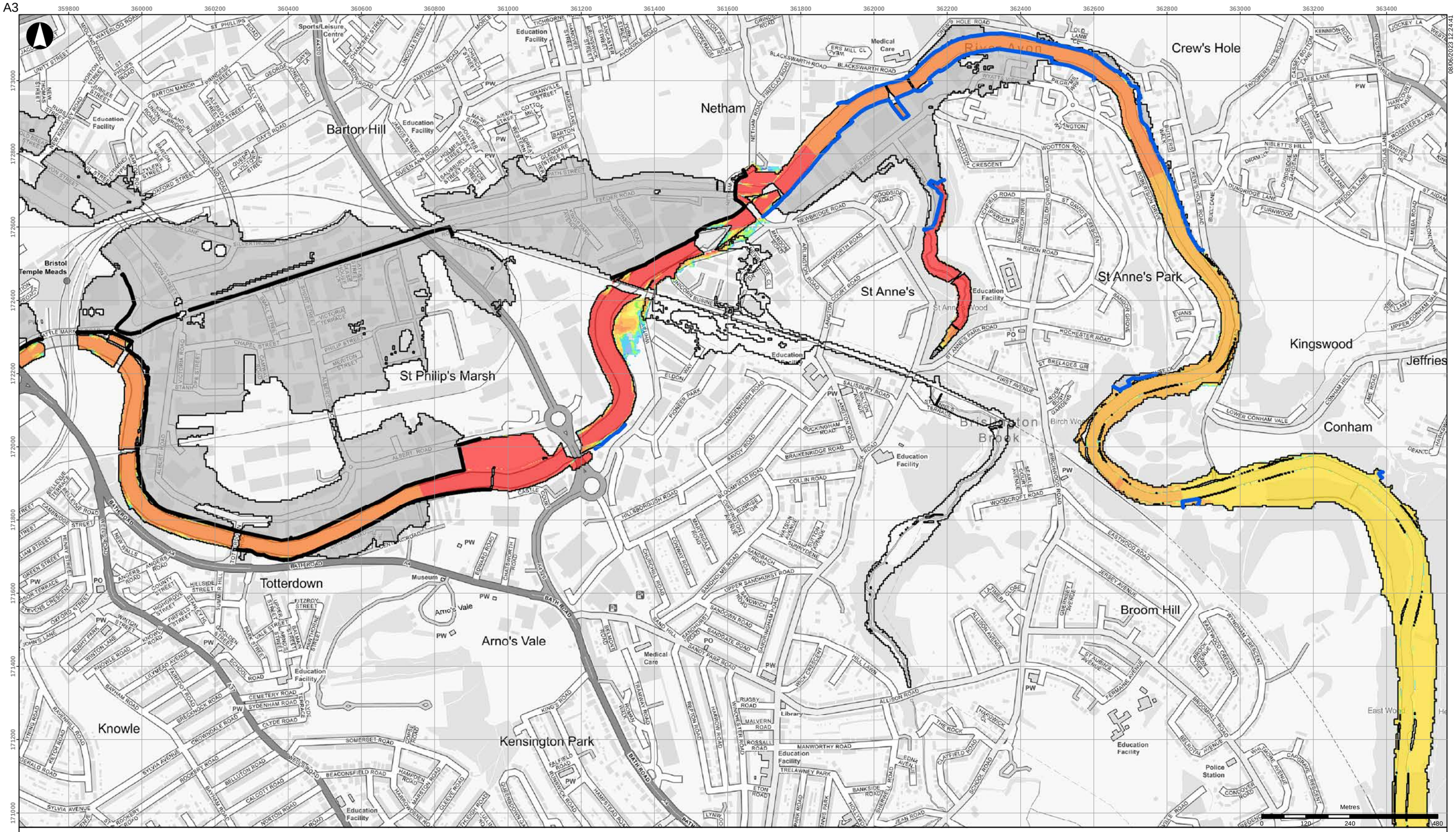
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-043**

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- Scheme defences
- Detriment mitigation defences
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Client
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Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Detriment for scheme incl. SOC det mitigation**
**2130 fluvial 1:100yr event**
**Netham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

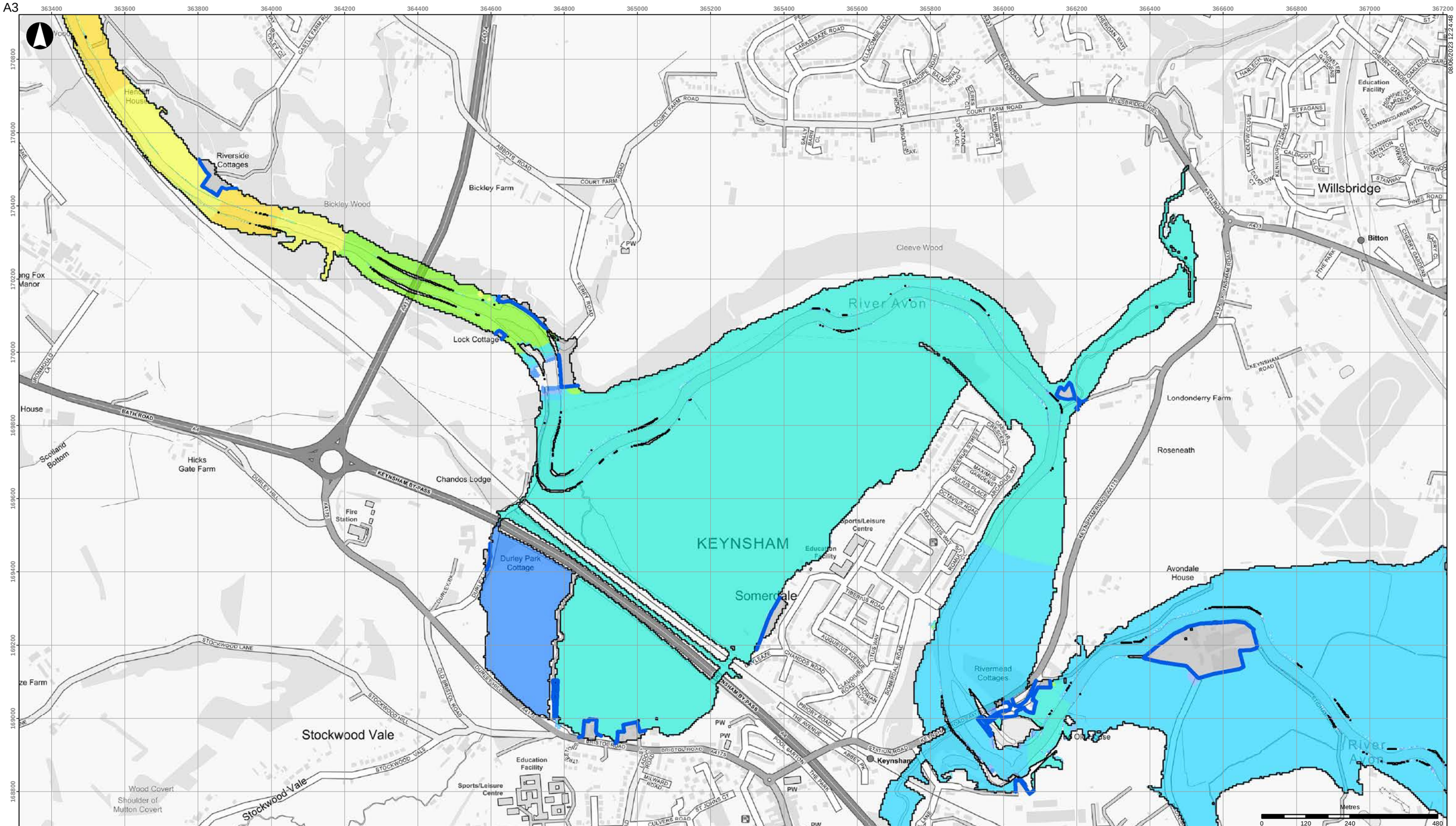
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-044**

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- Scheme defences
- Detriment mitigation defences
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

Based on the BAFS OBC model version v033_25.
Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Detriment for scheme incl. SOC det mitigation**
**2130 fluvial 1:100yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

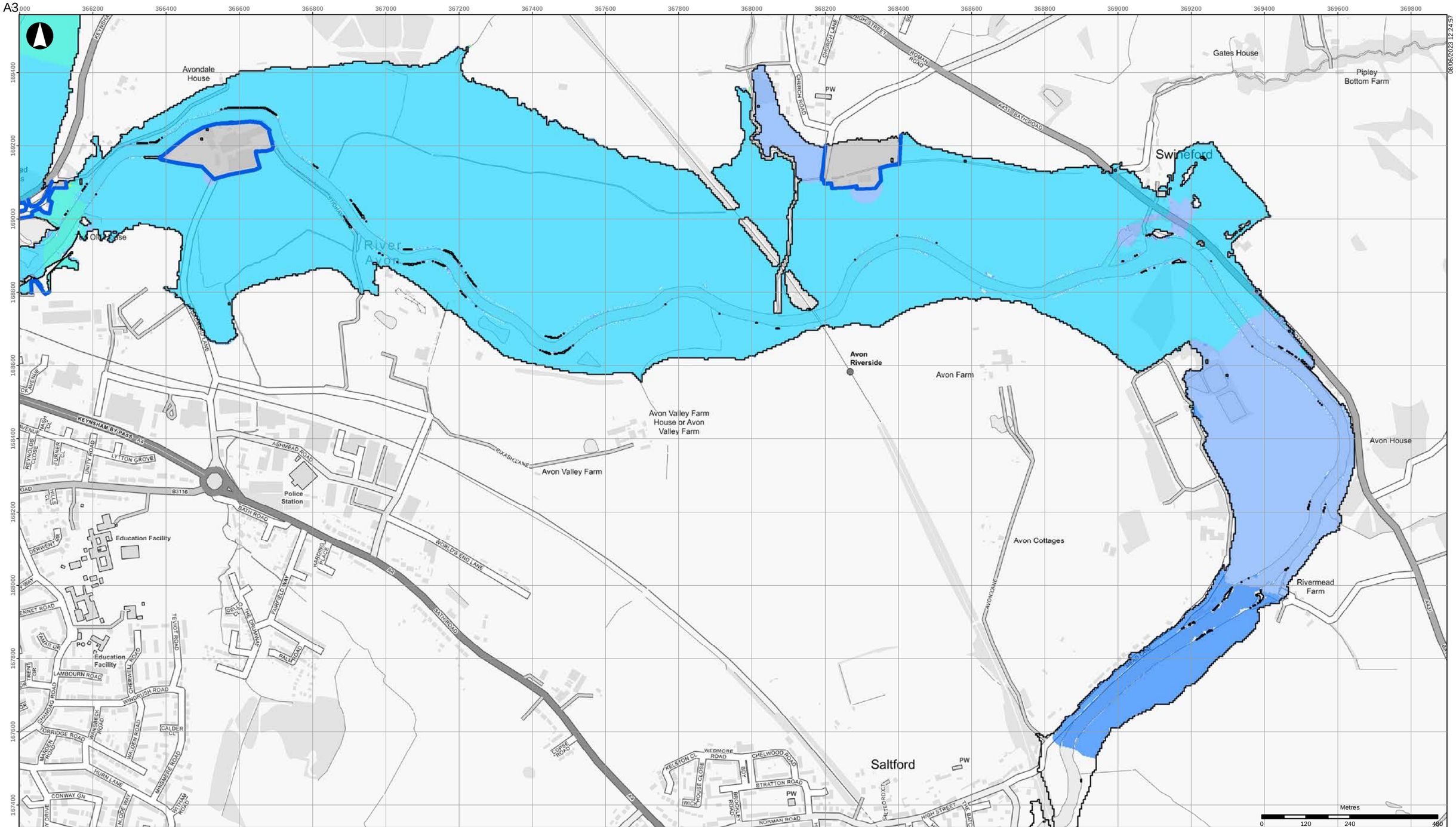
**285982-ARP-XX-DR-MOD-045**

08/06/2023 12:24:48

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- Scheme defences
- Detriment mitigation defences
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Project Title

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Drawing Title

**Detriment for scheme incl. SOC det mitigation**
**2130 fluvial 1:100yr event**
**Swineford area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

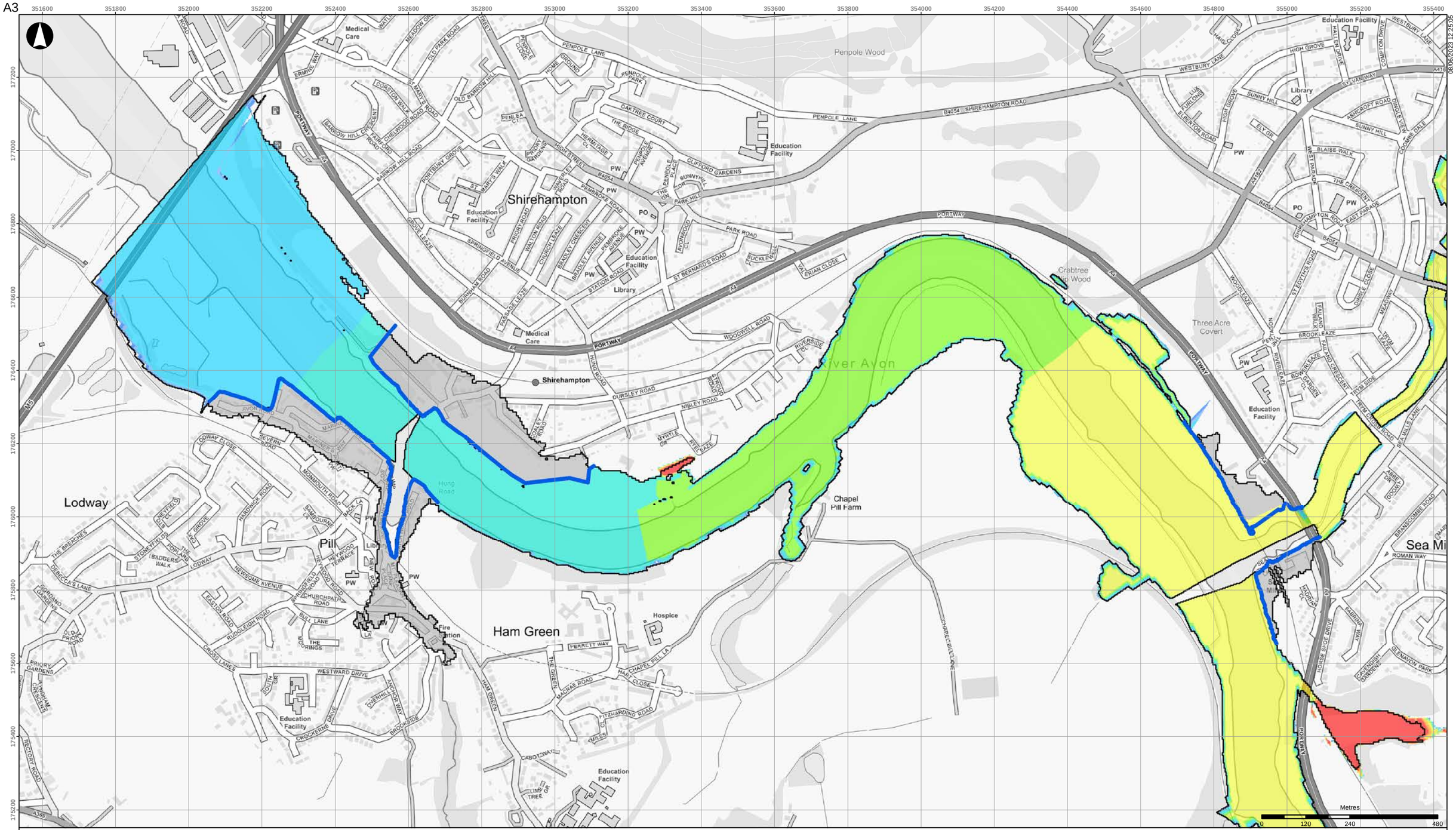
Name

**285982-ARP-XX-DR-MOD-046**

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- Scheme defences
- Detriment mitigation defences
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

Based on the BAFS OBC model version v033_25.
Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Client
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Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Detriment for scheme incl. SOC det mitigation**
**2130 tidal 1:200yr event**
**Downstream areas**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

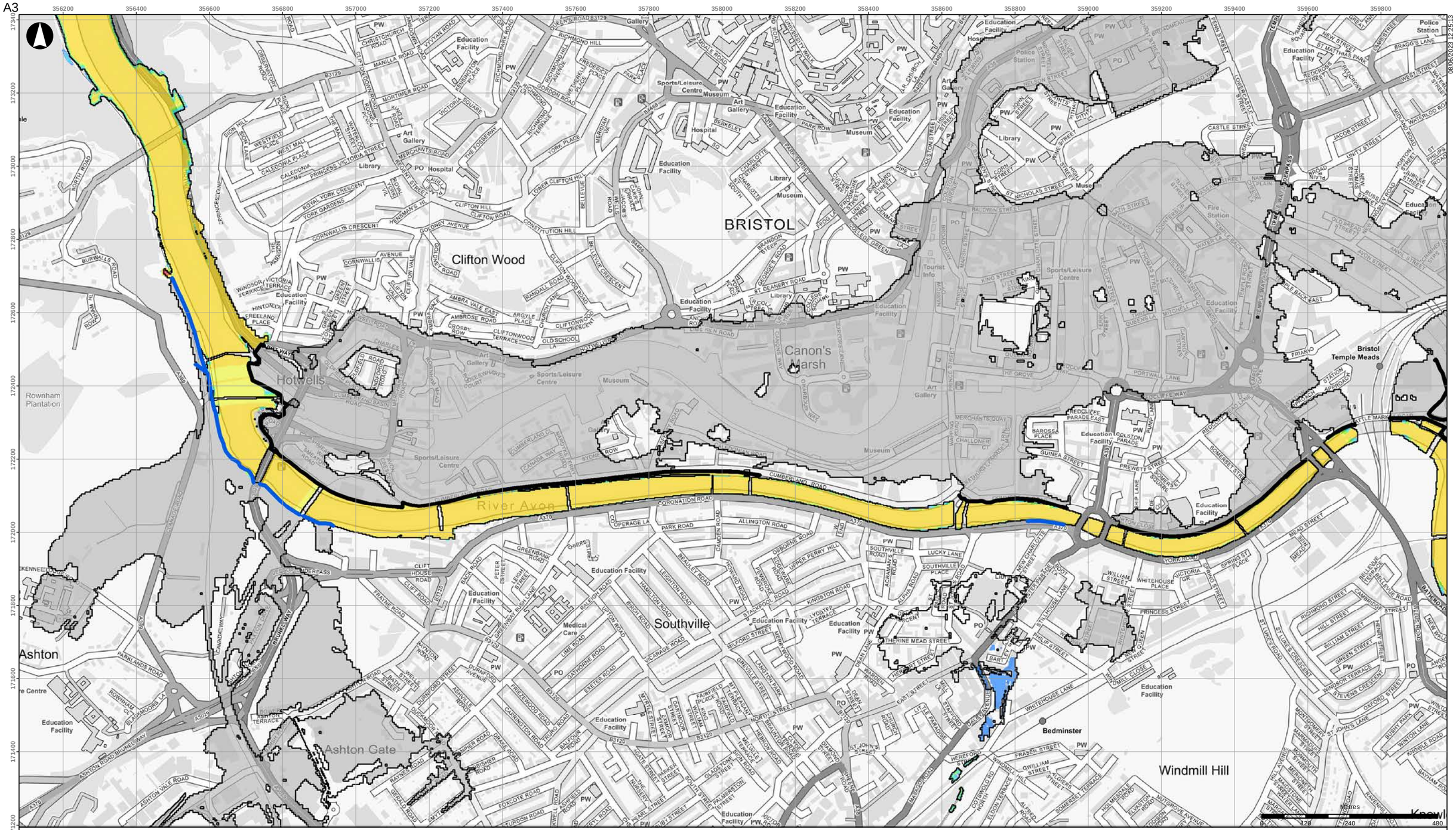
Name
**285982-ARP-XX-DR-MOD-047**

08/06/2023 12:25:05

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06/06/2023 12:25:13

- Scheme defences
- Detriment mitigation defences
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

Based on the BAFS OBC model version v033_25.
Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Detriment for scheme incl. SOC det mitigation**
**2130 tidal 1:200yr event**
**Bristol area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

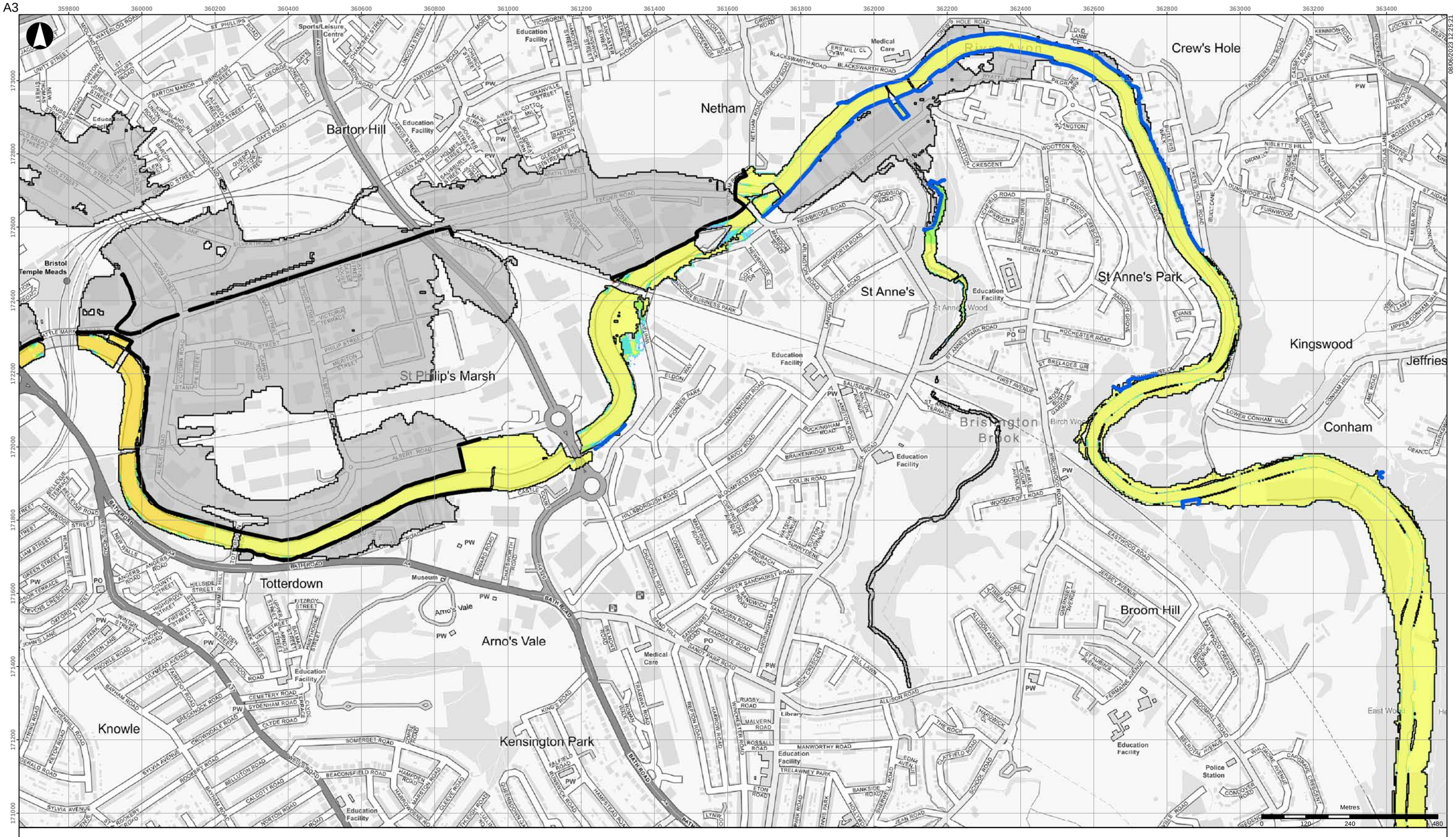
Name
**285982-ARP-XX-DR-MOD-048**

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- Scheme defences
- Detriment mitigation defences
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

Contains OS data (C) Crown Copyright and database right 2023

Notes:

Based on the BAFS OBC model version v033_25.
Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Detriment for scheme incl. SOC det mitigation**
**2130 tidal 1:200yr event**
**Netham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

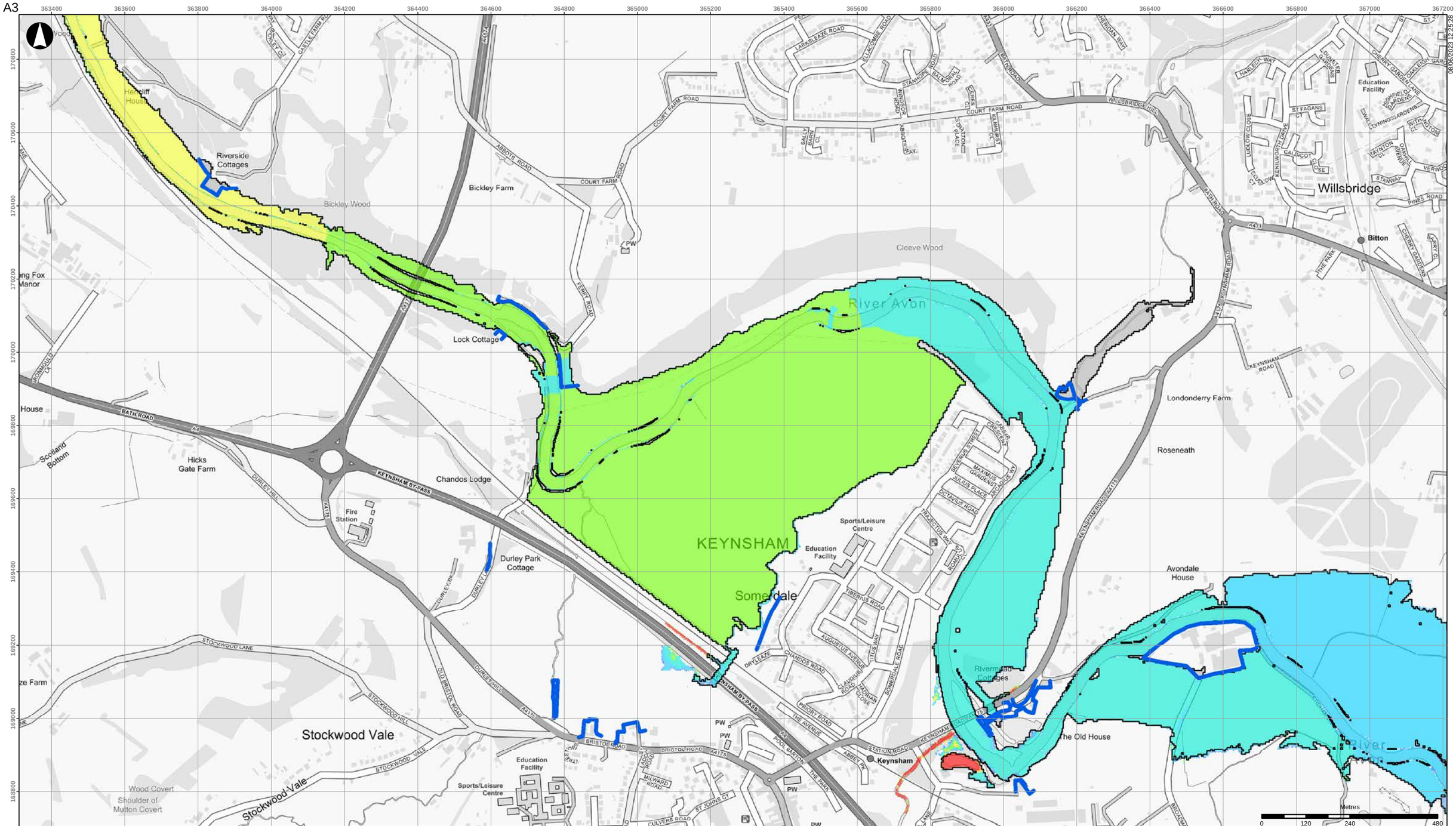
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-049**

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- Scheme defences
- Detriment mitigation defences
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

Based on the BAFS OBC model version v033_25.
Assumes glass-wall defences throughout.

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|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Detriment for scheme incl. SOC det mitigation**
**2130 tidal 1:200yr event**
**Keynsham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-050**

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A3




08/06/2023 12:25:36

- Scheme defences
- Detriment mitigation defences
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-10m
- 0.01 - 0.02
- 0.02 - 0.03
- 0.03 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

Based on the BAFS OBC model version v033_25.
Assumes glass-wall defences throughout.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-06-08 | DvdL | DvdL | PS |

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Client
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Project Title
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Drawing Title
**Detriment for scheme incl. SOC det mitigation**
**2130 tidal 1:200yr event**
**Swineford area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

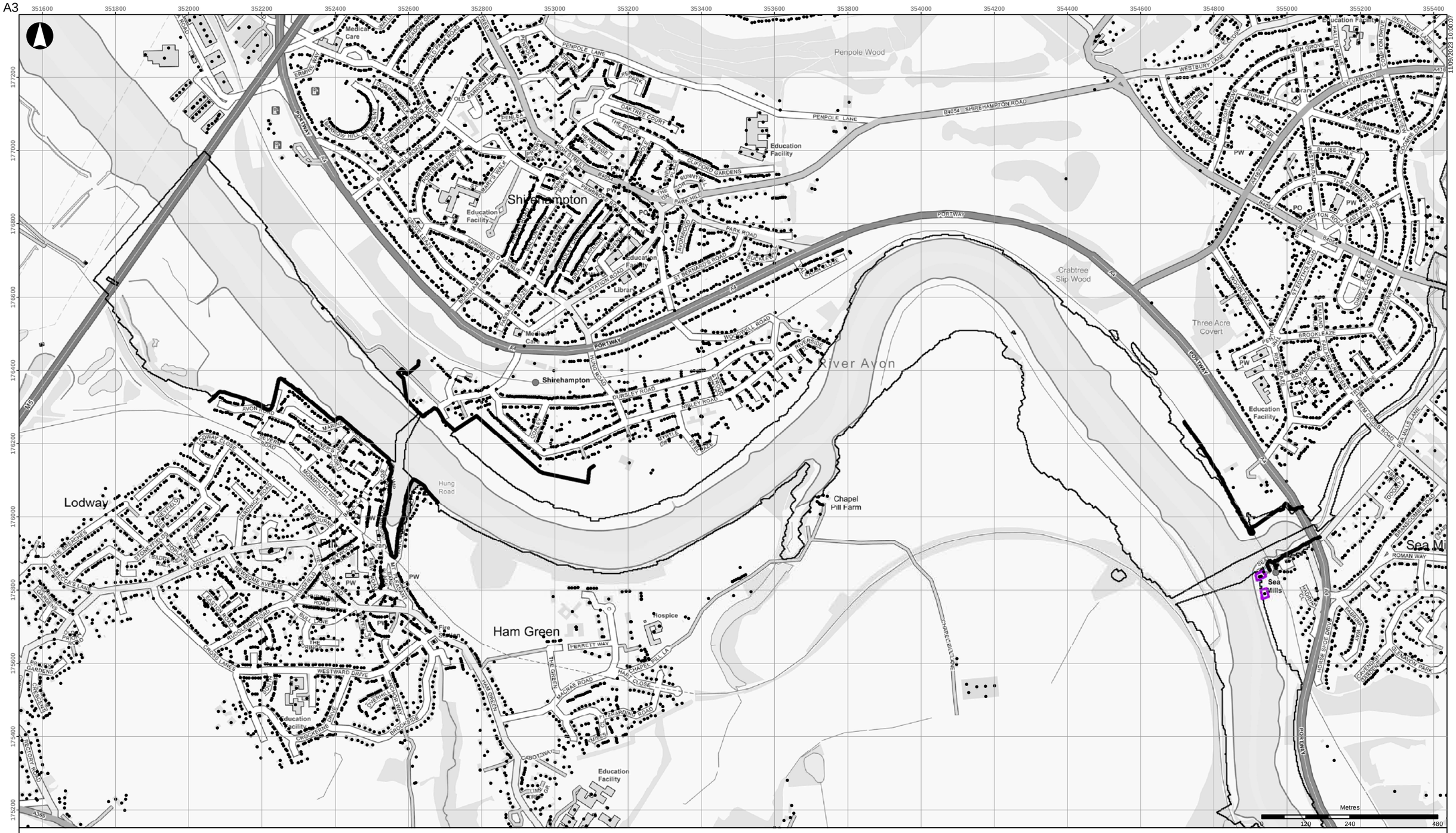
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-051**

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

Based on the BAFS OBC model version v034_27.

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| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Client
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Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 1 scheme impact**
**2030 fluvial 1:20yr event**
**Downstream areas**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

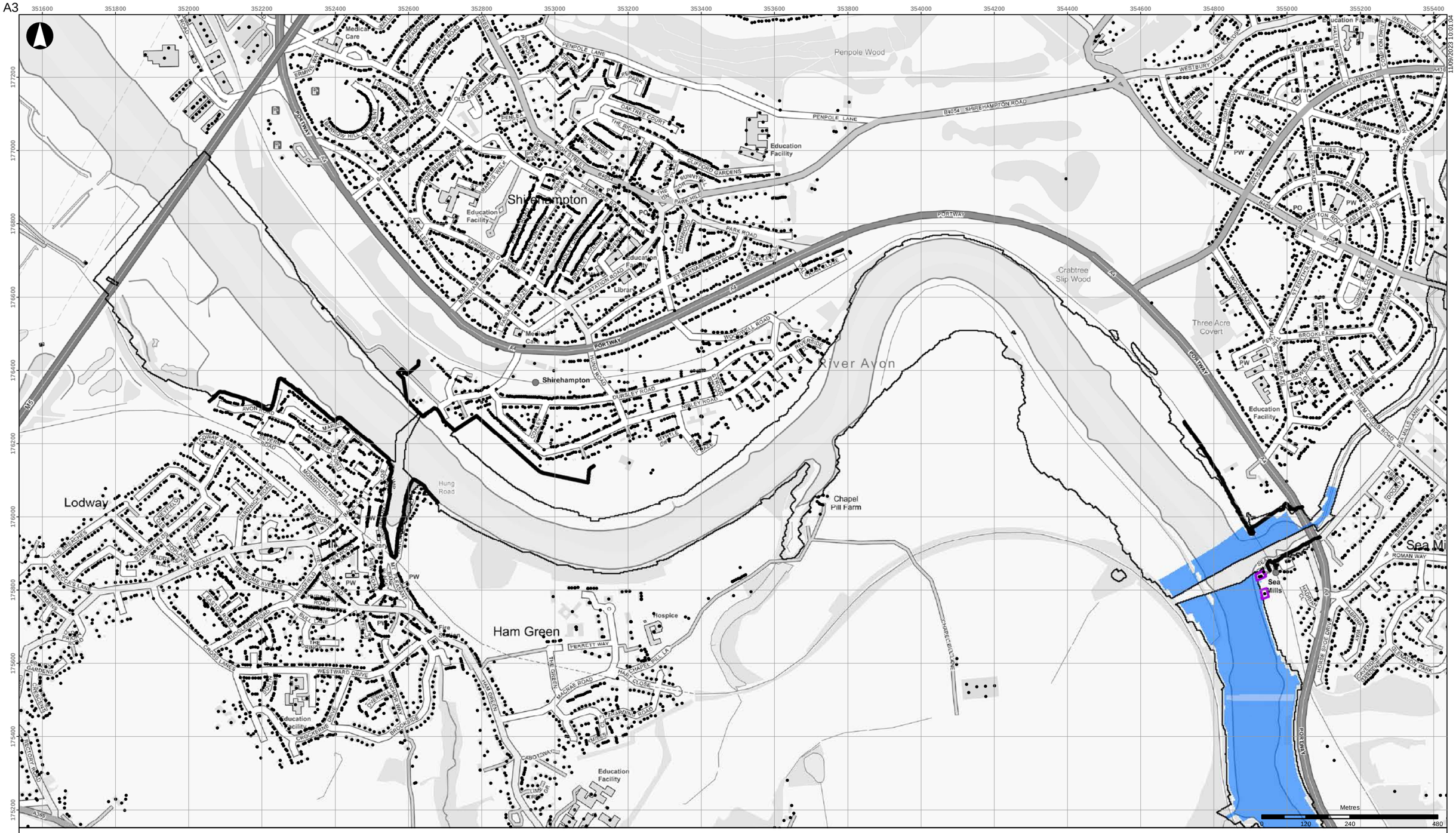
Name
**285982-ARP-XX-DR-MOD-063**

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11/09/2023 10:01:04




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

Based on the BAFS OBC model version v034_27.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2030 fluvial 1:75yr event**
**Downstream areas**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

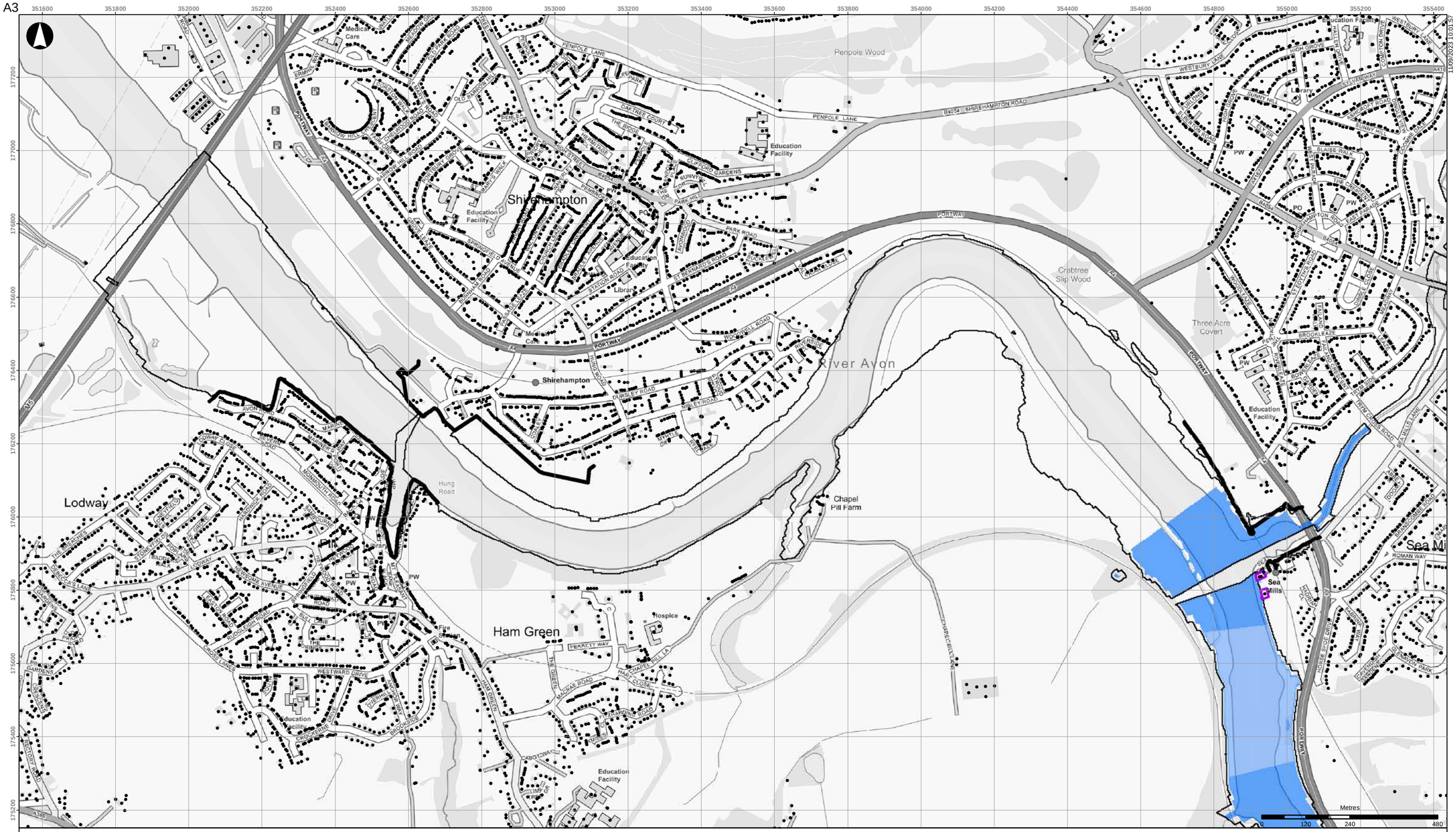
Name

**285982-ARP-XX-DR-MOD-064**

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| D1 | 2023-09-11 | DvdL | DvdL | PS |

ARUP

63 St Thomas Street
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+44 117 976 5432
www.arup.com

Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2030 fluvial 1:100yr event**
**Downstream areas**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

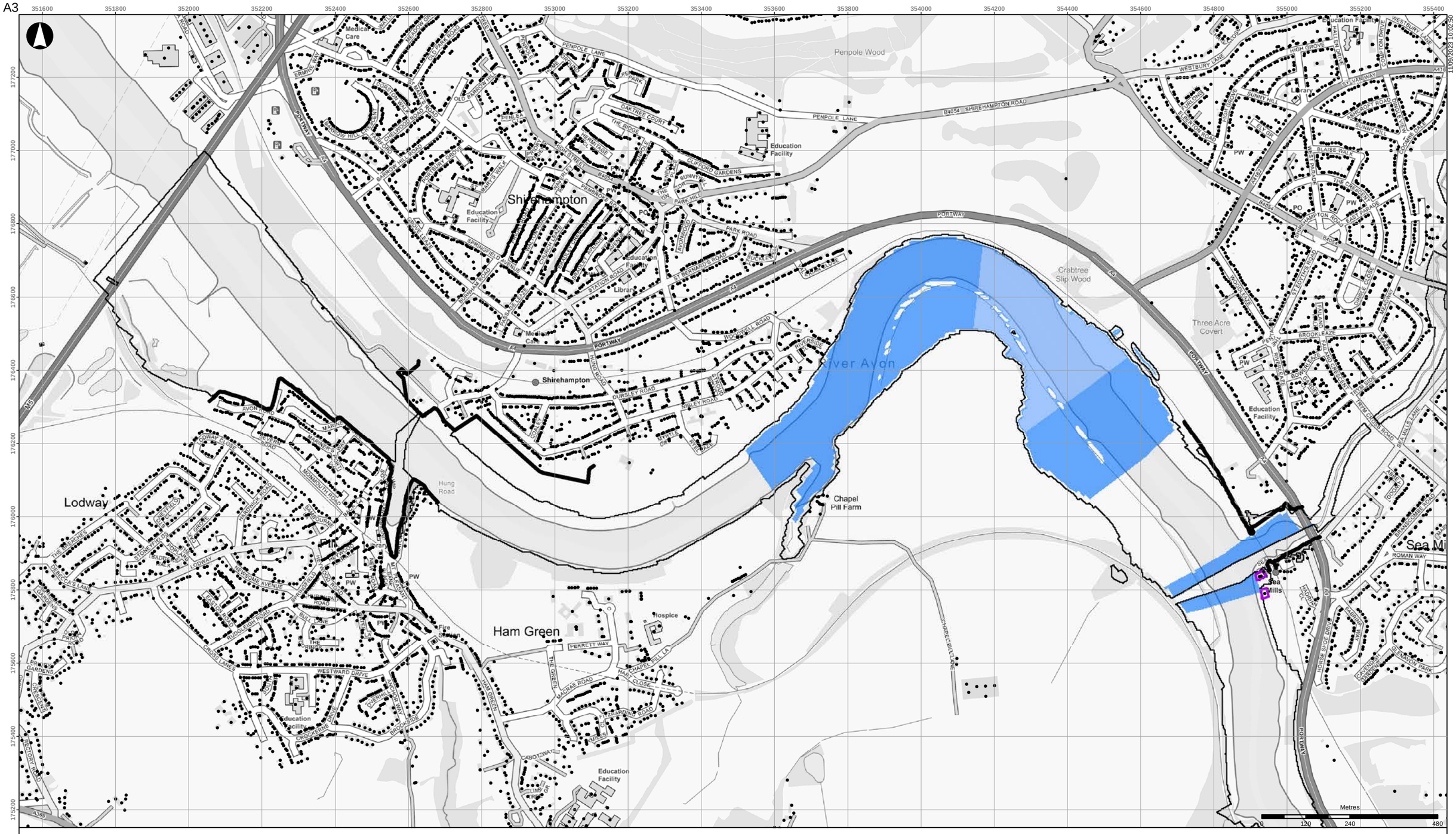
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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 1 scheme impact**
**2030 fluvial 1:200yr event**
**Downstream areas**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

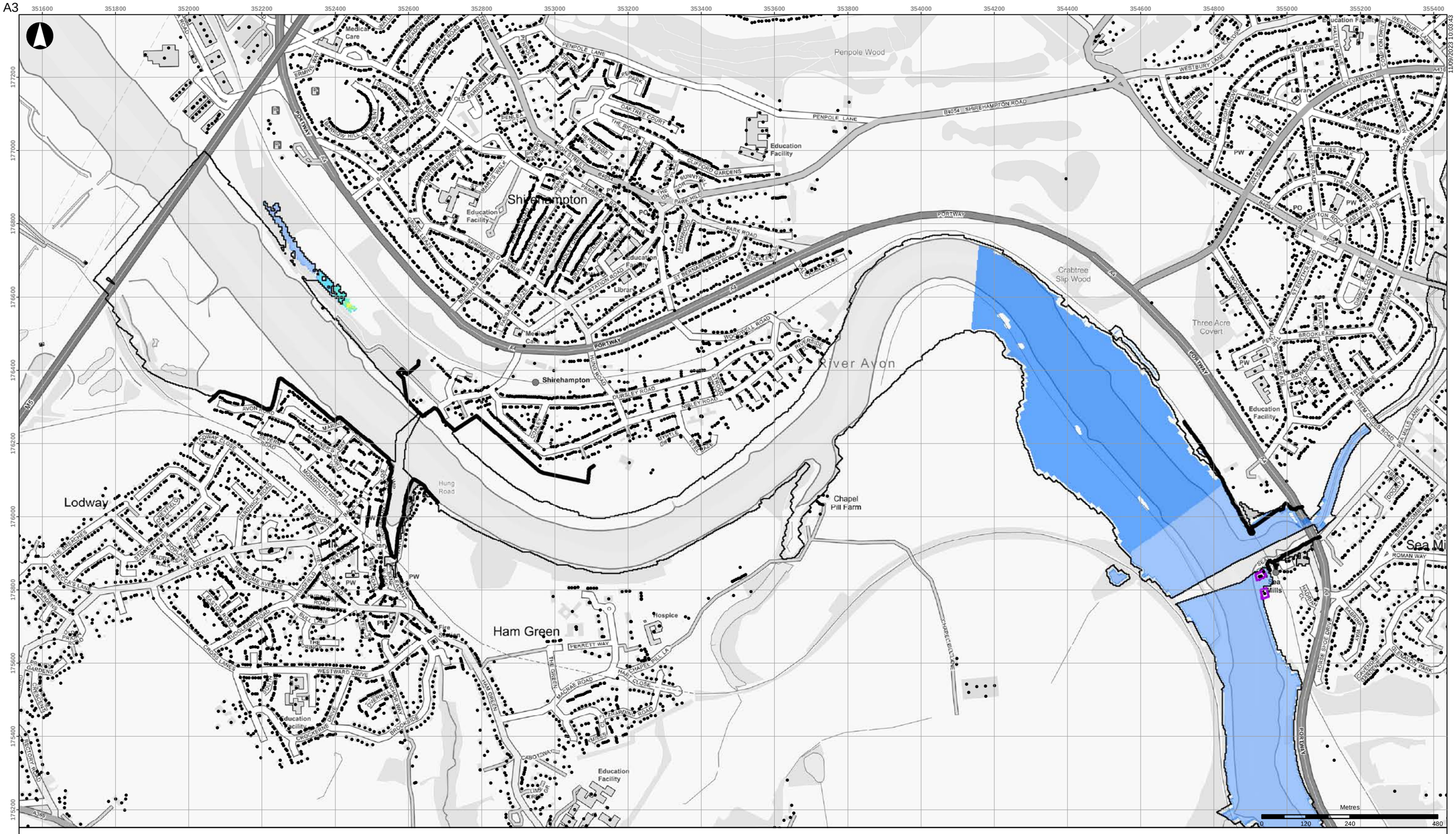
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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2069 fluvial 1:20yr event**
**Downstream areas**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

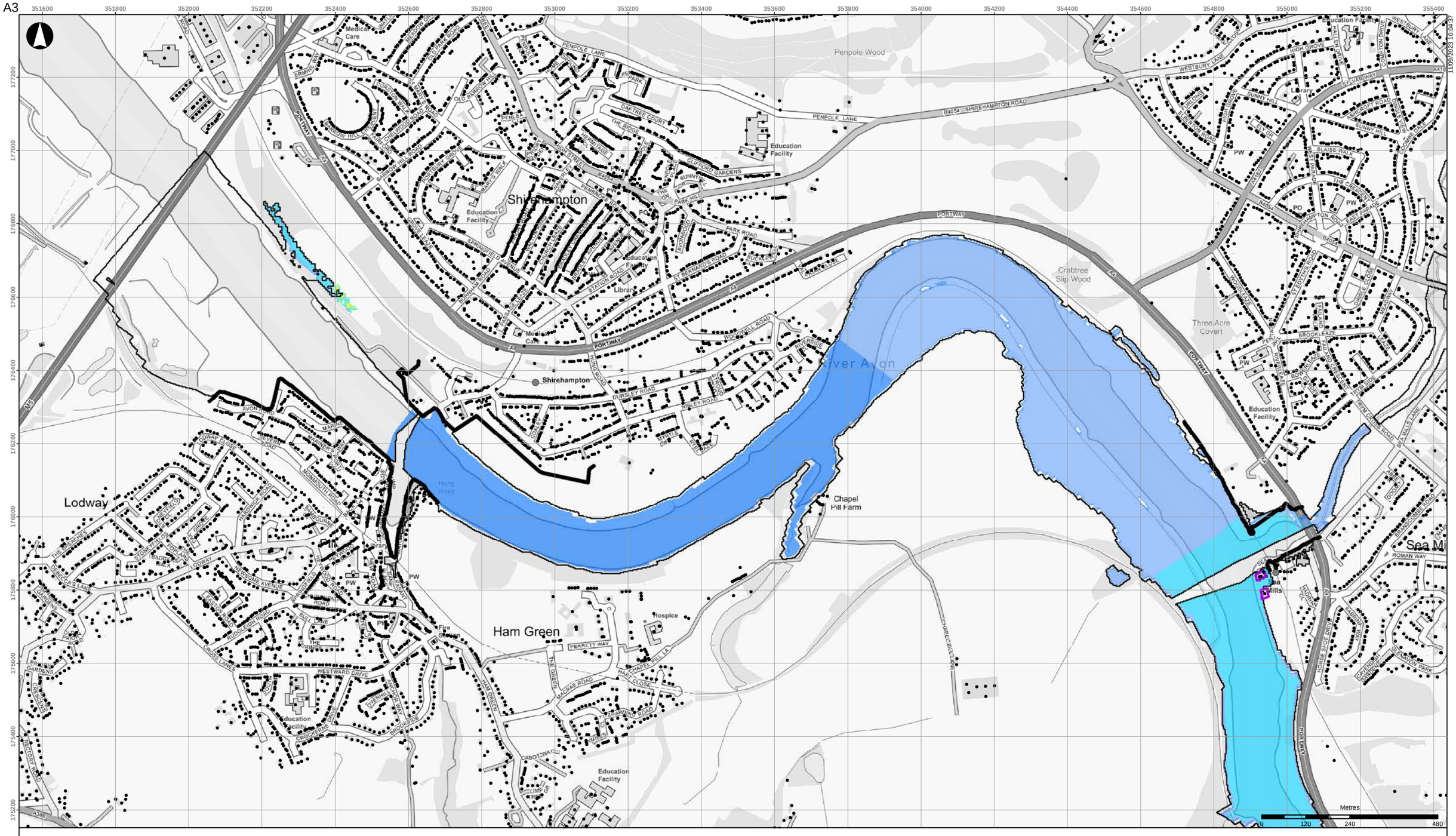
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11/09/2023 10:03:43

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Project Title

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Drawing Title

**Phase 1 scheme impact**
**2069 fluvial 1:75yr event**
**Downstream areas**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

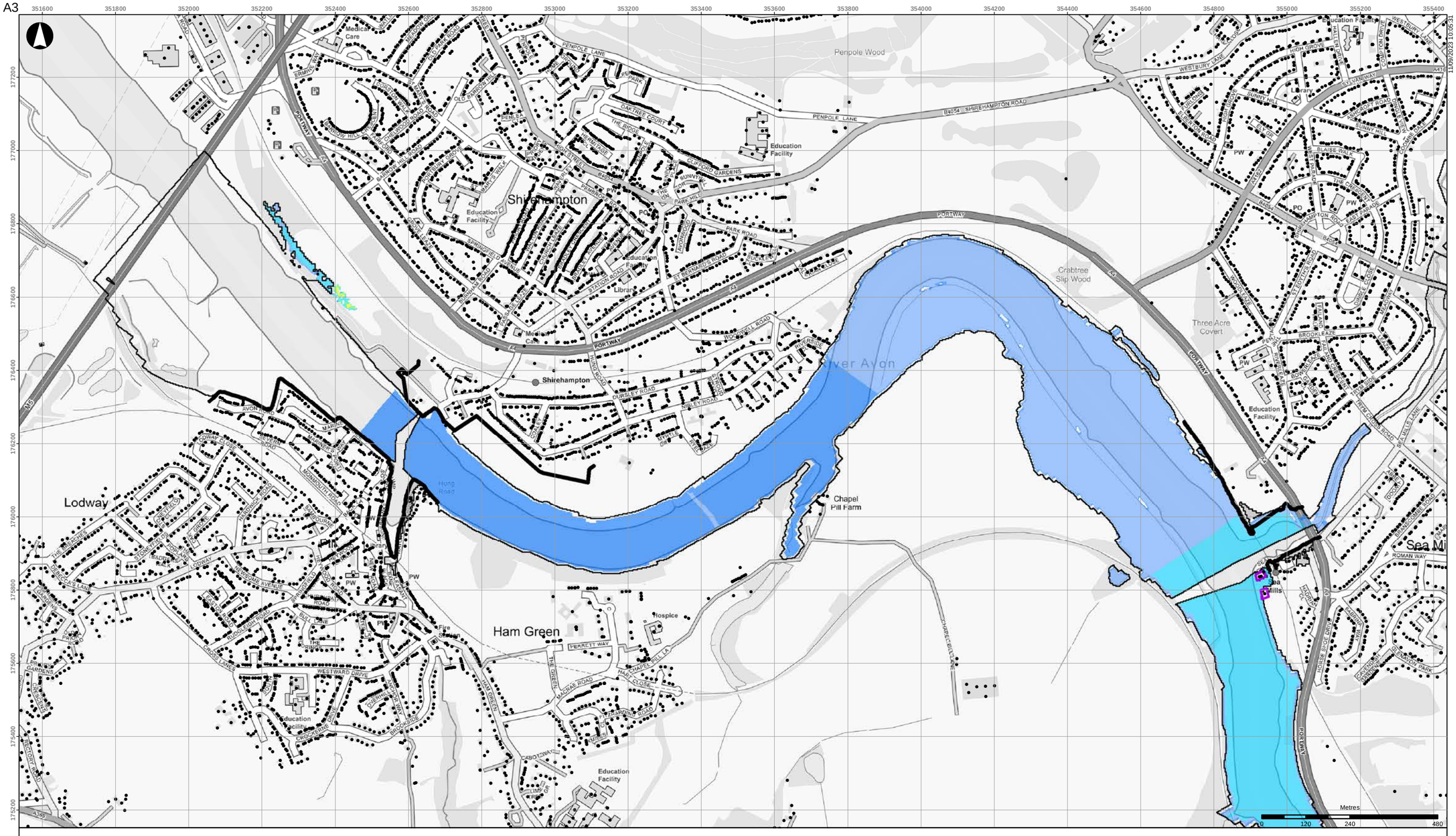
Name

**285982-ARP-XX-DR-MOD-068**

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11/09/2023 10:05:31

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Drawing Title

**Phase 1 scheme impact**
**2069 fluvial 1:100yr event**
**Downstream areas**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

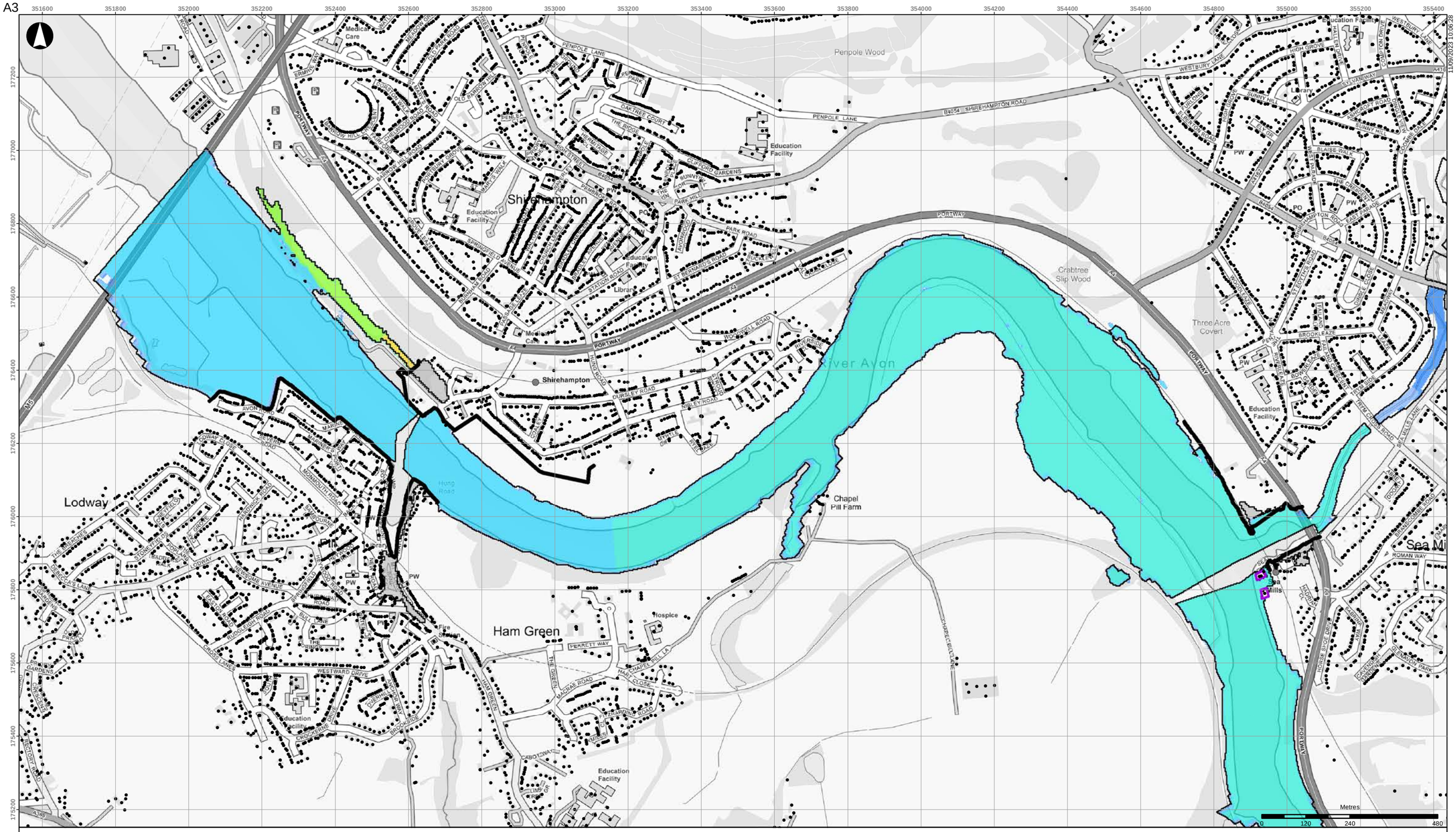
Name

**285982-ARP-XX-DR-MOD-069**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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**Phase 1 scheme impact**
**2069 fluvial 1:200yr event**
**Downstream areas**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

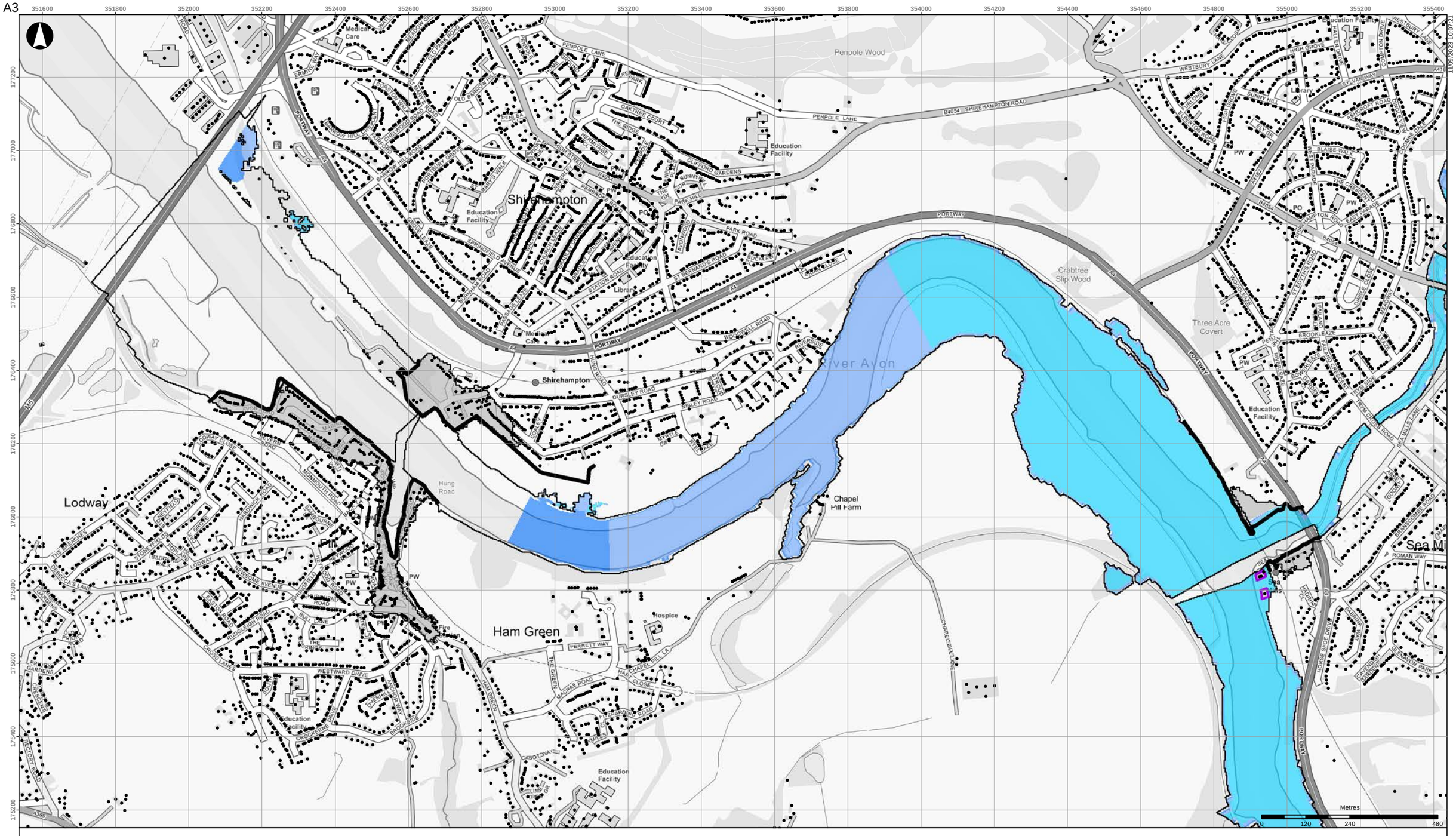
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11/09/2023 10:06:28

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2130 fluvial 1:20yr event**
**Downstream areas**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

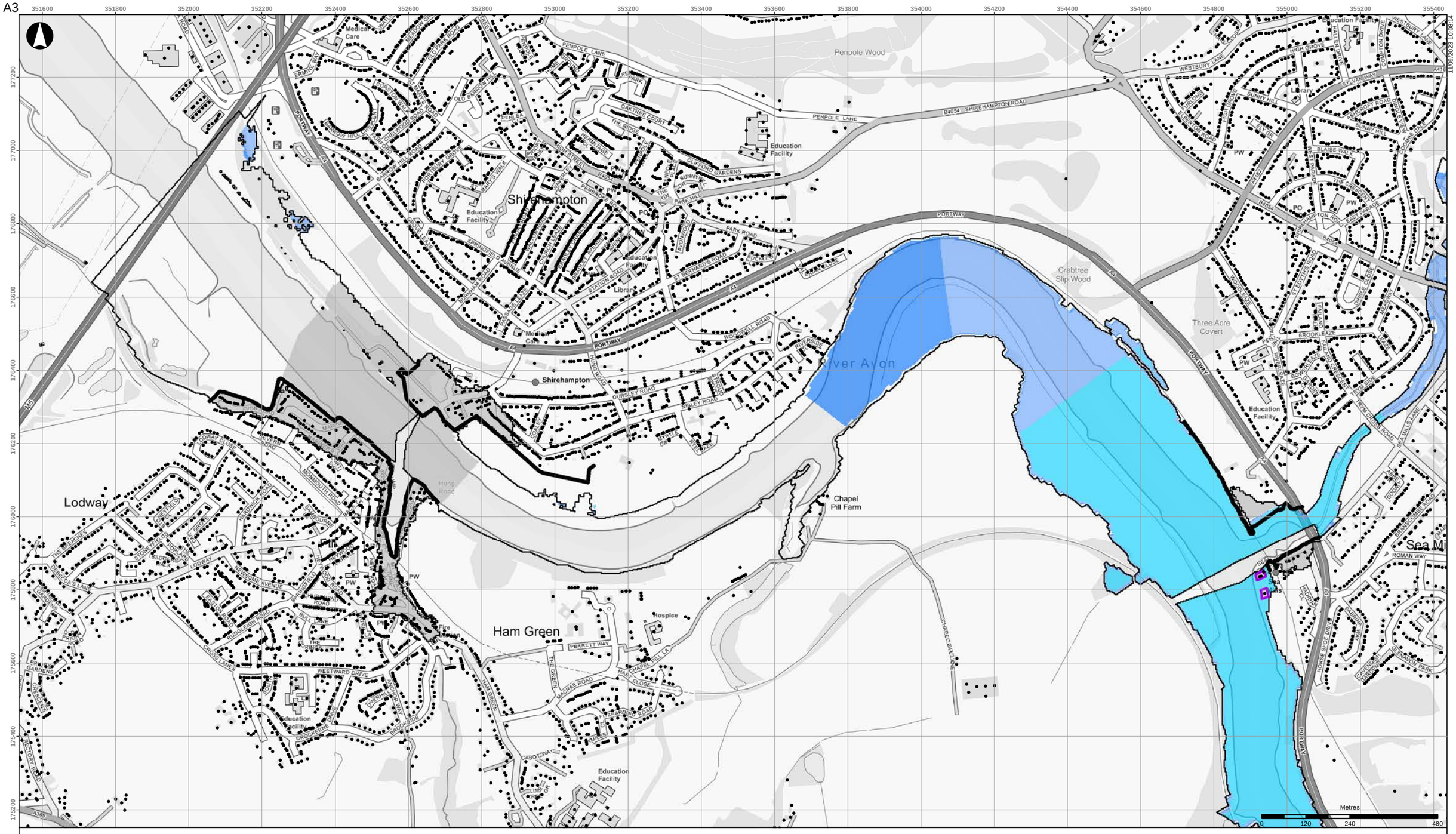
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11/09/2023 10:07:21

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2130 fluvial 1:75yr event**
**Downstream areas**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

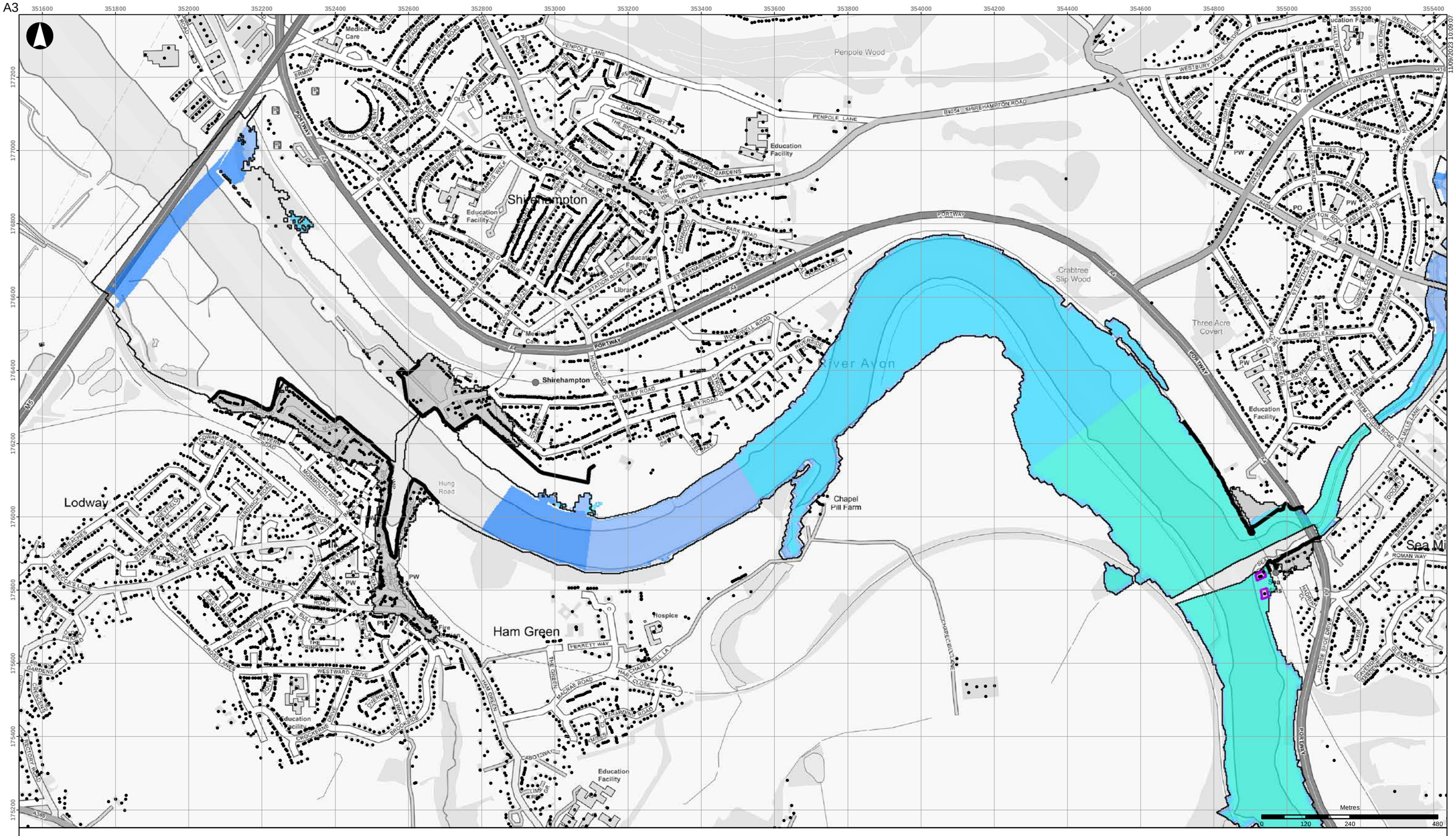
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11/09/2023 10:08:14

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2130 fluvial 1:100yr event**
**Downstream areas**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

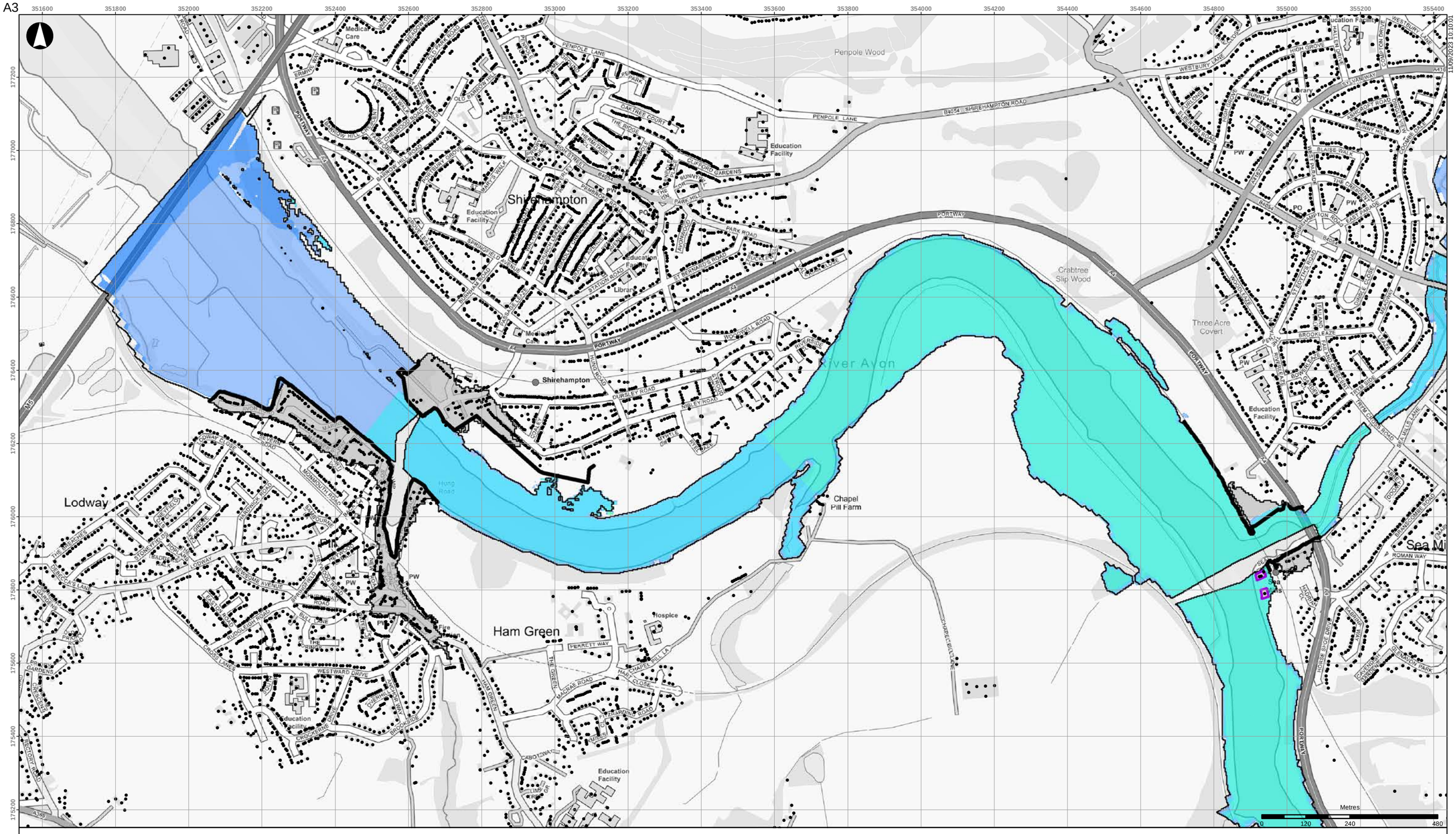
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11/09/2023 10:09:07

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 1 scheme impact**
**2130 fluvial 1:200yr event**
**Downstream areas**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

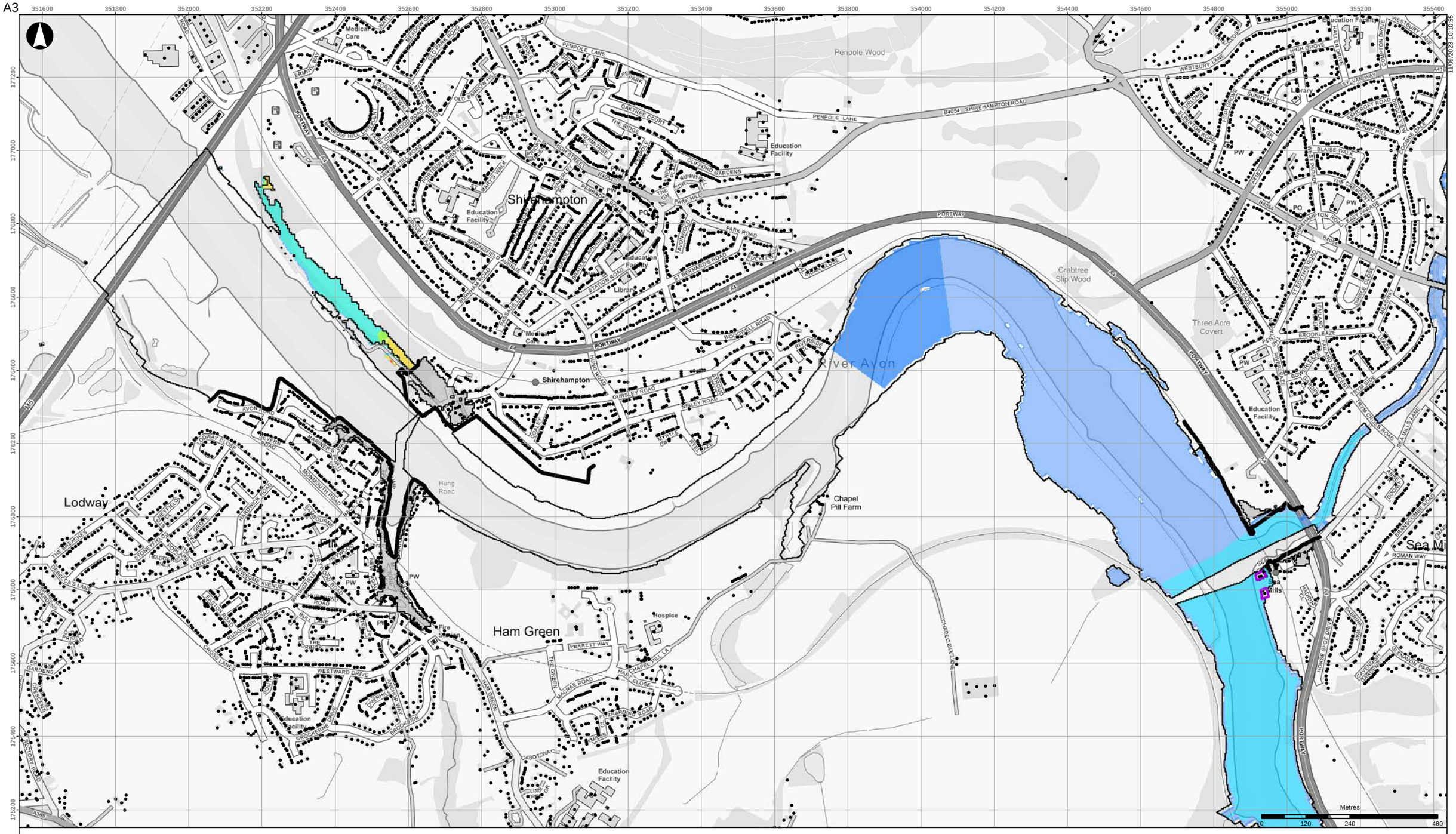
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11/09/2023 10:10:01

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Project Title

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Drawing Title

**Phase 1 scheme impact**
**2030 tidal 1:20yr event**
**Downstream areas**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

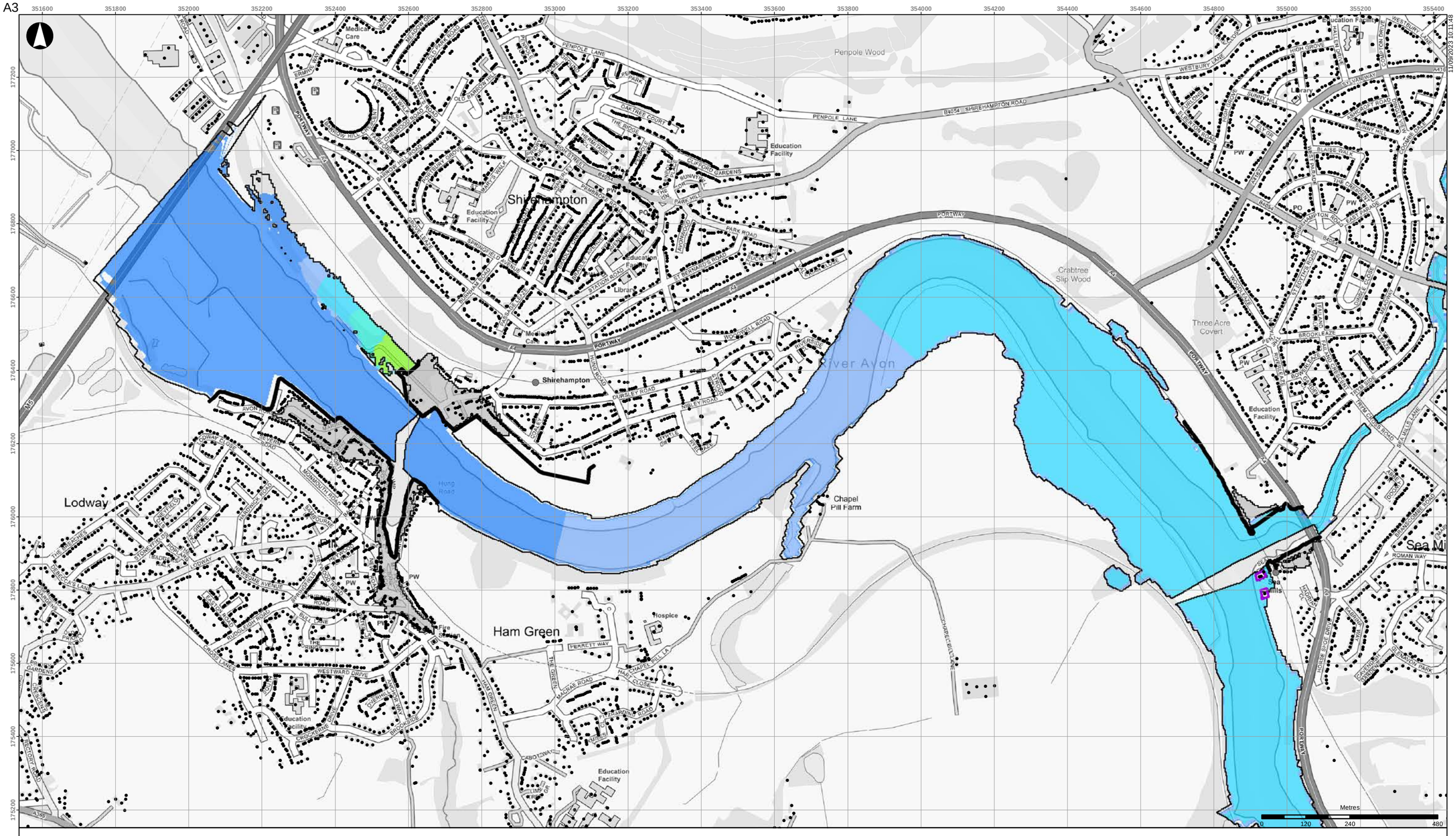
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11/09/2023 10:10:55

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Drawing Title

**Phase 1 scheme impact**
**2030 tidal 1:75yr event**
**Downstream areas**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

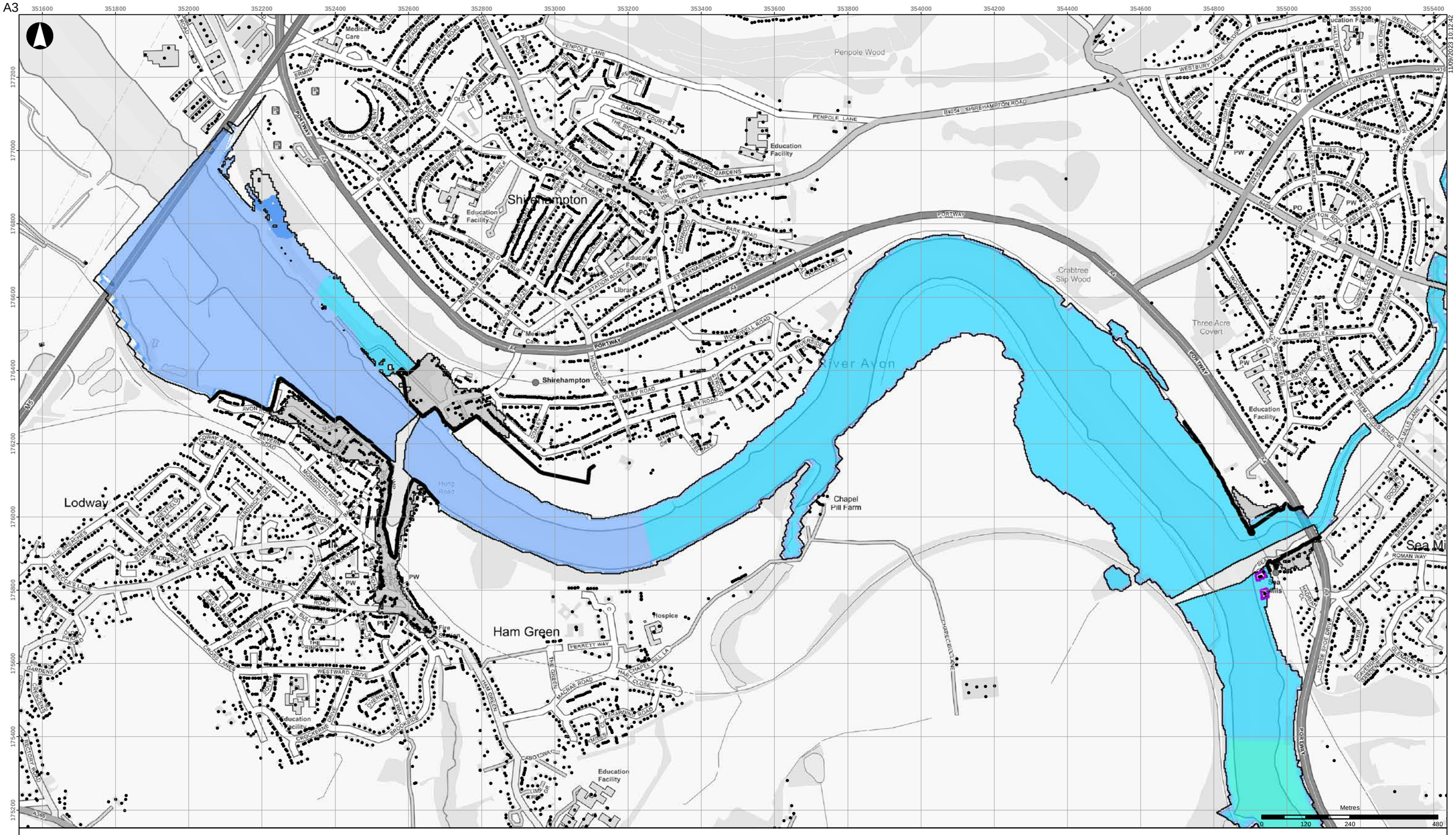
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11/09/2023 10:11:48

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Project Title

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Drawing Title

**Phase 1 scheme impact**
**2030 tidal 1:100yr event**
**Downstream areas**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

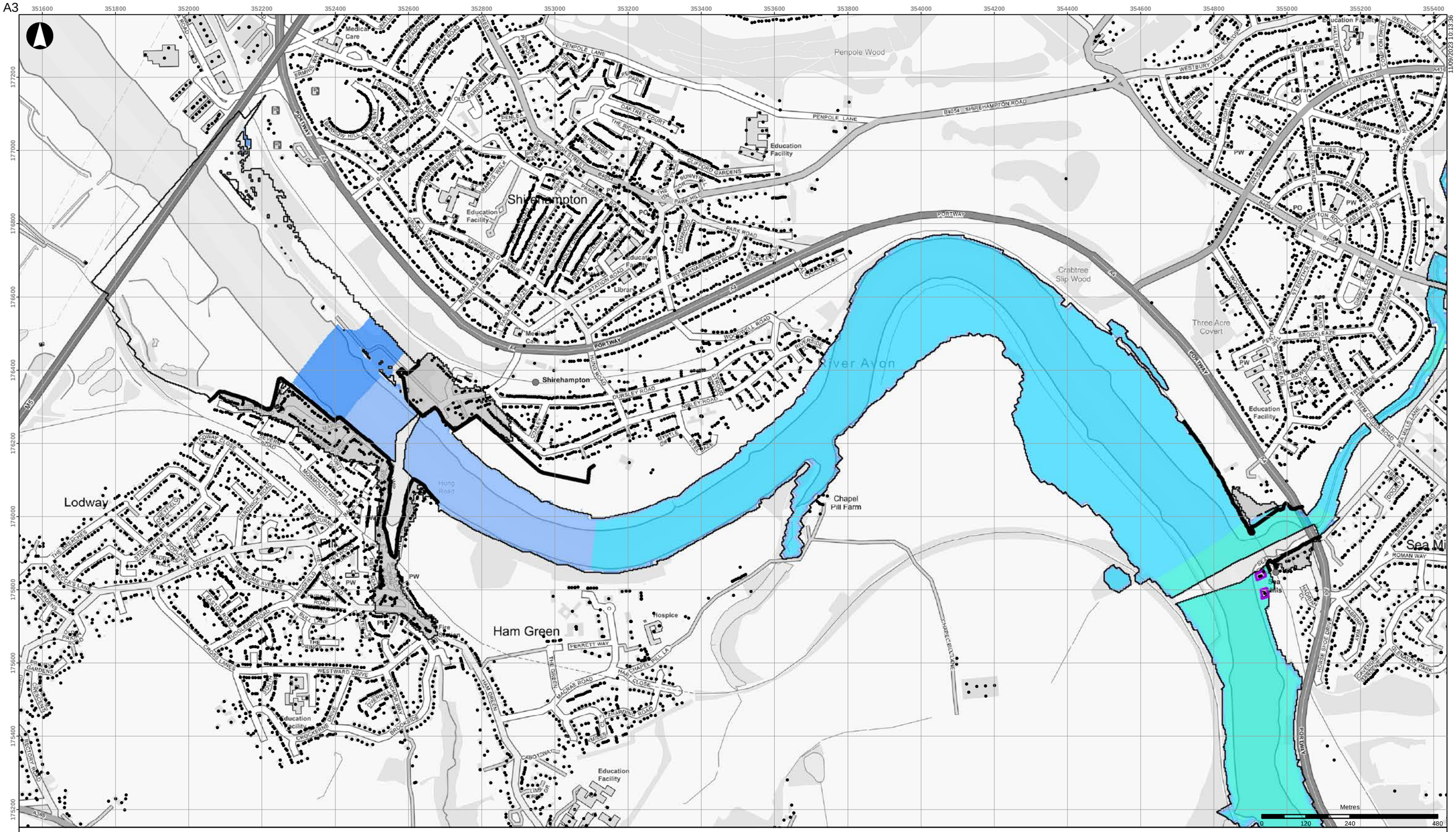
**285982-ARP-XX-DR-MOD-077**

11/09/2023 10:12:42

\\global\europe\Bristol\Jobs\285xxx\285982-00\4.30_Drgs\2_GIS\04_Map Documents\WAT_Water\2023-09-05_Phase1_SchemeImpact_Rev2.mxd

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

Based on the BAFS OBC model version v034_27.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

ARUP

63 St Thomas Street
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+44 117 976 5432
www.arup.com

Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2030 tidal 1:200yr event**
**Downstream areas**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

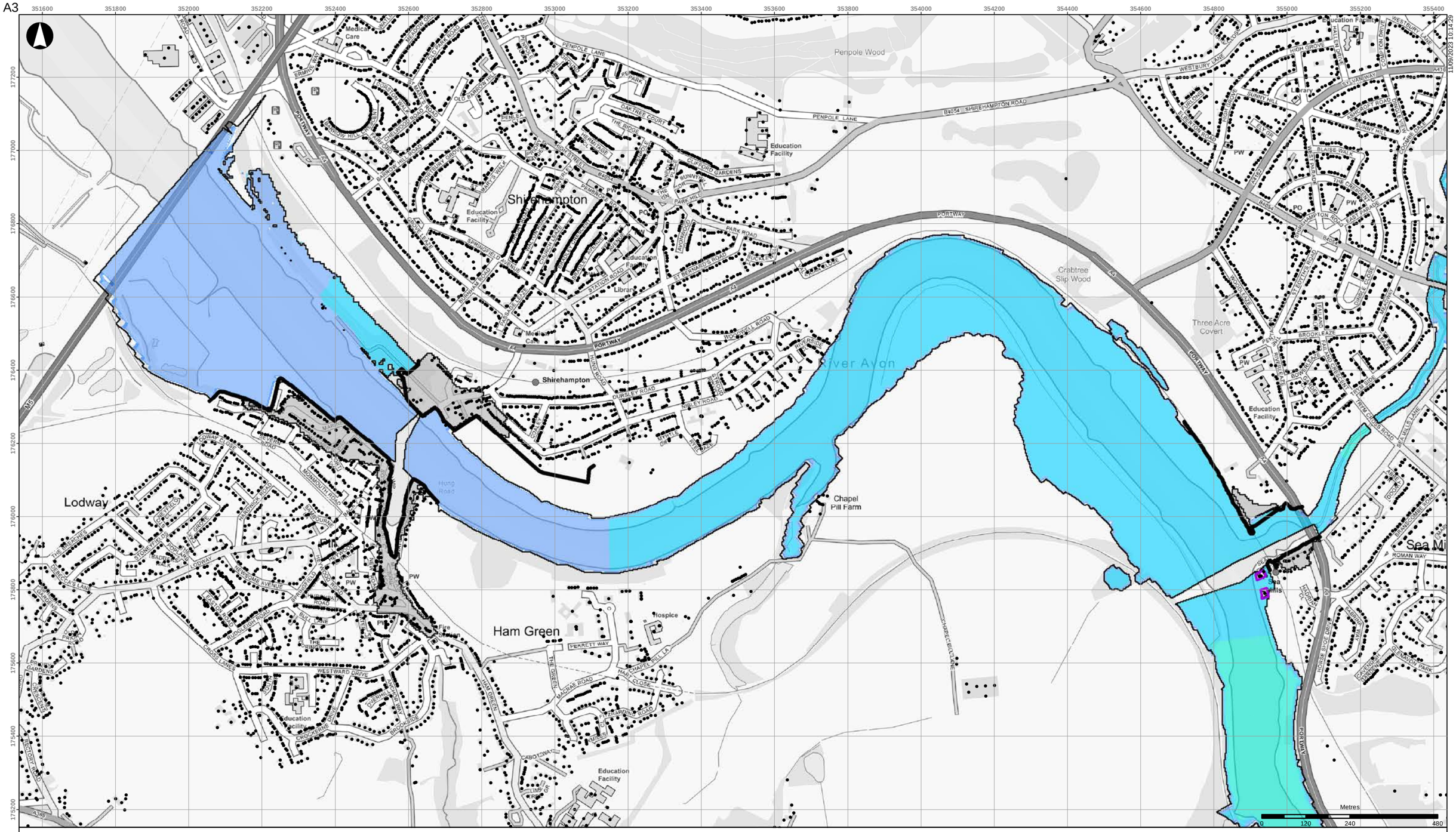
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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

Contains OS data (C) Crown Copyright and database right 2023

Notes:

Based on the BAFS OBC model version v034_27.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2069 tidal 1:20yr event**
**Downstream areas**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

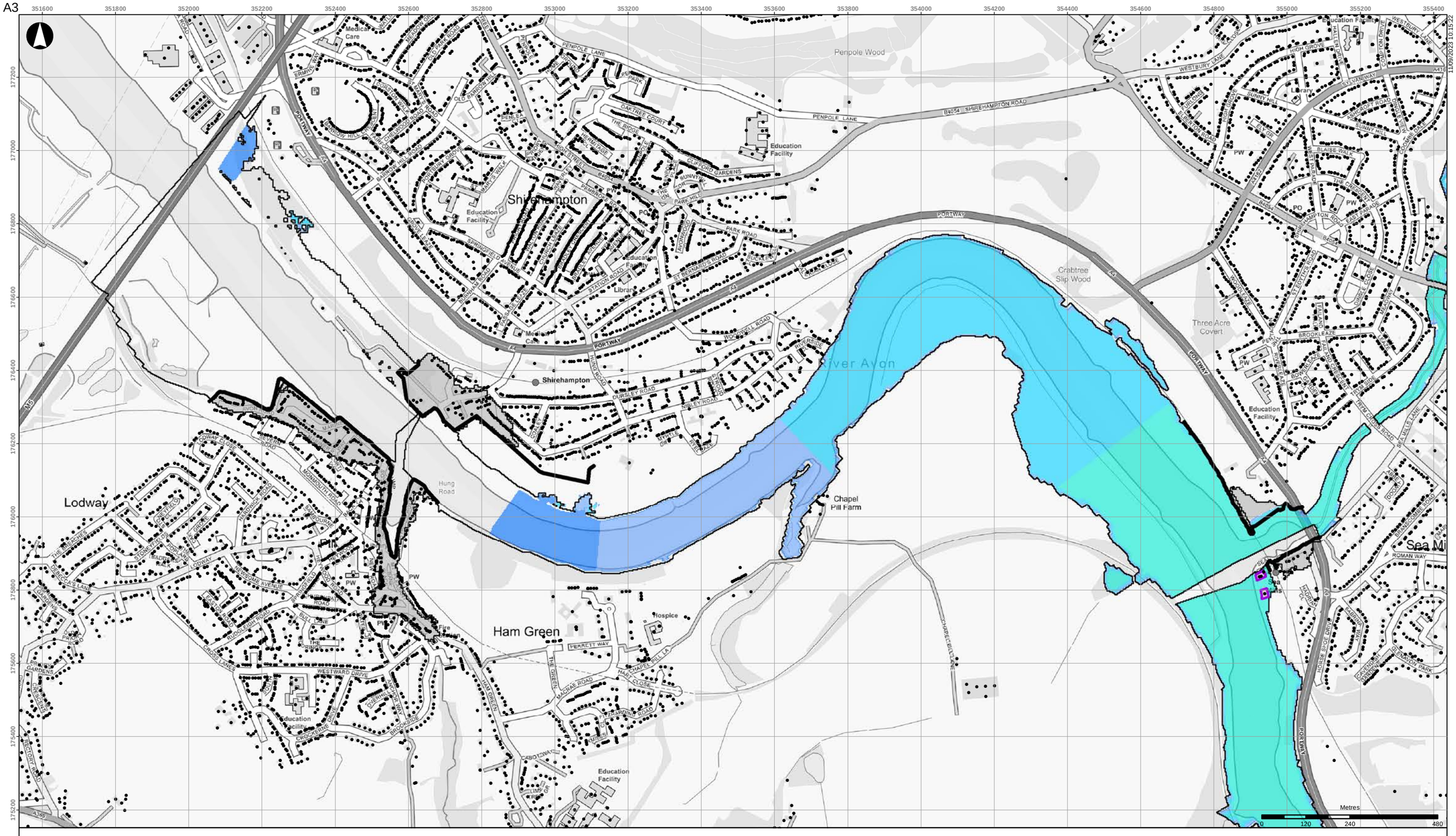
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11/09/2023 10:14:29

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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Notes:

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**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2069 tidal 1:75yr event**
**Downstream areas**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

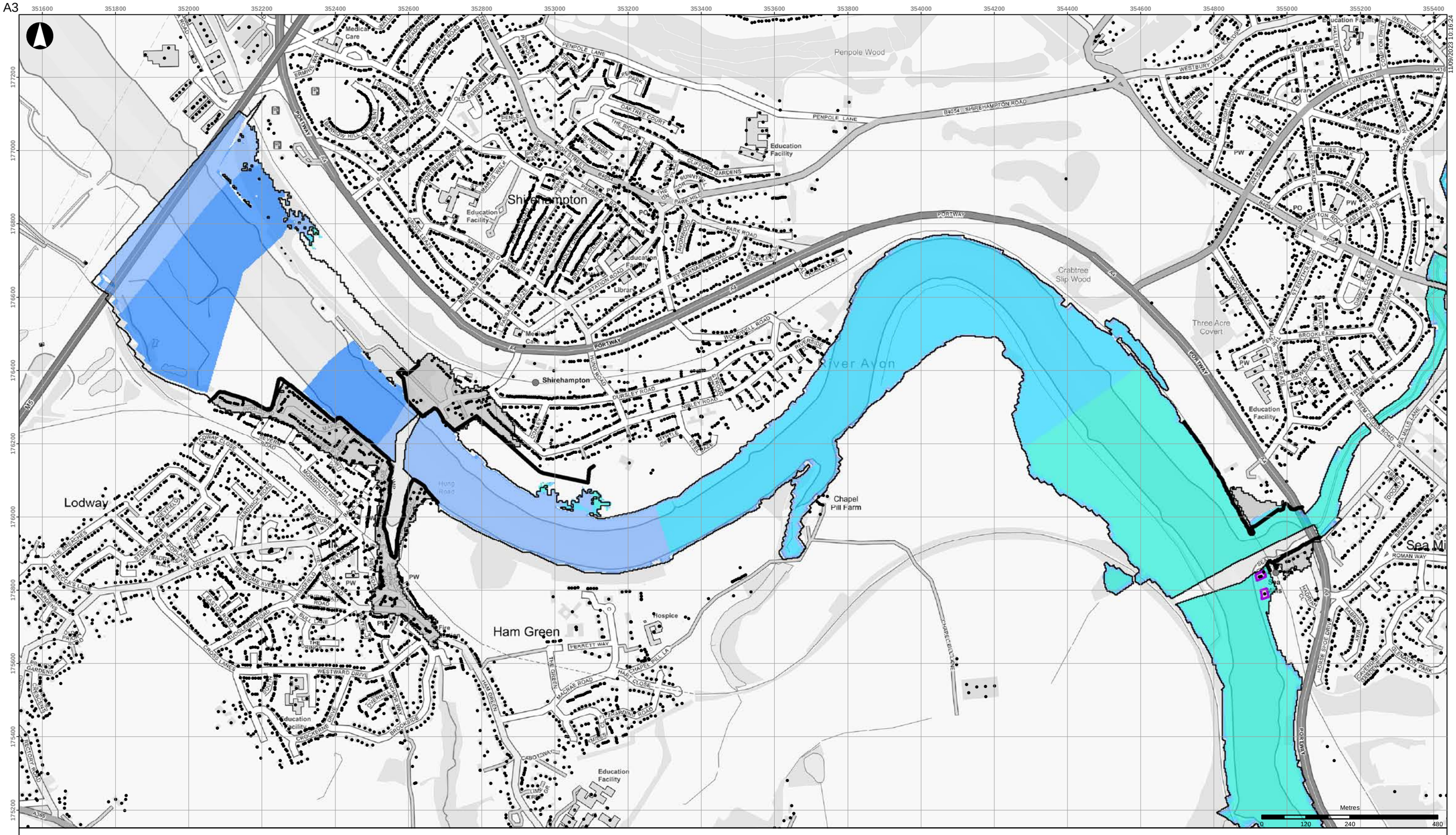
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11/09/2023 10:15:22

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Client

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2069 tidal 1:100yr event**
**Downstream areas**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

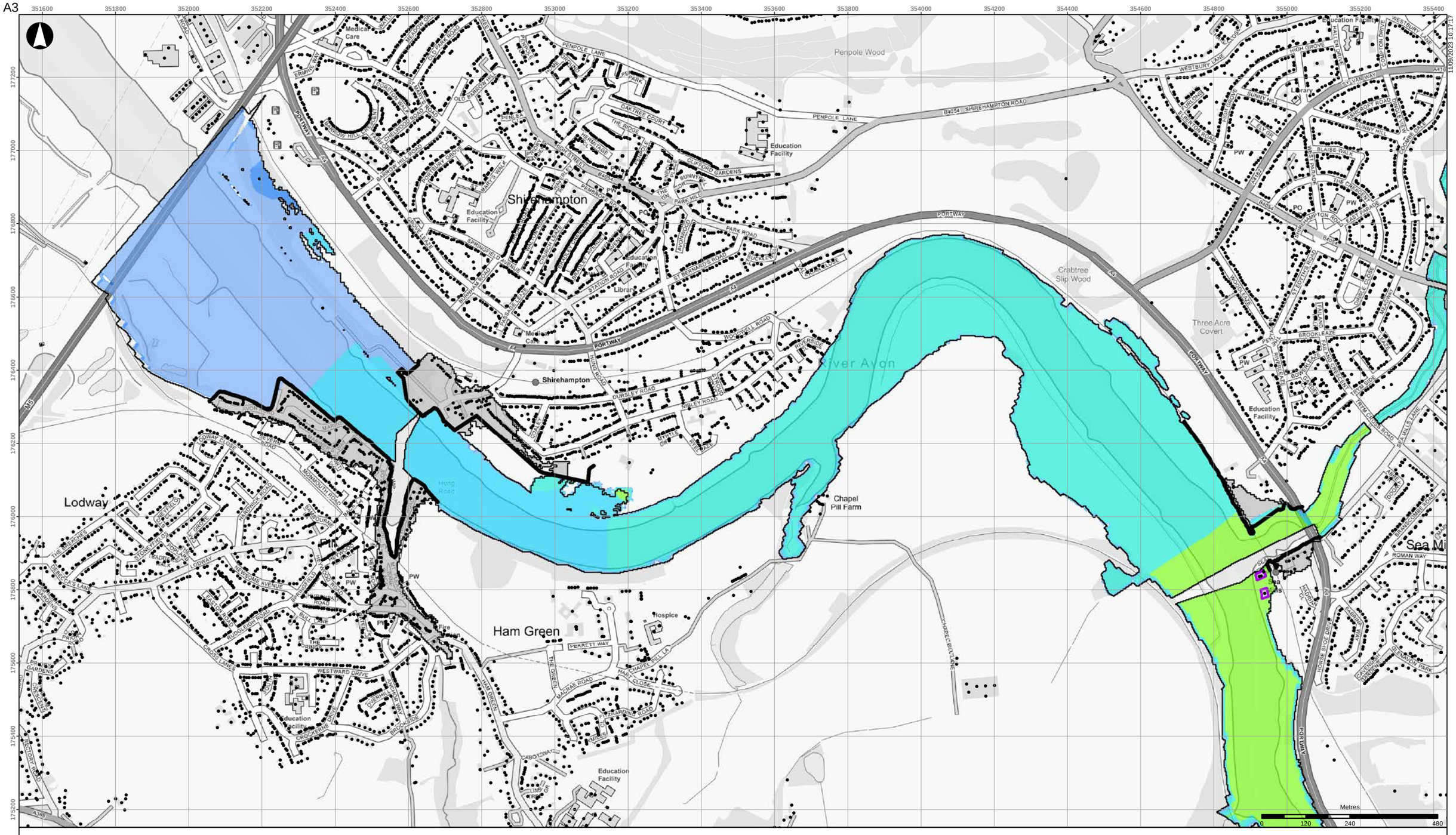
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11/09/2023 10:15:24

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 1 scheme impact**
**2069 tidal 1:200yr event**
**Downstream areas**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

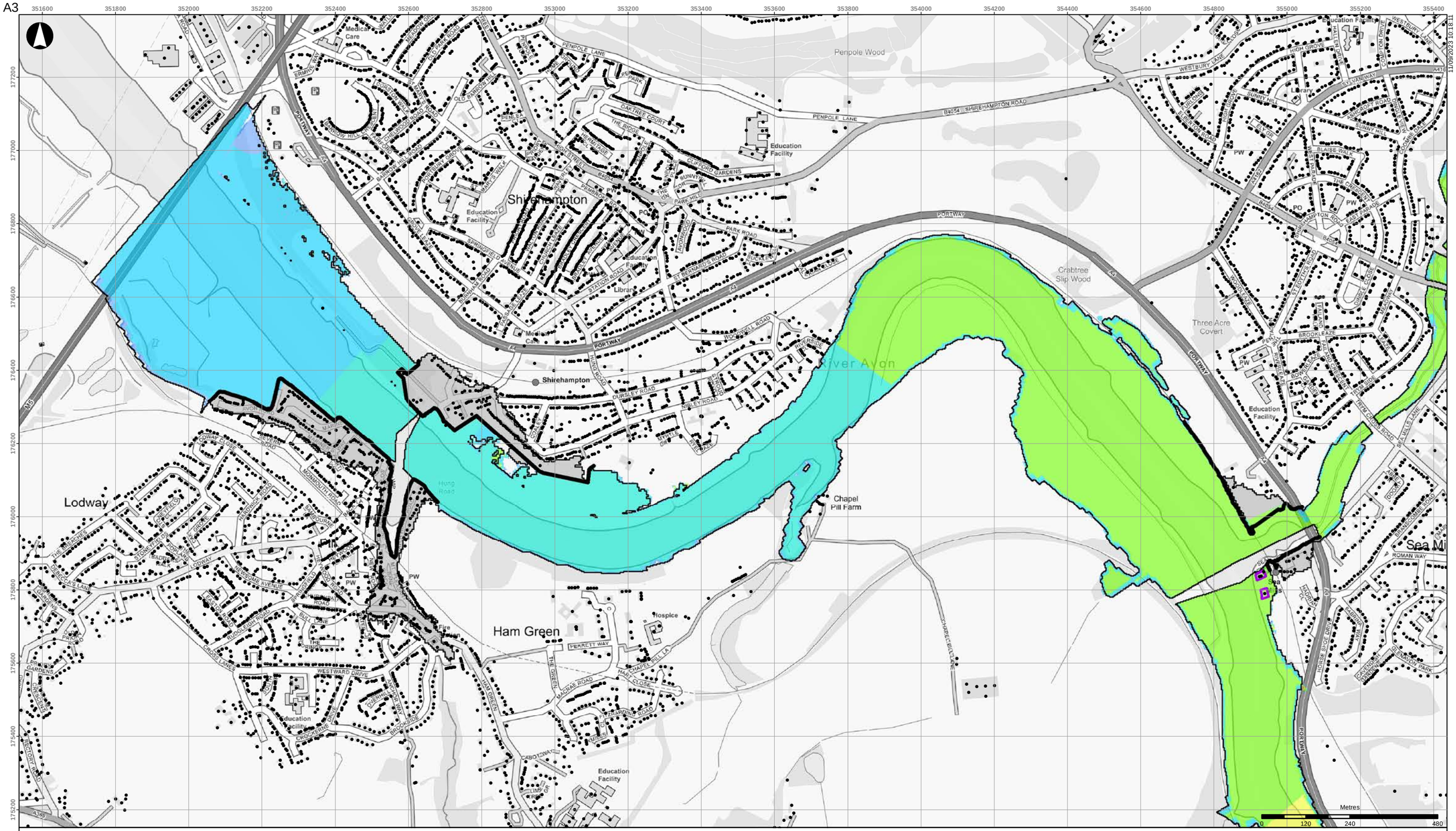
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11/09/2023 10:17:17

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
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Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 1 scheme impact**
**2130 tidal 1:20yr event**
**Downstream areas**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

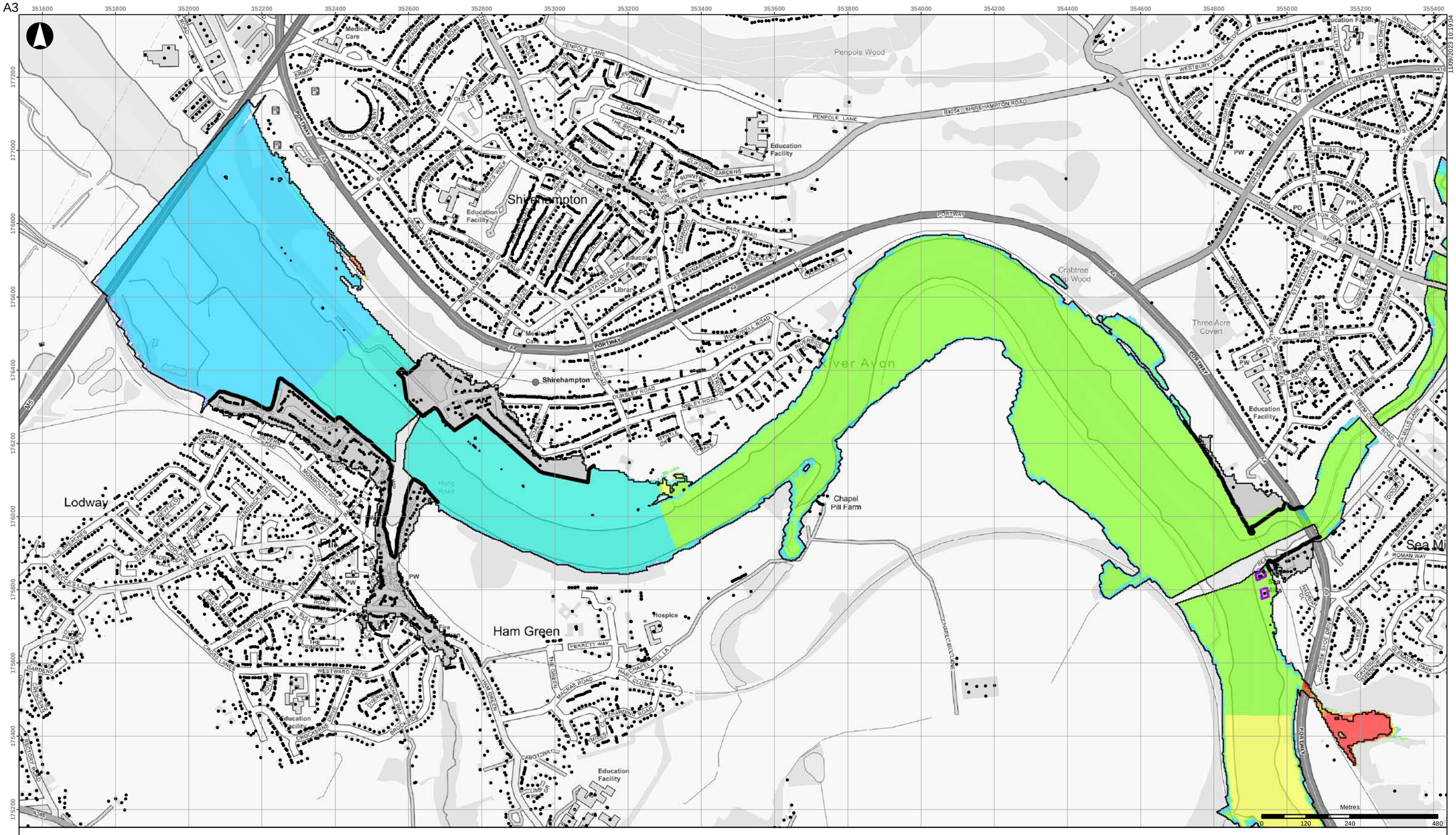
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11/09/2023 10:18:31

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2130 tidal 1:75yr event**
**Downstream areas**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

**285982-ARP-XX-DR-MOD-084**

11/09/2023 10:19:04

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A3

11/09/2023 10:19:56

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 1 scheme impact**
**2130 tidal 1:100yr event**
**Downstream areas**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

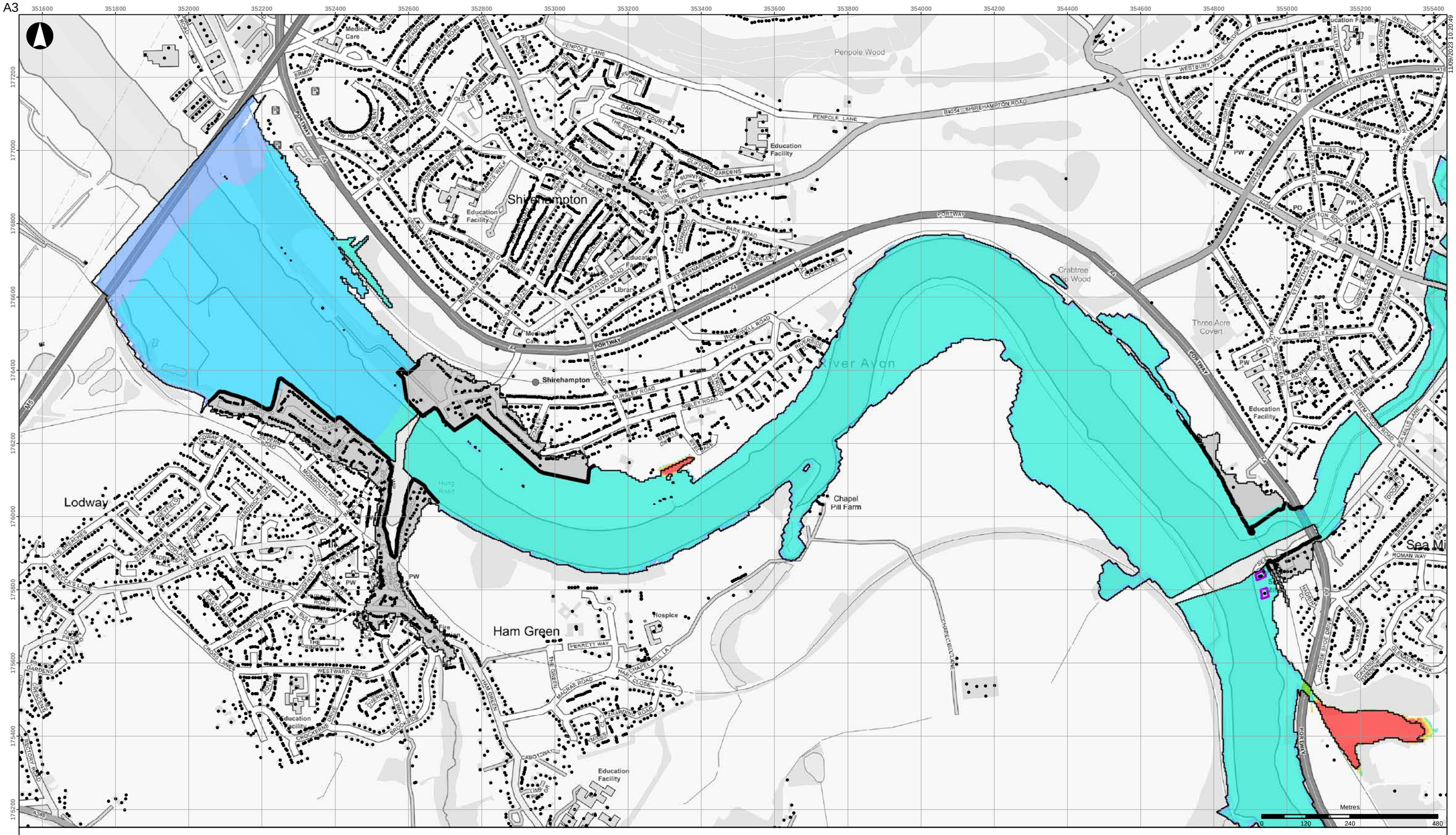
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-085**

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2130 tidal 1:200yr event**
**Downstream areas**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

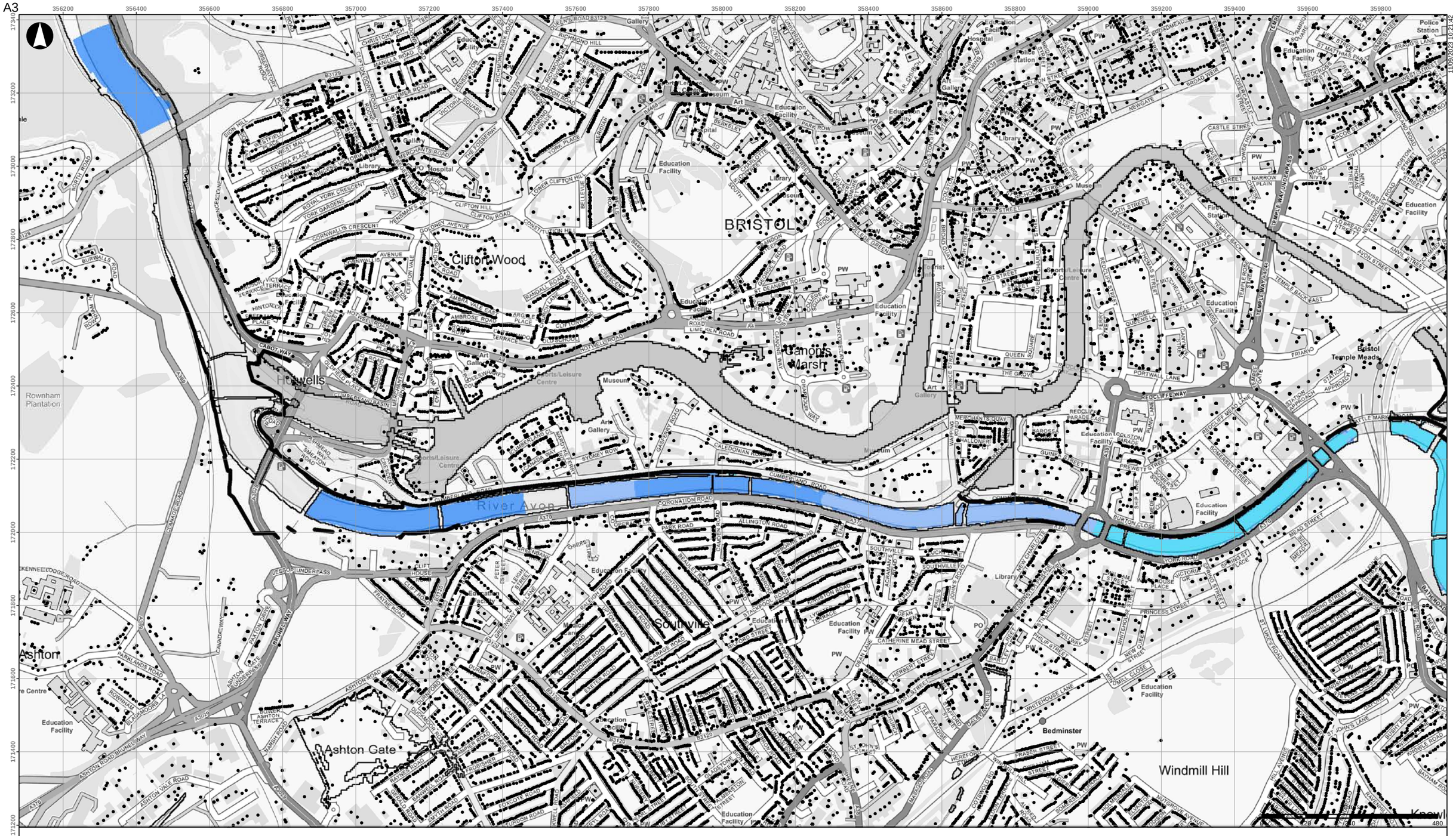
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11/09/2023 10:20:49

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A3

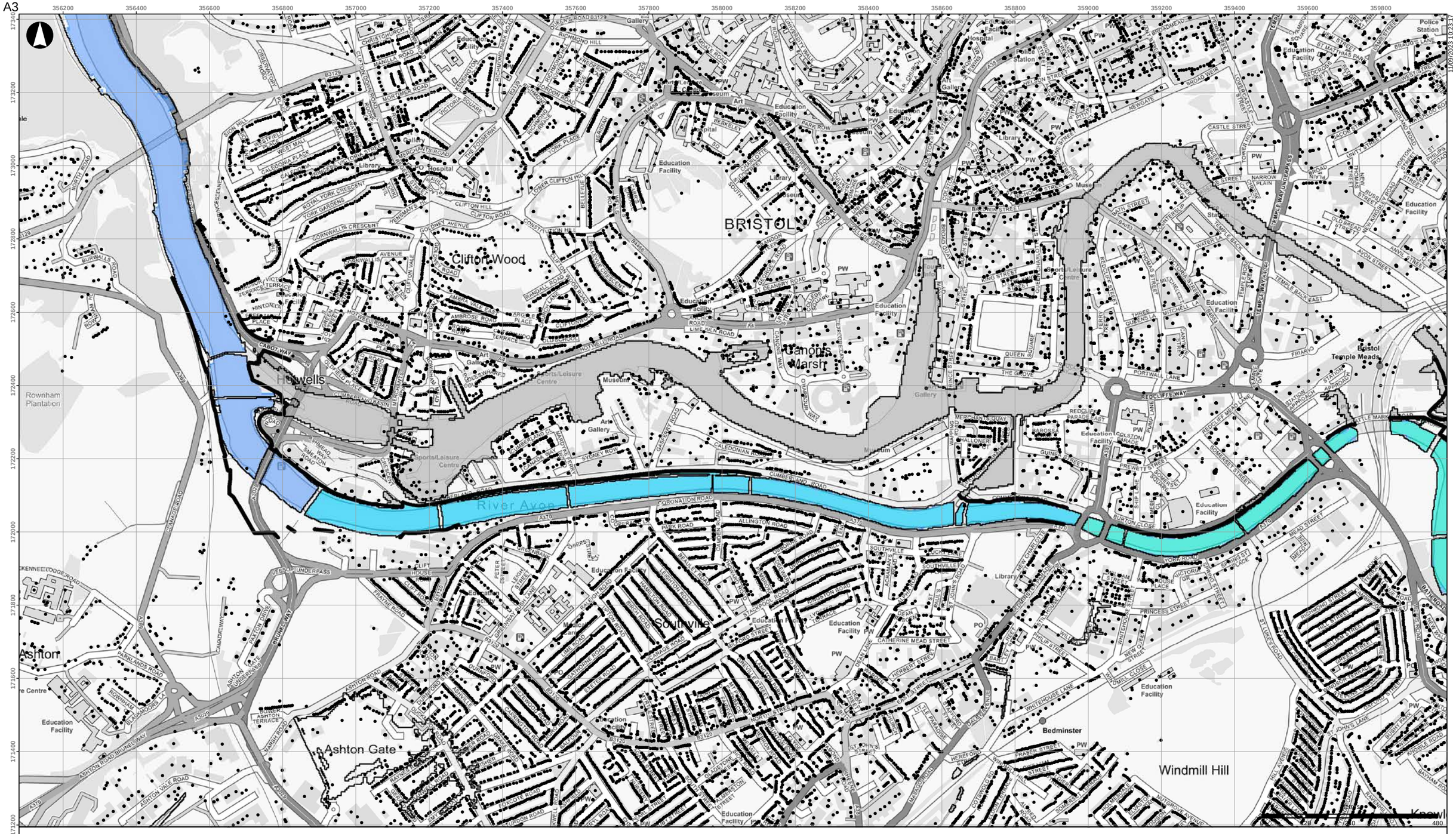

BRISTOL
Clifton Wood
Harbourside
Canon's Marsh
Southville
Ashton Gate
Bedminster
Windmill Hill
Redcliffe
Temple Meads
Hotwells
Rownham Plantation
River Avon
Education Facility
Museum
Art Gallery
Sports/Leisure Centre
Library
Hospital
Police Station
Fire Station
Tourist Info Centre
Gallery
PW
Bristol Temple Meads
Ashton
Ashton Gate
Windmill Hill
Redcliffe
Southville
Clifton Wood
Harbourside
Canon's Marsh

A3

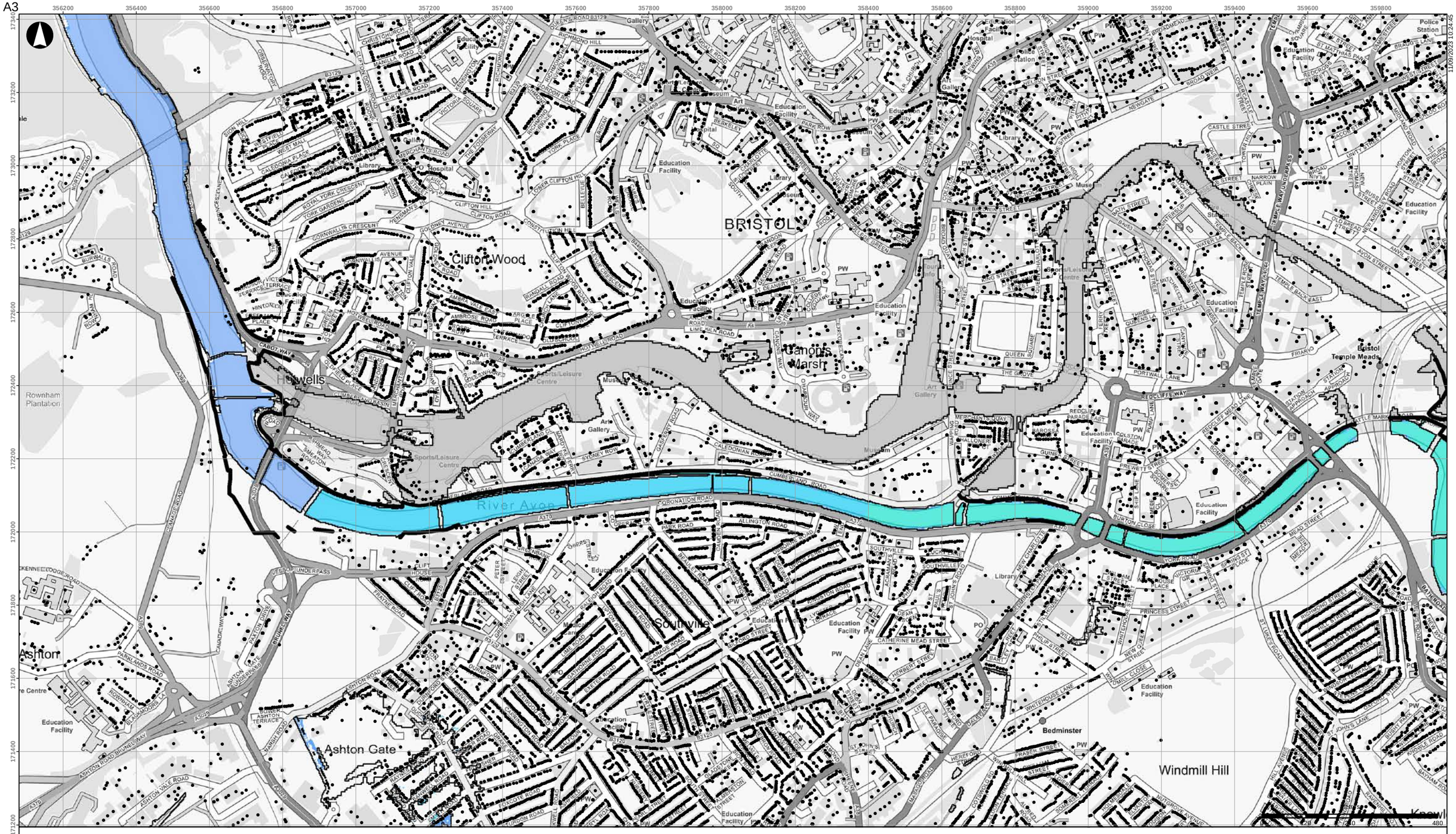
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11/09/2023 10:23:17


BRISTOL
Clifton Wood
Harbourside
Canon's Marsh
Redcliffe
Temple Meads
Bristol Temple Meads
Southville
Ashton Gate
Bedminster
Windmill Hill
Ashton
Rownham Plantation
River Avon
Education Facility
Museum
Art Gallery
Sports/Leisure Centre
Library
Hospital
Police Station
PW
PO
Gallery
Court
Info
Station
Clifton Hill
Clifton Road
Queens Road
Park Row
Broad Quay
Corn Street
Queen Square
Redcliffe Way
Temple Way
Cumberland Road
Coronation Road
Ashton Road
Bristol Bridge
Castle Street
Newgate
Wine Street
Baldwin Street
Broadmead
Bond Street
Colston Avenue
Princess Street
Whitehouse Lane
Bedminster Parade
Dean Lane
Merchants Road
Whiteladies Road
Gloucester Road
Cabot Way
Jessop Underpass
Bristol Bridge
Redcliffe Bridge
Prince Street Bridge
Cumberland Basin
Hotwells
Clifton Wood
Ashton
Southville
Windmill Hill
Bedminster

A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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| D1 | 2023-09-11 | DvdL | DvdL | PS |

ARUP

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2030 fluvial 1:100yr event**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

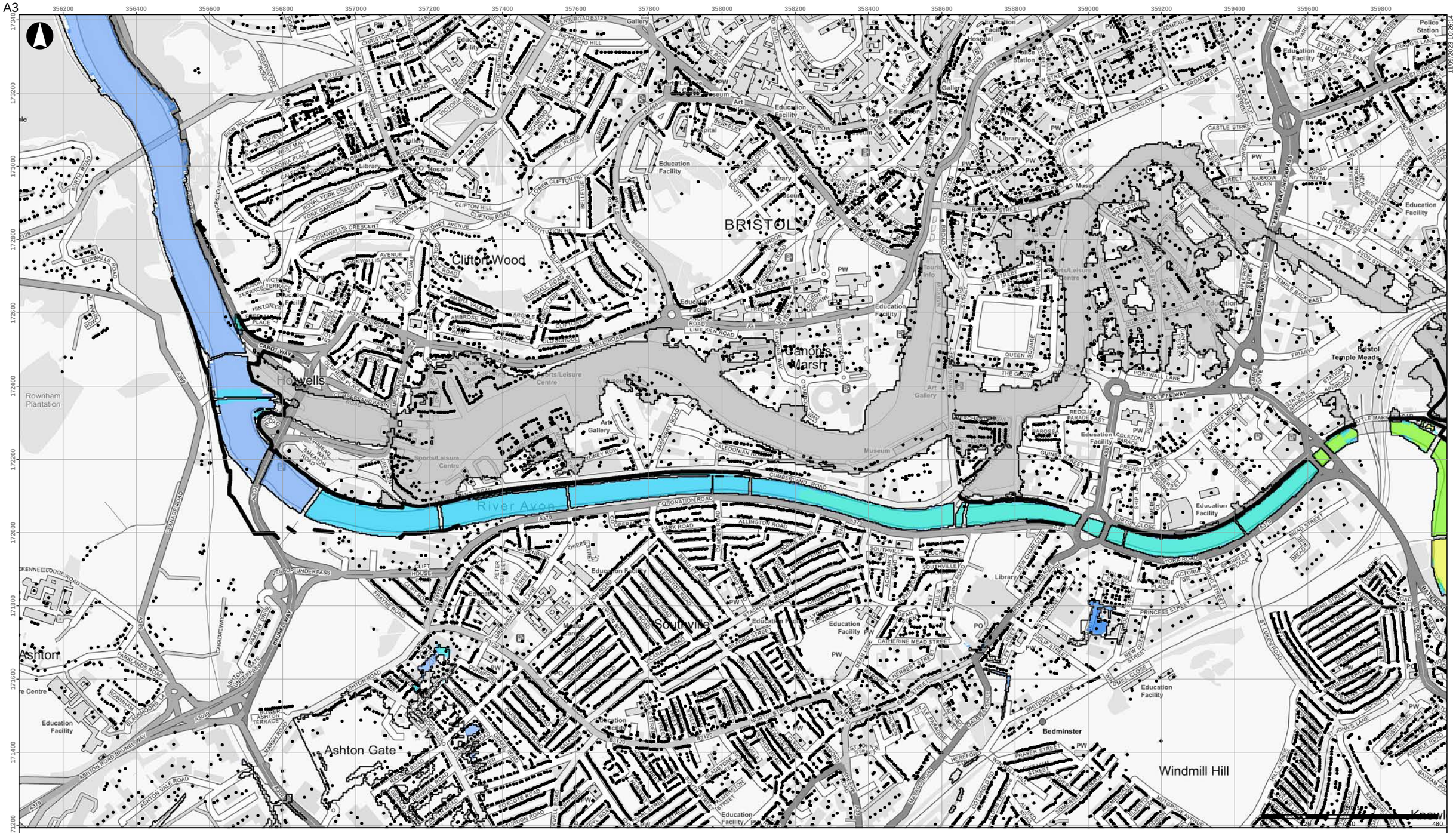
**285982-ARP-XX-DR-MOD-089**

11/09/2023 10:24:45

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A3




11/09/2023 10:26:14

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2030 fluvial 1:200yr event**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

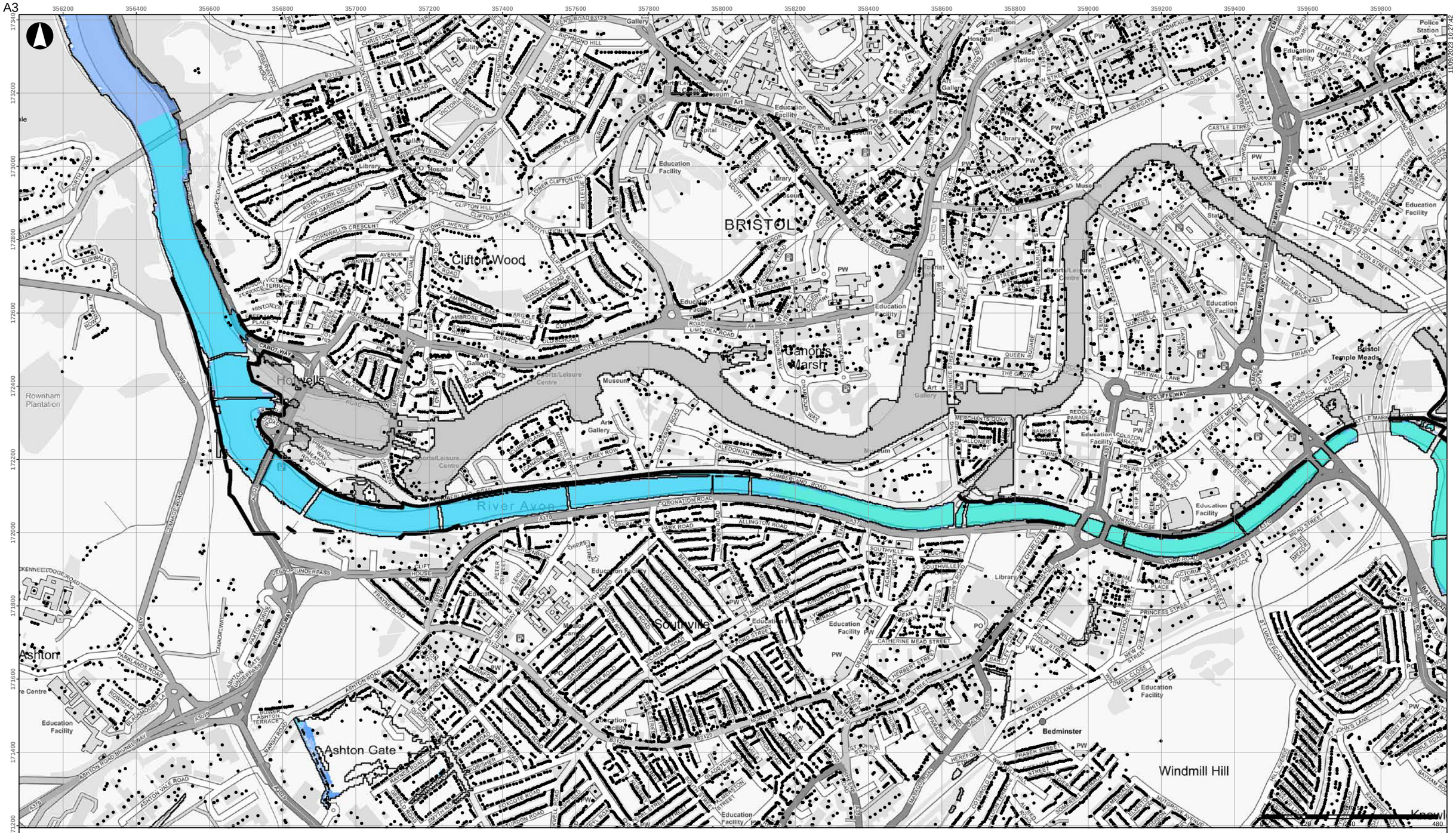
Name

**285982-ARP-XX-DR-MOD-090**

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A3




11/09/2023 10:27:42

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2069 fluvial 1:20yr event**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

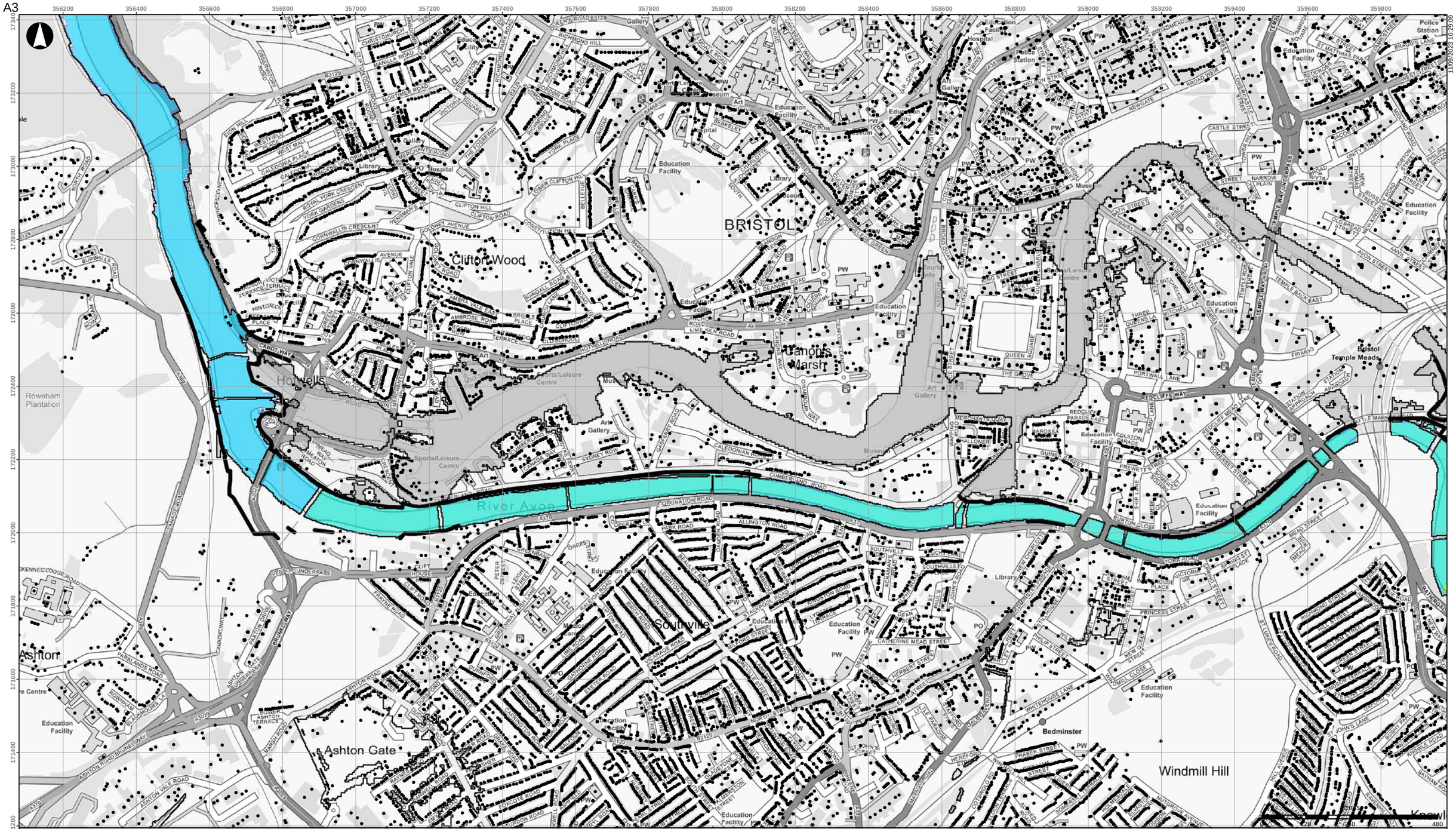
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**285982-ARP-XX-DR-MOD-091**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

ARUP

63 St Thomas Street
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www.arup.com

Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2069 fluvial 1:75yr event**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

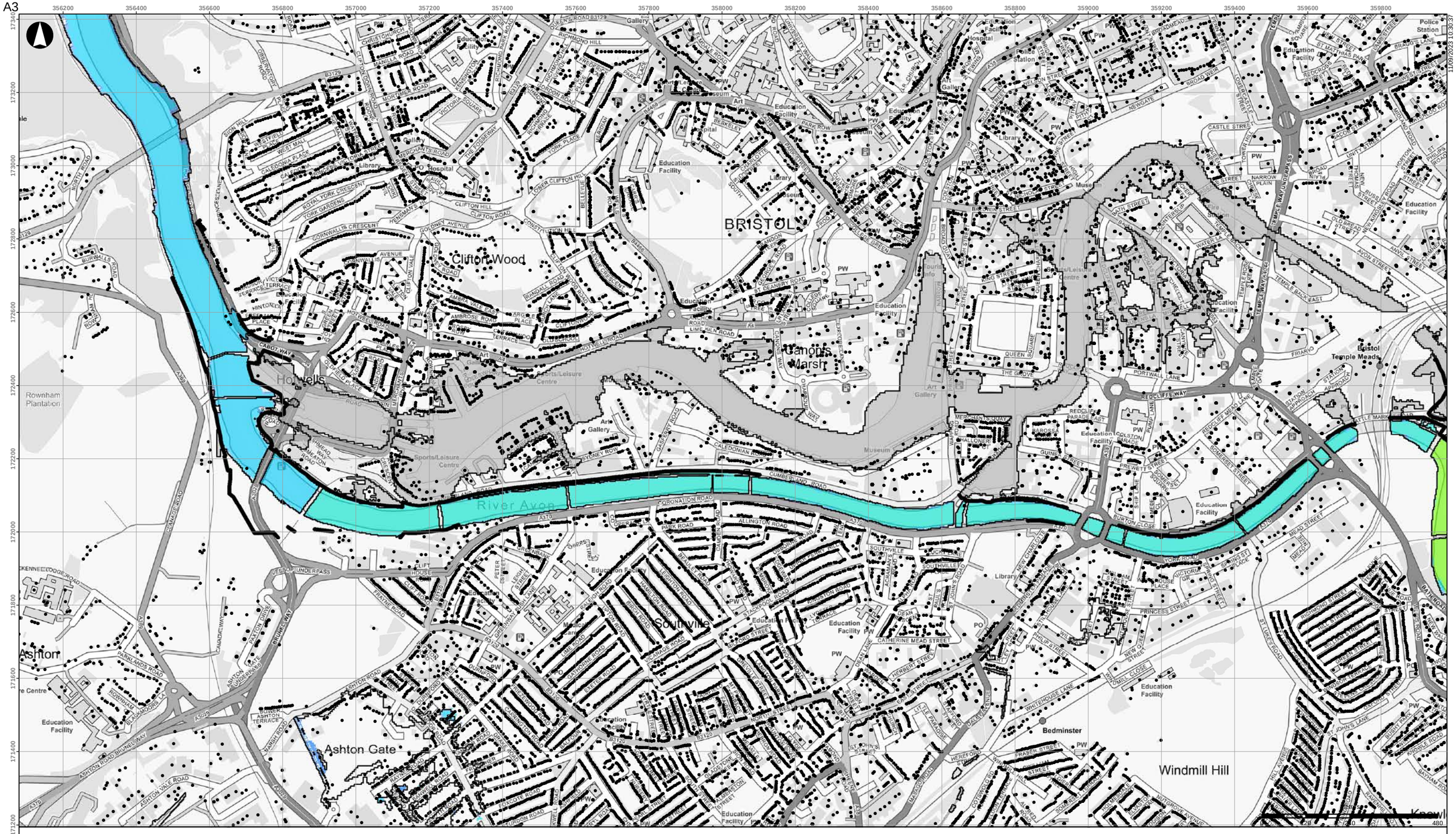
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11/09/2023 10:30:37

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2069 fluvial 1:100yr event**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

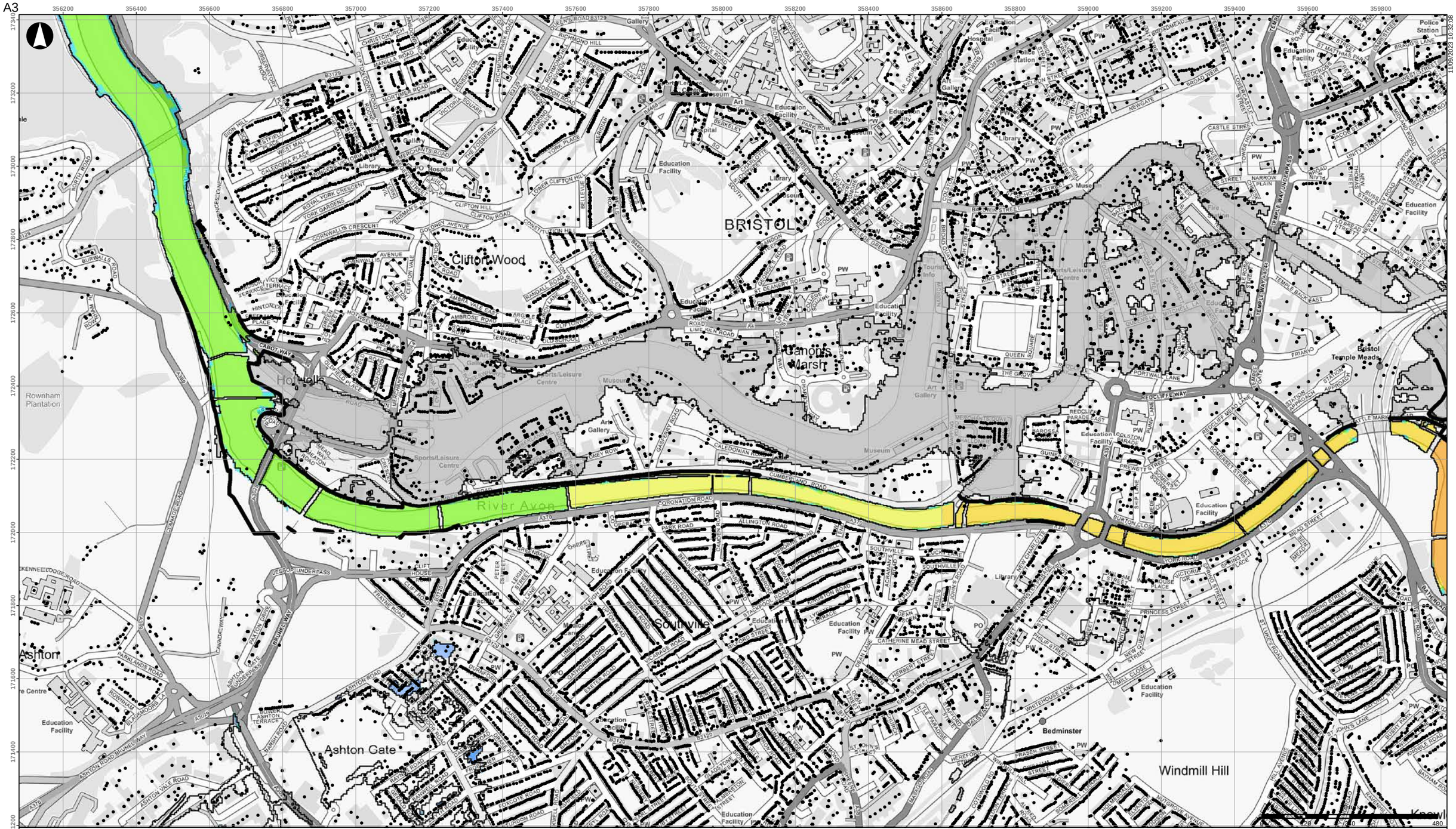
Name

**285982-ARP-XX-DR-MOD-093**

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11/09/2023 10:32:08

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
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**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2069 fluvial 1:200yr event**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

**285982-ARP-XX-DR-MOD-094**

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A3

11/09/2023 10:33:36

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2130 fluvial 1:20yr event**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

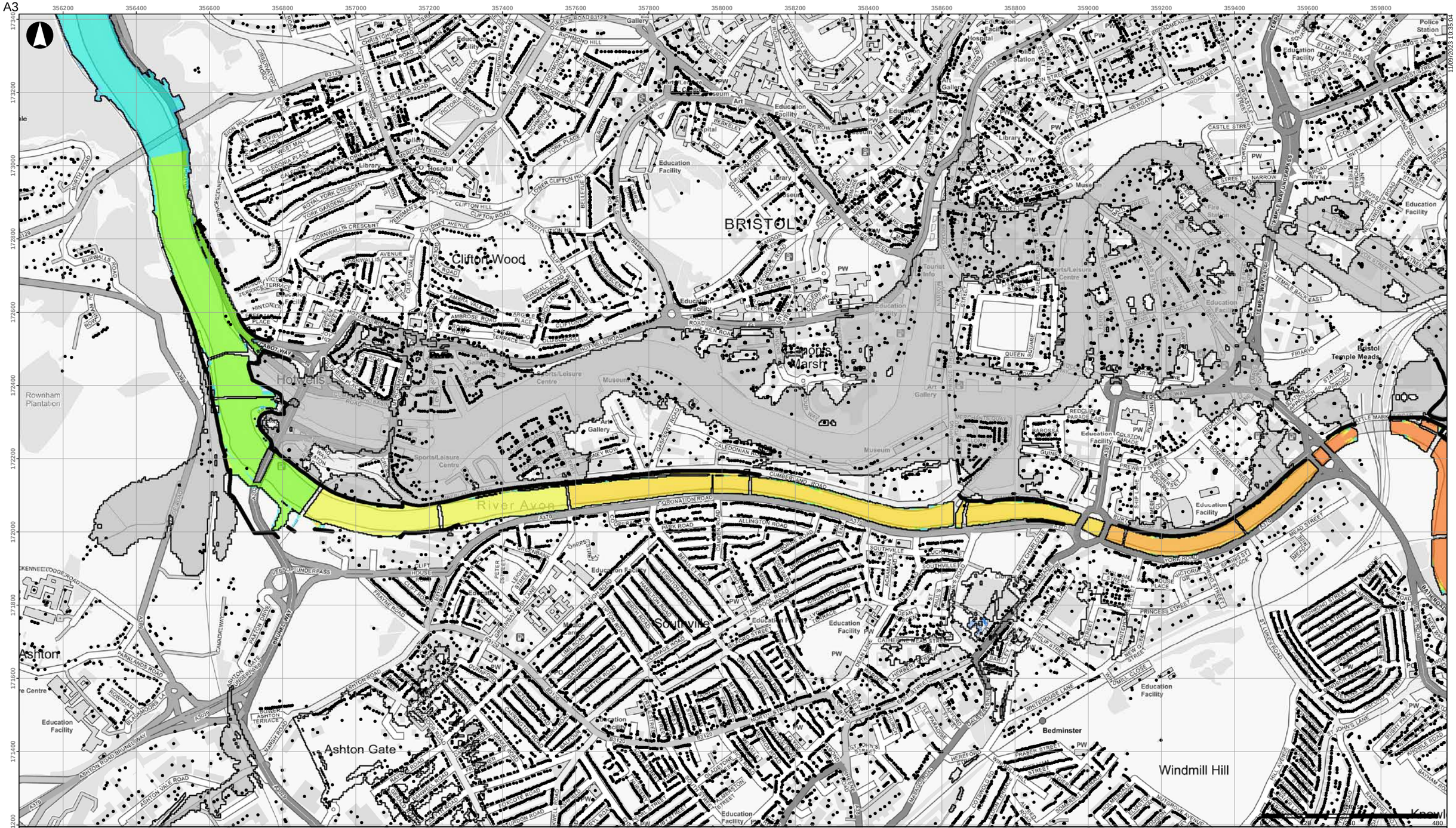
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**285982-ARP-XX-DR-MOD-095**

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 1 scheme impact**
**2130 fluvial 1:75yr event**
**Bristol area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

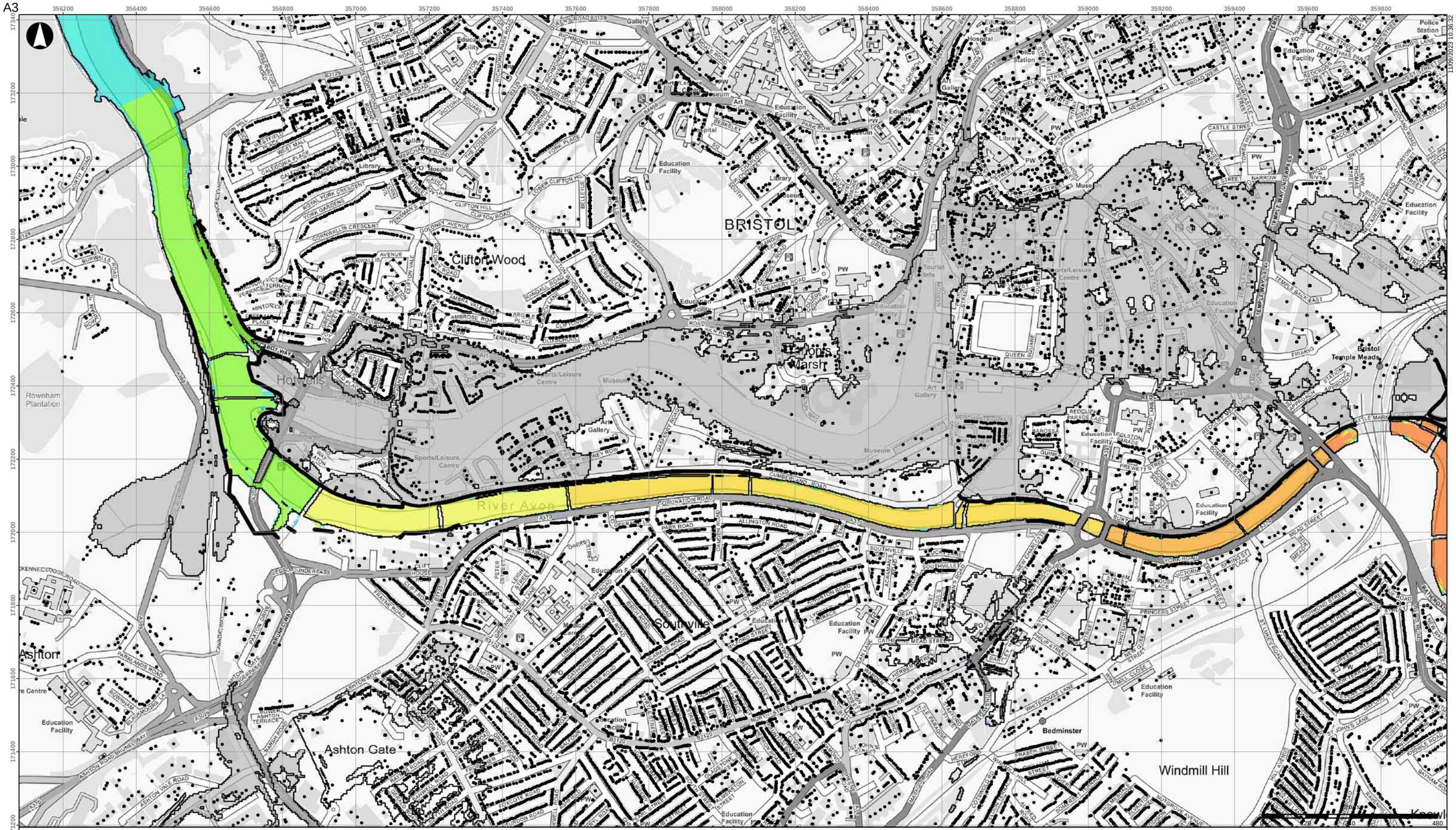
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**D1**

Name
**285982-ARP-XX-DR-MOD-096**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Client

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Project Title

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Drawing Title

**Phase 1 scheme impact**
**2130 fluvial 1:100yr event**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

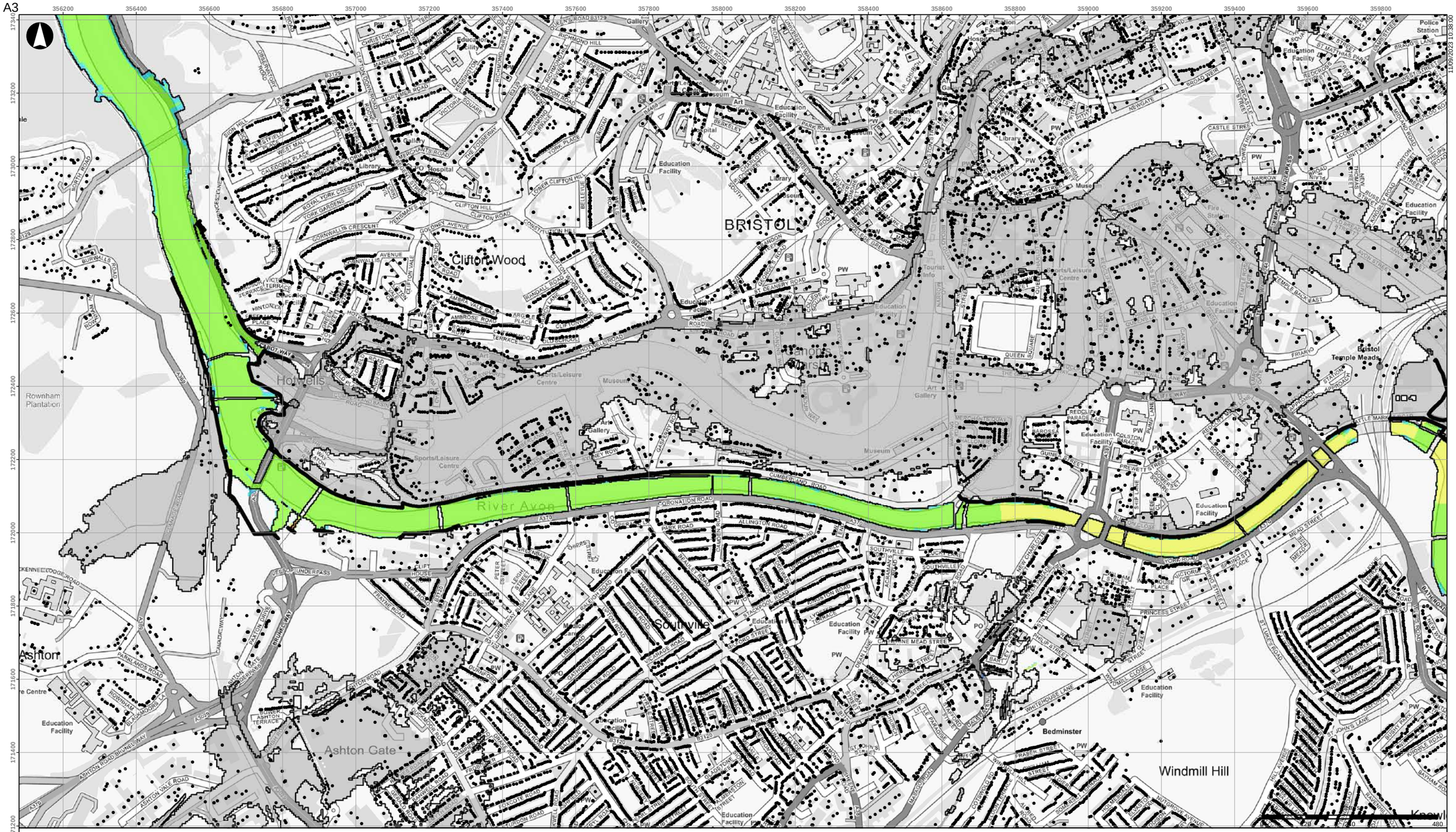
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**285982-ARP-XX-DR-MOD-097**

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A3


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171200
BRISTOL
Clifton Wood
Hotwells
Rownham Plantation
River Avon
Southville
Ashton
Ashton Gate
Bedminster
Windmill Hill
Temple Meads
Education Facility
Sports/Leisure Centre
Museum
Art Gallery
Library
Police Station
Fire Station
Tourist Info
PW
Hospital
Gallery
A369
A4018
A370
A3029
B3129
B3120
B3128
B4469
CLIFTON HILL
CLIFTON ROAD
CORNWALLIS CRESCENT
ROYAL YORK CRESCENT
QUEEN SQUARE
PARK ROW
CASTLE STREET
NEWGATE
BROAD WEIR
CORN STREET
WINE STREET
BROADMEAD
PRINCESS STREET
CORONATION ROAD
CUMBERLAND ROAD
ALLINGTON ROAD
PARK ROAD
ASHTON ROAD
BRUNEL WAY
ASHTON VALE ROAD
ASHTON GATE ROAD
WHITEHOUSE LANE
WINDMILL HILL
BEDMINSTER PARADE
REDCLIFF WAY
REDCLIFF BACK
TEMPLE BACK EAST
TEMPLE WAY
FRIARY
ST MARY REDCLIFF CHURCH
ST JOHN'S LANE
ST THOMAS STREET
ST JAMES PARK
ST JAMES ROAD
ST PHILIPS ROAD
ST MARKS ROAD
ST MARYS ROAD
ST MICHAELS HILL
ST MICHAELS PARK
ST MICHAELS ROAD
ST PAULS ROAD
ST STEPHENS AVENUE
ST STEPHENS CHURCH
ST STEPHENS STREET
ST THOMAS STREET
ST WERBURGHS ROAD
ST WERBURGHS TOWER
ST WERBURGHS TOWER ROAD
ST WERBURGHS TOWER STEPS
ST WERBURGHS TOWER WALK
ST WERBURGHS TOWER WAY
ST WERBURGHS TOWER WAY
ST WERBURGHS TOWER WAY

A3

11/09/2023 08:39:27

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 1 scheme impact**
**2030 tidal 1:20yr event**
**Bristol area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

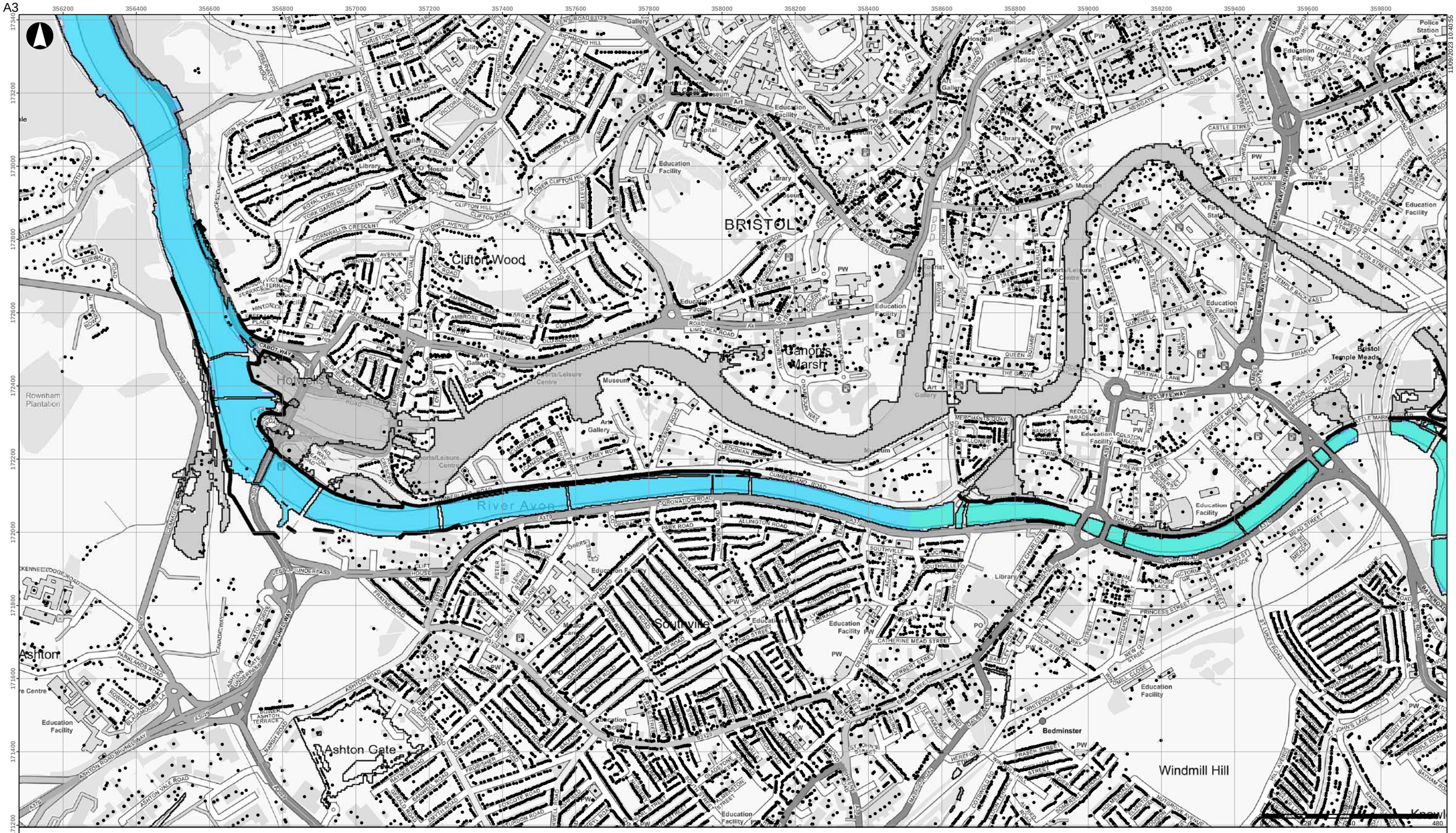
Rev
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Name
**285982-ARP-XX-DR-MOD-099**

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A3




11/09/2023 10:40:55

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2030 tidal 1:75yr event**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

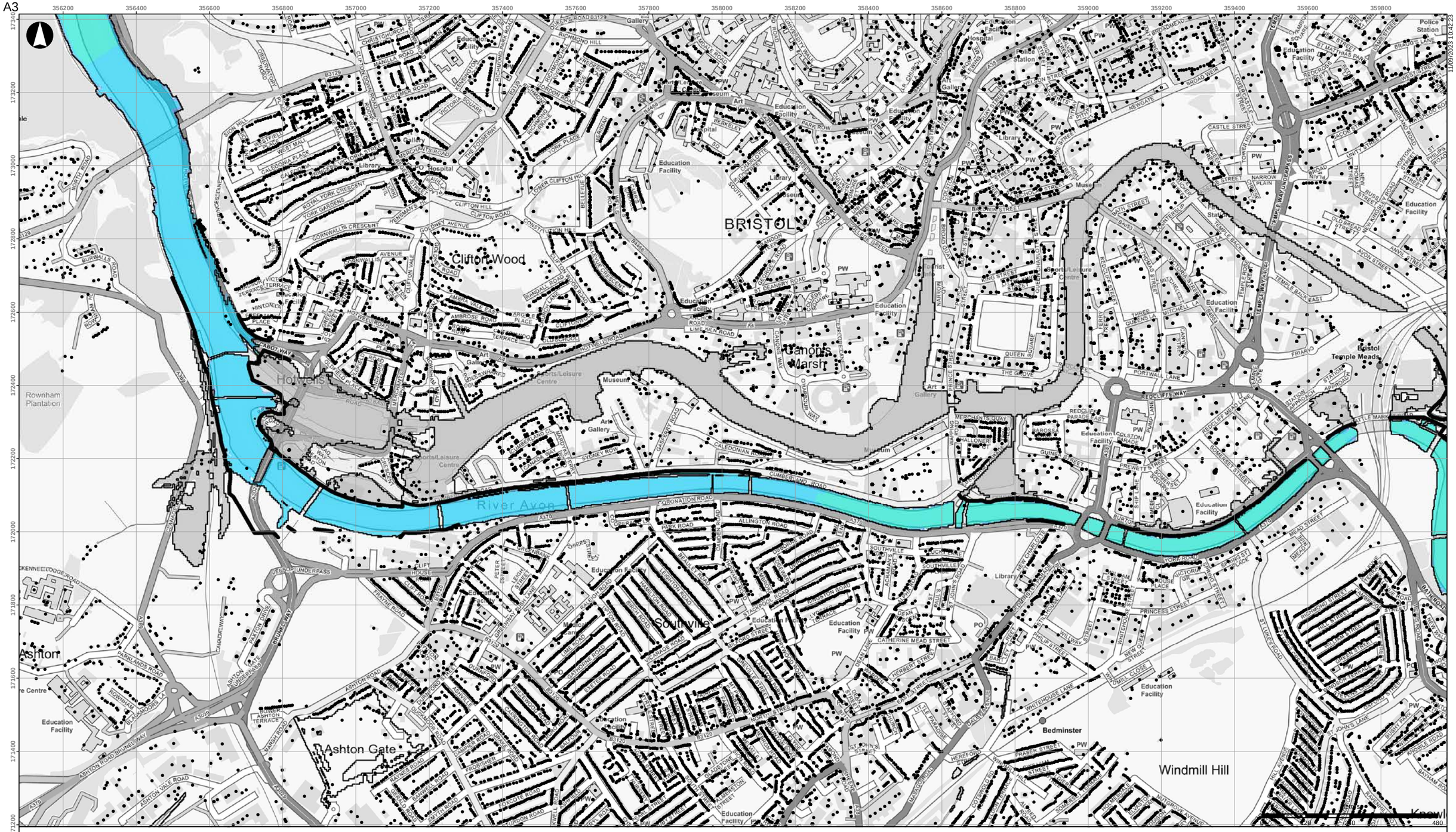
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A3

11/09/2023 10:42:23




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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Notes:

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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 1 scheme impact**
**2030 tidal 1:100yr event**
**Bristol area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

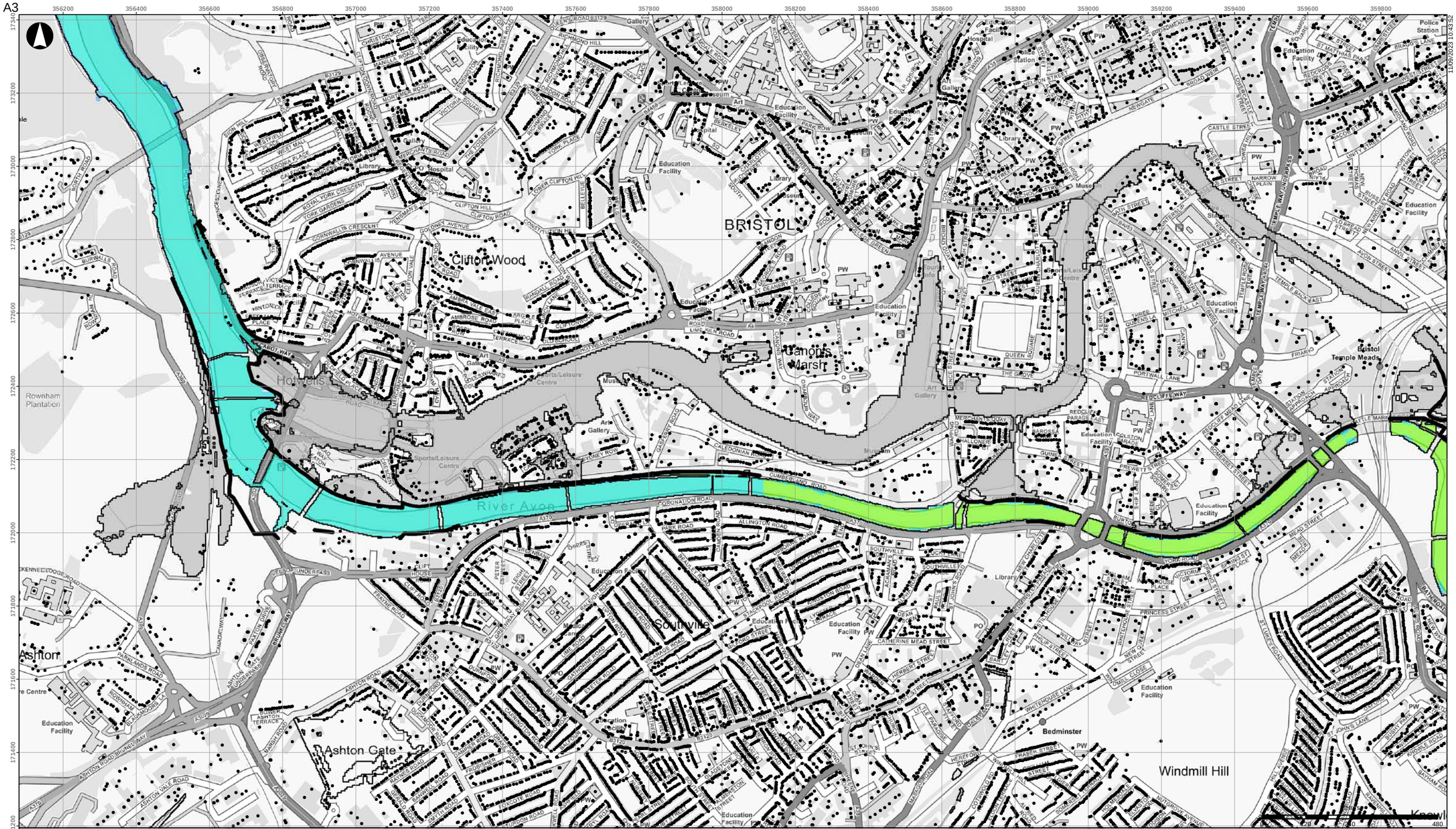
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-101**

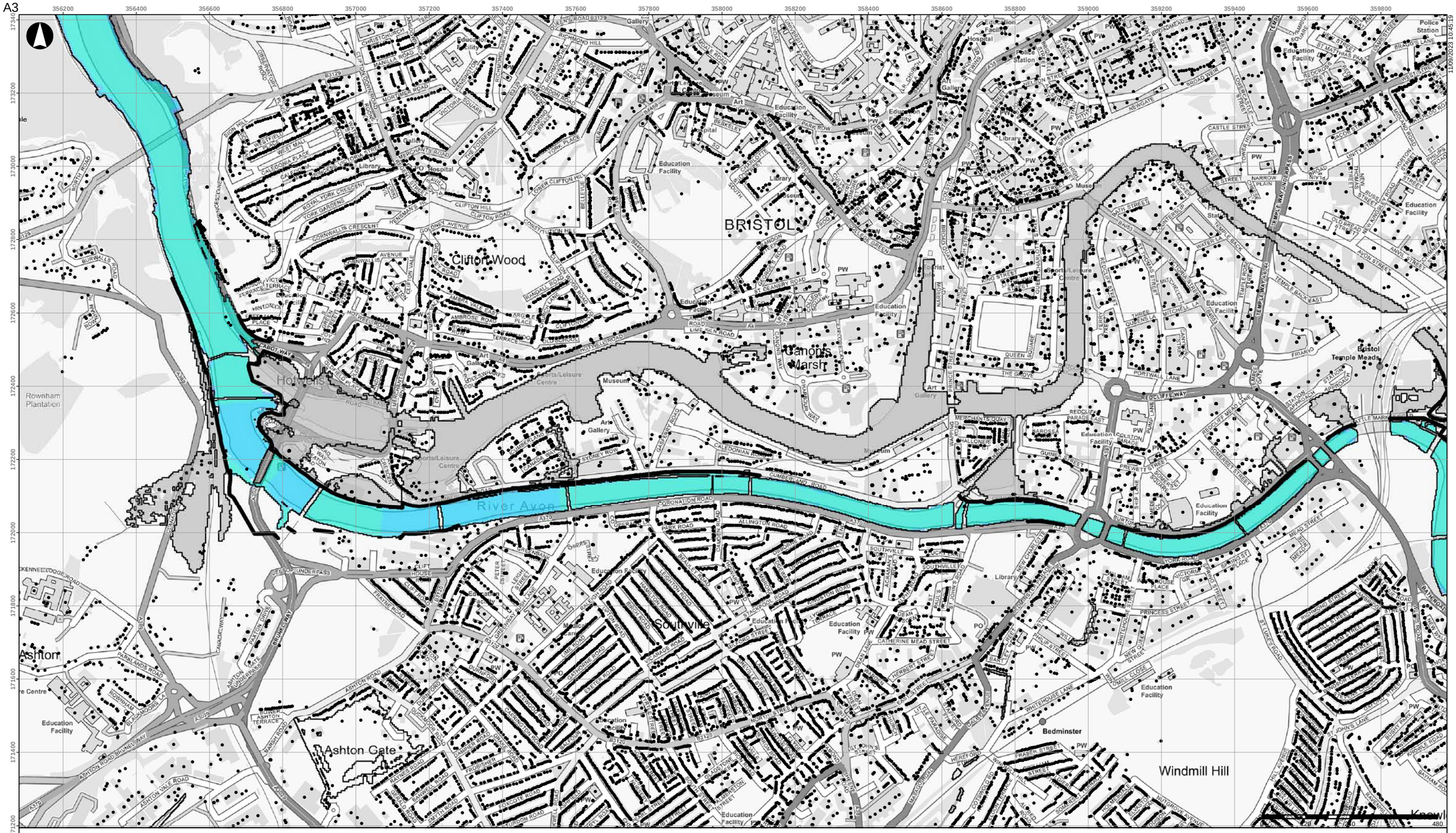
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A3


BRISTOL
Clifton Wood
Canon's Marsh
Hotwells
Rownham Plantation
River Avon
Southville
Ashton
Ashton Gate
Bedminster
Windmill Hill
Education Facility
Sports/Leisure Centre
Art Gallery
Museum
Library
Hospital
Police Station
Tourist Info
PW
Bristol Temple Meads
CLIFTON HILL
CLIFTON ROAD
CORBETT CLIFTON HILL
CONSTITUTION HILL
GORDON AVENUE
TEMPLE WAY
REDCLIFFE WAY
CUMBERLAND ROAD
CORONATION ROAD
ALLINGTON ROAD
ASHTON ROAD
PRINCESS STREET
CATHERINE MEAD STREET
WHITEHOUSE LANE
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A3




11/09/2023 10:45:19

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2069 tidal 1:20yr event**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

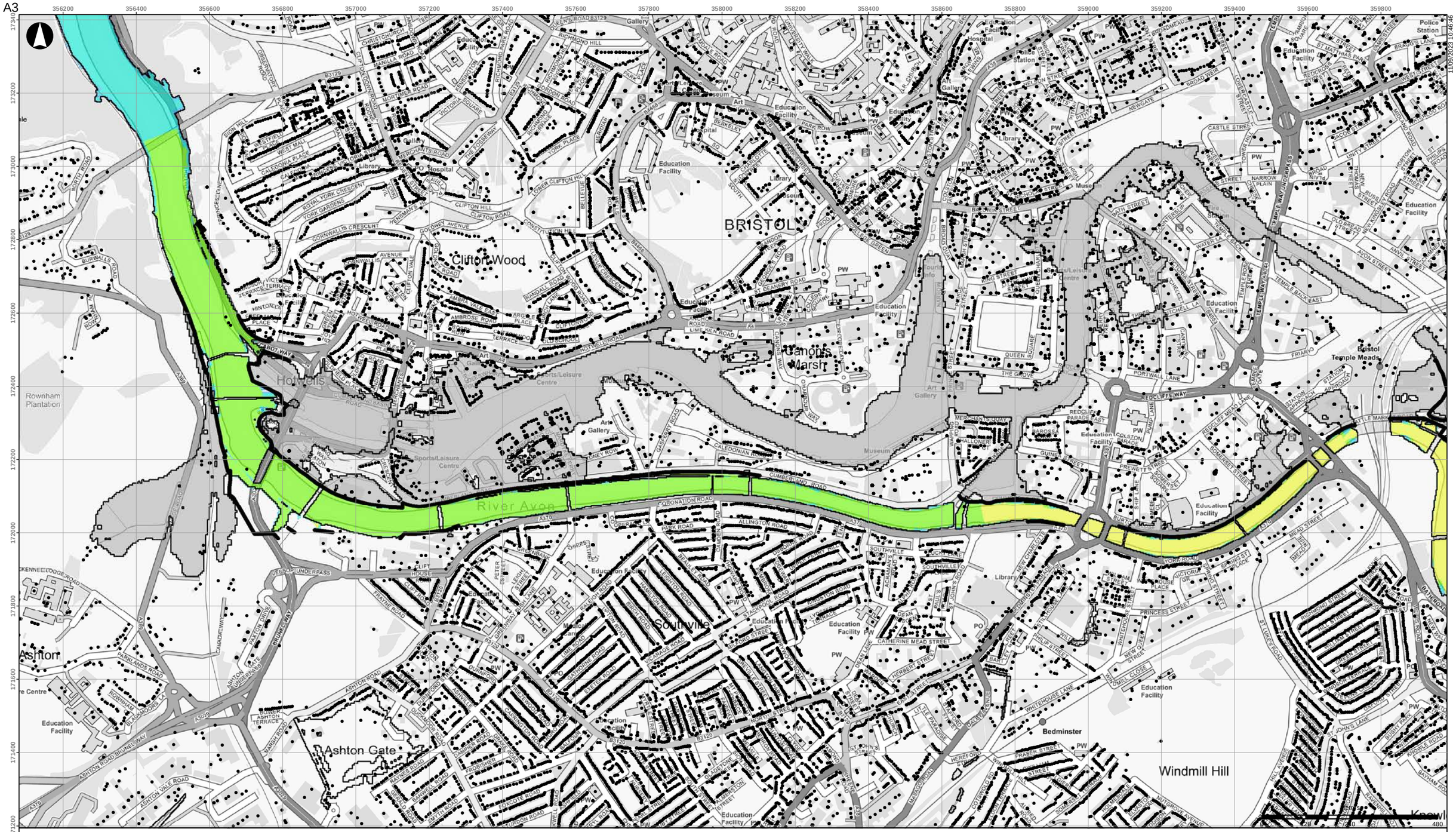
Name

**285982-ARP-XX-DR-MOD-103**

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A3




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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2069 tidal 1:75yr event**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

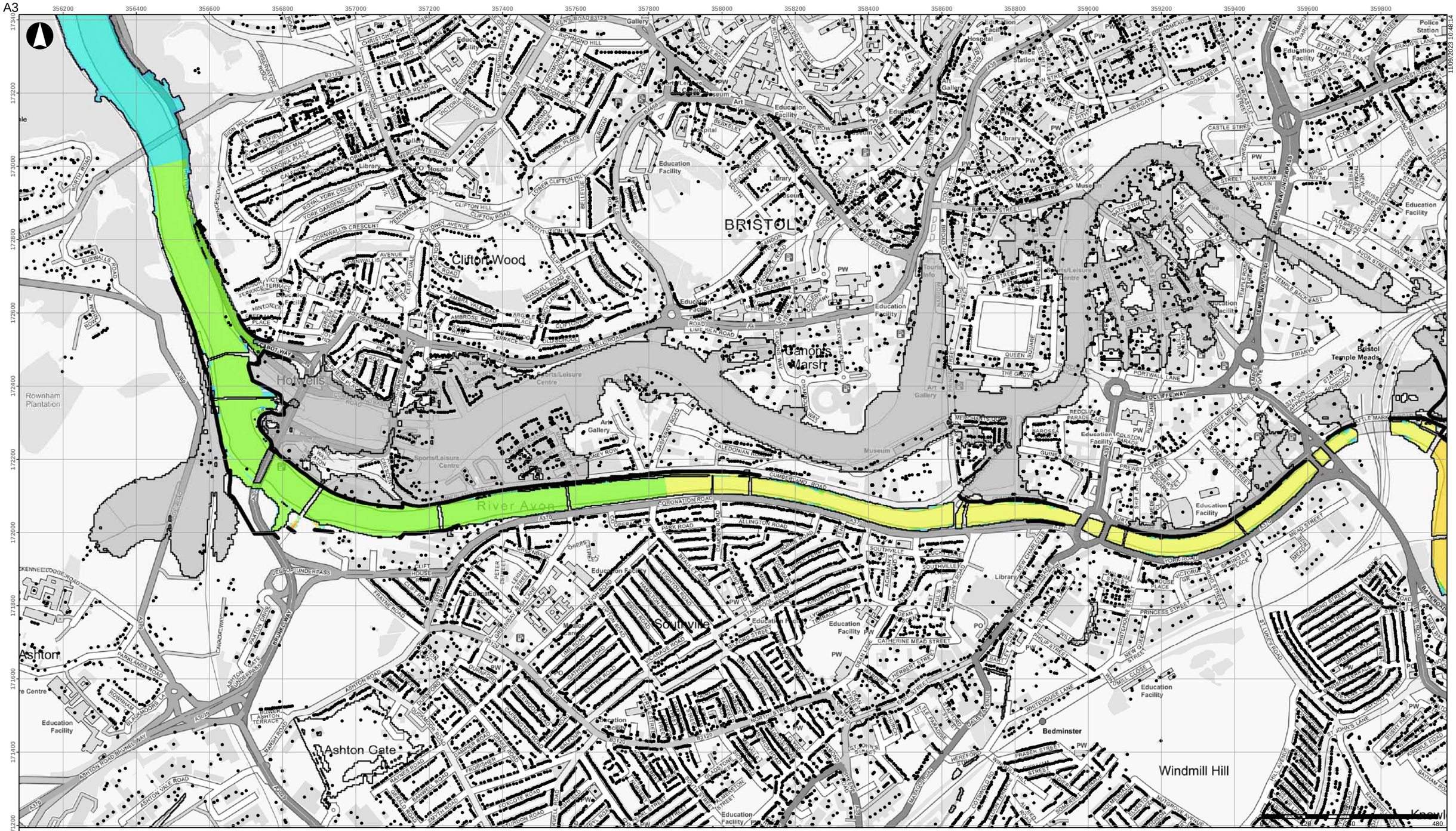
Name

**285982-ARP-XX-DR-MOD-104**

\\global\europe\Bristol\Jobs\285xxx\285982-00\4.30_Drgs\2_GIS\04_Map Documents\WAT_Water\2023-09-05_Phase1_SchemeImpact_Rev2.mxd

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11/09/2023 10:48:14

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

Based on the BAFS OBC model version v034_27.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

ARUP

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www.arup.com

Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2069 tidal 1:100yr event**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

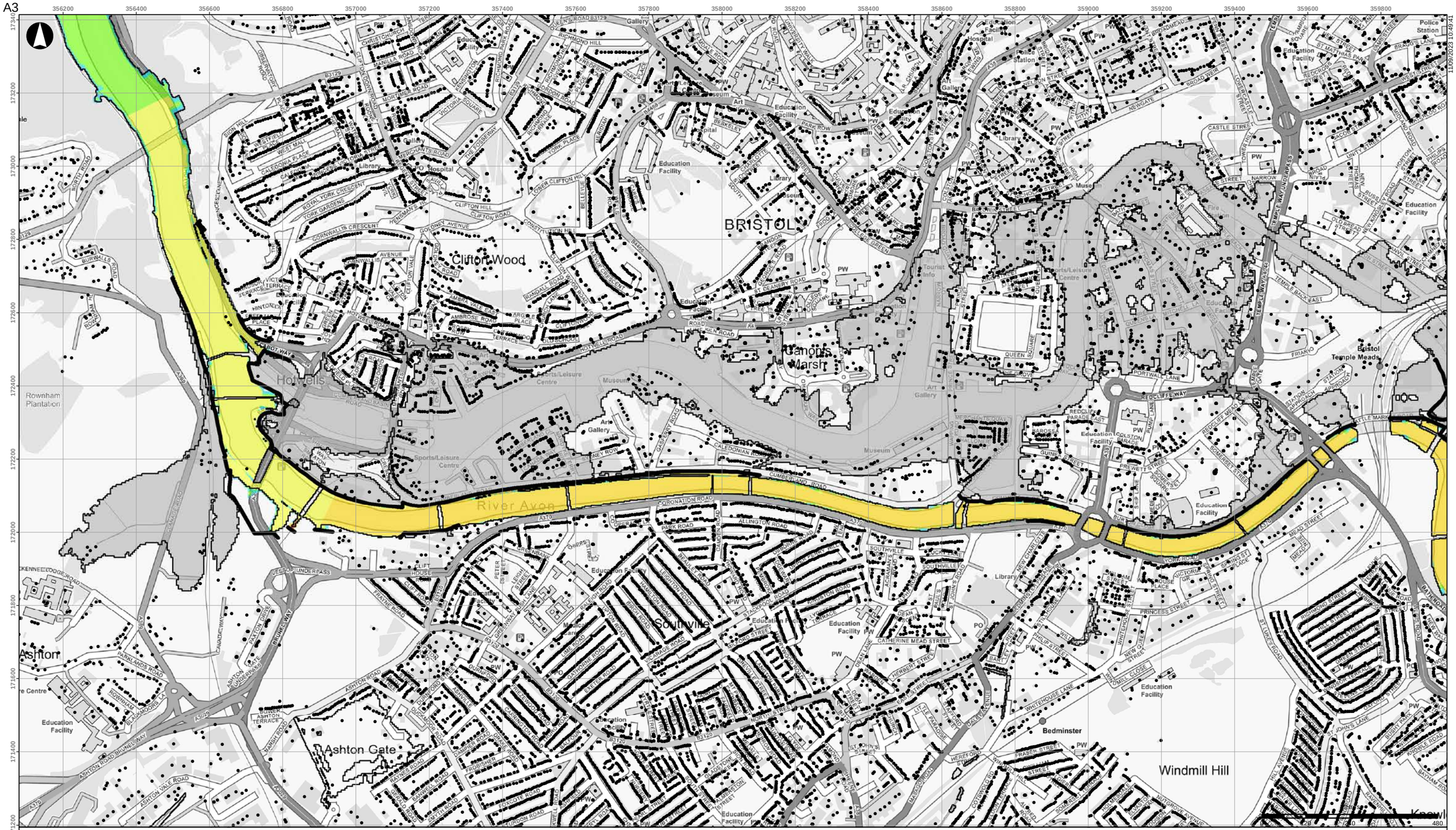
Name

**285982-ARP-XX-DR-MOD-105**

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11/09/2023 10:49:41

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2069 tidal 1:200yr event**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

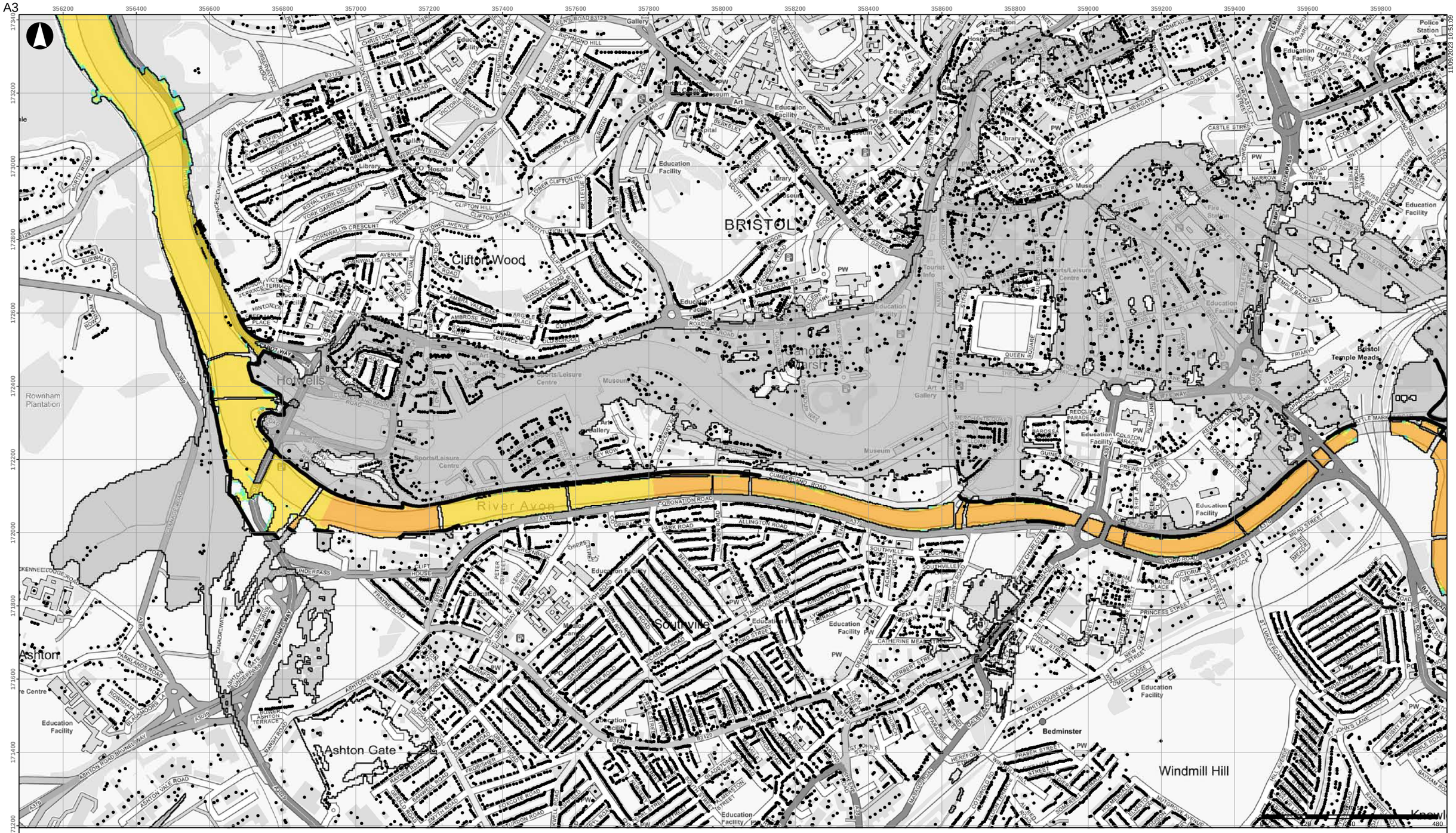
Name

**285982-ARP-XX-DR-MOD-106**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 1 scheme impact**
**2130 tidal 1:20yr event**
**Bristol area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

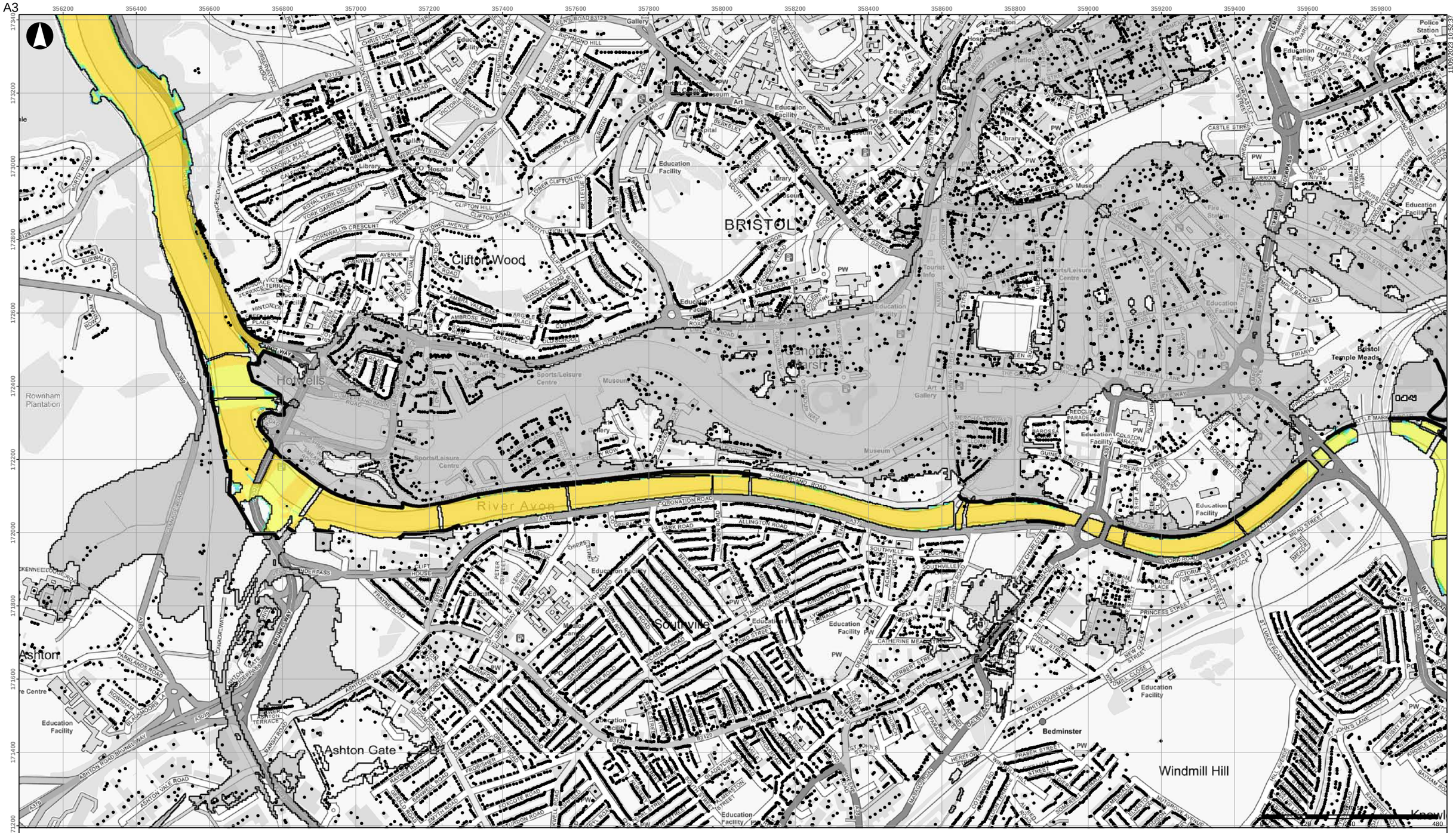
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-107**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 1 scheme impact**
**2130 tidal 1:75yr event**
**Bristol area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

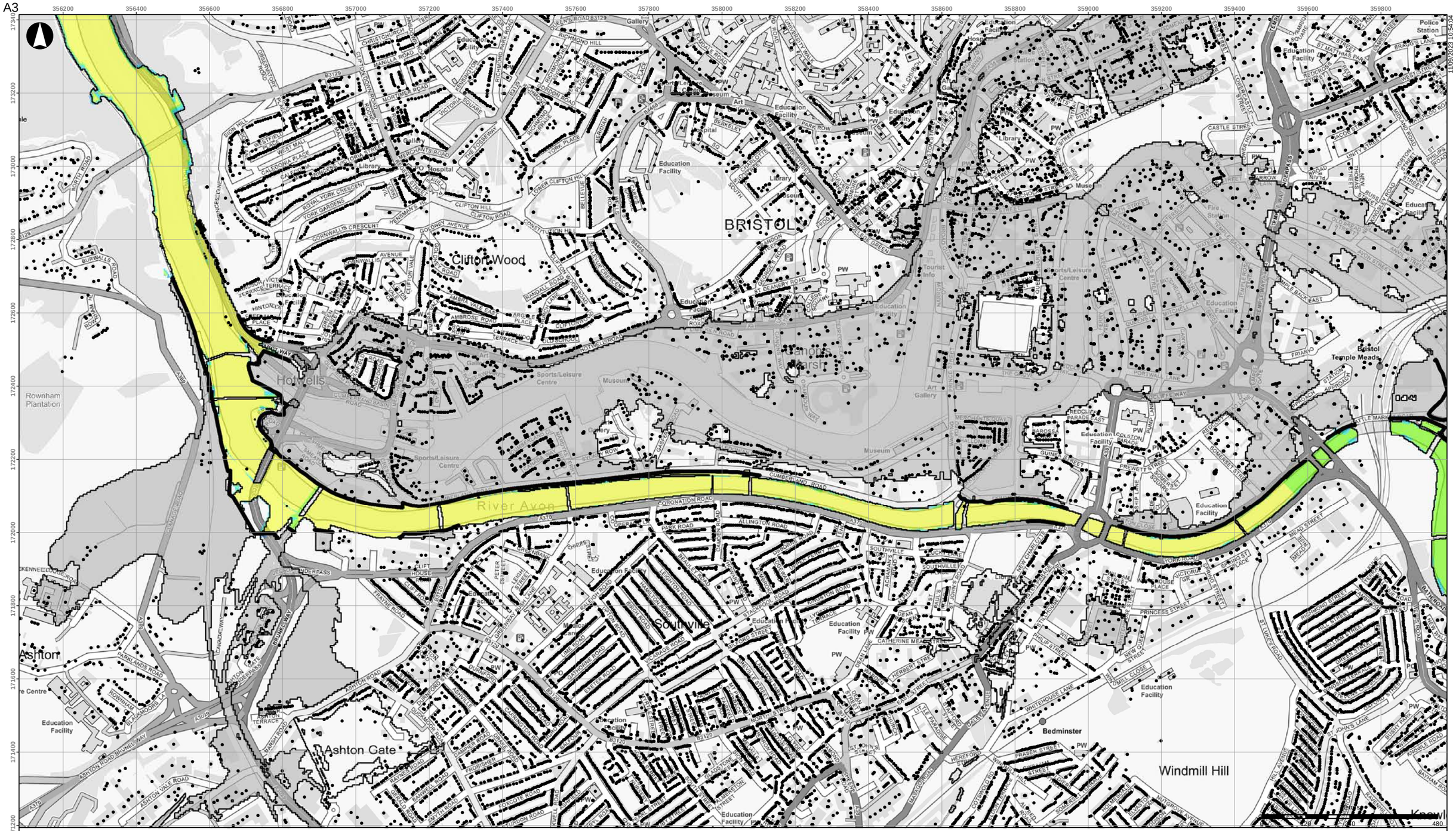
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-108**

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11/09/2023 10:54:04

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2130 tidal 1:100yr event**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

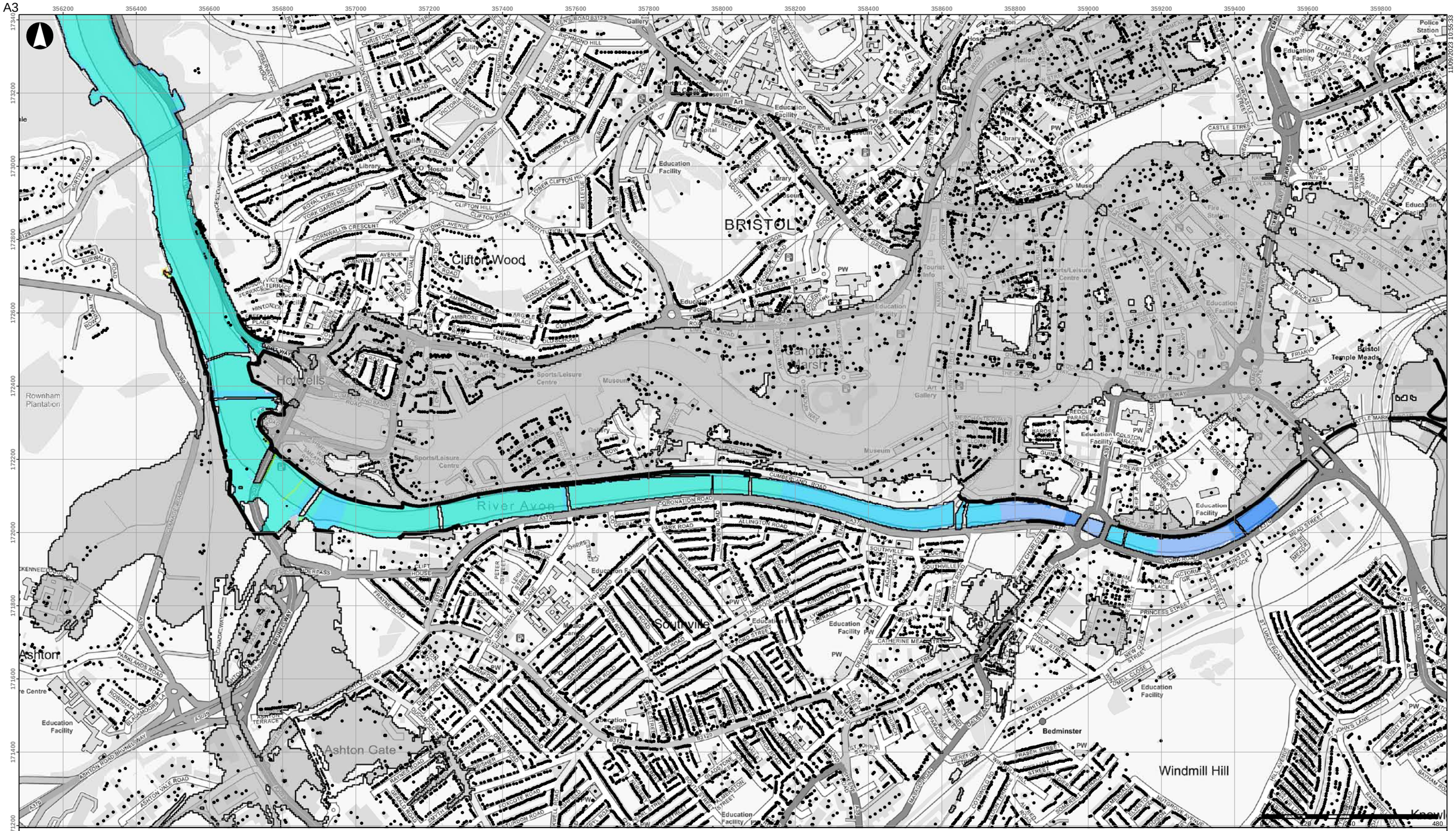
Name

**285982-ARP-XX-DR-MOD-109**

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11/09/2023 10:55:33

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2130 tidal 1:200yr event**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

**285982-ARP-XX-DR-MOD-110**

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11/09/2023 10:57:01

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2030 fluvial 1:20yr event**
**Netham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

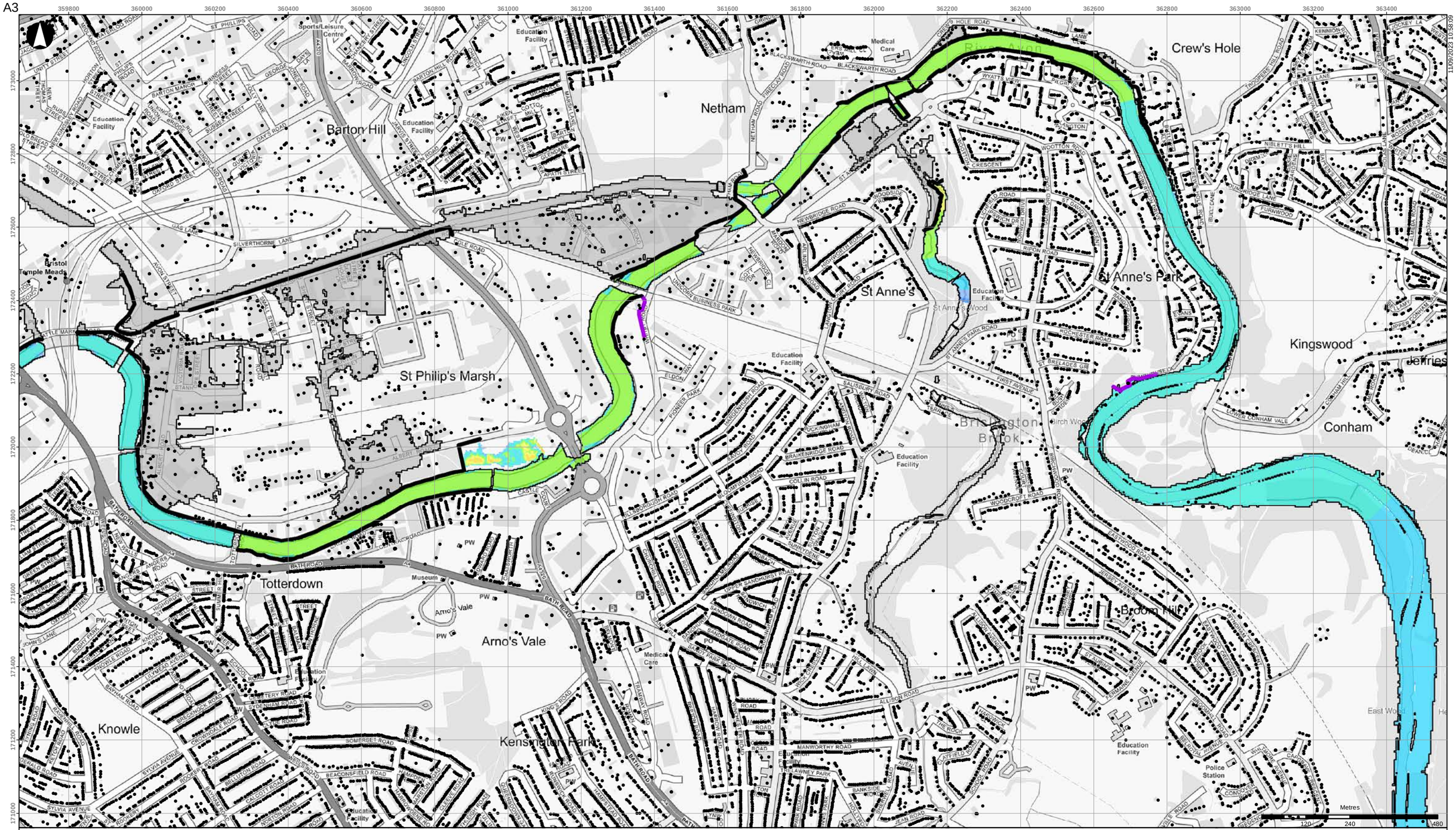
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11/09/2023 10:58:09




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 1 scheme impact**
**2030 fluvial 1:75yr event**
**Netham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

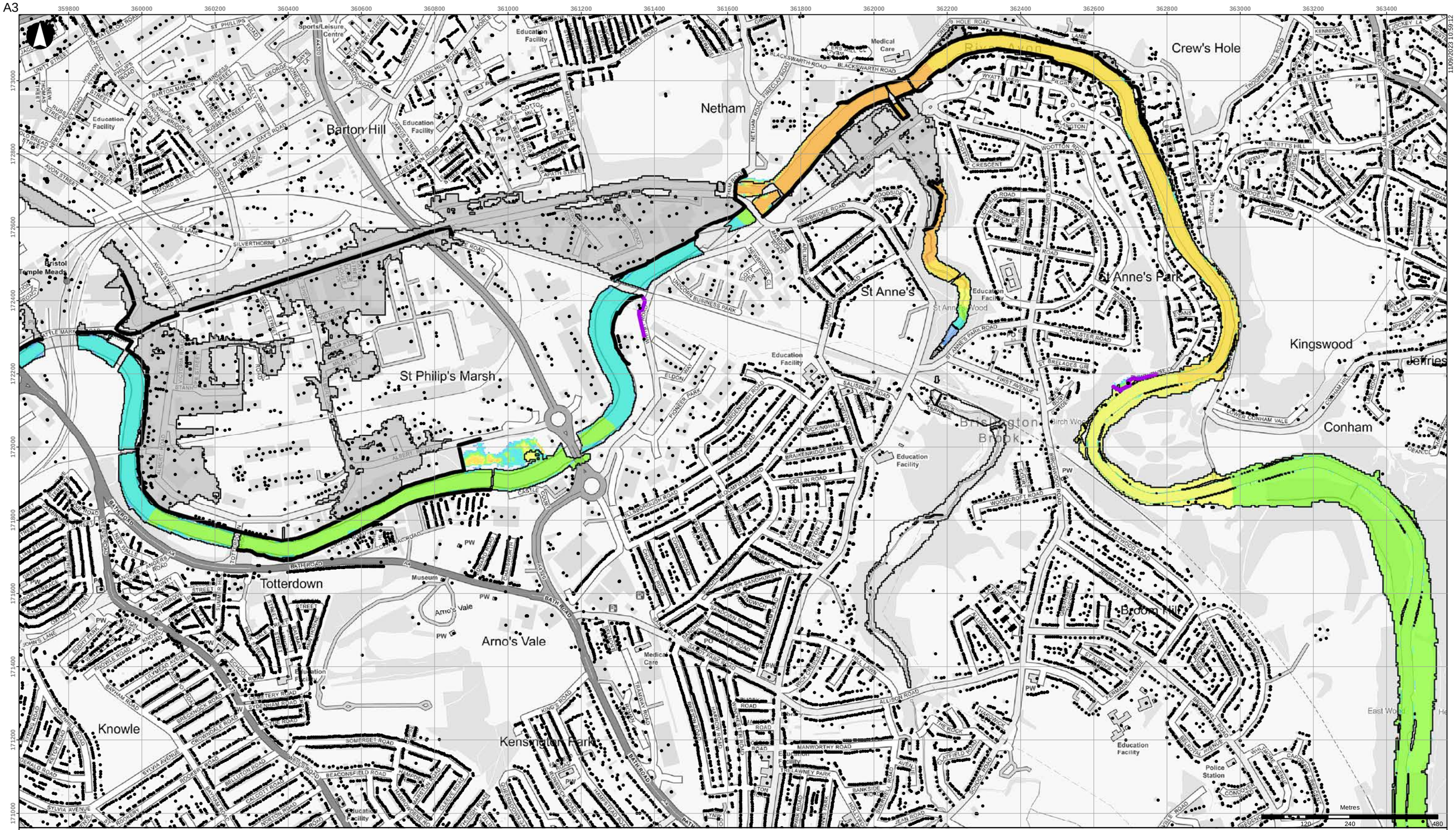
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-112**

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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Notes:

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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 1 scheme impact**
**2030 fluvial 1:100yr event**
**Netham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

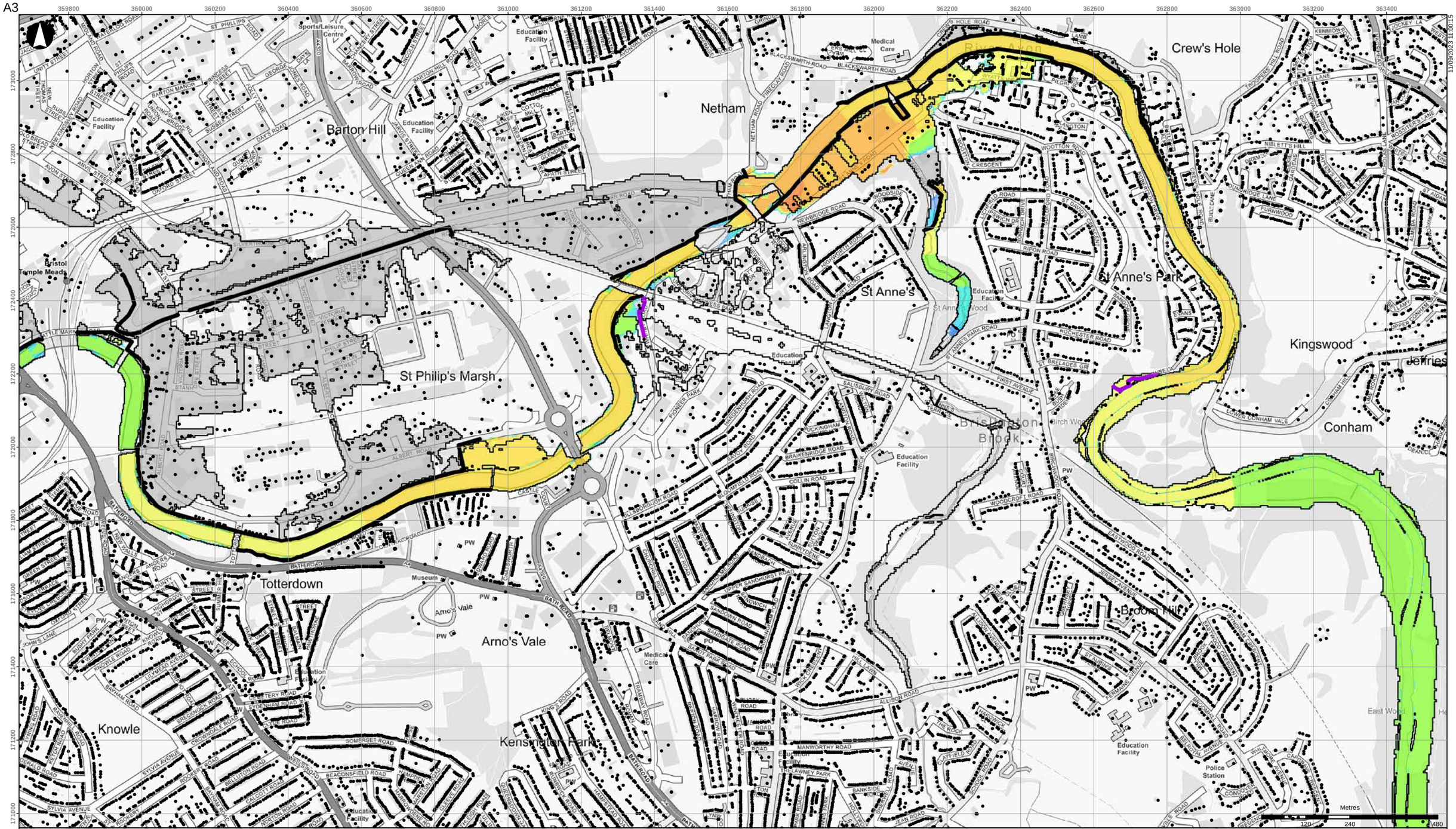
Name
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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2030 fluvial 1:200yr event**
**Netham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

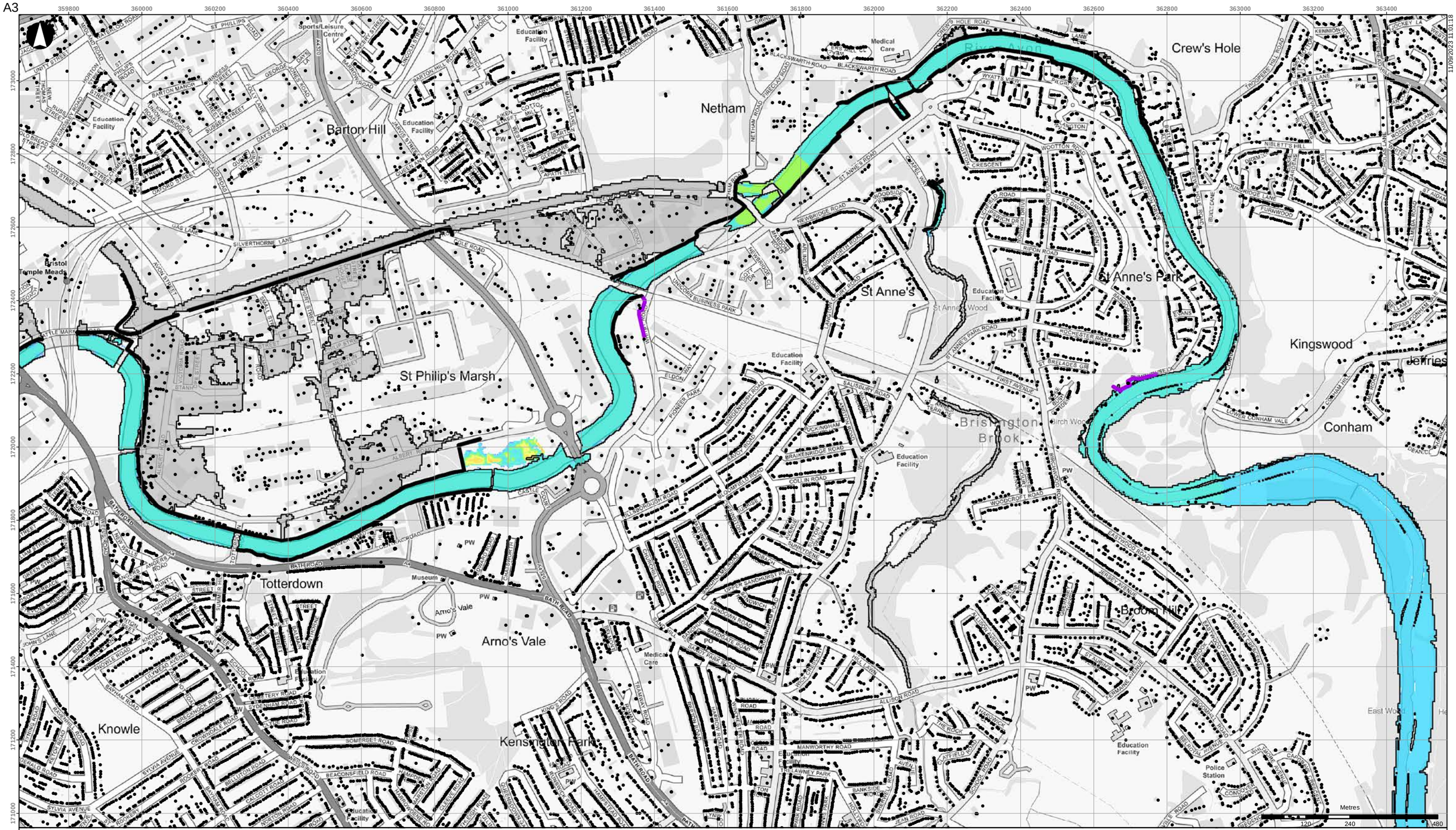
Name

**285982-ARP-XX-DR-MOD-114**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2069 fluvial 1:20yr event**
**Netham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

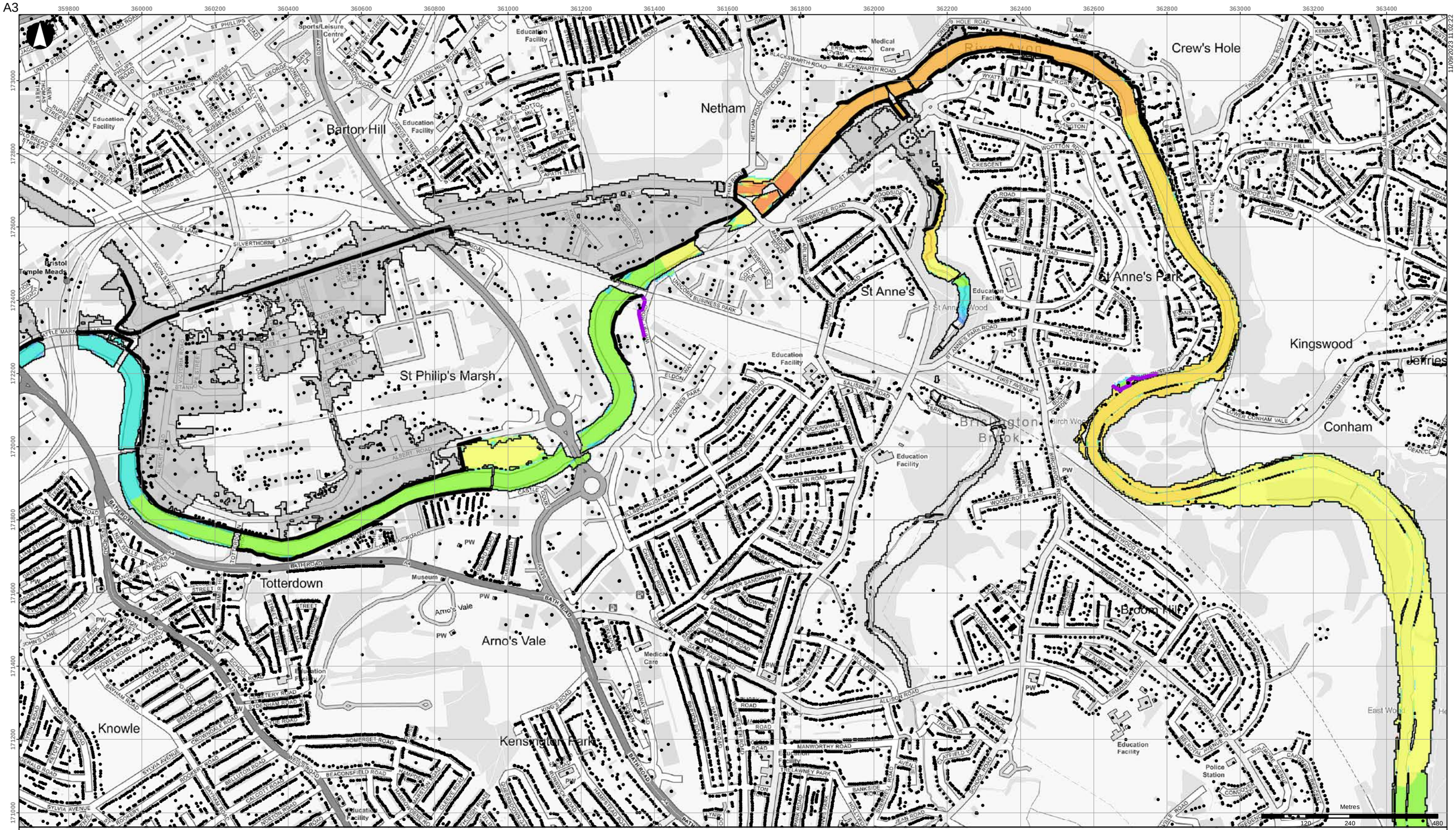
Name

**285982-ARP-XX-DR-MOD-115**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2069 fluvial 1:75yr event**
**Netham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

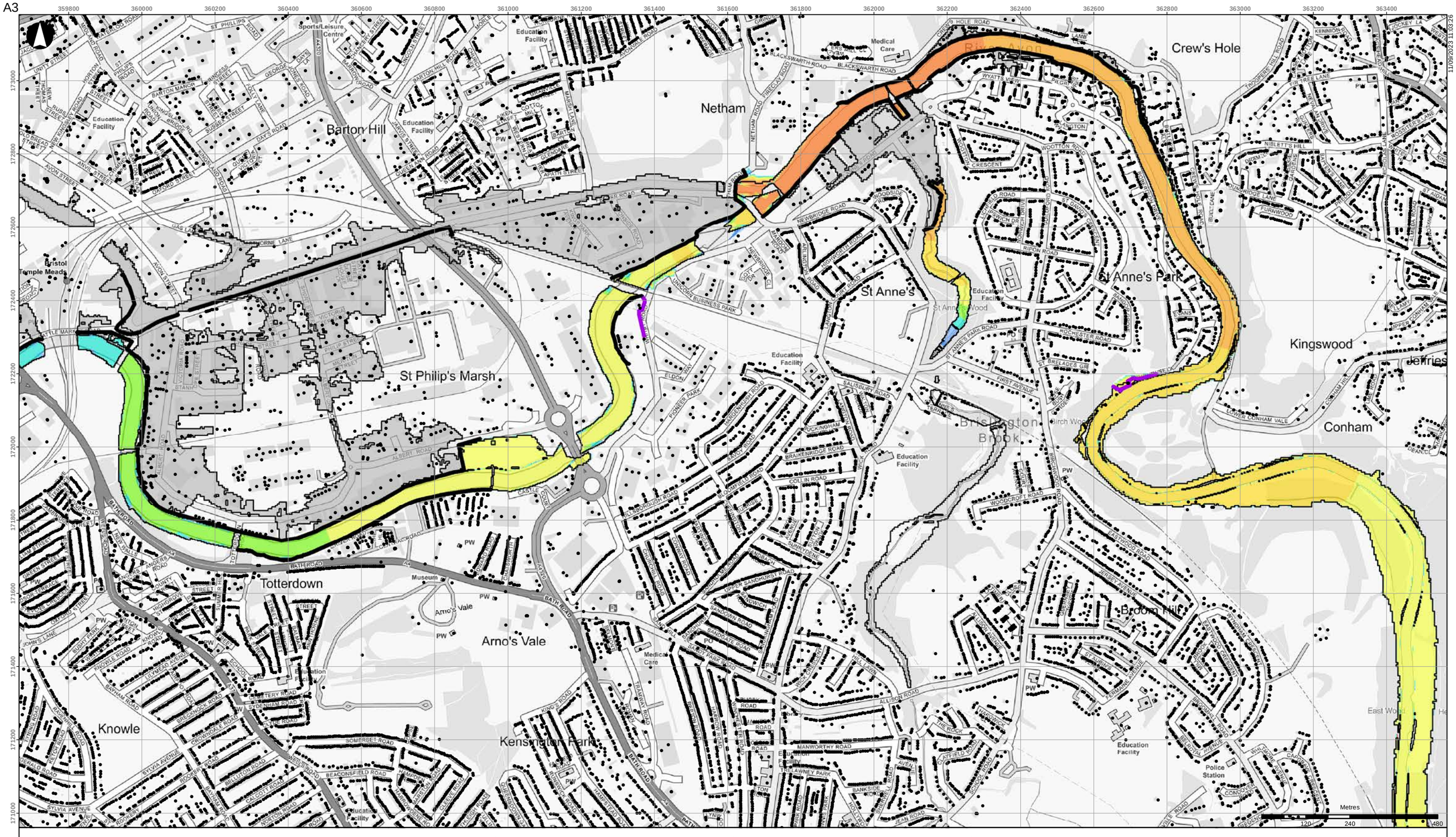
Name

**285982-ARP-XX-DR-MOD-116**

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

Contains OS data (C) Crown Copyright and database right 2023

Notes:

Based on the BAFS OBC model version v034_27.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 1 scheme impact**
**2069 fluvial 1:100yr event**
**Netham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

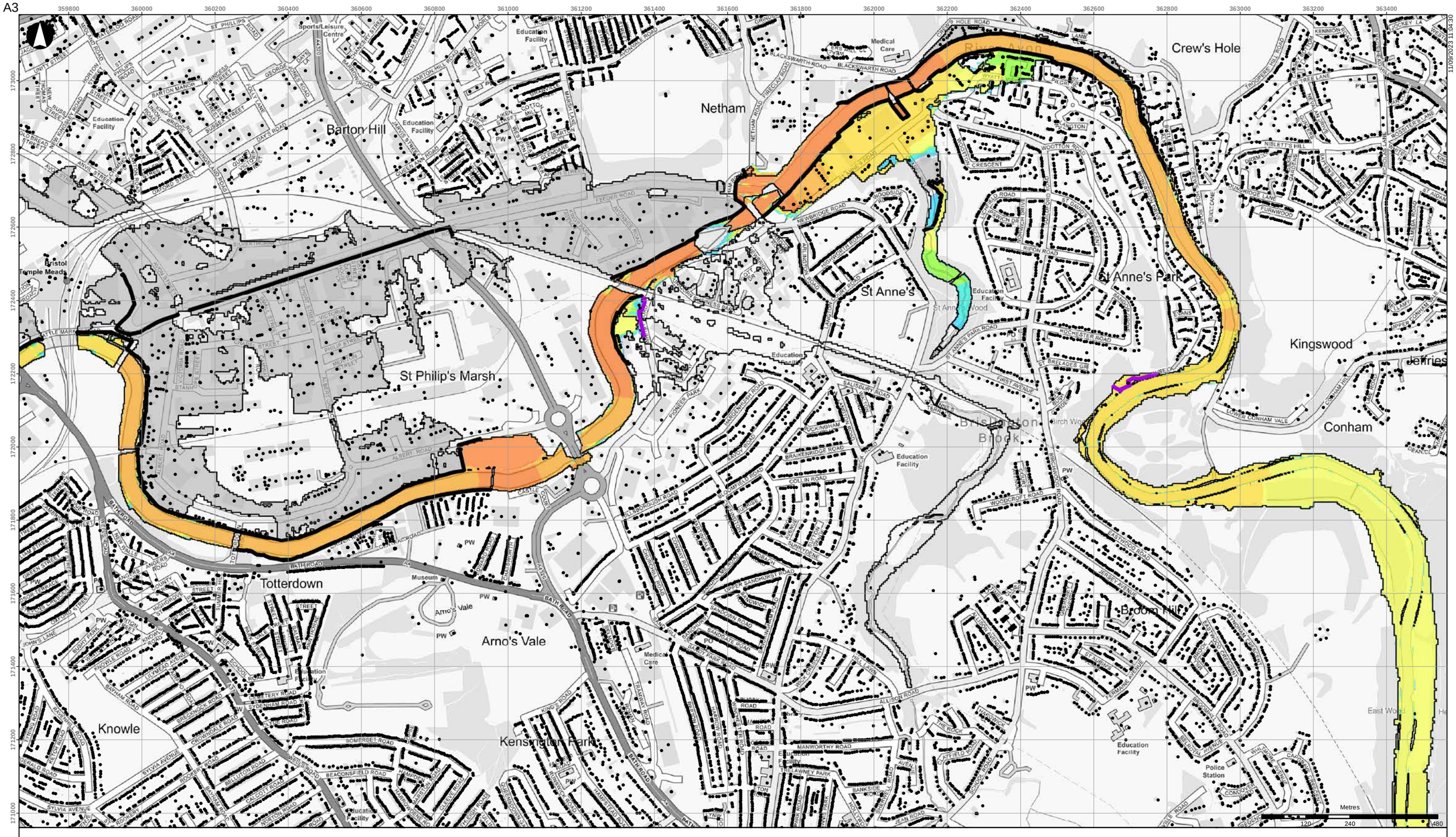
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-117**

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

ARUP

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+44 117 976 5432
www.arup.com

Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 1 scheme impact**
**2069 fluvial 1:200yr event**
**Netham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-118**

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359800 360000 360200 360400 360600 360800 361000 361200 361400 361600 361800 362000 362200 362400 362600 362800 363000 363200 363400

173000 172800 172600 172400 172200 172000 171800 171600 171400 171200 171000

Barton Hill
Netham
Crew's Hole
Bristol Temple Meads
St Philip's Marsh
St Anne's
St Anne's Park
Kingswood
Jefferies
Conham
Brislington Brook
Totterdown
Arno's Vale
Knowle
Kensington Park
Broom Hill
Education Facility
Medical Care
Police Station
Museum
Sports/Leisure Centre
PW
Metres 120 240 480

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 1 scheme impact**
**2130 fluvial 1:20yr event**
**Netham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

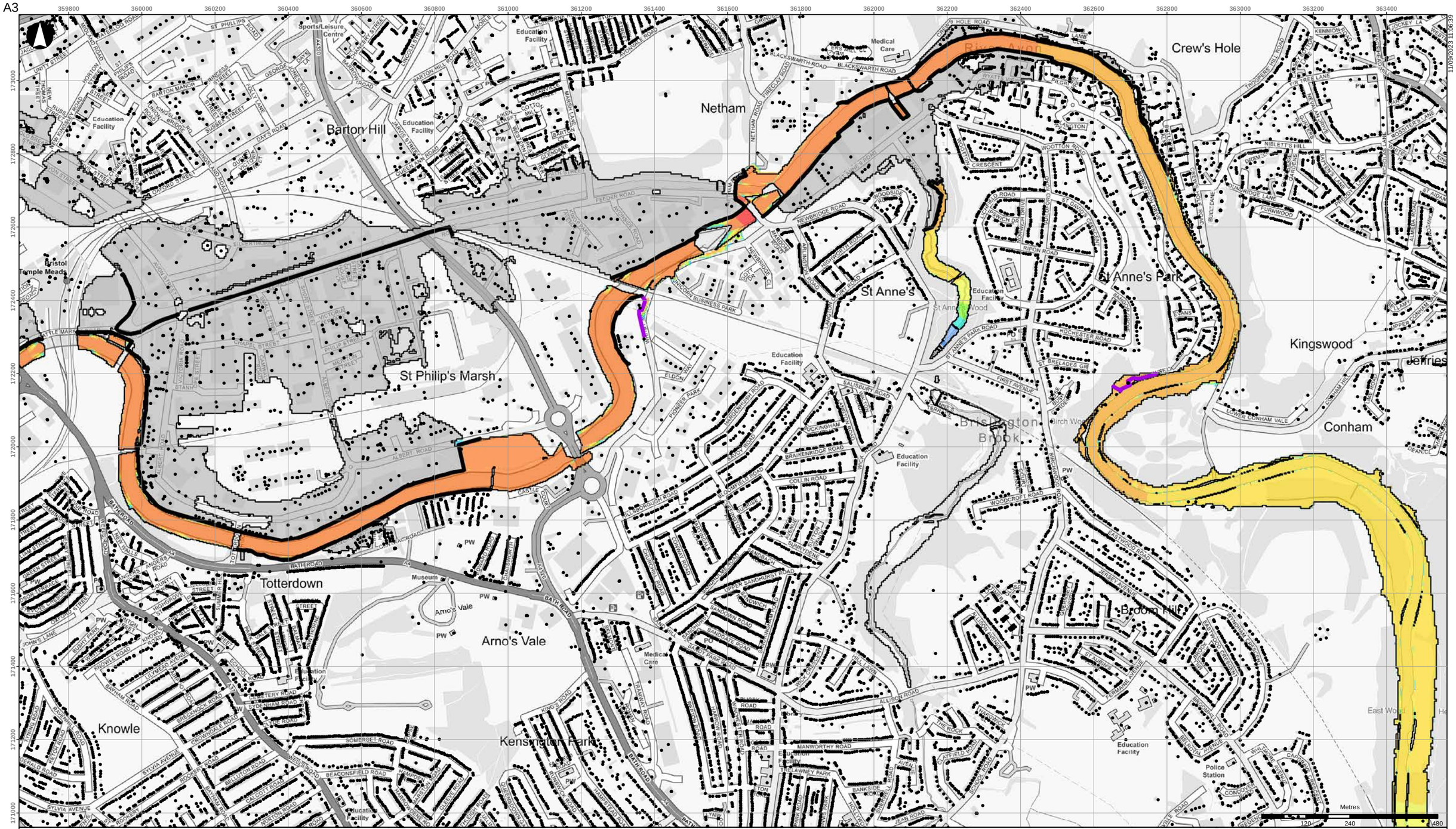
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-119**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2130 fluvial 1:75yr event**
**Netham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

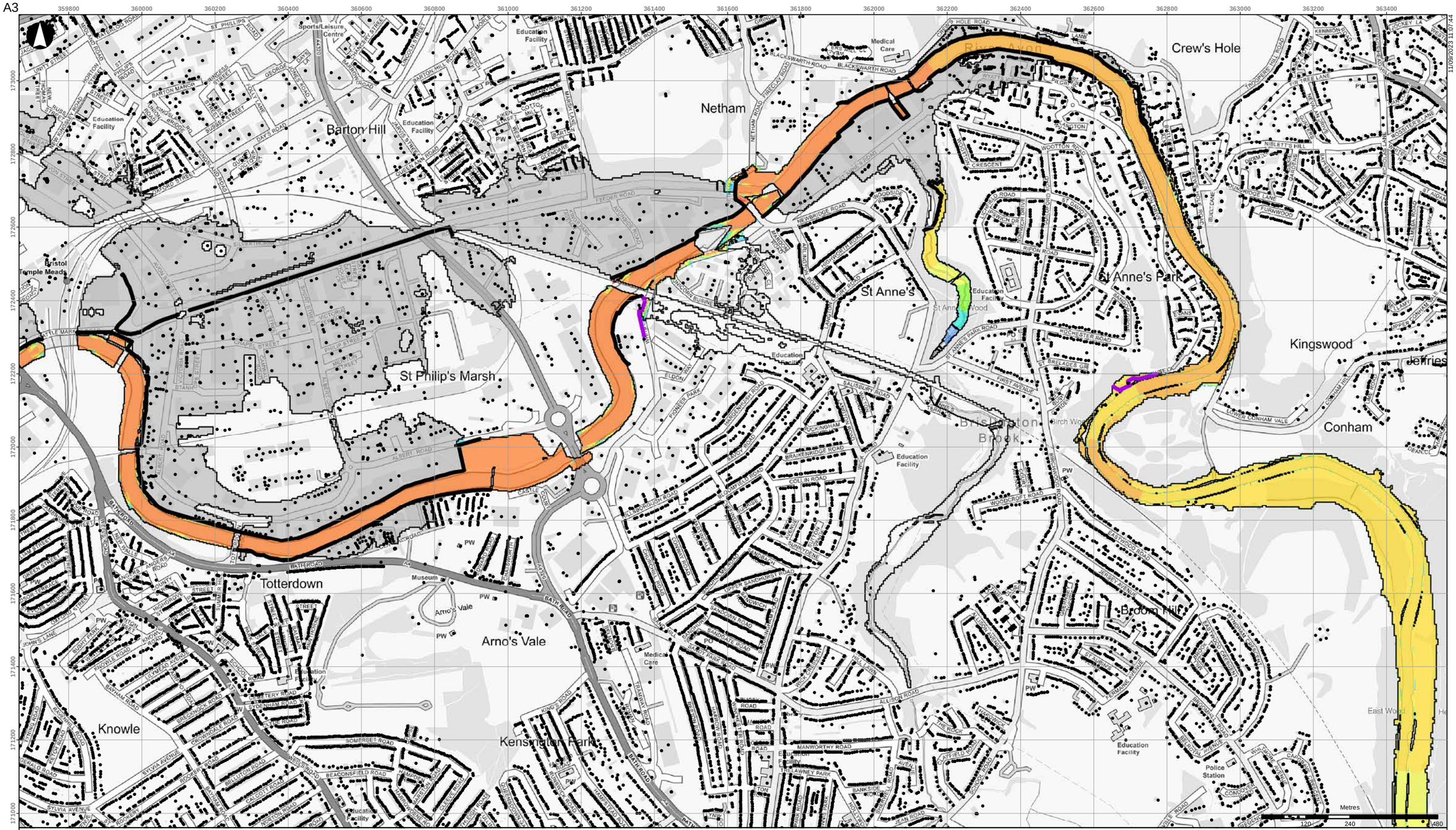
Name

**285982-ARP-XX-DR-MOD-120**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2130 fluvial 1:100yr event**
**Netham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

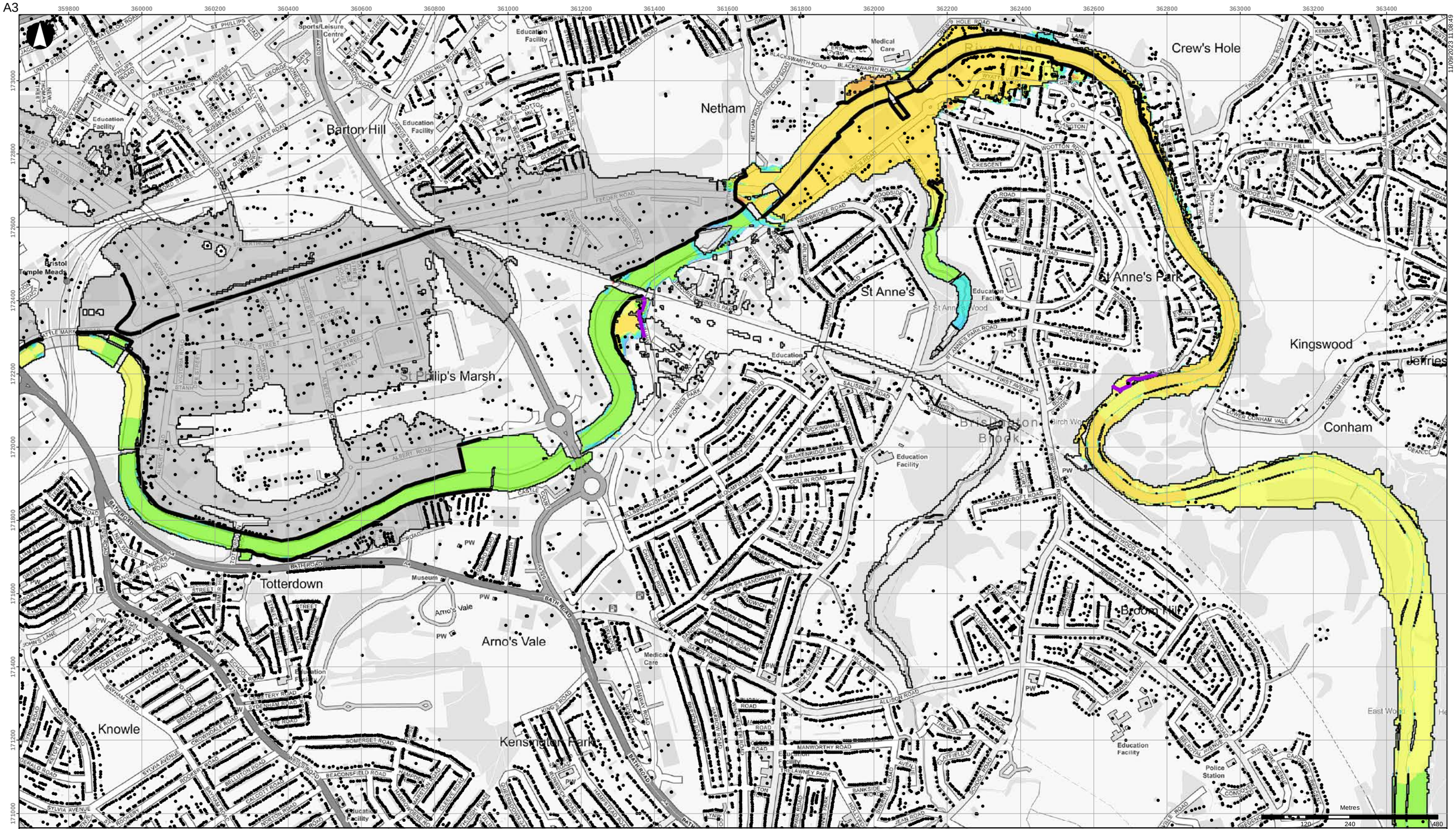
Name

**285982-ARP-XX-DR-MOD-121**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2130 fluvial 1:200yr event**
**Netham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

**285982-ARP-XX-DR-MOD-122**

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359800 360000 360200 360400 360600 360800 361000 361200 361400 361600 361800 362000 362200 362400 362600 362800 363000 363200 363400

173000 172800 172600 172400 172200 172000 171800 171600 171400 171200 171000

Barton Hill
Netham
Crew's Hole
St Philip's Marsh
St Anne's
St Anne's Park
Kingswood
Jefferies
Conham
Totterdown
Arno's Vale
Knowle
Kensington Park
Broom Hill
Bristol Temple Meads
Brislington Brook
Education Facility
Medical Care
Sports/Leisure Centre
Museum
Police Station
Metres 120 240 480

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Client
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Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 1 scheme impact**
**2030 tidal 1:20yr event**
**Netham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

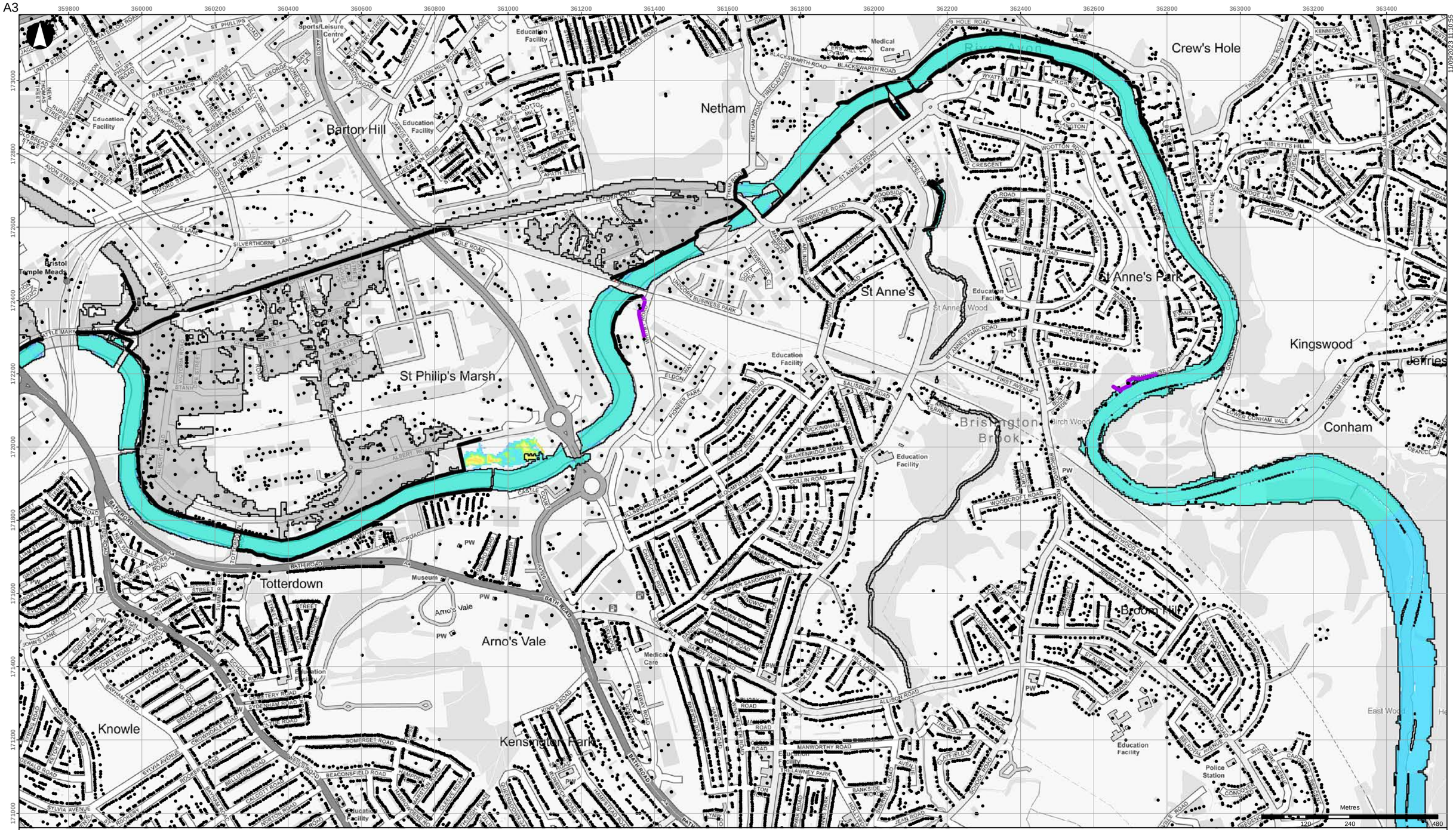
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-123**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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|---|---|---|---|---|
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Client
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Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 1 scheme impact**
**2030 tidal 1:75yr event**
**Netham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-124**

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11/09/2023 12:11:59

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2030 tidal 1:100yr event**
**Netham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

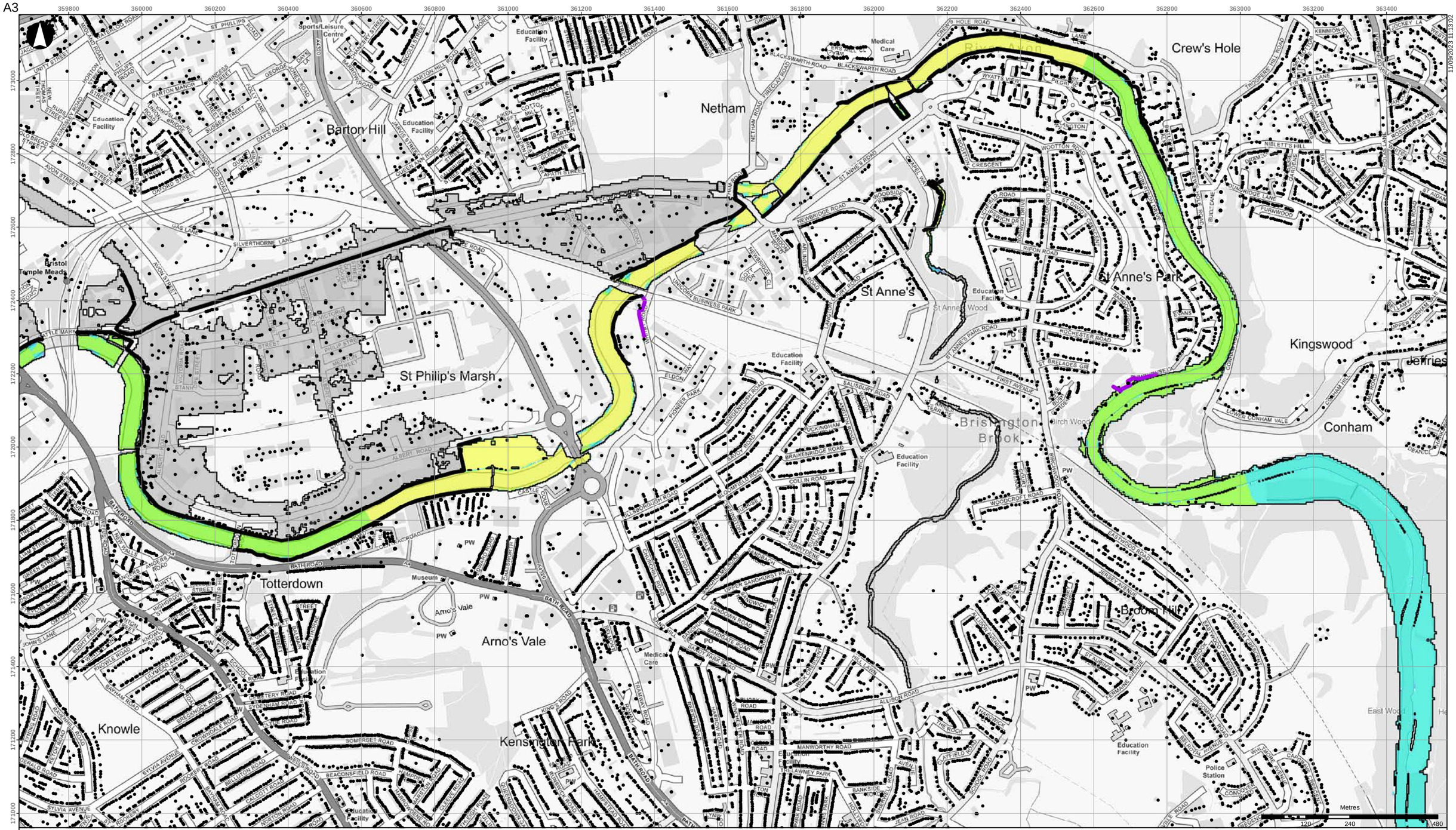
Name

**285982-ARP-XX-DR-MOD-125**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

Contains OS data (C) Crown Copyright and database right 2023

Notes:

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|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

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**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2030 tidal 1:200yr event**
**Netham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

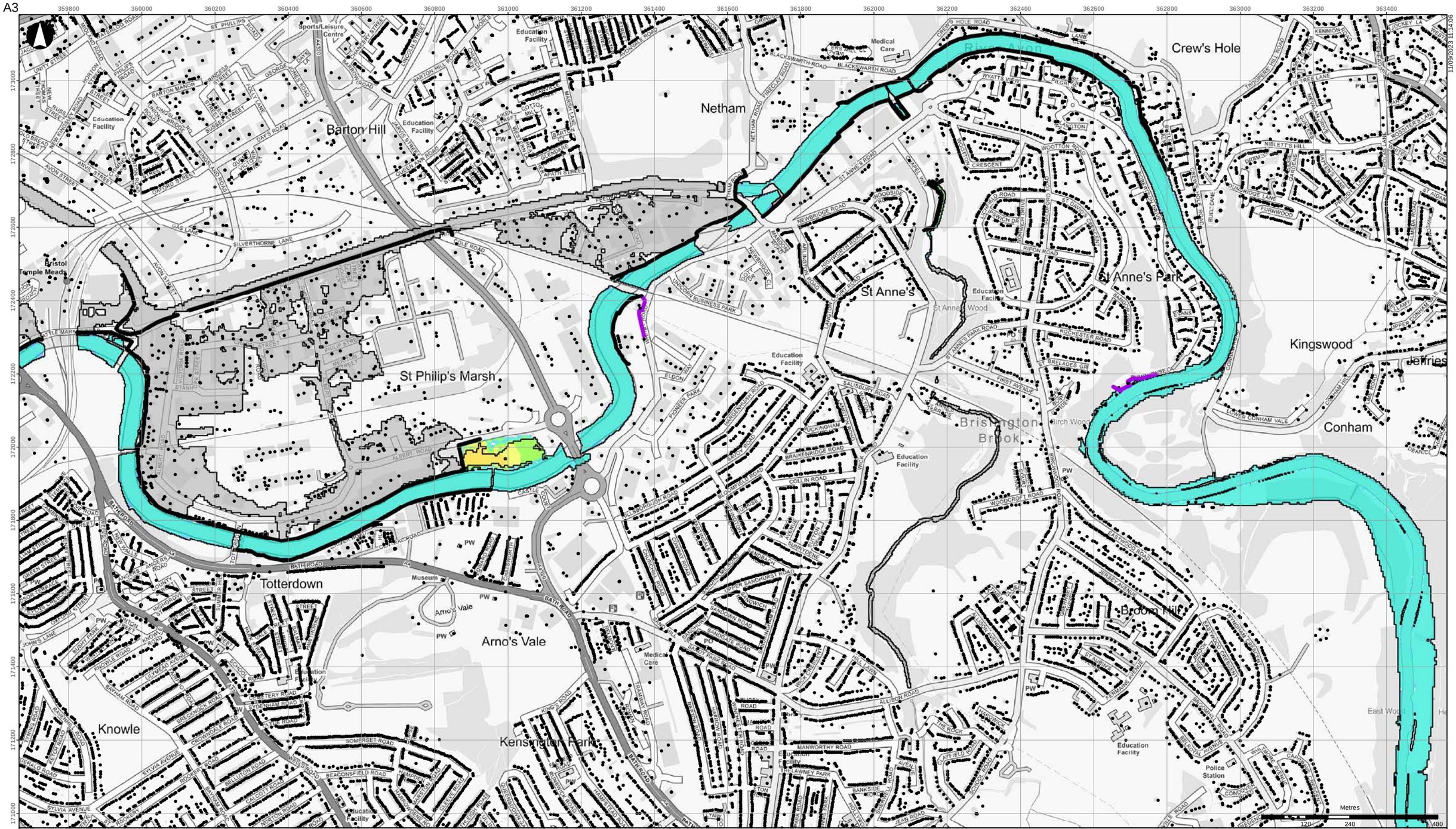
Name

**285982-ARP-XX-DR-MOD-126**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2069 tidal 1:20yr event**
**Netham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

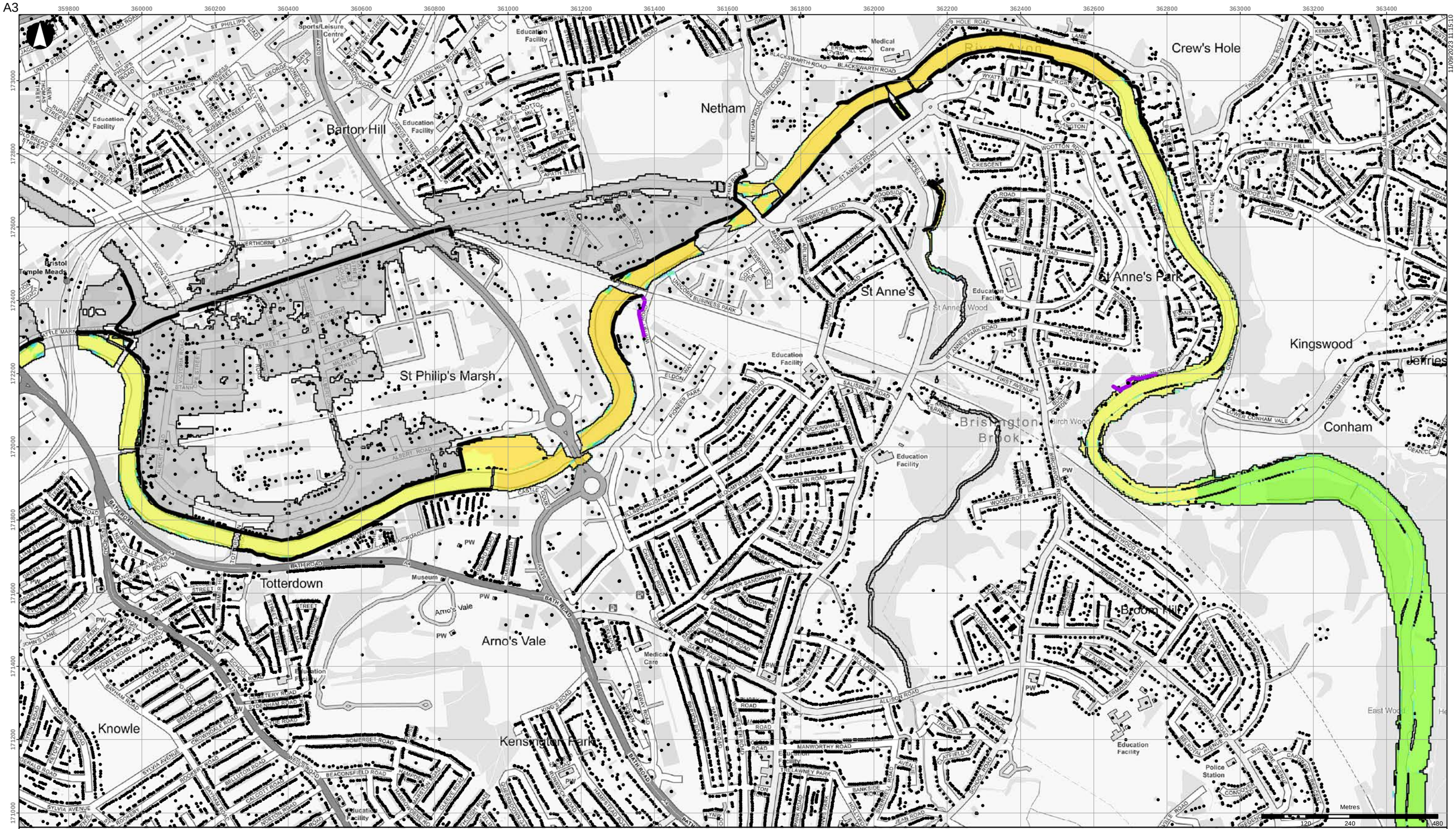
Name

**285982-ARP-XX-DR-MOD-127**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2069 tidal 1:75yr event**
**Netham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

**285982-ARP-XX-DR-MOD-128**

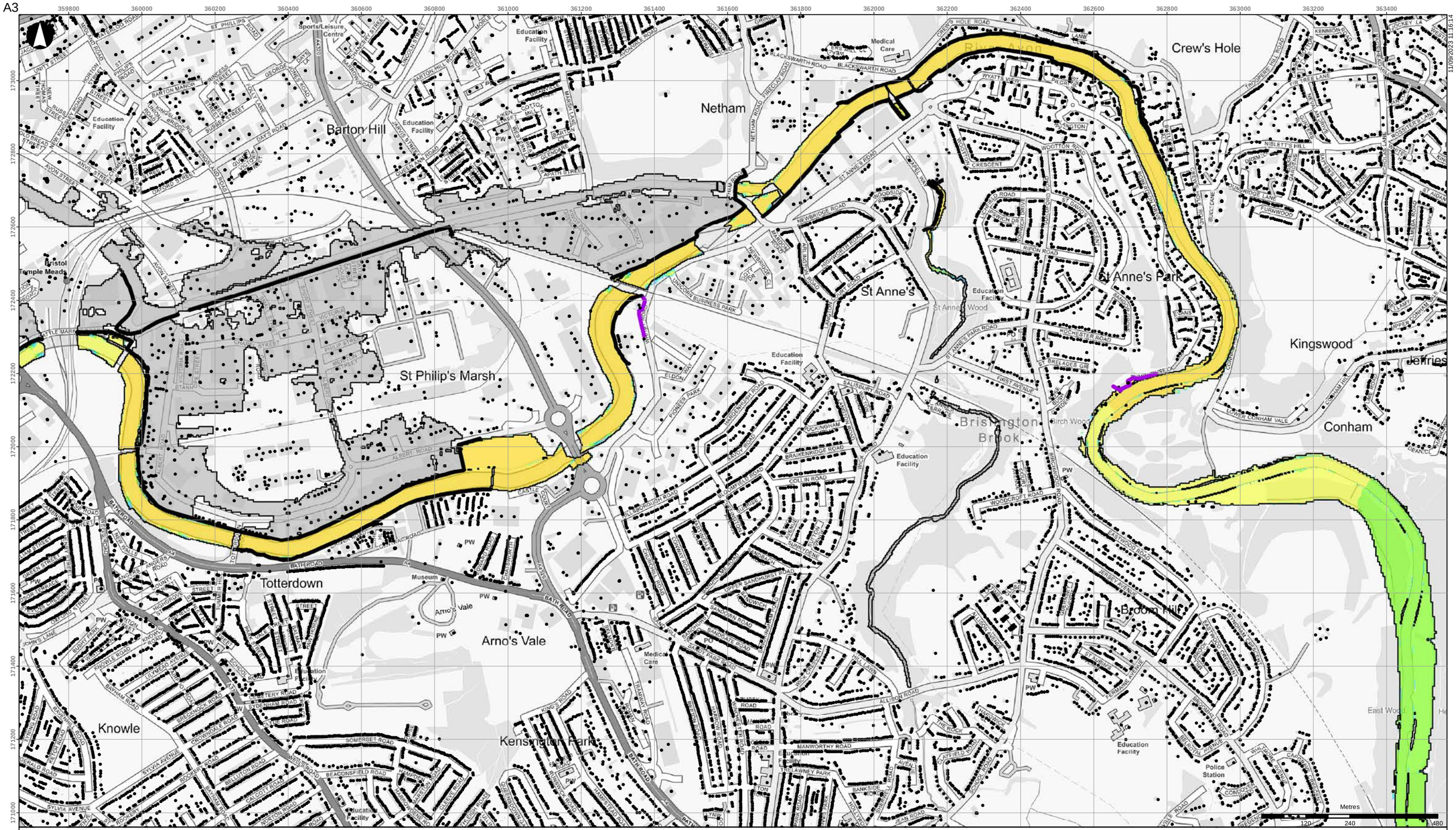
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A3

11/09/2023 11:16:14




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 1 scheme impact**
**2069 tidal 1:100yr event**
**Netham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

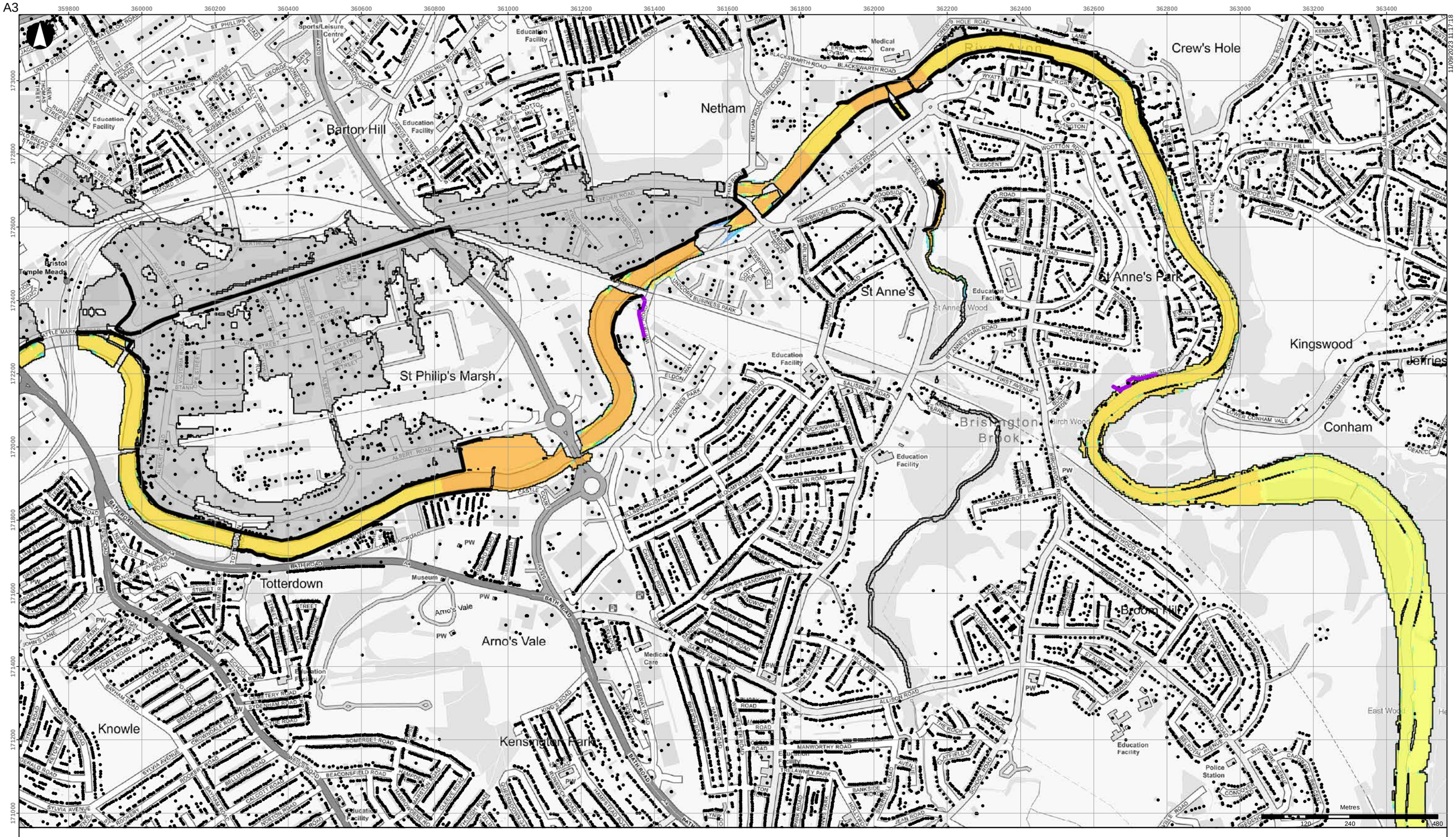
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-129**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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Notes:

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| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 1 scheme impact**
**2069 tidal 1:200yr event**
**Netham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

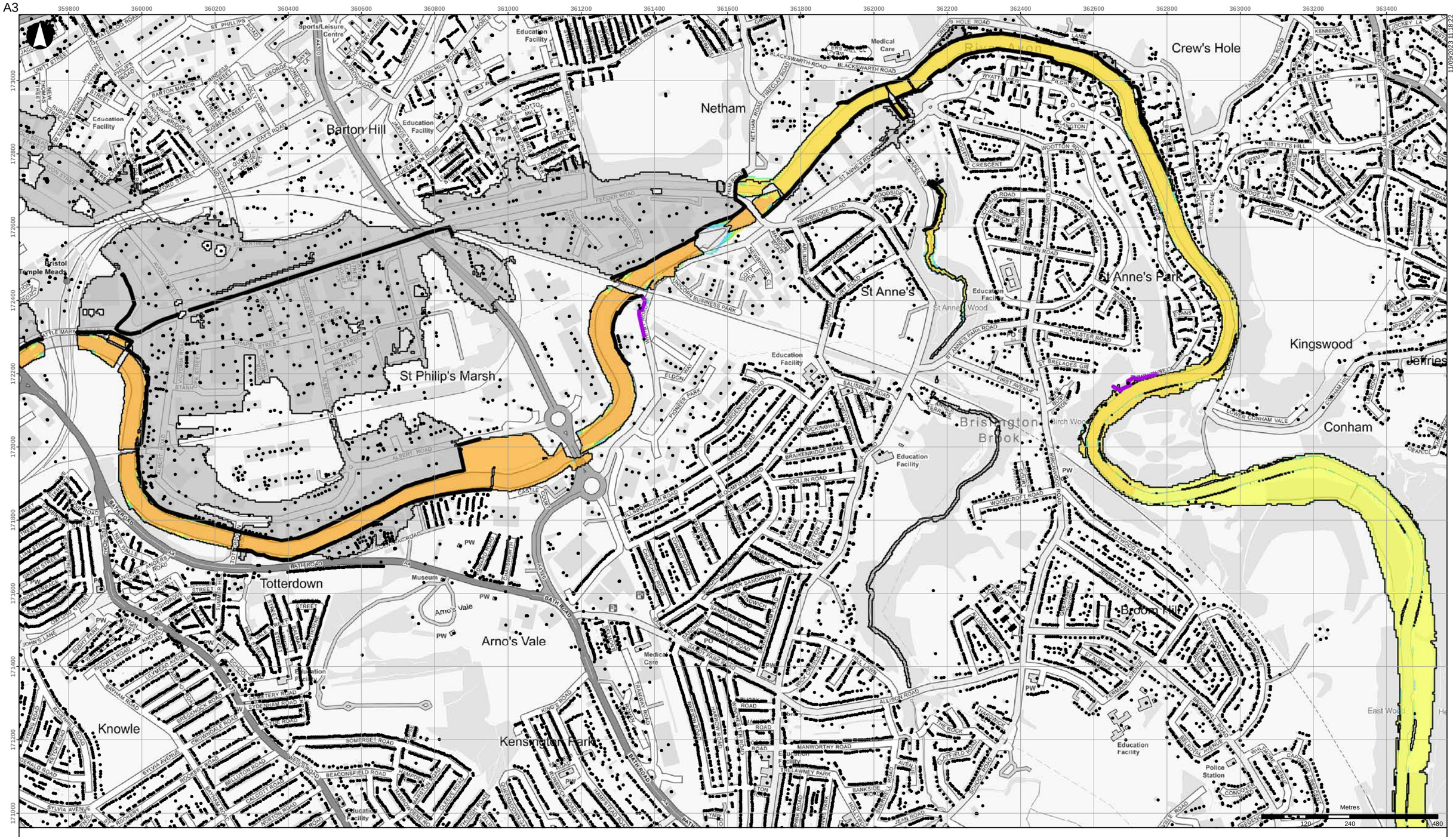
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-130**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
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| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 1 scheme impact**
**2130 tidal 1:20yr event**
**Netham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

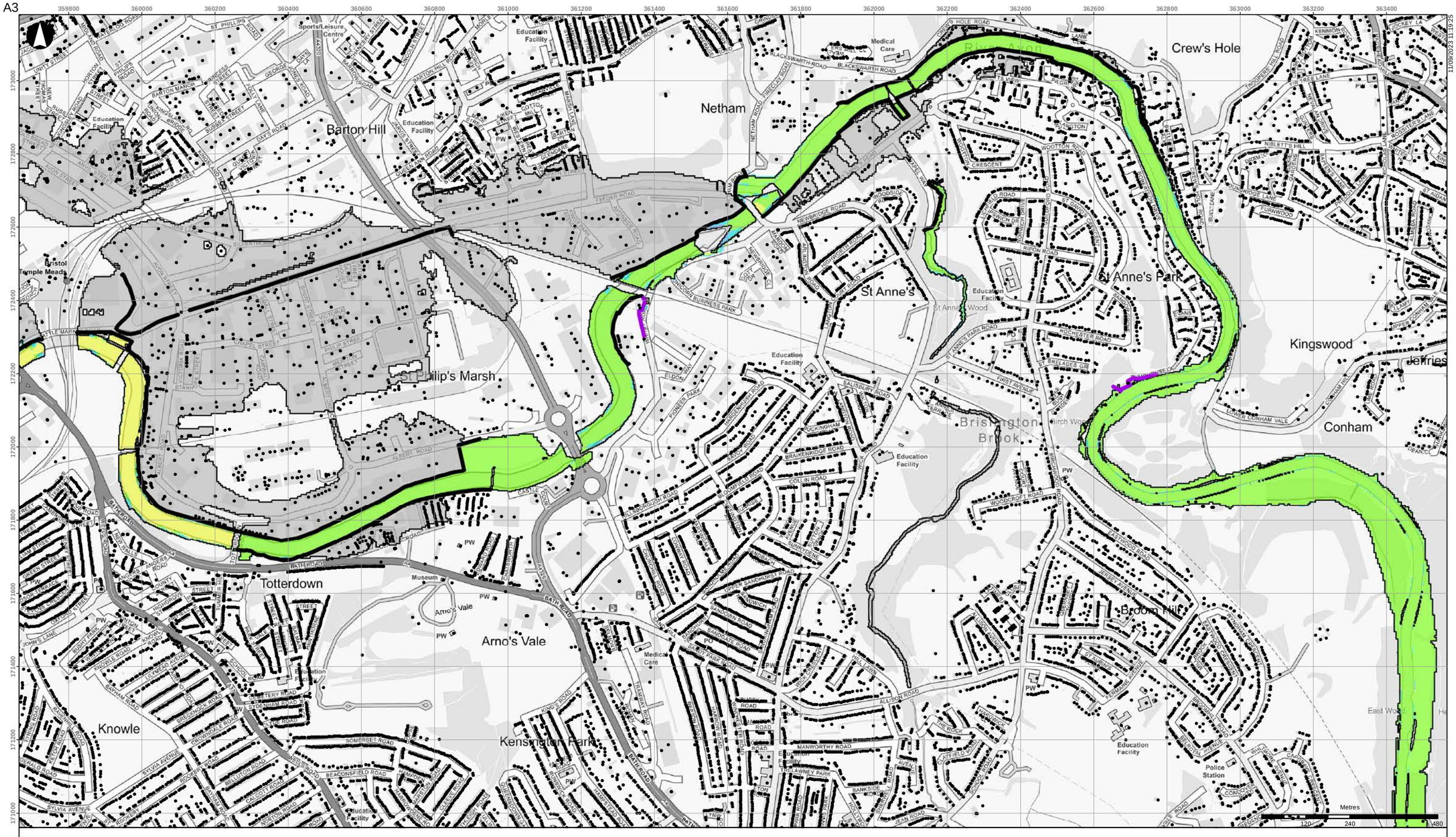
Rev
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Name
**285982-ARP-XX-DR-MOD-131**

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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**Netham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

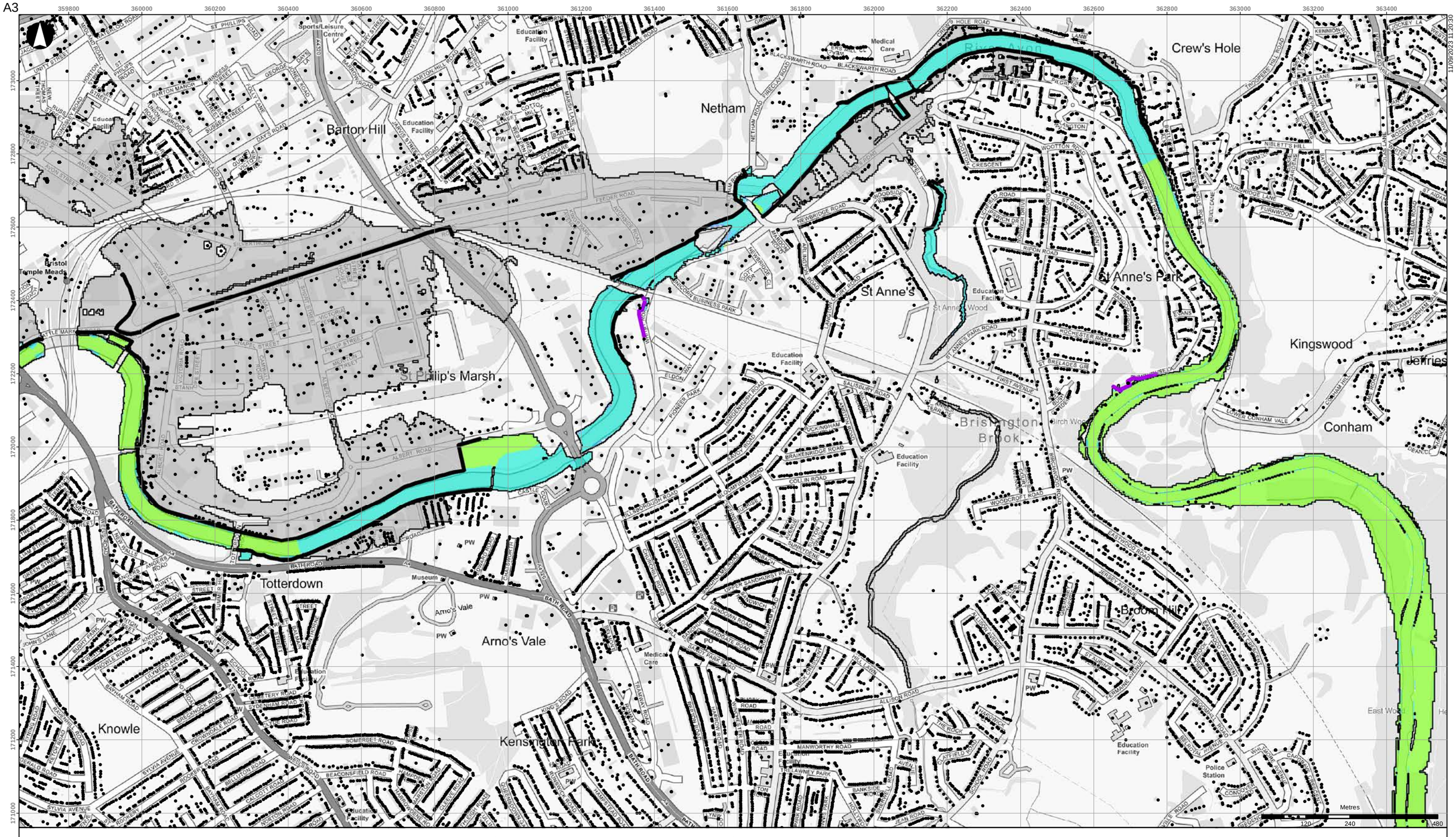
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Name
**285982-ARP-XX-DR-MOD-132**

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- Buildings
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- Baseline flood outline

**Scheme impact (m)**

| | |
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| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
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Coordinate System: British National Grid

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**Netham area**

Scale at A3
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Role

Suitability
**Draft**

Arup Job No
**285982-00**

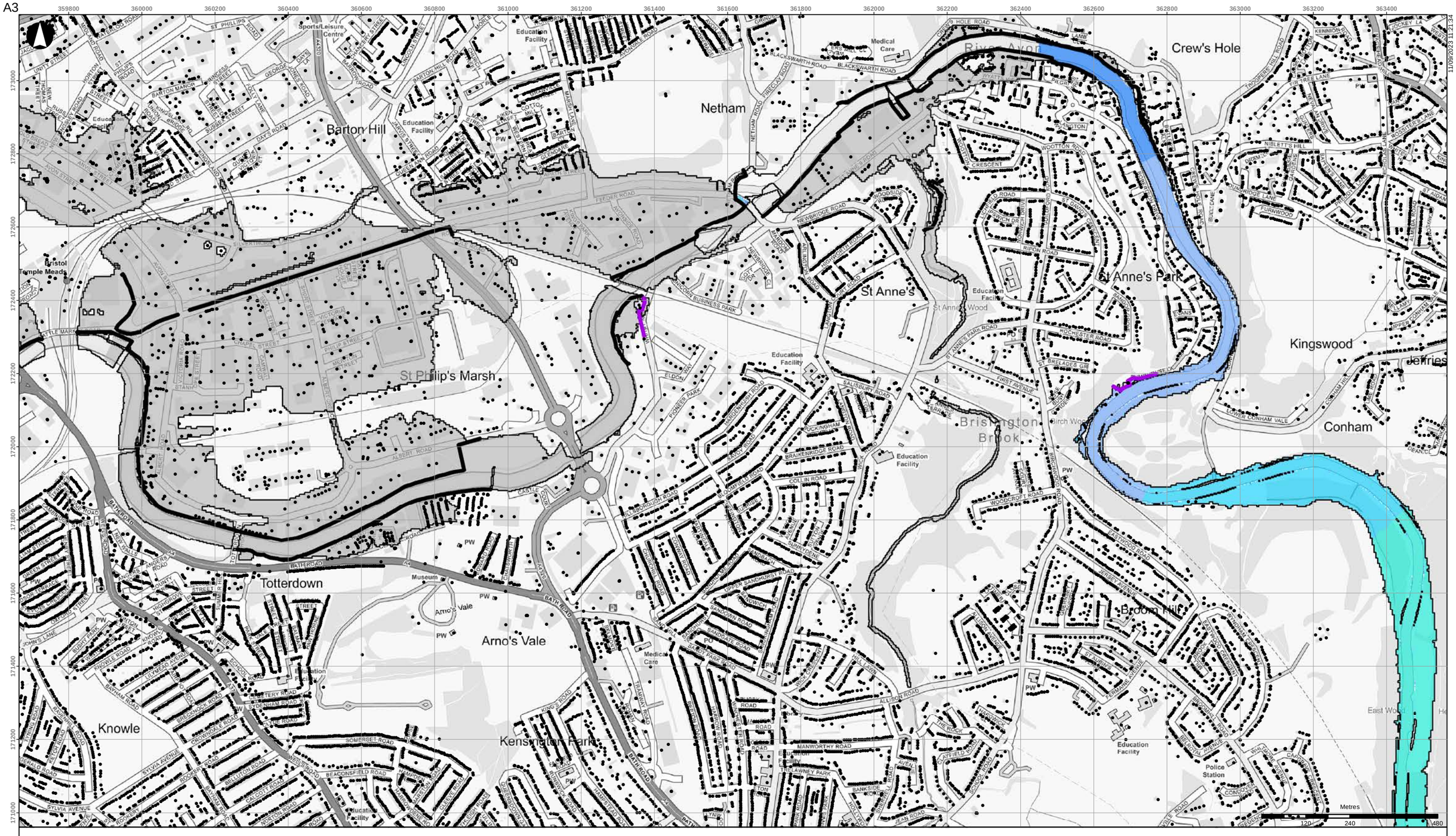
Rev
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Name
**285982-ARP-XX-DR-MOD-133**

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- Buildings
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**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
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Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

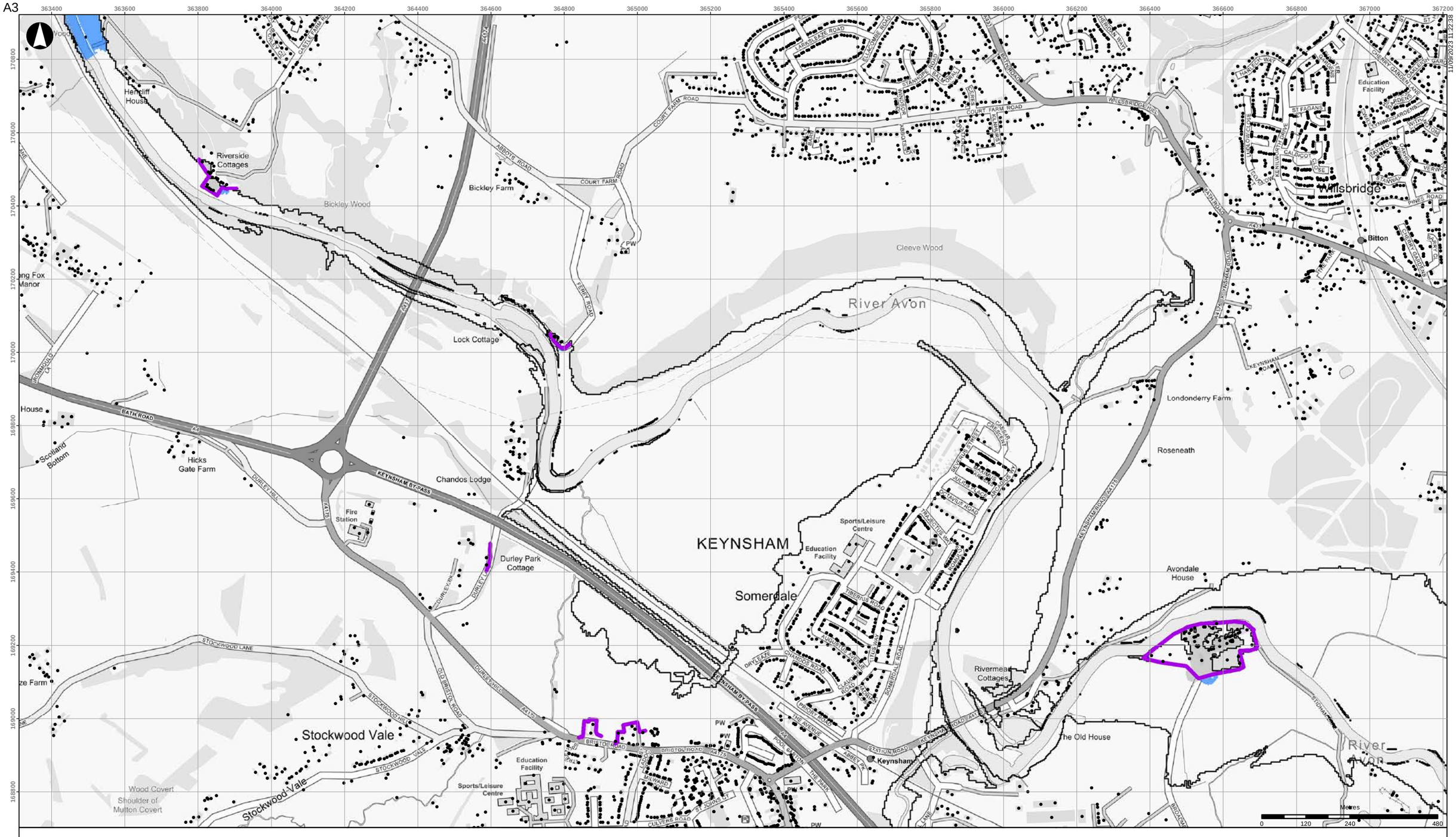
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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

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**2030 fluvial 1:20yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

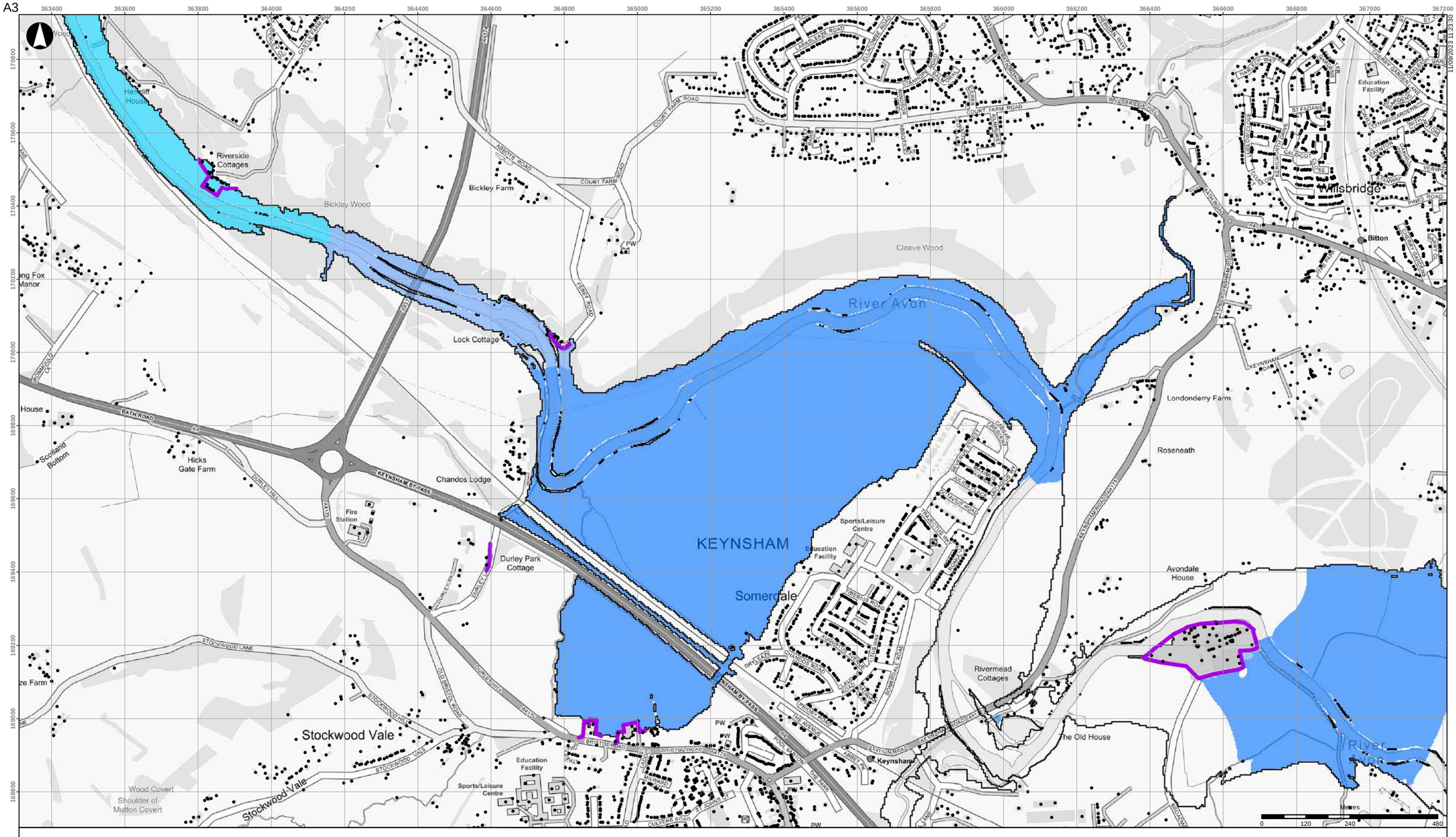
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- Buildings
- Scheme defences
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**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
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Coordinate System: British National Grid

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**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

| Arup Job No | Rev |
|---|---|
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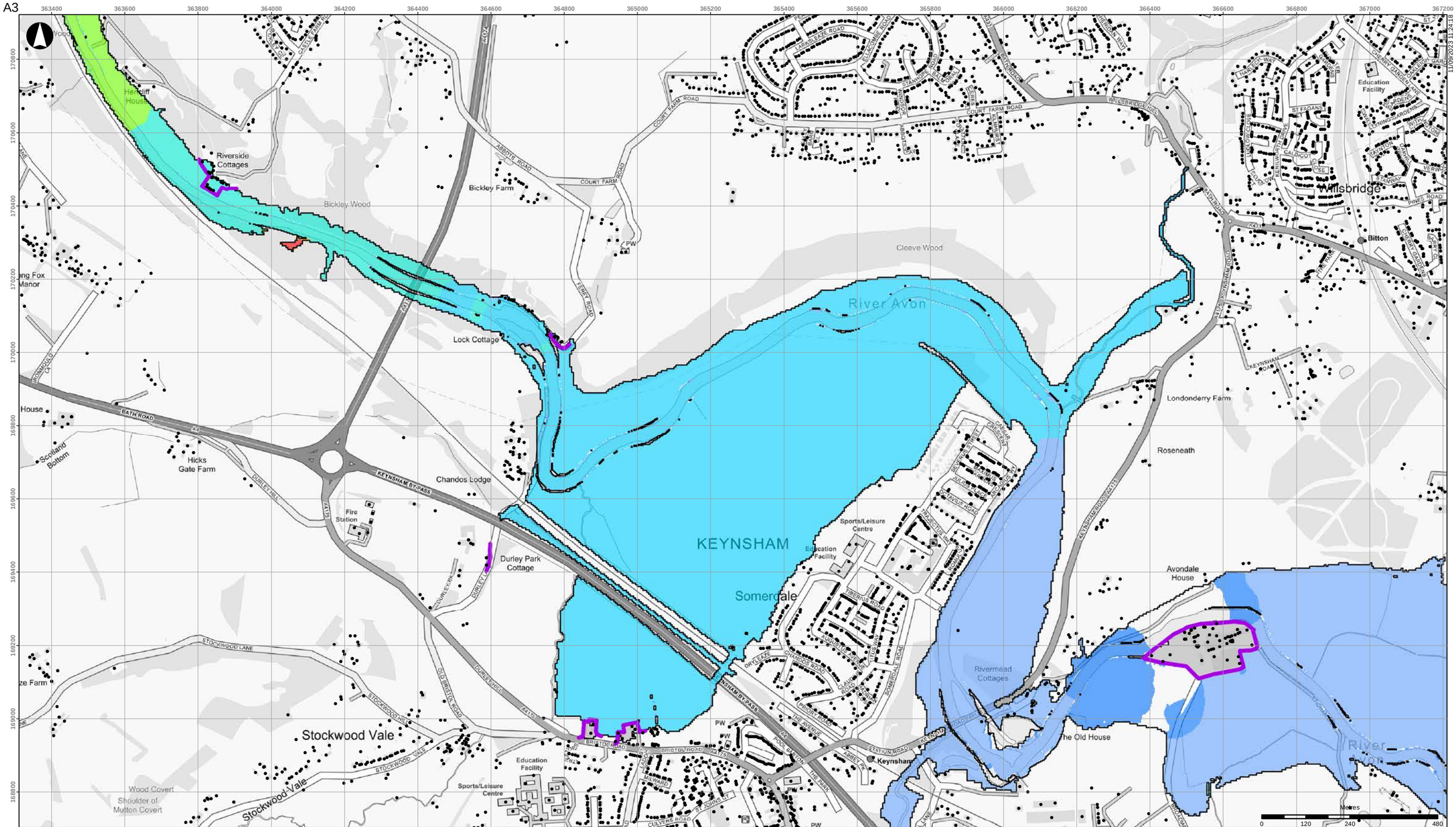
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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

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**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

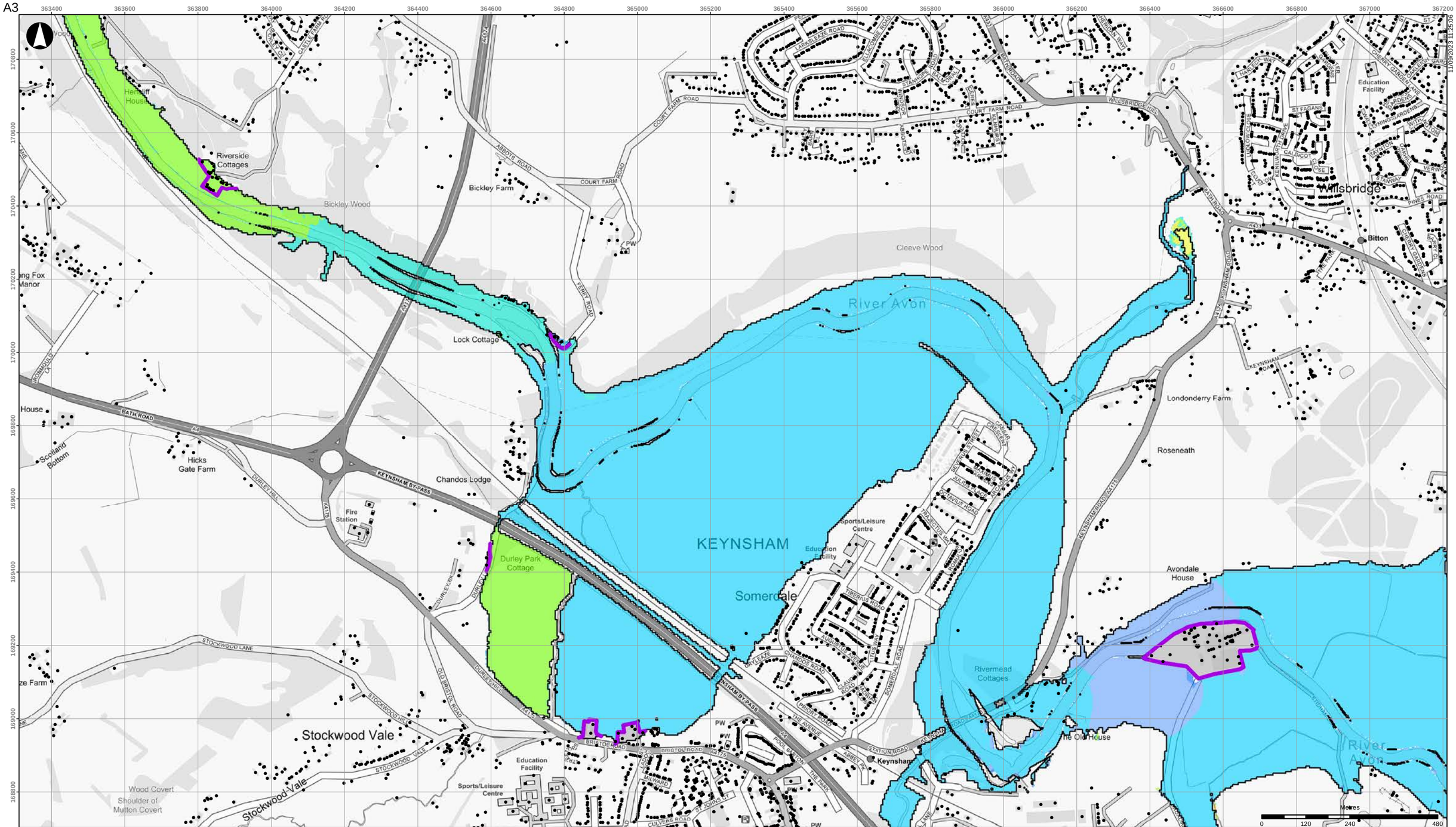
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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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Project Title

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Drawing Title

**Phase 1 scheme impact**
**2030 fluvial 1:200yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

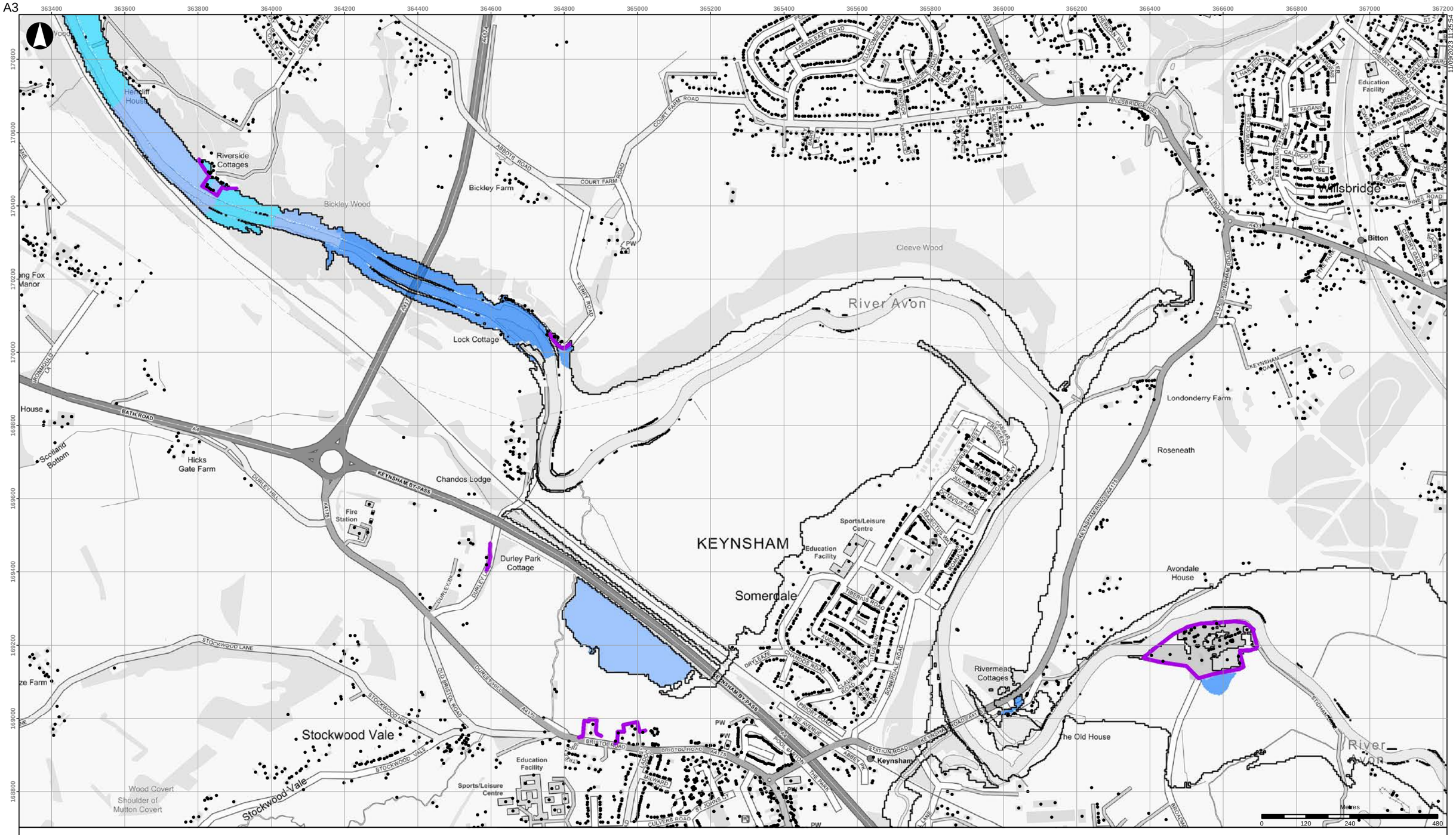
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11/09/2023 11:25:54

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

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**Phase 1 scheme impact**
**2069 fluvial 1:20yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

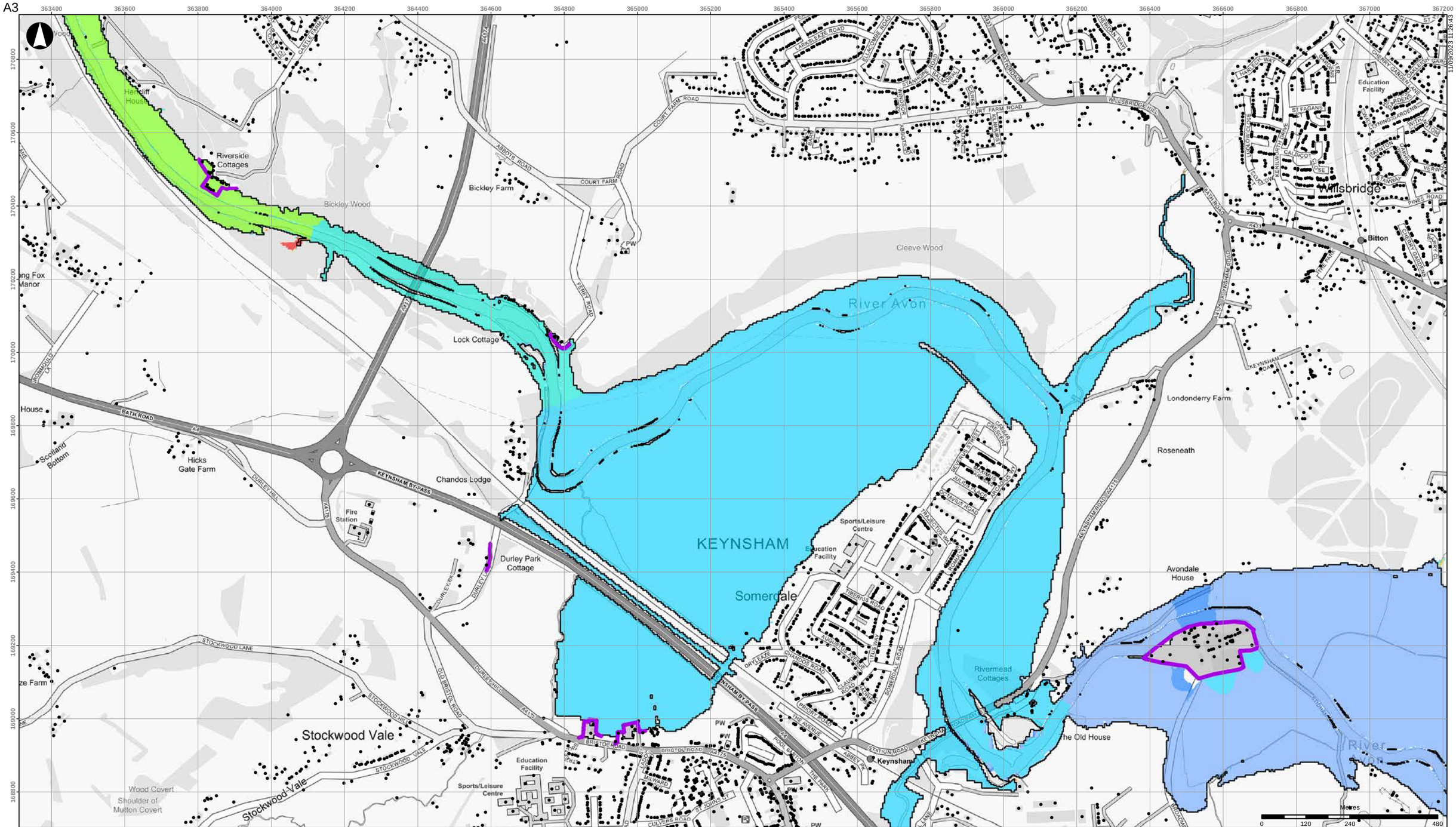
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**285982-ARP-XX-DR-MOD-139**

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- Buildings
- Scheme defences
- Detriment mitigation
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**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

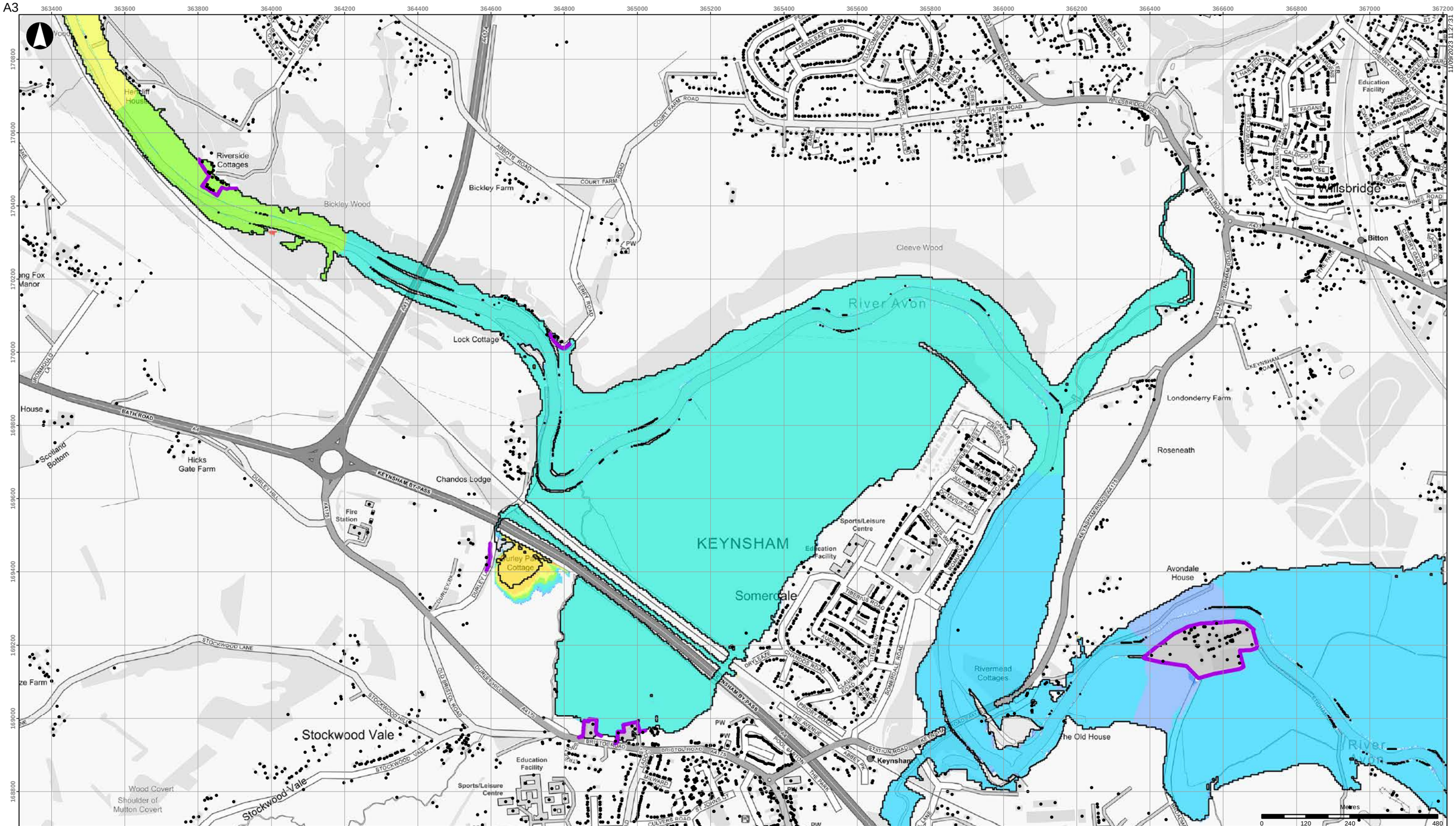
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- Buildings
- Scheme defences
- Detriment mitigation
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**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Scale at A3

**1:10,000**

Role

Suitability

**Draft**

| Arup Job No | Rev |
|---|---|
| **285982-00** | **D1** |

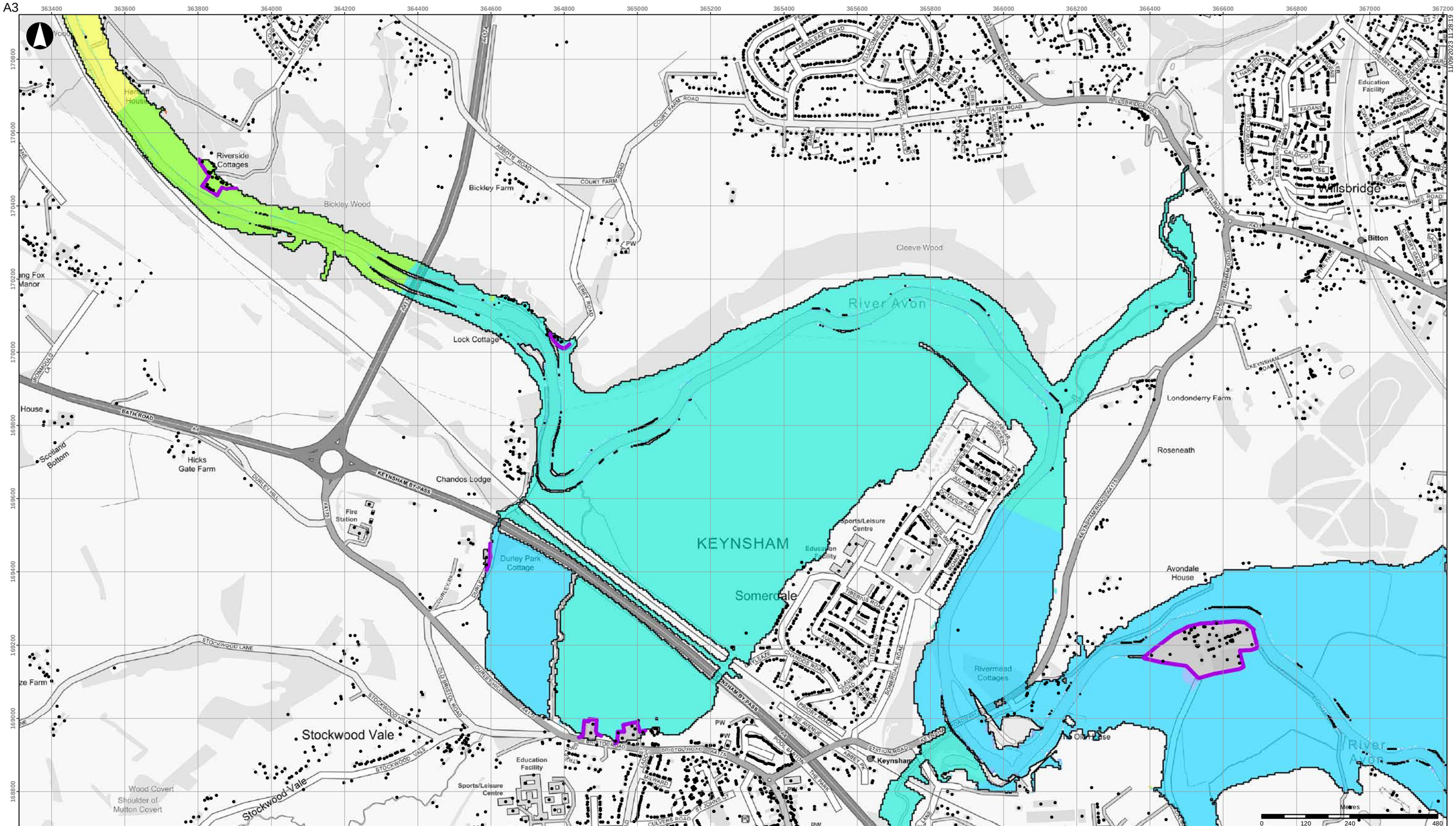
Name

**285982-ARP-XX-DR-MOD-141**

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**Scheme impact (m)**

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- 0.015 - 0.025
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- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

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**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

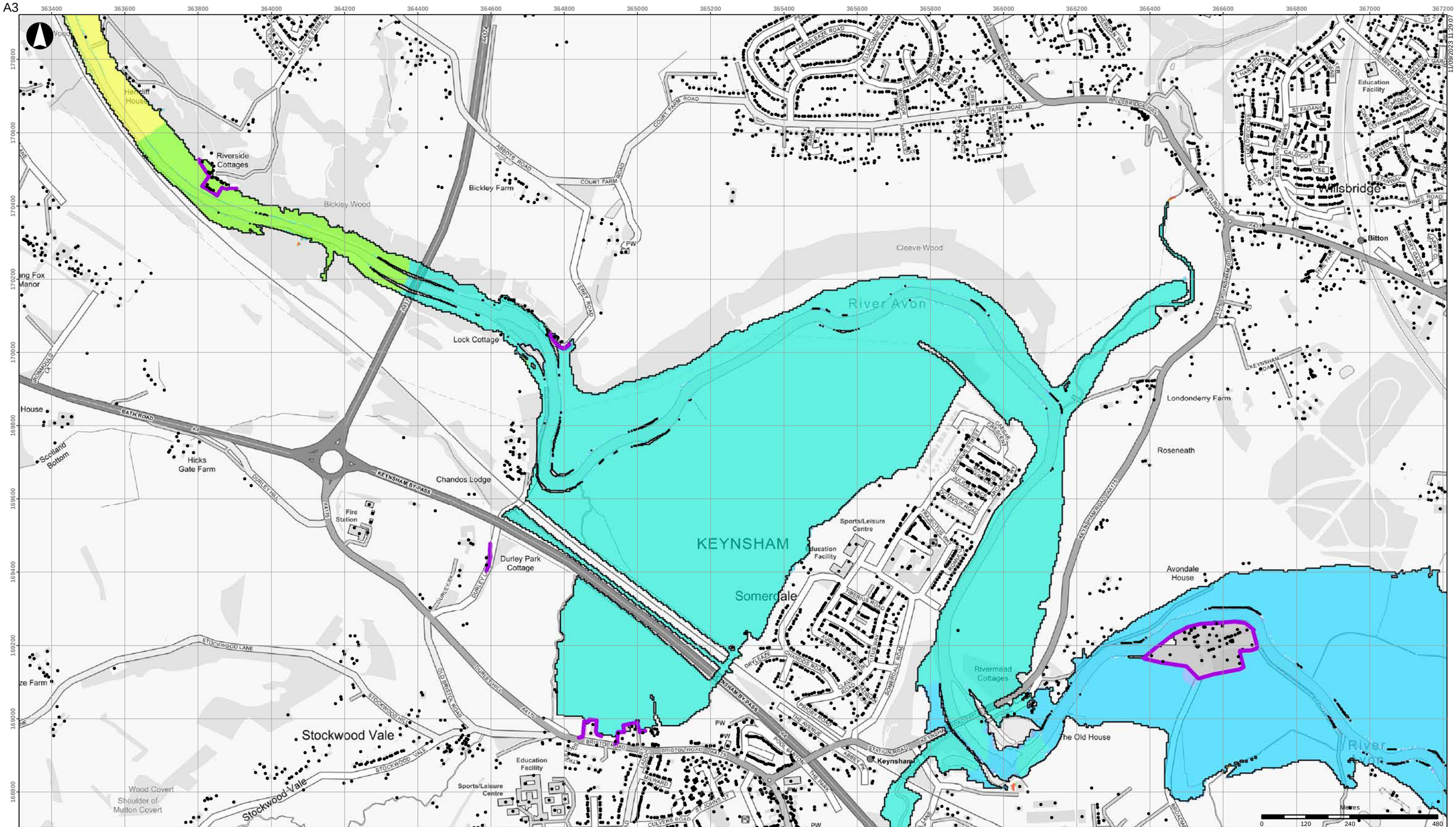
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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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**2130 fluvial 1:20yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

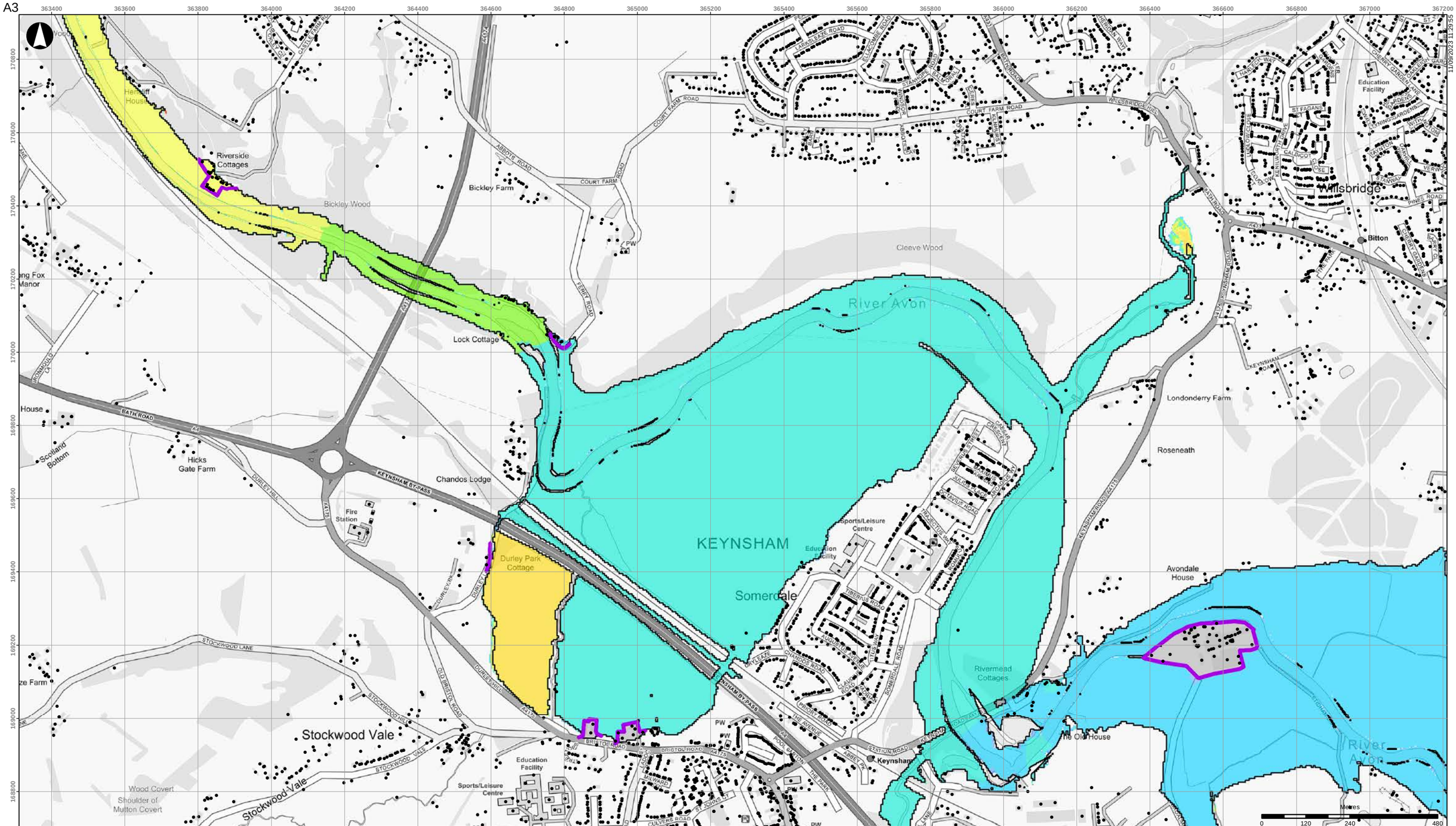
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- Buildings
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**Scheme impact (m)**

- Betterment
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- 0.015 - 0.025
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- 0.10 - 0.15
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- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2130 fluvial 1:75yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

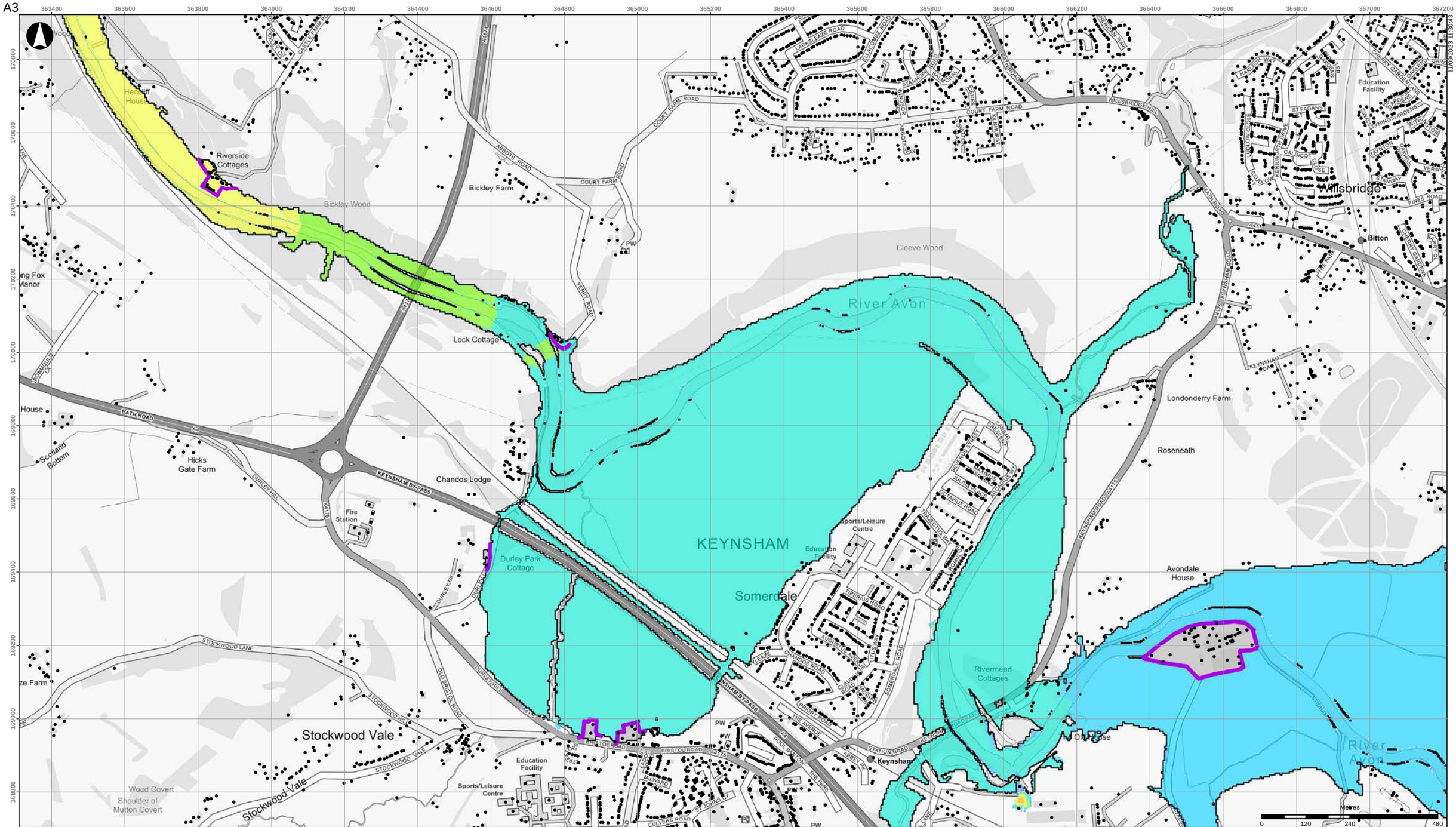
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**285982-ARP-XX-DR-MOD-144**

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| D1 | 2023-09-11 | DvdL | DvdL | PS |

ARUP

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2130 fluvial 1:100yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

**285982-ARP-XX-DR-MOD-145**

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363400 363600 363800 364000 364200 364400 364600 364800 365000 365200 365400 365600 365800 366000 366200 366400 366600 366800 367000 367200

170800 170600 170400 170200 170000 169800 169600 169400 169200 169000 168800

11/09/2023 13:31

Riverside Cottages
Bickley Farm
Bickley Wood
Cleeve Wood
River Avon
Lock Cottage
Wilsbridge
Bitton
Londonderry Farm
Roseneath
KEYNSHAM
Somerdale
Education Facility
Sports/Leisure Centre
Durley Park Cottage
Chandos Lodge
Fire Station
Hicks Gate Farm
Scotland Bottom
Stockwood Vale
Wood Covert
Shoulder of Mutton Covert
Avondale House
Rivermead Cottages
Keynsham
Meres
0 120 240 480

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 1 scheme impact**
**2130 fluvial 1:200yr event**
**Keynsham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

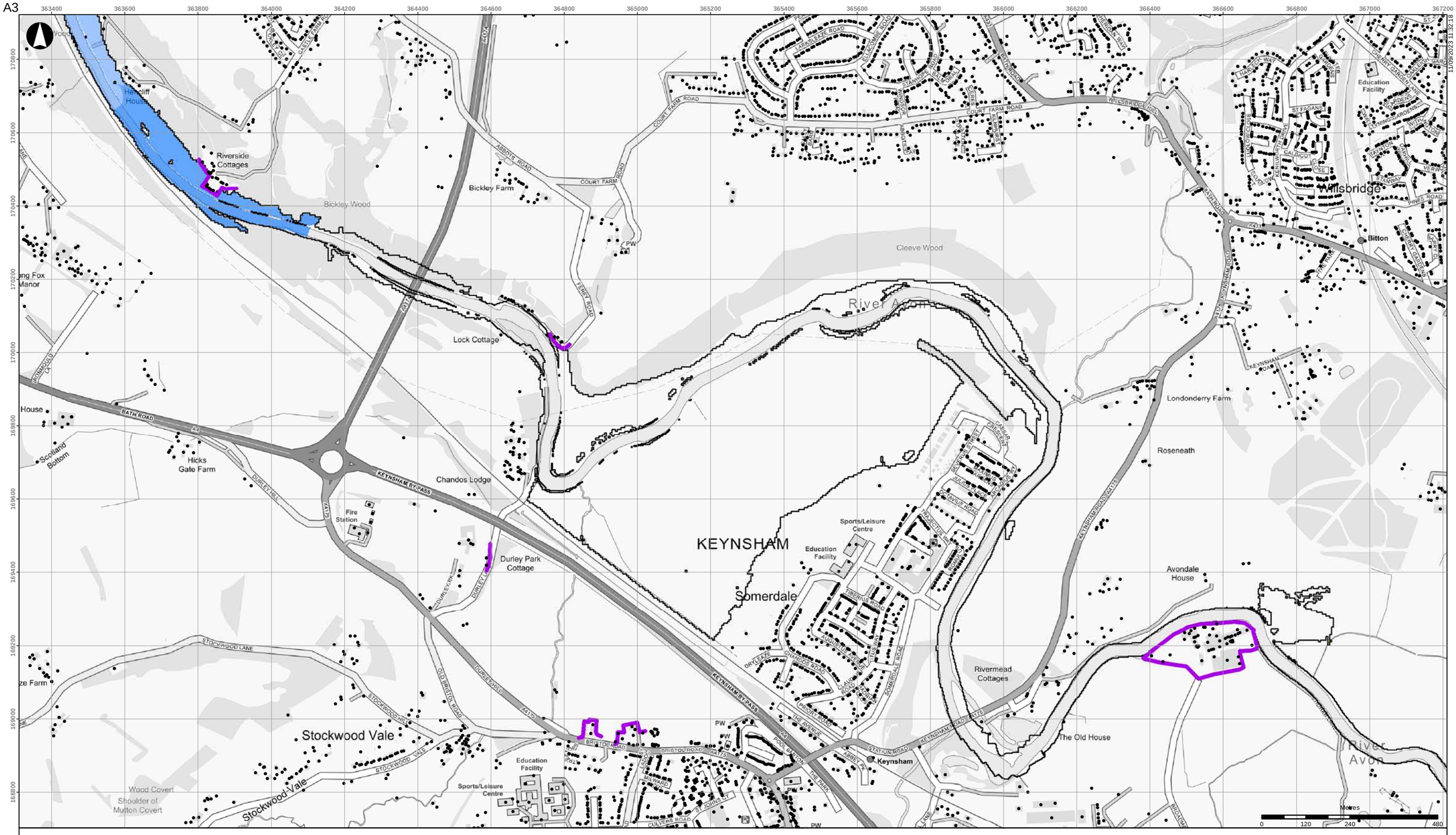
Rev
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**285982-ARP-XX-DR-MOD-146**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2030 tidal 1:20yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

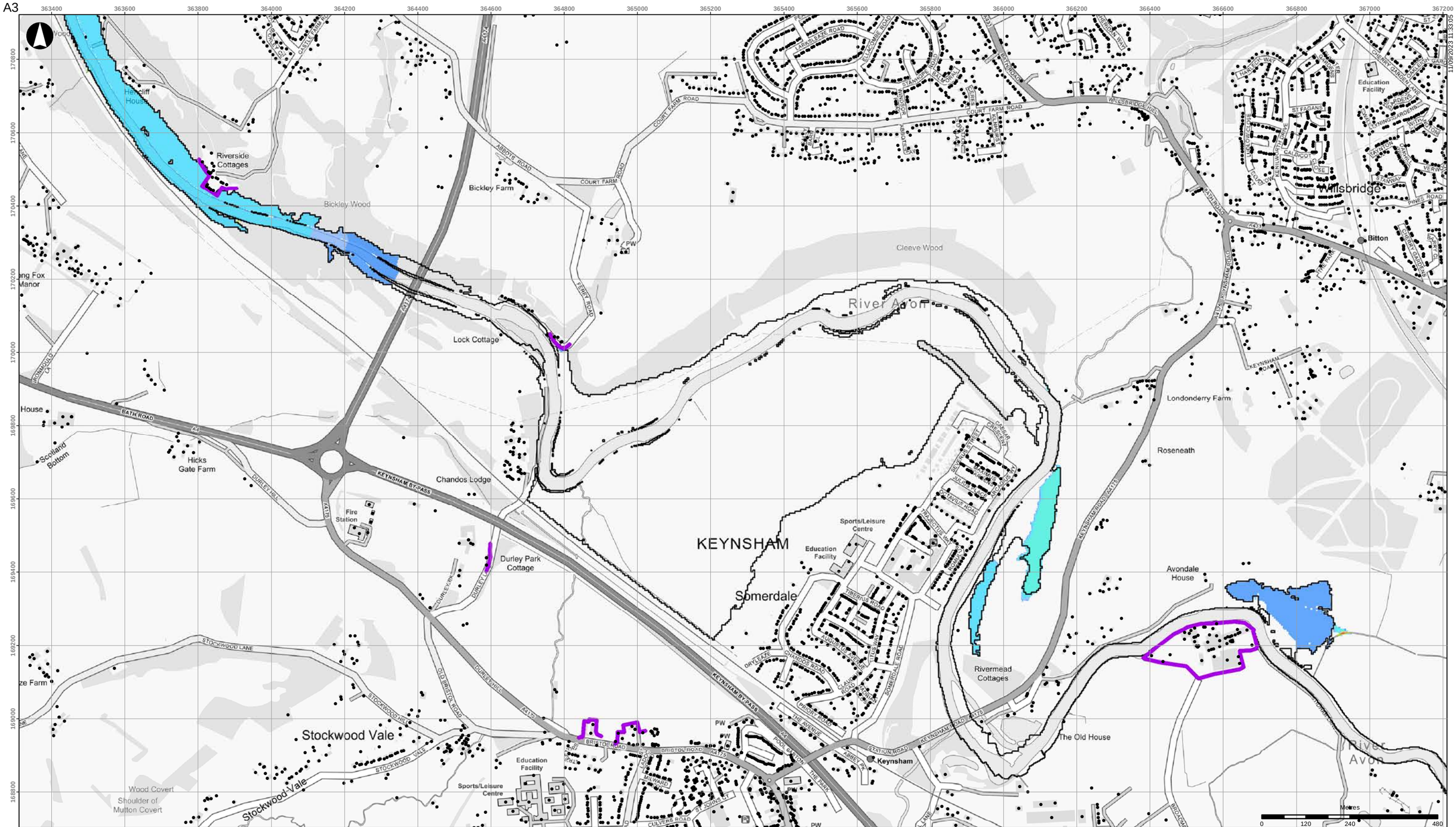
Name

**285982-ARP-XX-DR-MOD-147**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
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Drawing Title

**Phase 1 scheme impact**
**2030 tidal 1:75yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

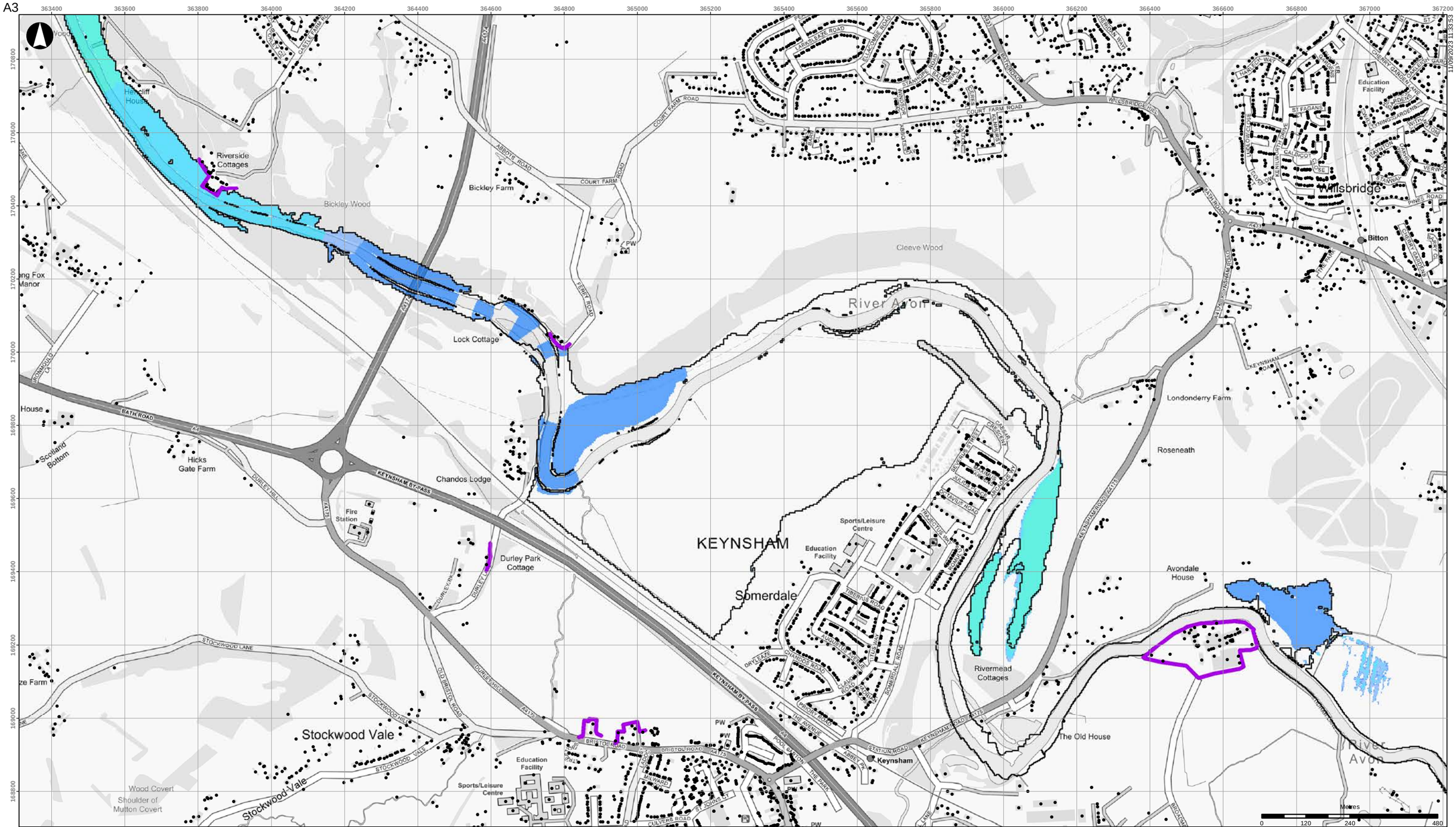
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**285982-ARP-XX-DR-MOD-148**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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**Phase 1 scheme impact**
**2030 tidal 1:100yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

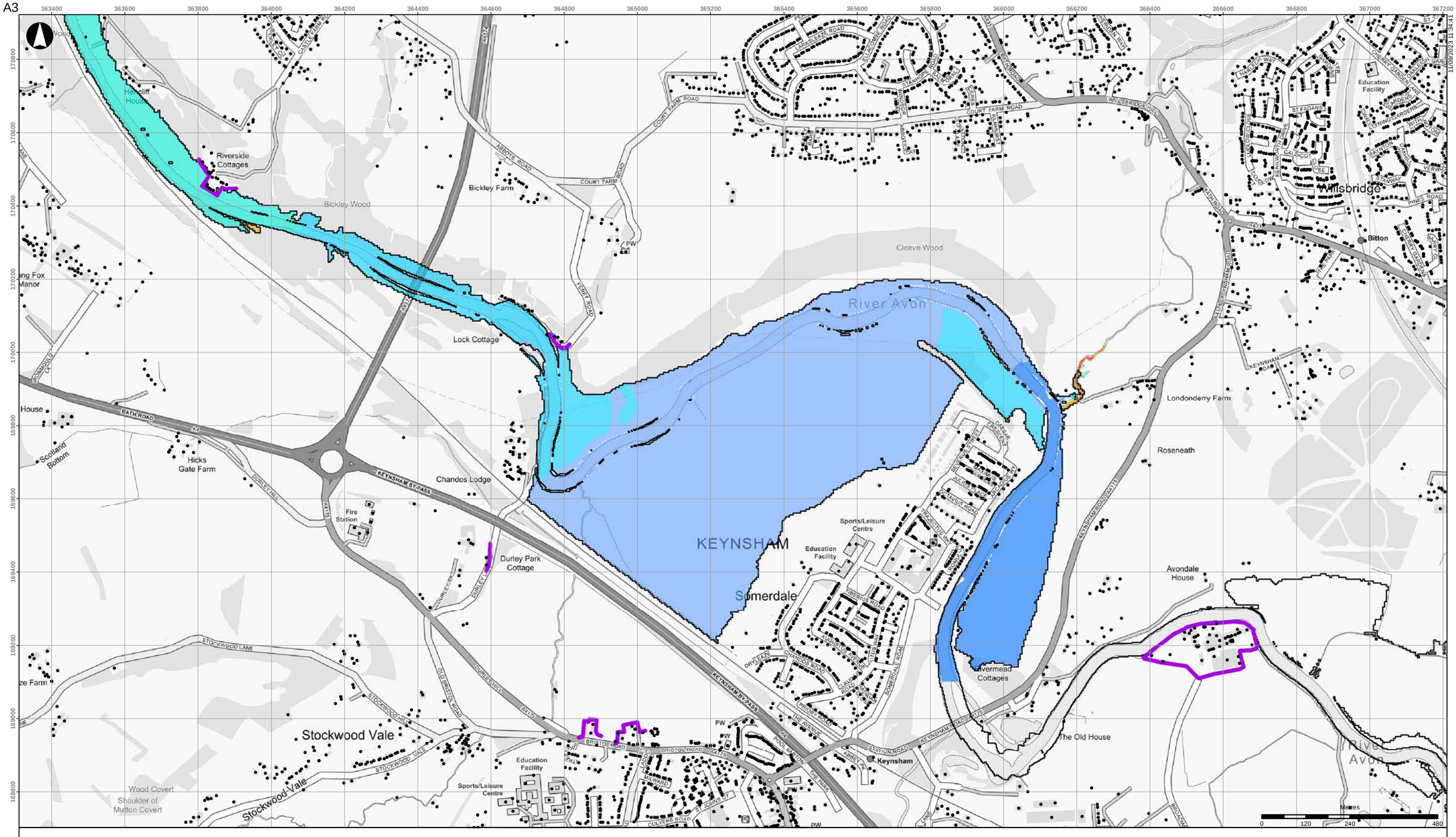
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**285982-ARP-XX-DR-MOD-149**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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**Bristol Avon Flood Strategy OBC**

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**Phase 1 scheme impact**
**2030 tidal 1:200yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

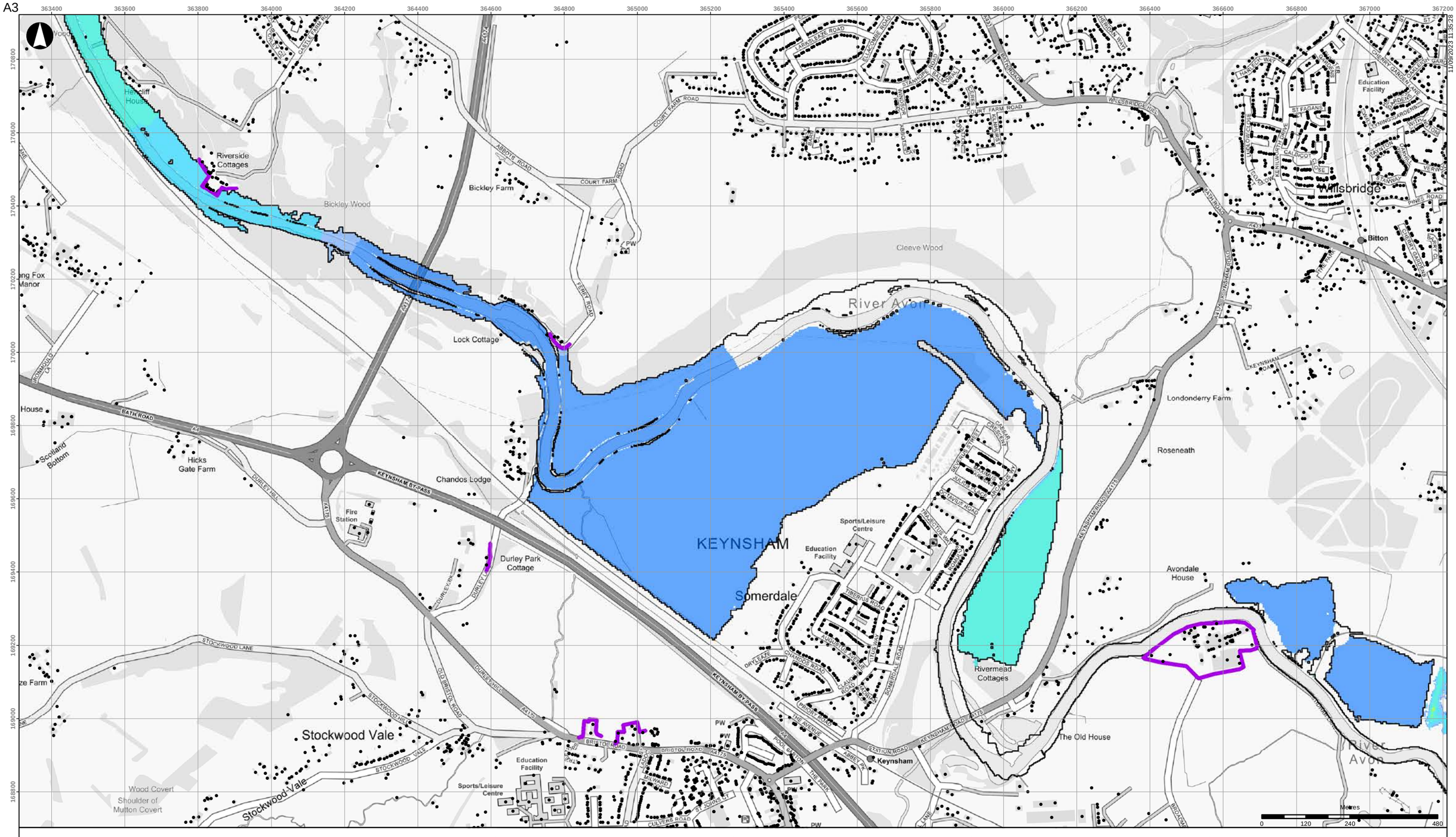
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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2069 tidal 1:20yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

**285982-ARP-XX-DR-MOD-151**

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11/09/2023 13:36:15

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
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Client

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2069 tidal 1:75yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

**285982-ARP-XX-DR-MOD-152**

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363400 363600 363800 364000 364200 364400 364600 364800 365000 365200 365400 365600 365800 366000 366200 366400 366600 366800 367000 367200

170800 170600 170400 170200 170000 169800 169600 169400 169200 169000 168800

S:\473\ST\2020\0711

Riverside Cottages
Bickley Wood
Bickley Farm
Cleeve Wood
River Avon
Lock Cottage
Wilsbridge
Bitton
Londonderry Farm
Roseneath
Chandos Lodge
Durley Park Cottage
KEYNSHAM
Somerdale
Avondale House
Rivermead Cottages
The Old House
Keynsham
Stockwood Vale
Scotland Bottom
Hicks Gate Farm
Education Facility
Sports/Leisure Centre
Fire Station

Meters
0 120 240 480

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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Notes:

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**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 1 scheme impact**
**2069 tidal 1:100yr event**
**Keynsham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

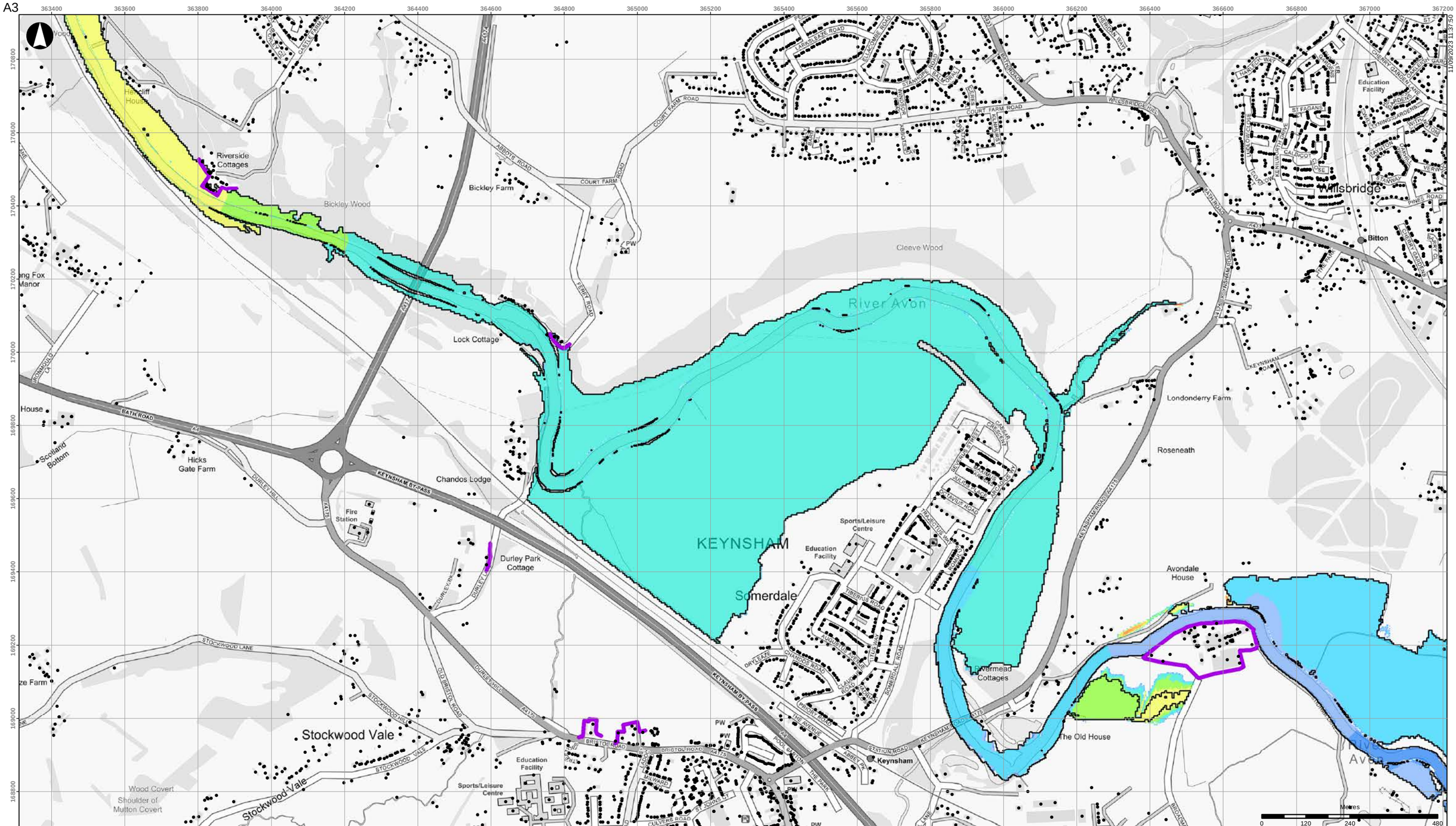
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-153**

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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Notes:

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2069 tidal 1:200yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

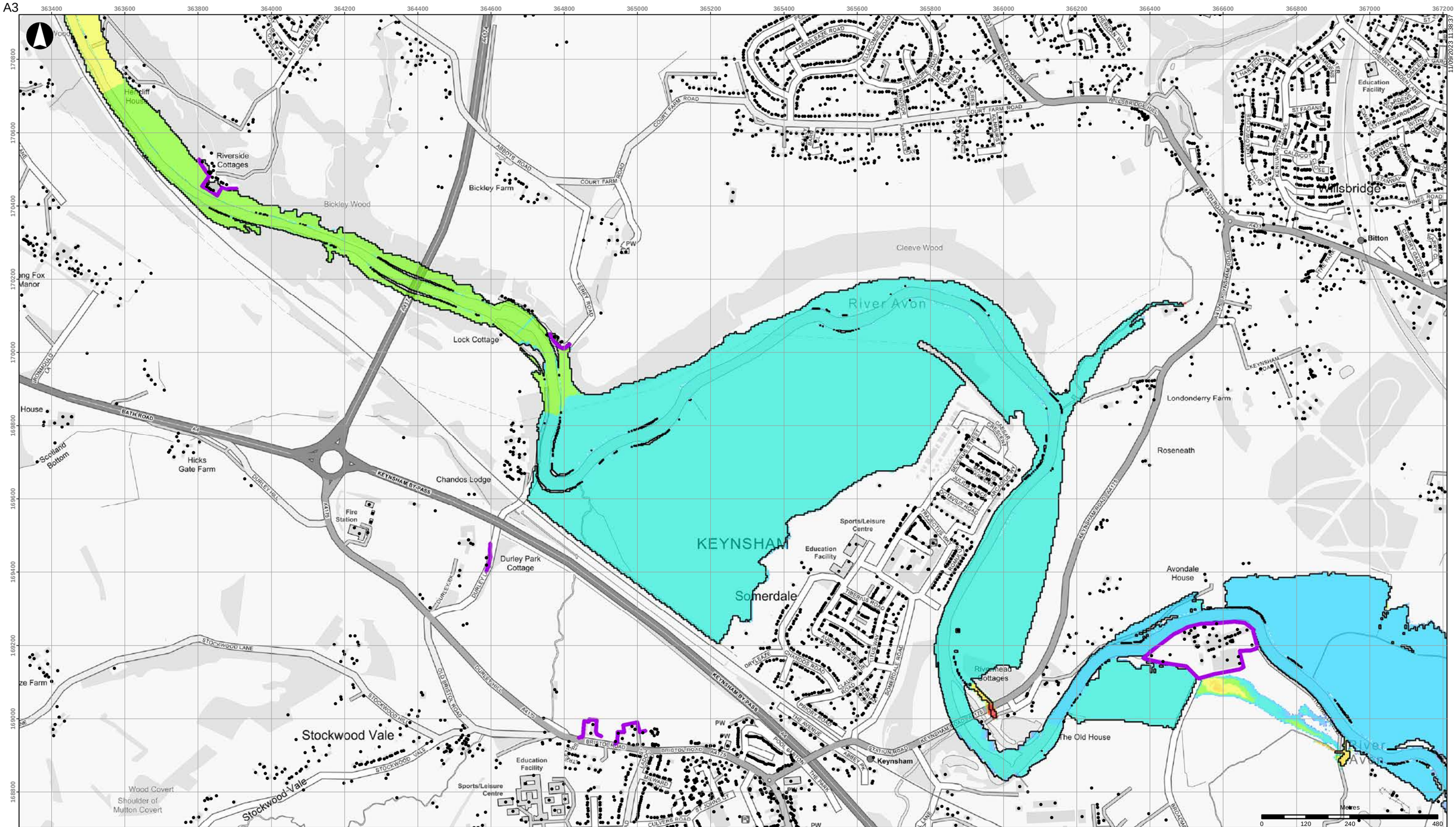
Name

**285982-ARP-XX-DR-MOD-154**

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2130 tidal 1:20yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

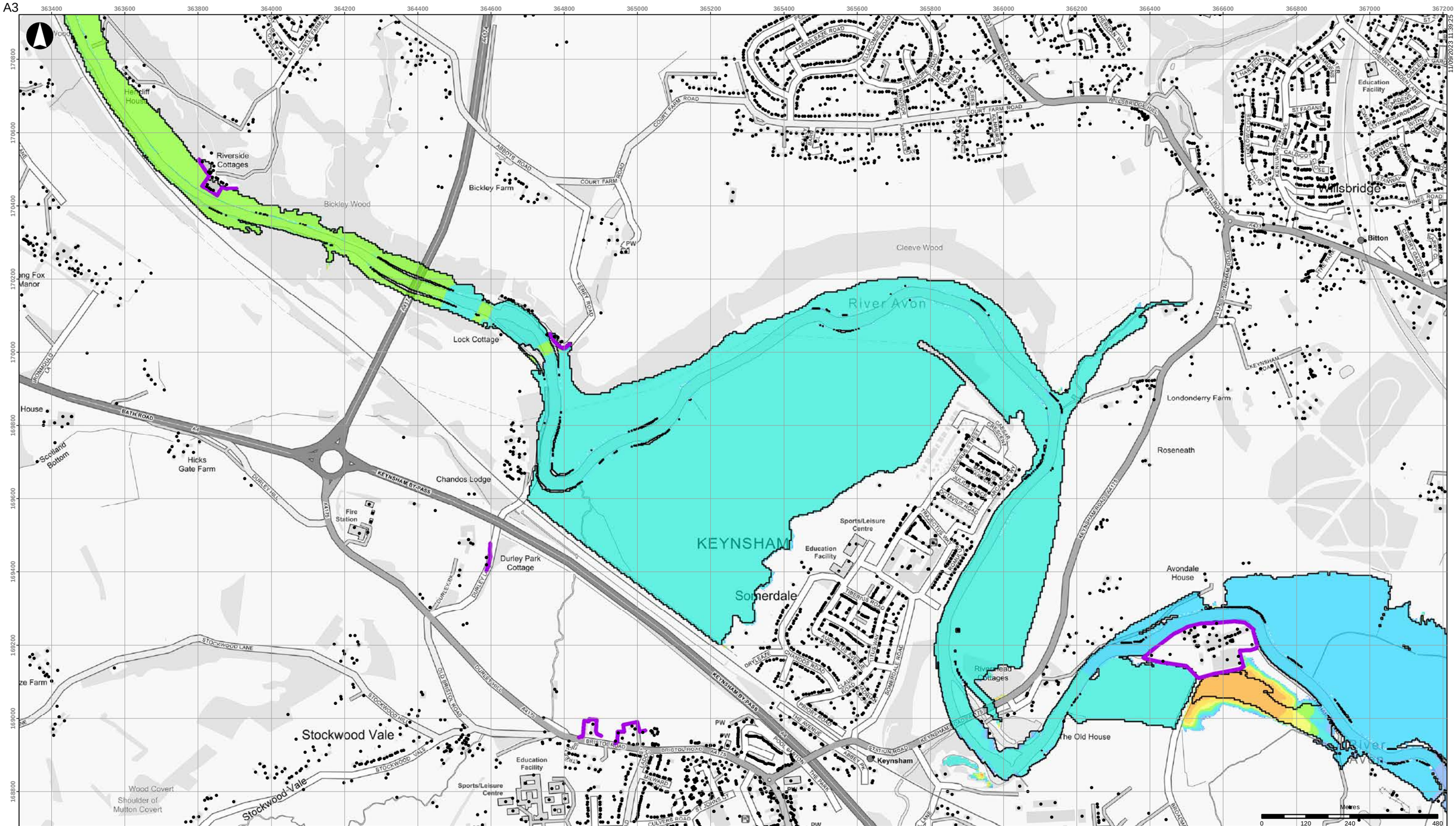
Name

**285982-ARP-XX-DR-MOD-155**

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
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**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2130 tidal 1:75yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

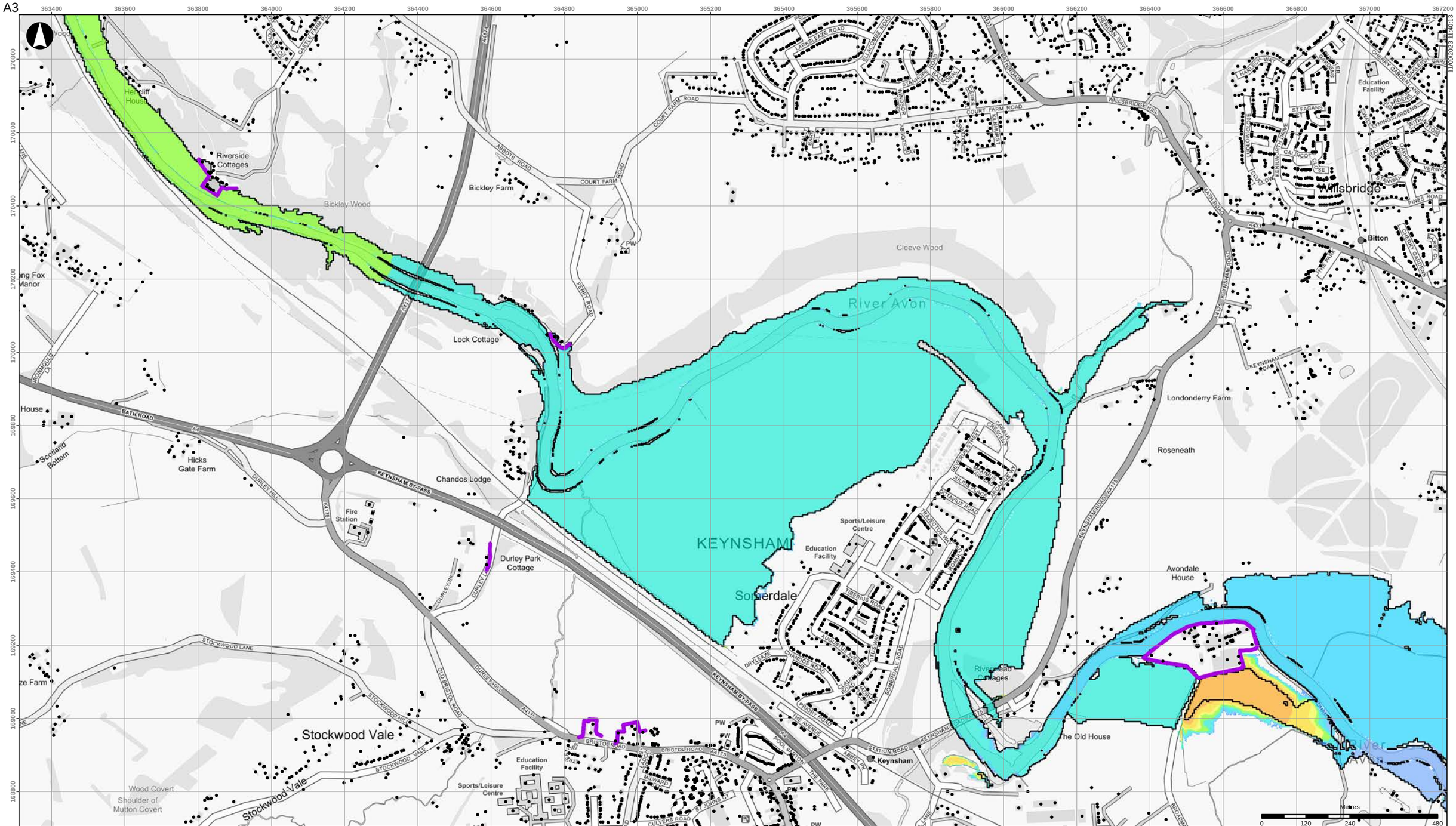
Name

**285982-ARP-XX-DR-MOD-156**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Project Title

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Drawing Title

**Phase 1 scheme impact**
**2130 tidal 1:100yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

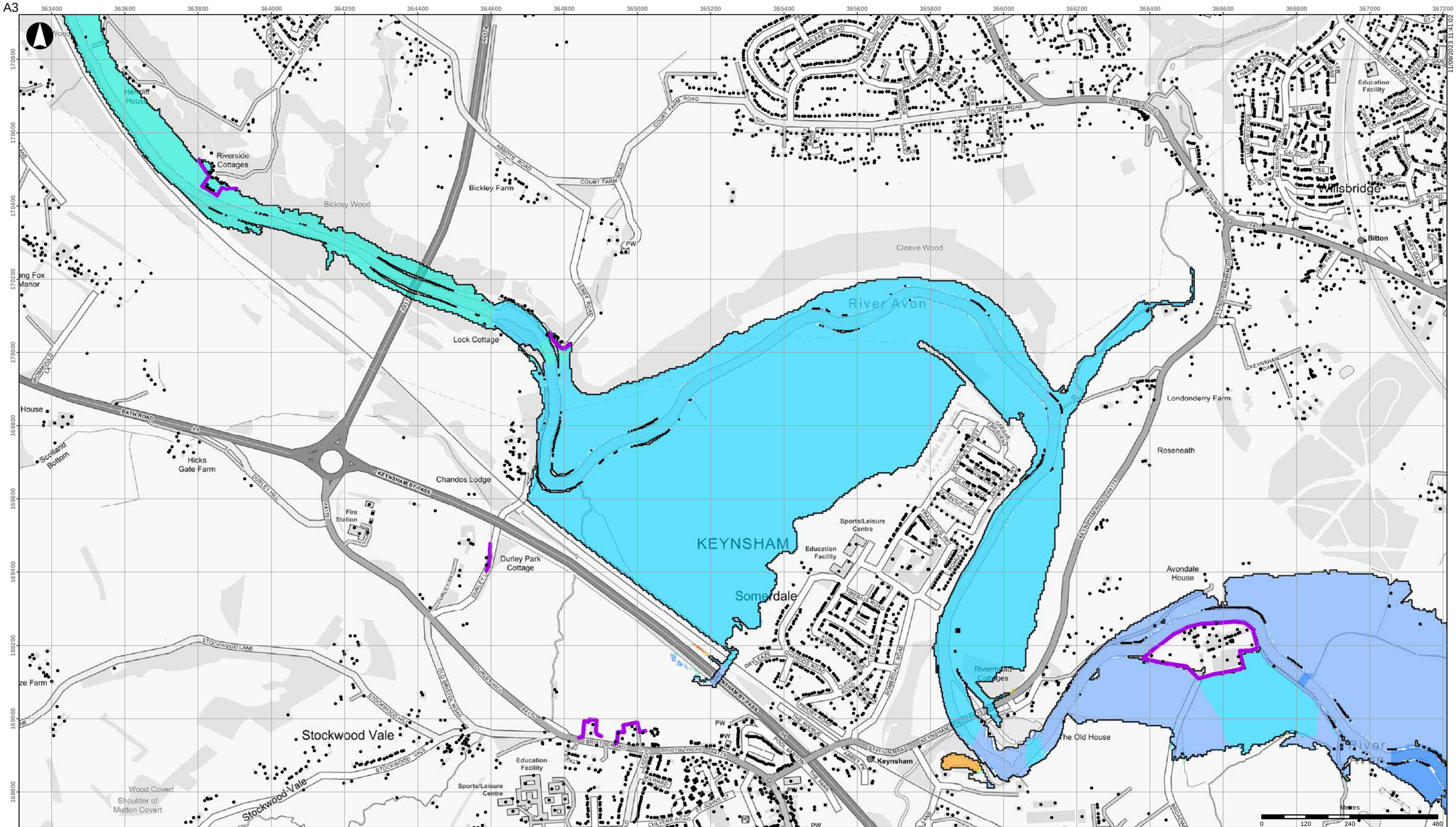
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**285982-ARP-XX-DR-MOD-157**

\\global\europe\Bristol\Jobs\285xxx\285982-00\4.30_Drgs\2_GIS\04_Map Documents\WAT_Water\2023-09-05_Phase1_SchemeImpact_Rev2.mxd

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2130 tidal 1:200yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

**285982-ARP-XX-DR-MOD-158**

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A3

11/09/2023 11:41:48

Avondale House
Rivermead Cottages
The Old House
River Avon
Gates House
Swineford
Avon Riverside
Avon Farm
Avon Valley Farm House or Avon Valley Farm
Avon Valley Farm
Avon Cottages
Rivermead Farm
Saltford
Police Station
Education Facility
Education Facility
Medical Care
PW
PW
PW
PW
KEYNSHAM BY-PASS A4
BATH ROAD
BATH ROAD
BATH ROAD
A431 BATH ROAD
A431 BATH ROAD
A4
A3
A3
B3116
BROADMEAD LANE
PIXASH LANE
ASHMEAD ROAD
WORLD'S END LANE
STOCKWOOD LANE
ROMAN ROAD
HIGH STREET
HIGH STREET
AVONLEAZE
AVON GARDENS
AVON GARDENS
AVON GARDENS

A3

11/09/2023 11:42:34

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2030 fluvial 1:75yr event**
**Swineford area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

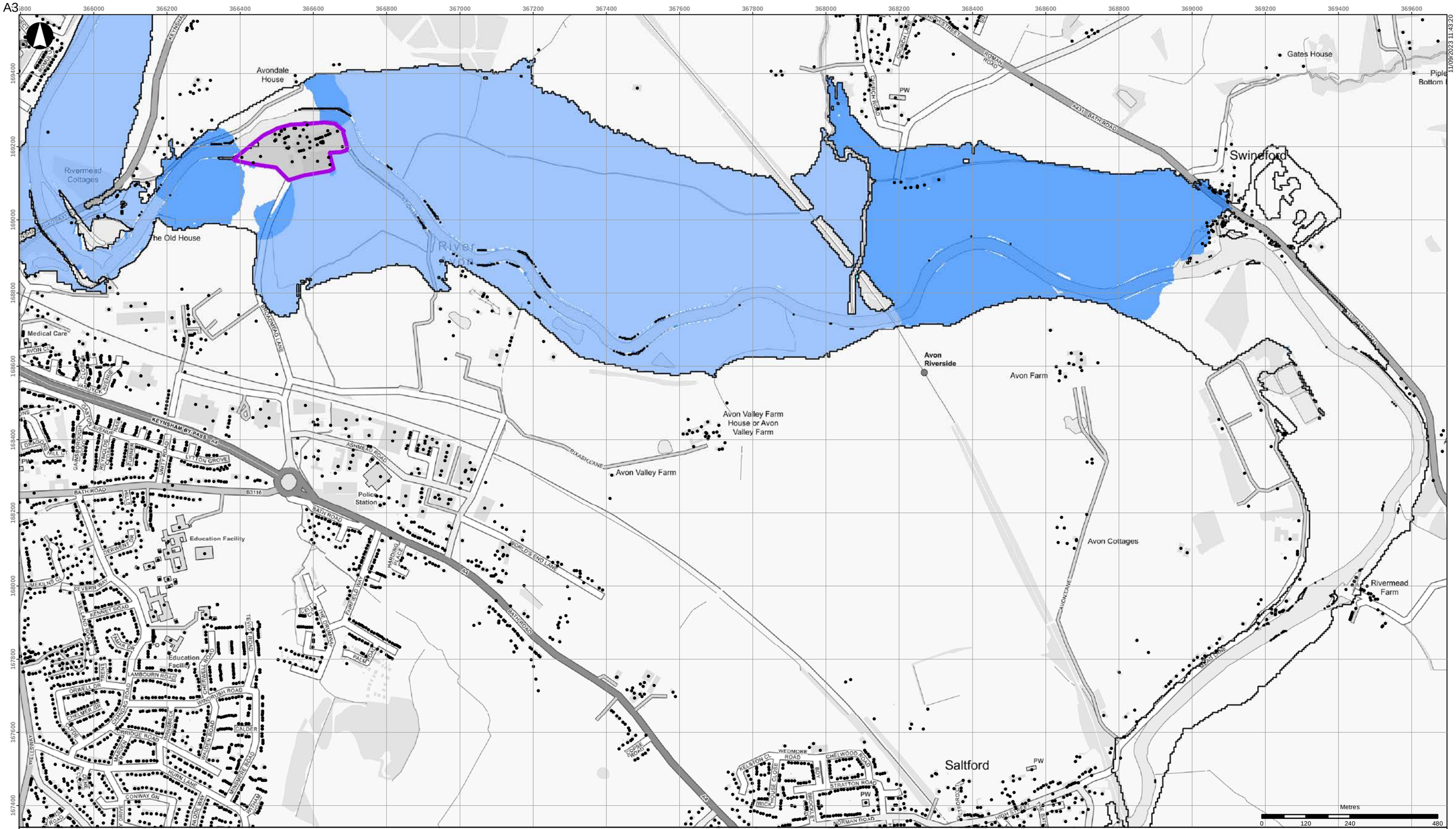
Name

**285982-ARP-XX-DR-MOD-160**

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A3




11/09/2023 11:43:20

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2030 fluvial 1:100yr event**
**Swineford area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

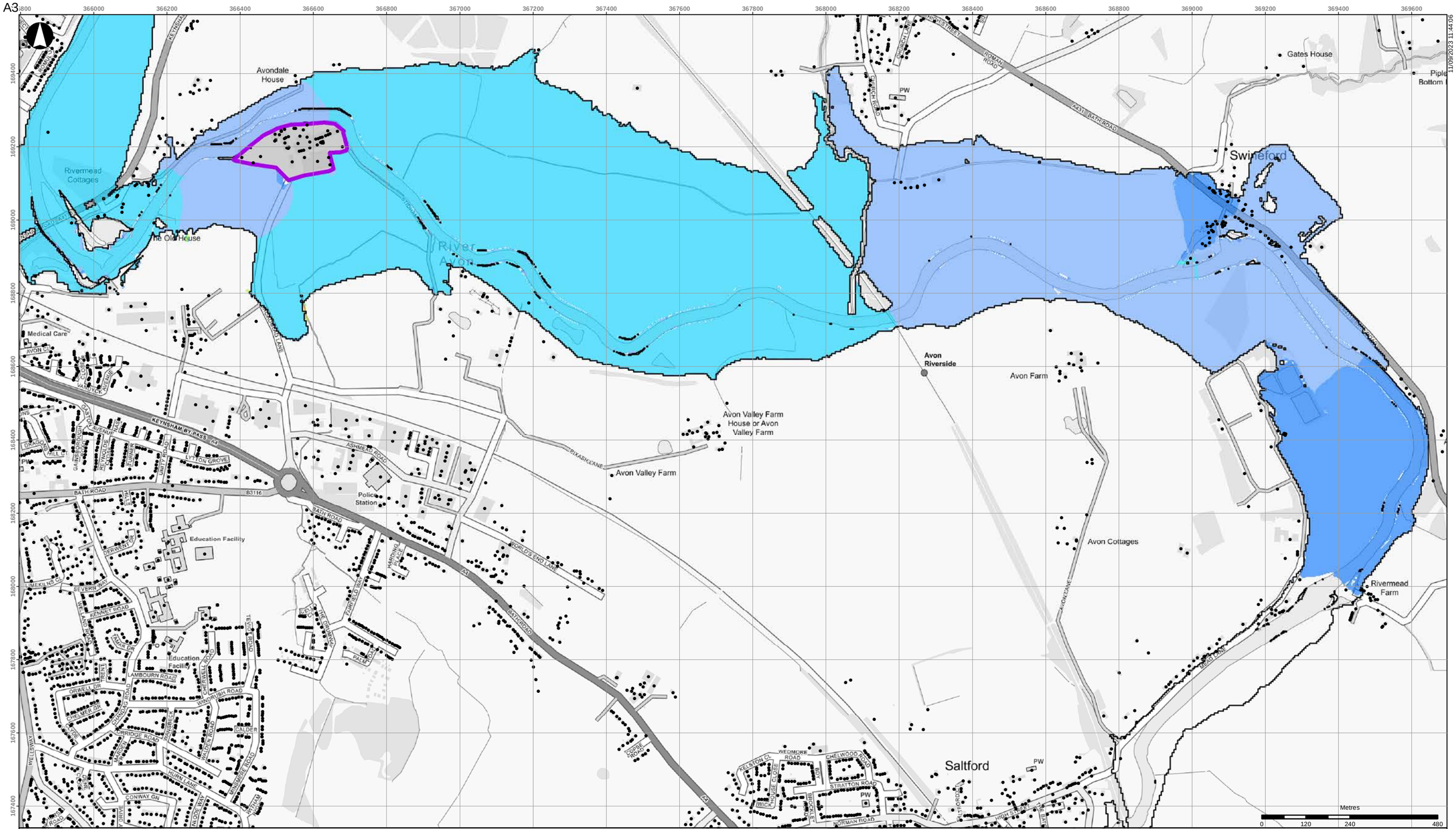
Name

**285982-ARP-XX-DR-MOD-161**

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11/09/2023 11:44:06

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
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**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2030 fluvial 1:200yr event**
**Swineford area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

**285982-ARP-XX-DR-MOD-162**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2069 fluvial 1:20yr event**
**Swineford area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

**285982-ARP-XX-DR-MOD-163**

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A3

11/09/2023 11:45:37

Avondale House
Rivermead Cottages
The Old House
River Avon
Gates House
Swineford
Avon Riverside
Avon Farm
Avon Valley Farm House or Avon Valley Farm
Avon Valley Farm
Avon Cottages
Rivermead Farm
Saltford
Police Station
Education Facility
Education Facility
Medical Care
PW
PW
PW
KEYNSHAM BY-PASS A4
BATH ROAD
B3116
A3
BROADMEAD LANE
PIXASH LANE
ASHMEAD ROAD
WORLD'S END LANE
BATH ROAD
ROMAN ROAD
A431 BATH ROAD
AVON LANE
WEDMORE ROAD
CHELWOOD ROAD
STRATTON ROAD
NORMAN ROAD
HIGH STREET
Metres
0 120 240 480

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 1 scheme impact**
**2069 fluvial 1:75yr event**
**Swineford area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

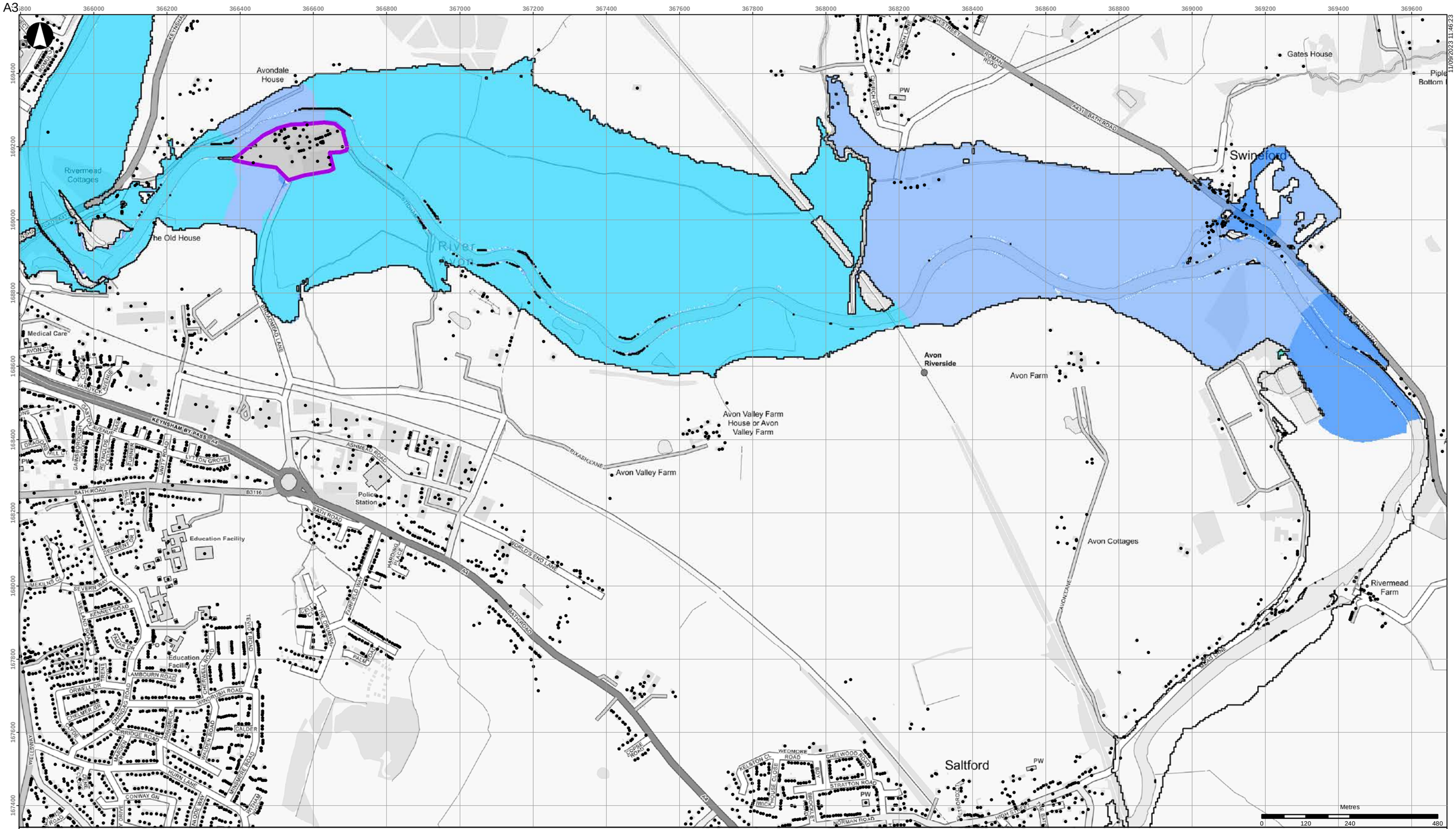
Rev
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Name
**285982-ARP-XX-DR-MOD-164**

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2069 fluvial 1:100yr event**
**Swineford area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

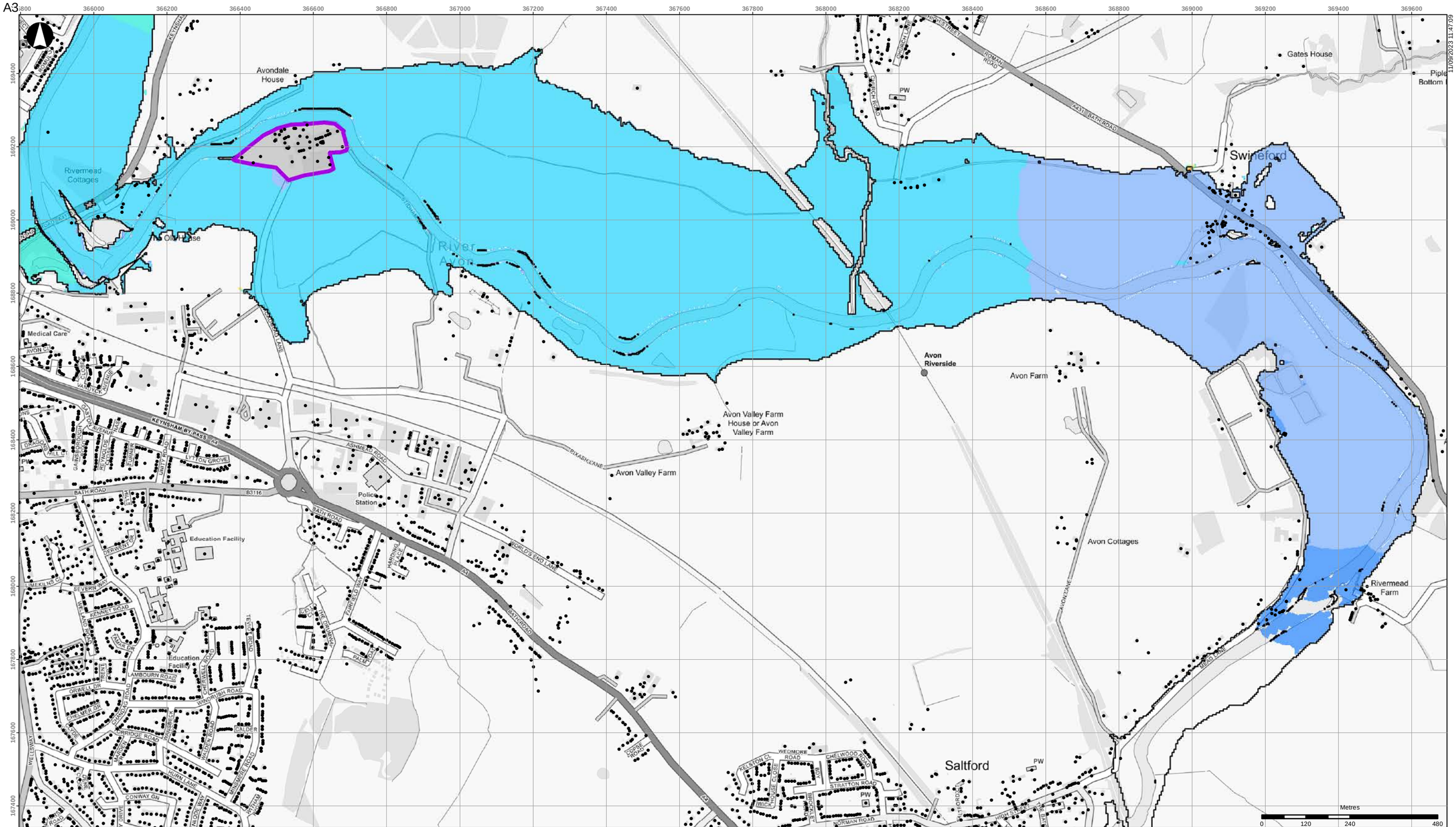
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**285982-ARP-XX-DR-MOD-165**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2069 fluvial 1:200yr event**
**Swineford area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

**285982-ARP-XX-DR-MOD-166**

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A3

11/09/2023 11:47:55

Avondale House
Rivermead Cottages
The Old House
River Avon
Gates House
Swineford
Avon Riverside
Avon Farm
Avon Valley Farm House or Avon Valley Farm
Avon Valley Farm
Avon Cottages
Rivermead Farm
Saltford
Police Station
Education Facility
Medical Care
PW
KEYNSHAM BY-PASS A4
BATH ROAD
B3116
A431 BATH ROAD
A3
BROADMEAD LANE
RIXASH LANE
ASHMEAD ROAD
WORLD'S END LANE
ROMAN ROAD
AVON LANE
WEDMORE ROAD
CHELWOOD ROAD
STRATTON ROAD
NORMAN ROAD
HIGH STREET

Metres
0 120 240 480

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 1 scheme impact**
**2130 fluvial 1:20yr event**
**Swineford area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

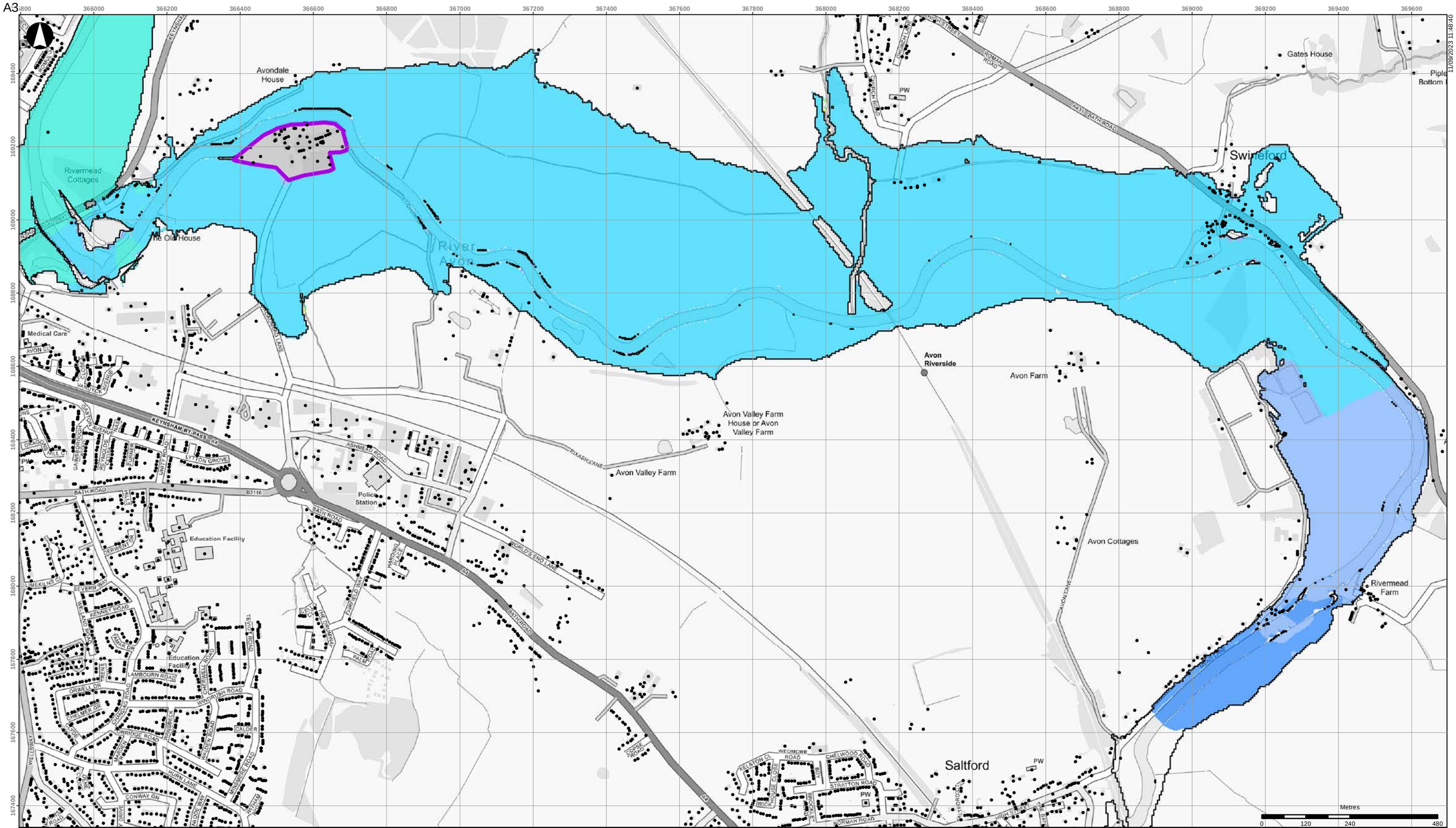
Rev
**D1**

Name
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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2130 fluvial 1:75yr event**
**Swineford area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

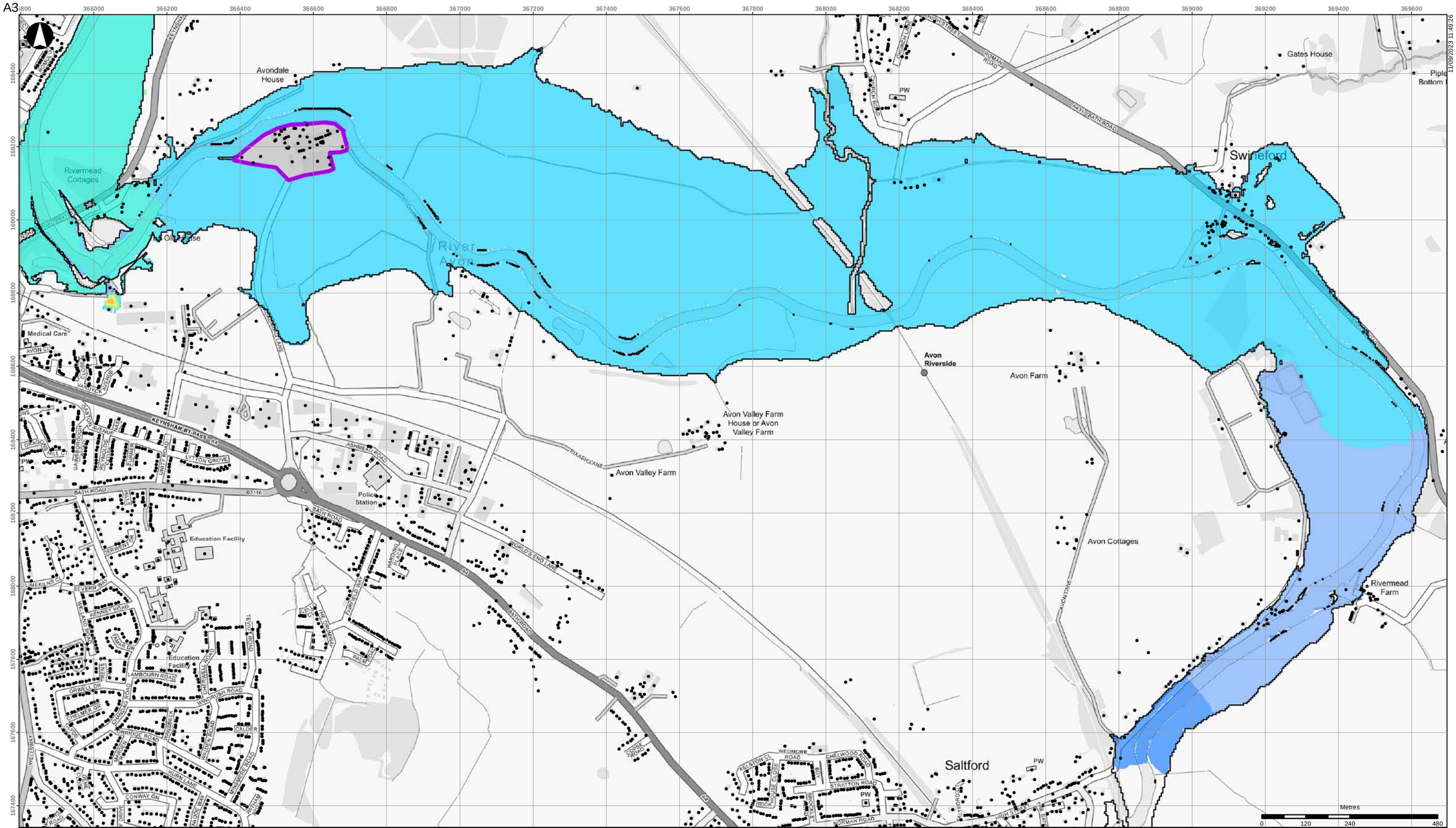
Name

**285982-ARP-XX-DR-MOD-168**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2130 fluvial 1:100yr event**
**Swineford area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

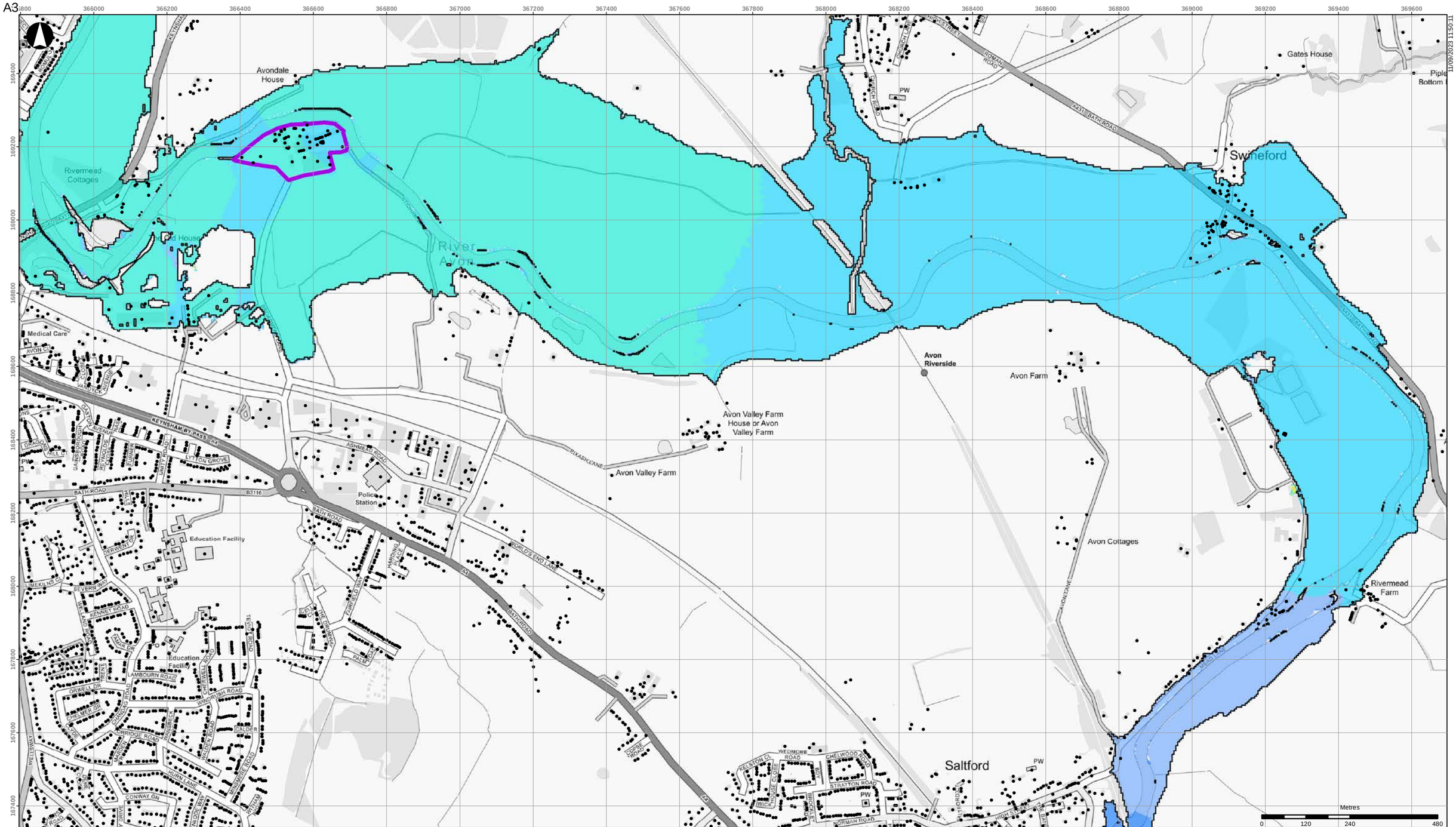
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11/09/2023 11:49:26

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2130 fluvial 1:200yr event**
**Swineford area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

**285982-ARP-XX-DR-MOD-170**

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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Notes:

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| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2030 tidal 1:20yr event**
**Swineford area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

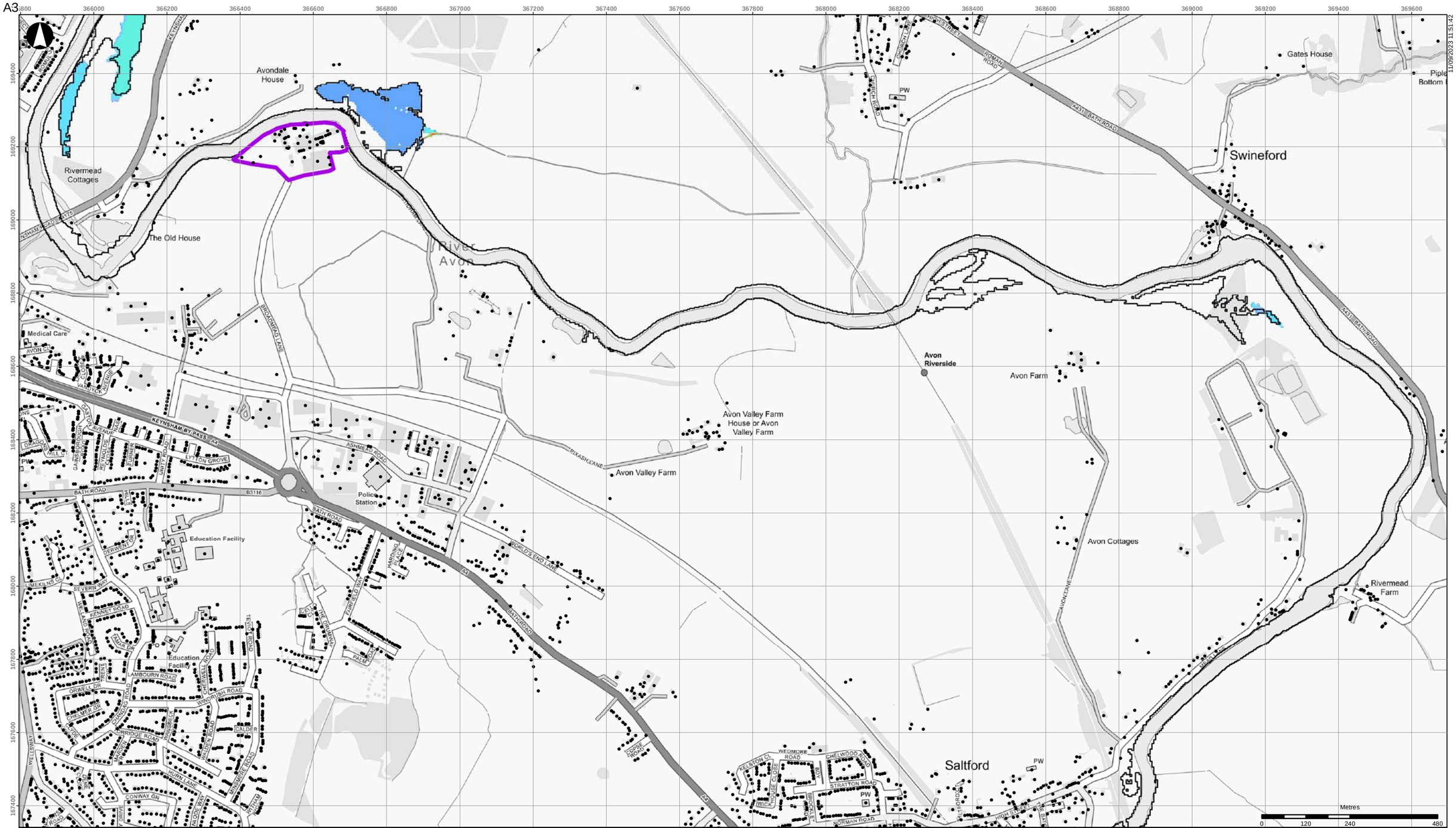
Name

**285982-ARP-XX-DR-MOD-171**

\\global\europe\Bristol\Jobs\285xxx\285982-00\4.30_Drgs\2_GIS\04_Map Documents\WAT_Water\2023-09-05_Phase1_SchemeImpact_Rev2.mxd

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2030 tidal 1:75yr event**
**Swineford area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

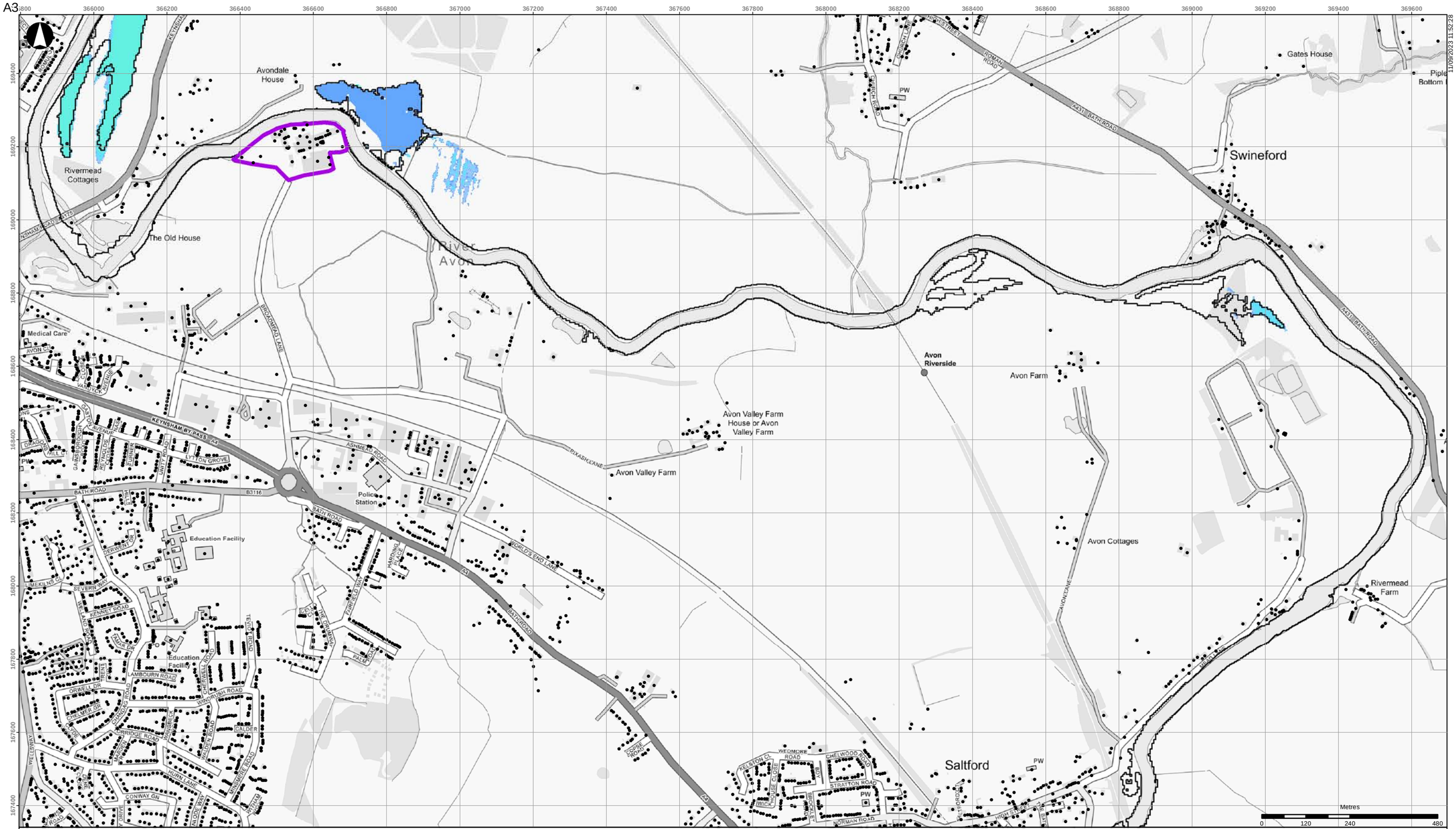
Name

**285982-ARP-XX-DR-MOD-172**

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Client

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2030 tidal 1:100yr event**
**Swineford area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

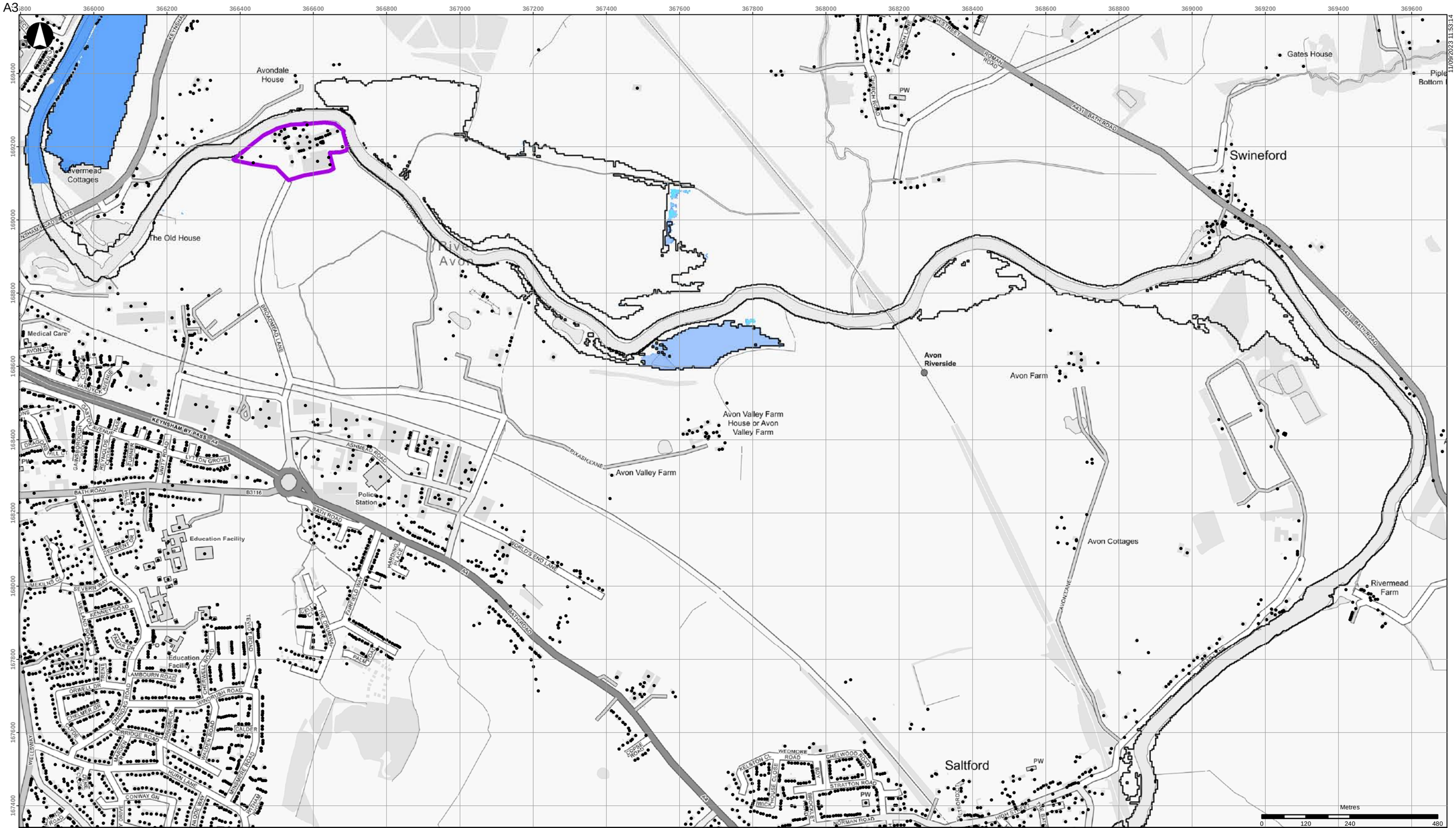
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**285982-ARP-XX-DR-MOD-173**

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Client

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2030 tidal 1:200yr event**
**Swineford area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

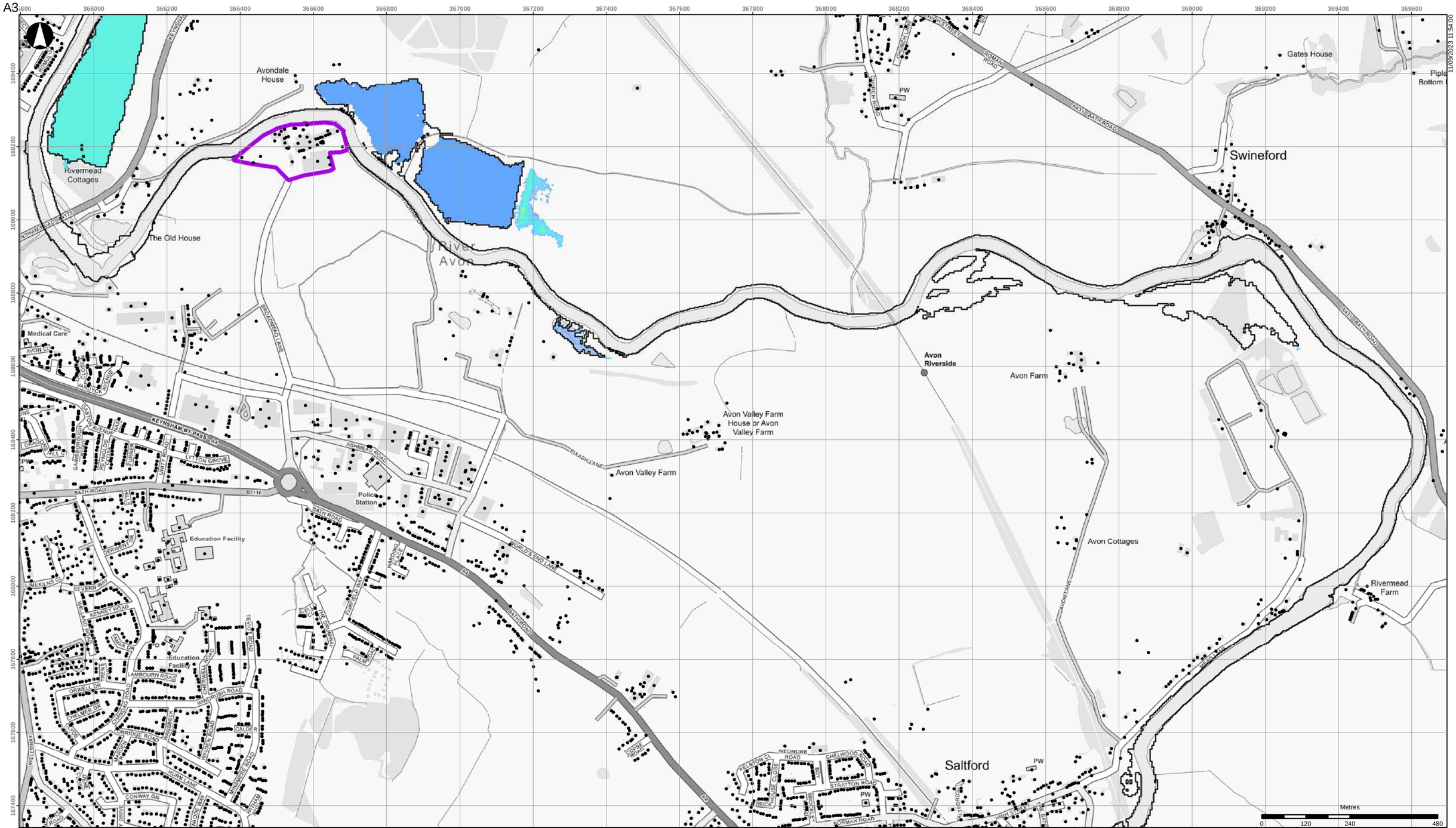
Name

**285982-ARP-XX-DR-MOD-174**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2069 tidal 1:20yr event**
**Swineford area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

**285982-ARP-XX-DR-MOD-175**

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A3

11/09/2023 11:54:46

Avondale House
Rivermead Cottages
The Old House
Gates House
Swineford
Avon Riverside
Avon Farm
Avon Valley Farm House or Avon Valley Farm
Avon Valley Farm
Avon Cottages
Rivermead Farm
Saltford
Police Station
Education Facility
Education Facility
Medical Care
PW
Metres
0 120 240 480

## Legend

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Client
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Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 1 scheme impact**
**2069 tidal 1:75yr event**
**Swineford area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

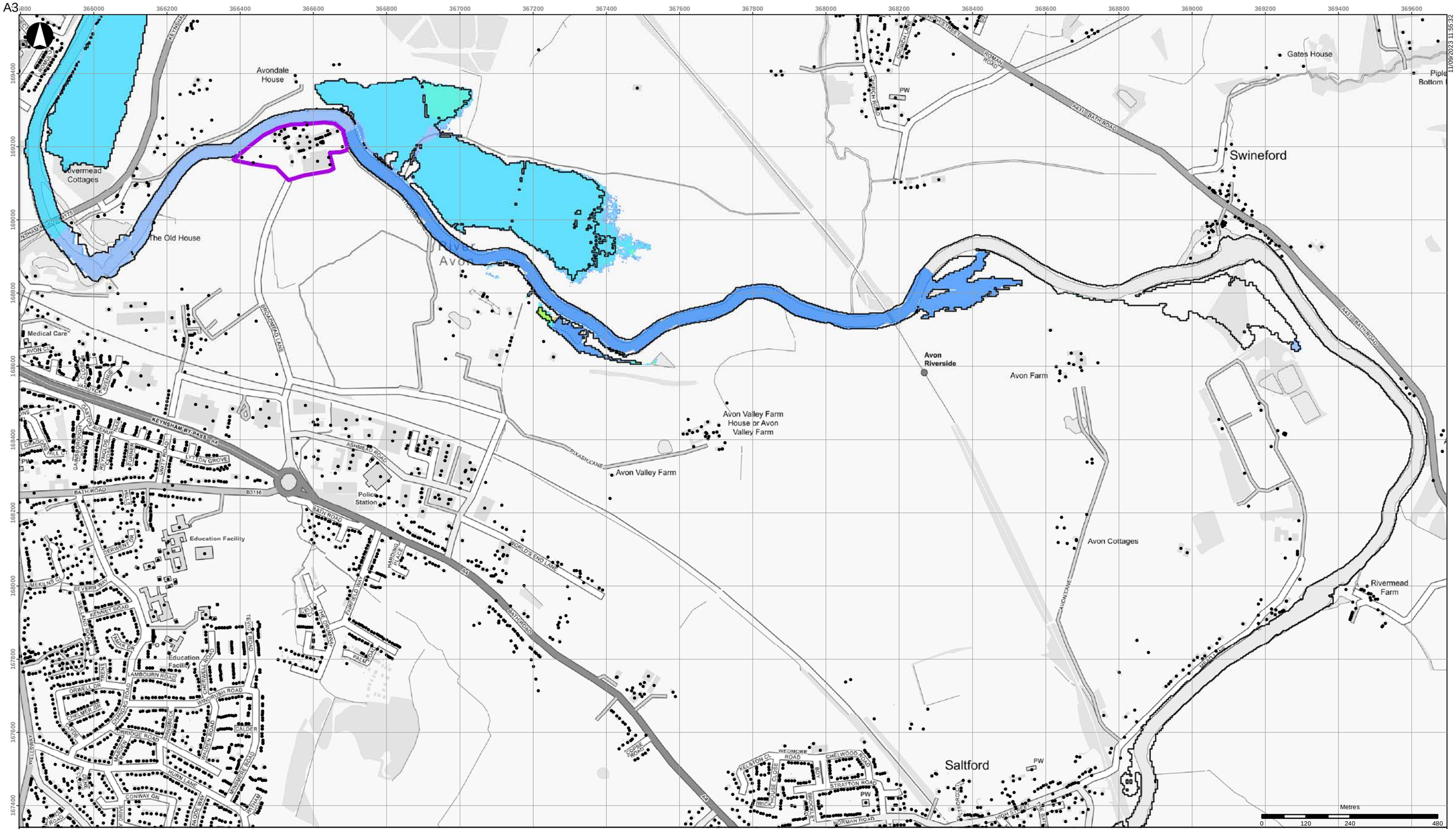
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-176**

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 1 scheme impact**
**2069 tidal 1:100yr event**
**Swineford area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

**285982-ARP-XX-DR-MOD-177**

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A3

11/09/2023 11:56:18

Avondale House
Gates House
Swineford
Vermead Cottages
The Old House
Avon Riverside
Avon Farm
Avon Valley Farm House or Avon Valley Farm
Avon Valley Farm
Police Station
Education Facility
Education Facility
Avon Cottages
Rivermead Farm
Saltford
Medical Care
PW
PW
PW
PW
A431 BATH ROAD
KEYNSHAM BY-PASS A4
BATH ROAD
B3116
BROADMEAD LANE
PIXASH LANE
ASHMEAD ROAD
WORLD'S END LANE
A3
ROMAN ROAD
HIGH STREET
CHELWOOD ROAD
STRATTON ROAD
NORMAN ROAD
WEDMORE ROAD
LYNTON GROVE
AMBOURN ROAD
HURLAINE
CONWAY GN
AVONLEAZE
Metres
0 120 240 480

## Scheme impact (m)

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 1 scheme impact**
**2069 tidal 1:200yr event**
**Swineford area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-178**

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A3

11/09/2023 11:57:04

Avondale House
Riverhead Cottages
The Old House
Gates House
Swineford
Avon Riverside
Avon Farm
Avon Valley Farm House or Avon Valley Farm
Avon Valley Farm
Police Station
Education Facility
Education Facility
Medical Care
Avon Cottages
Rivermead Farm
Saltford
PW
PW
PW
KEYNSHAM BY-PASS A4
BATH ROAD
B3116
A431 BATH ROAD
A3
BROADMEAD LANE
RIXASH LANE
ASHMEAD ROAD
WORLD'S END LANE
ROMAN ROAD
AVON LANE
Metres
0 120 240 480

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 1 scheme impact**
**2130 tidal 1:20yr event**
**Swineford area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-179**

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A3

11/09/2023 11:57:50

Avondale House
Riverhead Cottages
The Old House
Gates House
Swineford
Avon Riverside
Avon Farm
Avon Valley Farm House or Avon Valley Farm
Avon Valley Farm
Police Station
Education Facility
Education Facility
Medical Care
Avon Cottages
Rivermead Farm
Saltford
PW
PW
PW
River Avon
KEYNSHAM BY-PASS A4
BATH ROAD
B3116
BROADMEAD LANE
PIXASH LANE
ASHMEAD ROAD
WORLD'S END LANE
A431 BATH ROAD
A4
A3
AVONLEAZE
WEOMORE ROAD
CHELWOOD ROAD
STRATTON ROAD
NORMAN ROAD
HIGH STREET
Metres
0 120 240 480

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 1 scheme impact**
**2130 tidal 1:75yr event**
**Swineford area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-180**

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A3

11/09/2023 11:58:36

Avondale House
Riverhead Lodges
The Old House
Gates House
Swineford
Avon Riverside
Avon Farm
Avon Valley Farm House or Avon Valley Farm
Avon Valley Farm
Police Station
Education Facility
Education Facility
Avon Cottages
Rivermead Farm
Saltford
Medical Care
KEYNSHAM BY-PASS A4
BATH ROAD
B3116
A431 BATH ROAD
A3
BROADMEAD LANE
PIXASH LANE
ASHMEAD ROAD
WORLD'S END LANE
ROMAN ROAD
AVON LANE
Metres
0 120 240 480

## Scheme impact (m)

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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Notes:

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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 1 scheme impact**
**2130 tidal 1:100yr event**
**Swineford area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-181**

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11/09/2023 11:59:21

Avondale House
Rivermead Cottages
The Old House
River Avon
Gates House
Swineford
Avon Riverside
Avon Farm
Avon Valley Farm House or Avon Valley Farm
Avon Valley Farm
Avon Cottages
Rivermead Farm
Saltford
Police Station
Education Facility
Education Facility
Medical Care
KEYNSHAM BYPASS A4
BATH ROAD B3116
BATH ROAD
A431 BATH ROAD
A3
BROADMEAD LANE
PIXASH LANE
ASHMEAD ROAD
WORLD'S END LANE
ROMAN ROAD
HIGH STREET
AVON LANE
LYTTON GROVE
KENNET ROAD
AMBOURN ROAD
WINDRUSH ROAD
CHELWOOD ROAD
STRATTON ROAD
NORMAN ROAD
HURLAINE
CONWAY GN
CALDER
PW

Metres
0 120 240 480

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-11 | DvdL | DvdL | PS |

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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 1 scheme impact**
**2130 tidal 1:200yr event**
**Swineford area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

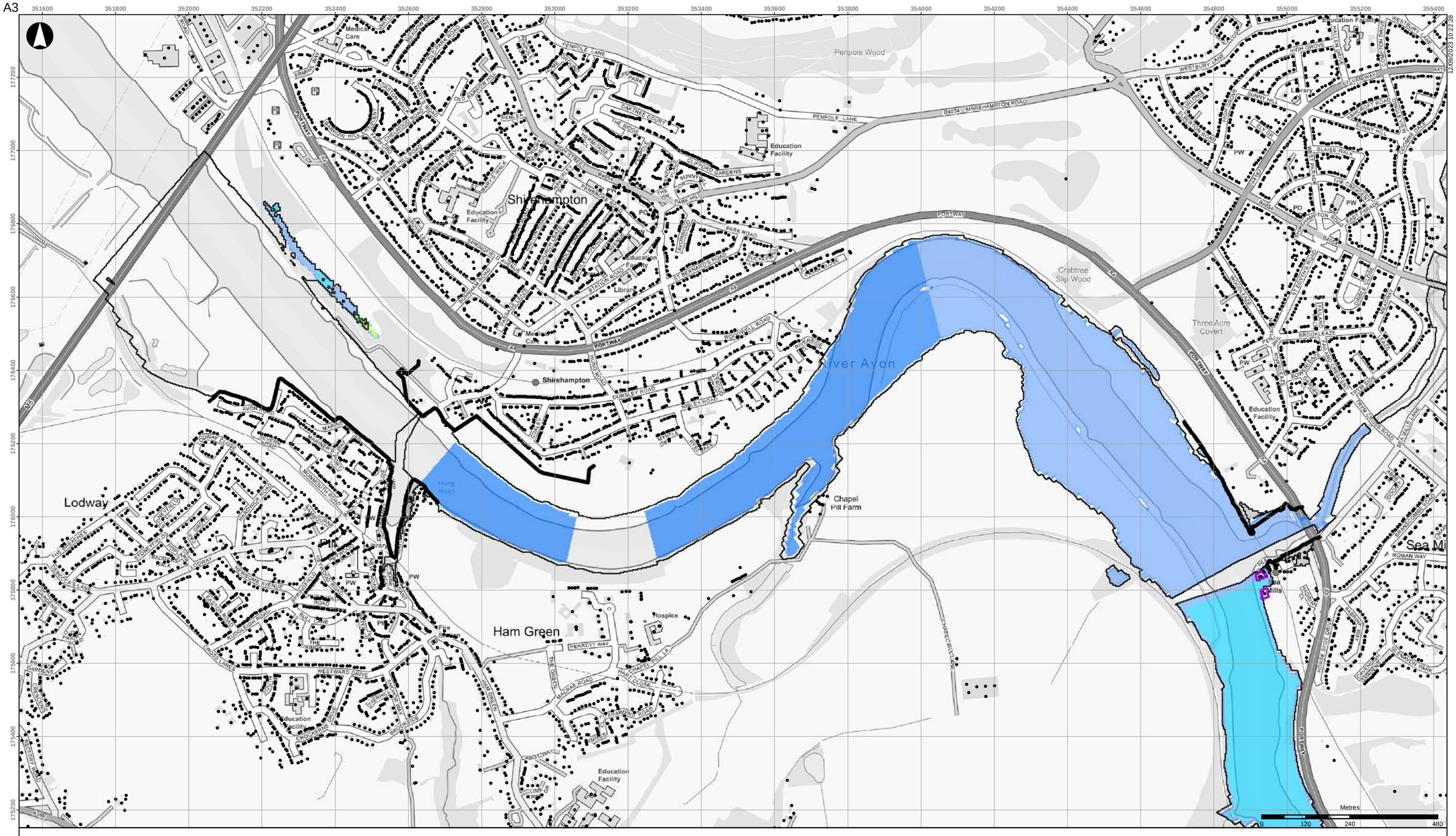
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-182**

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| D1 | 2023-09-12 | DvdL | DvdL | PS |

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Client

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2070 fluvial 1:20yr event**
**Downstream areas**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

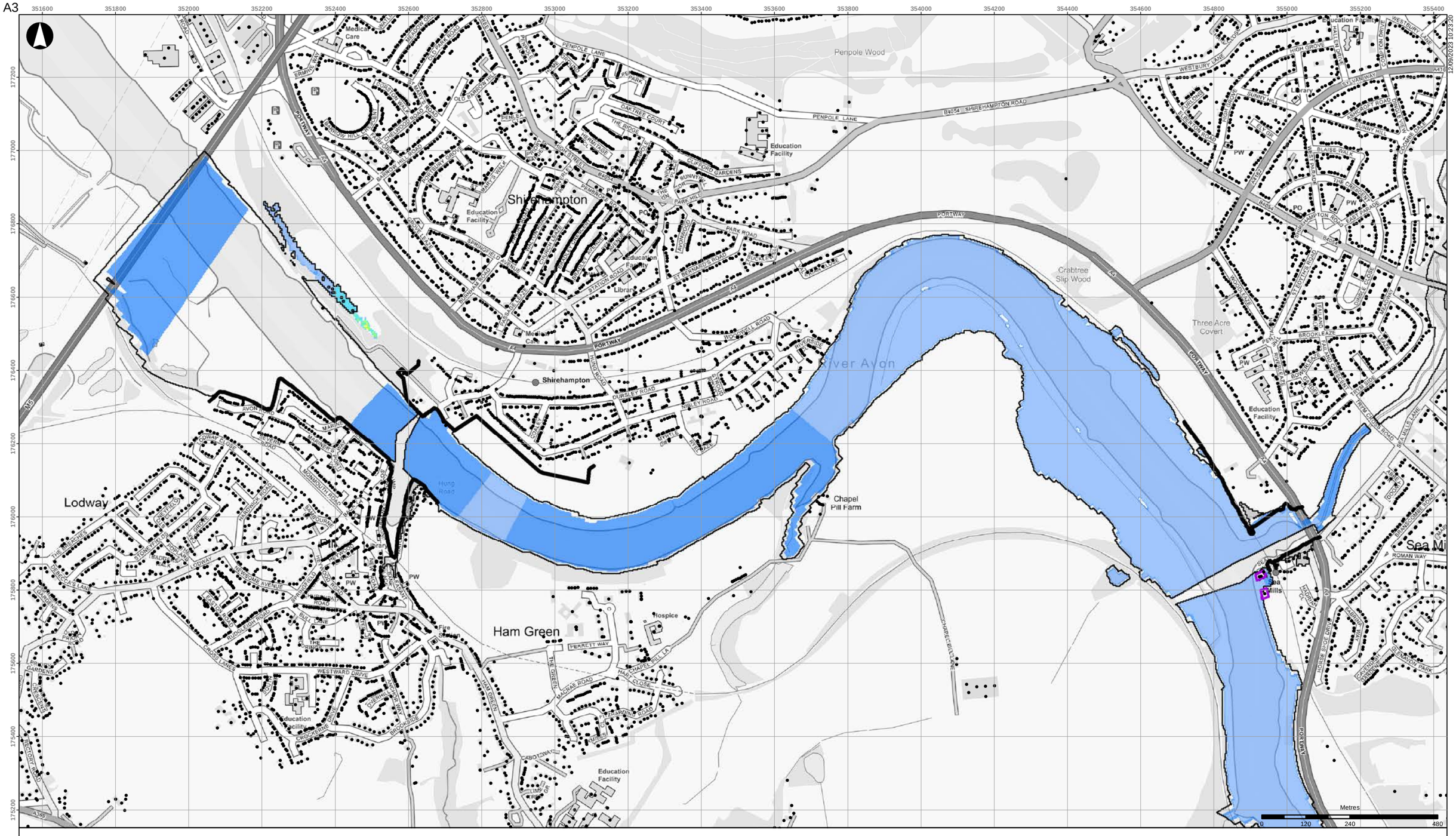
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12/09/2023 10:22:28

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

ARUP

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www.arup.com

Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2070 fluvial 1:75yr event**
**Downstream areas**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

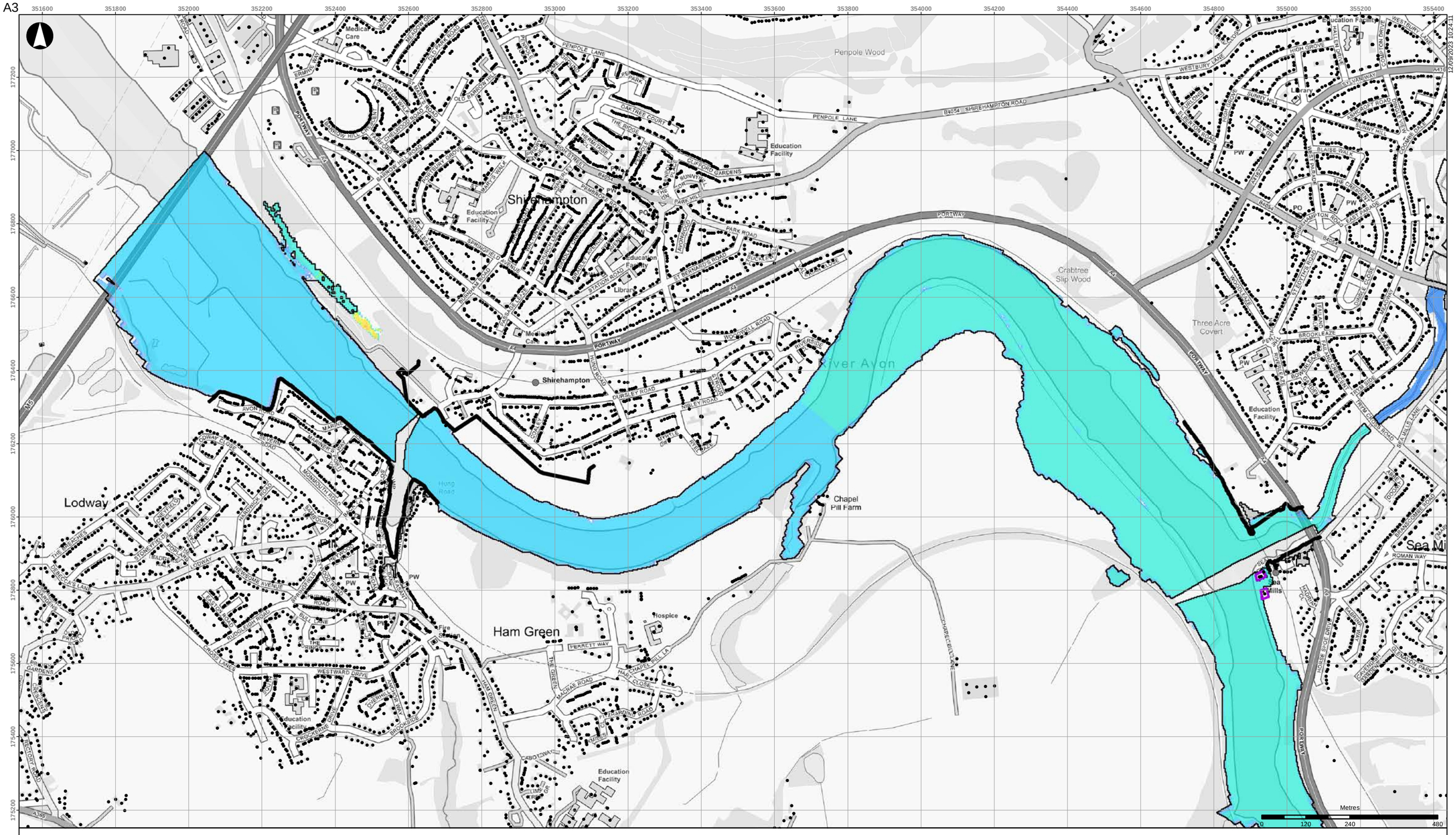
Name

**285982-ARP-XX-DR-MOD-184**

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

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Project Title

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Drawing Title

**Phase 2 scheme impact**
**2070 fluvial 1:100yr event**
**Downstream areas**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

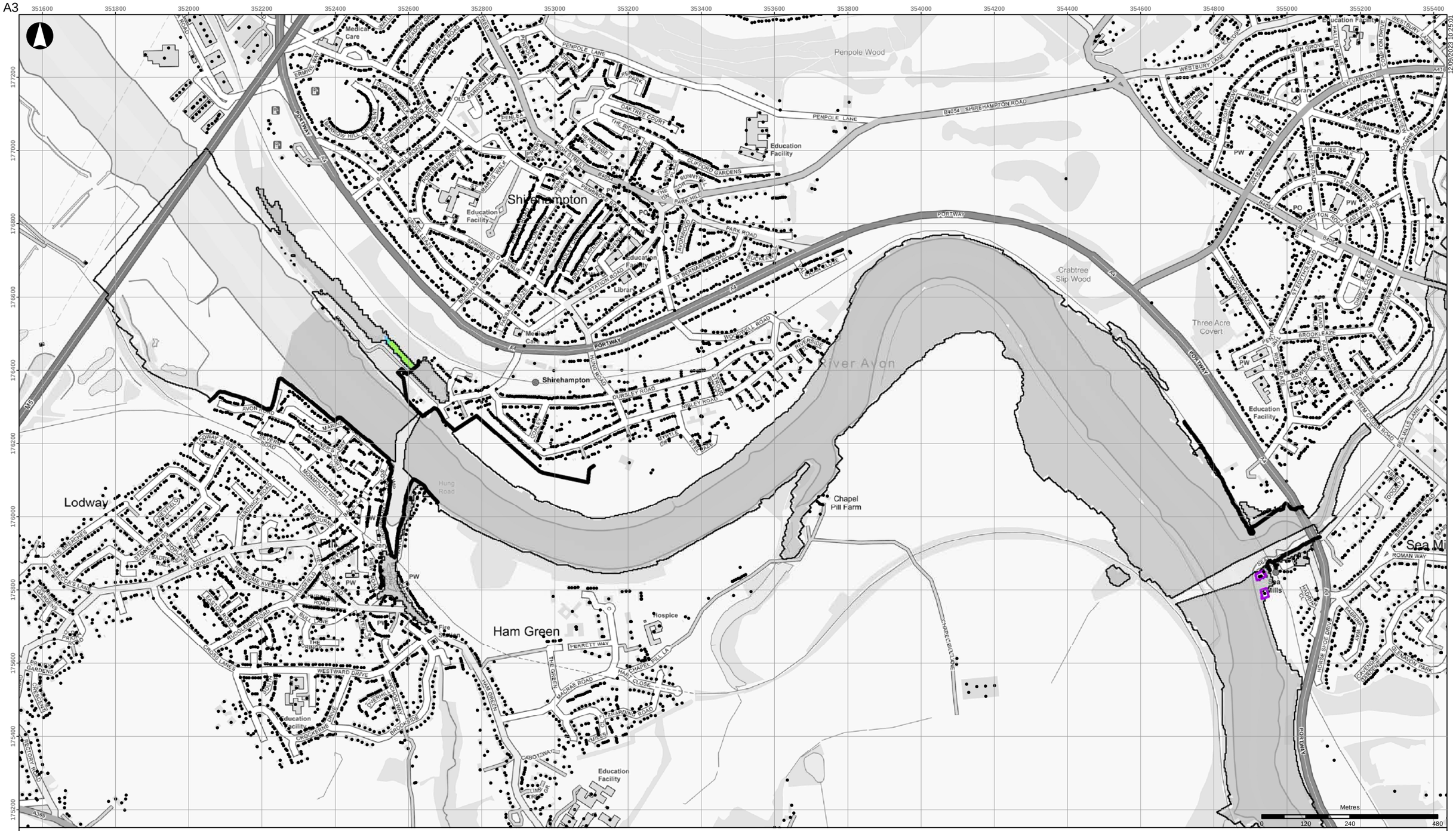
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12/09/2023 10:24:31

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
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Drawing Title

**Phase 2 scheme impact**
**2070 fluvial 1:200yr event**
**Downstream areas**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

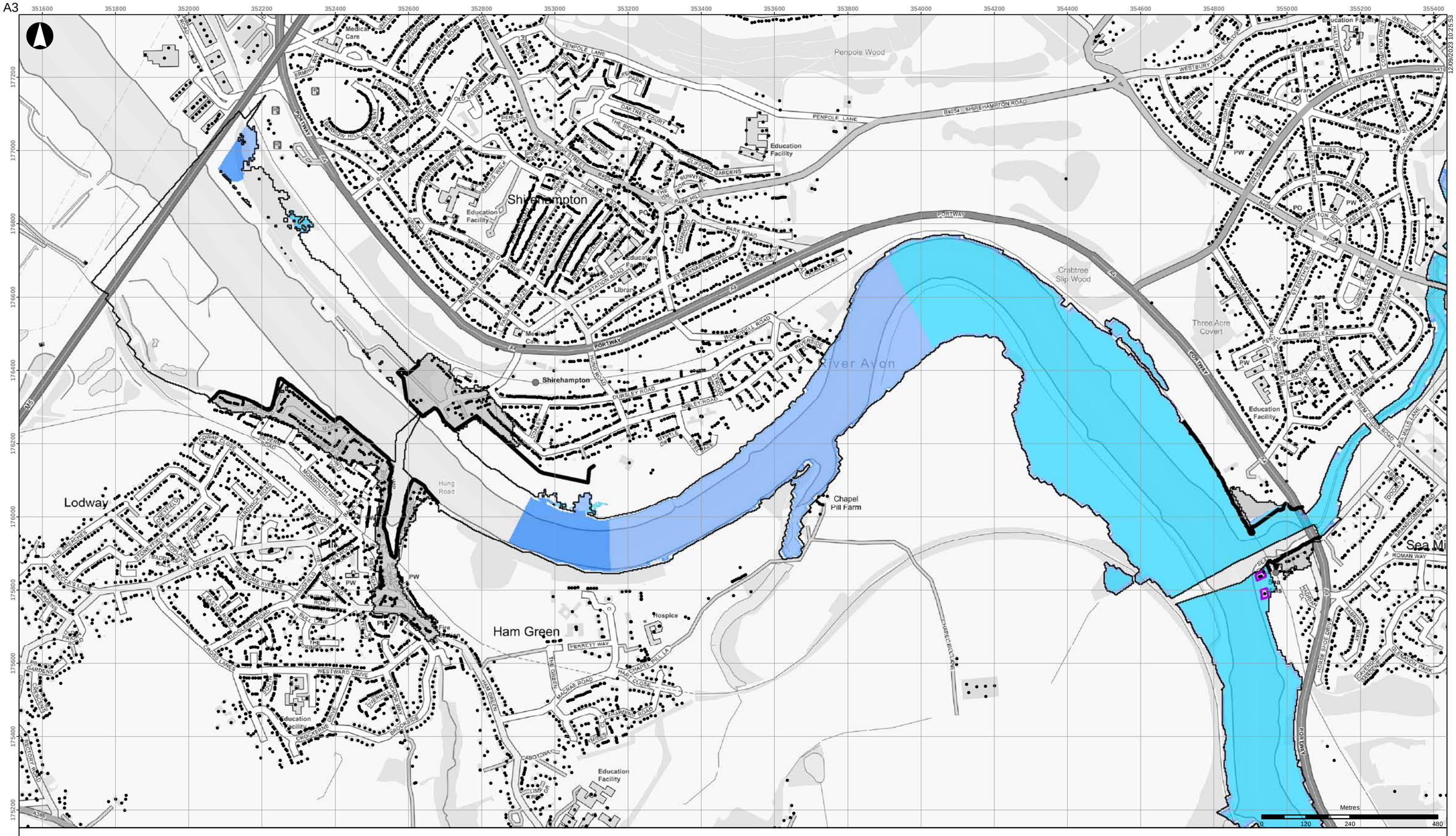
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12/09/2023 10:25:01

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

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Project Title

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Drawing Title

**Phase 2 scheme impact**
**2130 fluvial 1:20yr event**
**Downstream areas**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

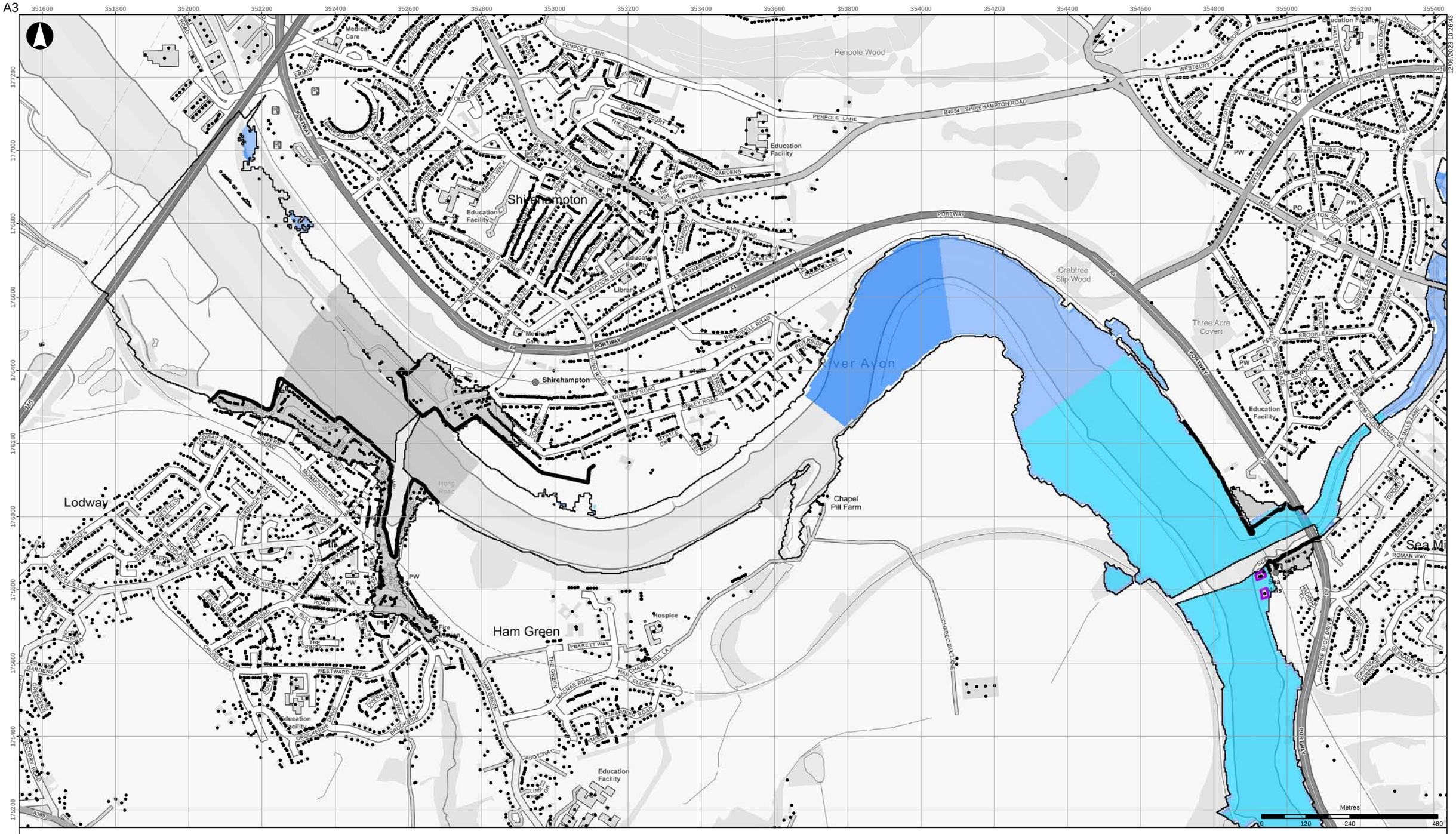
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12/09/2023 10:25:53

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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| D1 | 2023-09-12 | DvdL | DvdL | PS |

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Drawing Title

**Phase 2 scheme impact**
**2130 fluvial 1:75yr event**
**Downstream areas**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

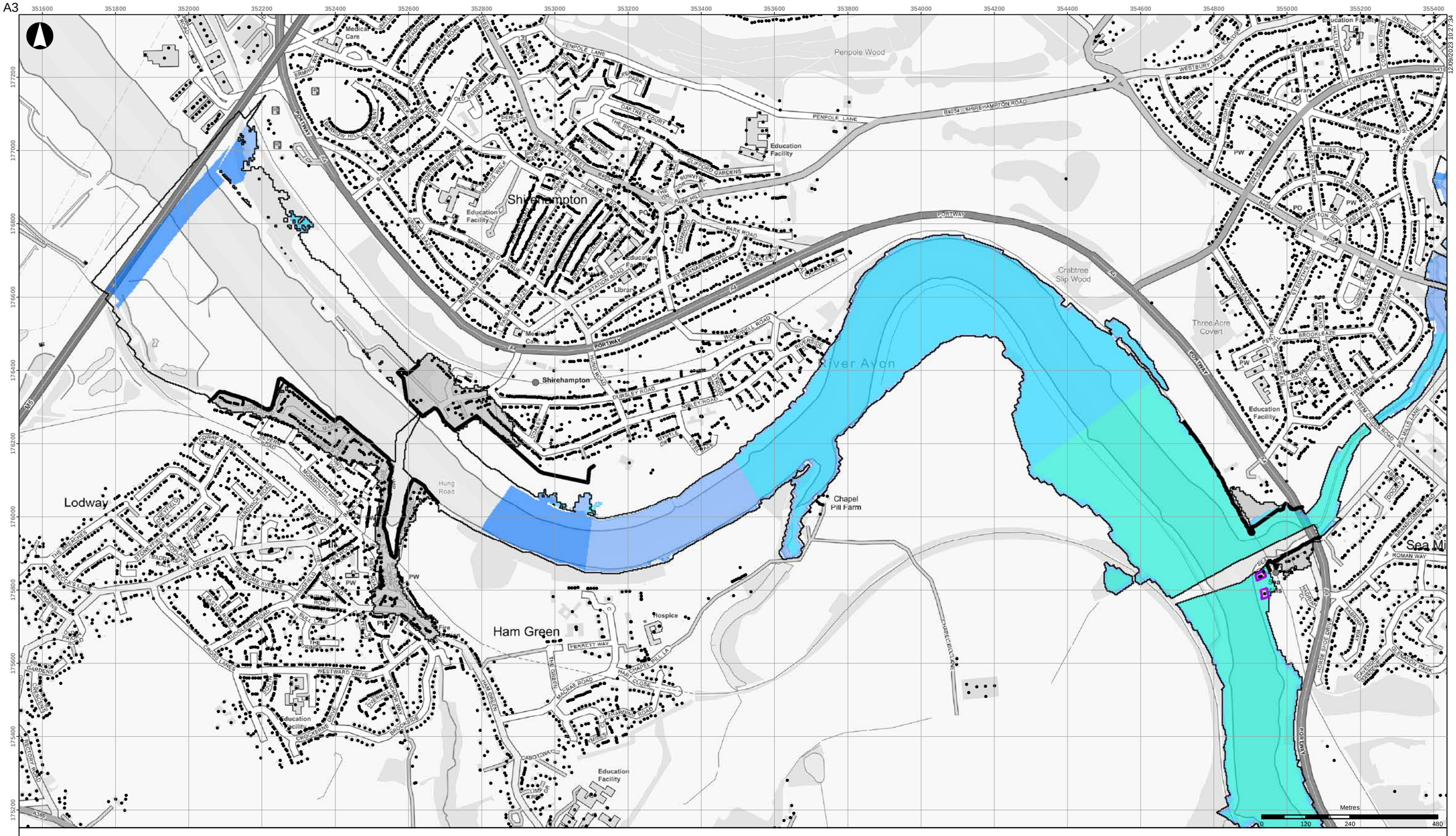
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12/09/2023 10:26:43

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Drawing Title

**Phase 2 scheme impact**
**2130 fluvial 1:100yr event**
**Downstream areas**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

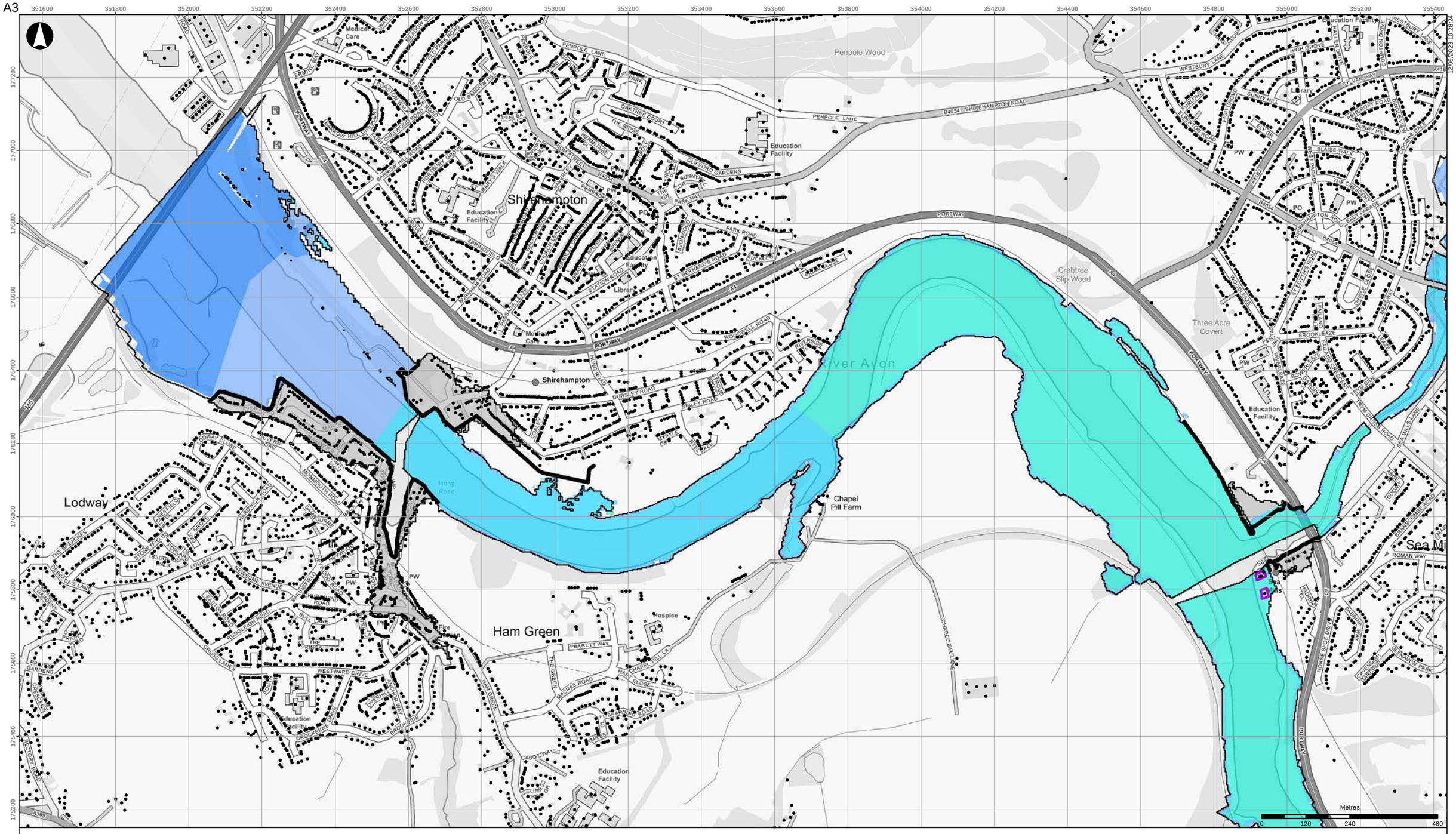
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12/09/2023 10:27:34

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

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Project Title

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Drawing Title

**Phase 2 scheme impact**
**2130 fluvial 1:200yr event**
**Downstream areas**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

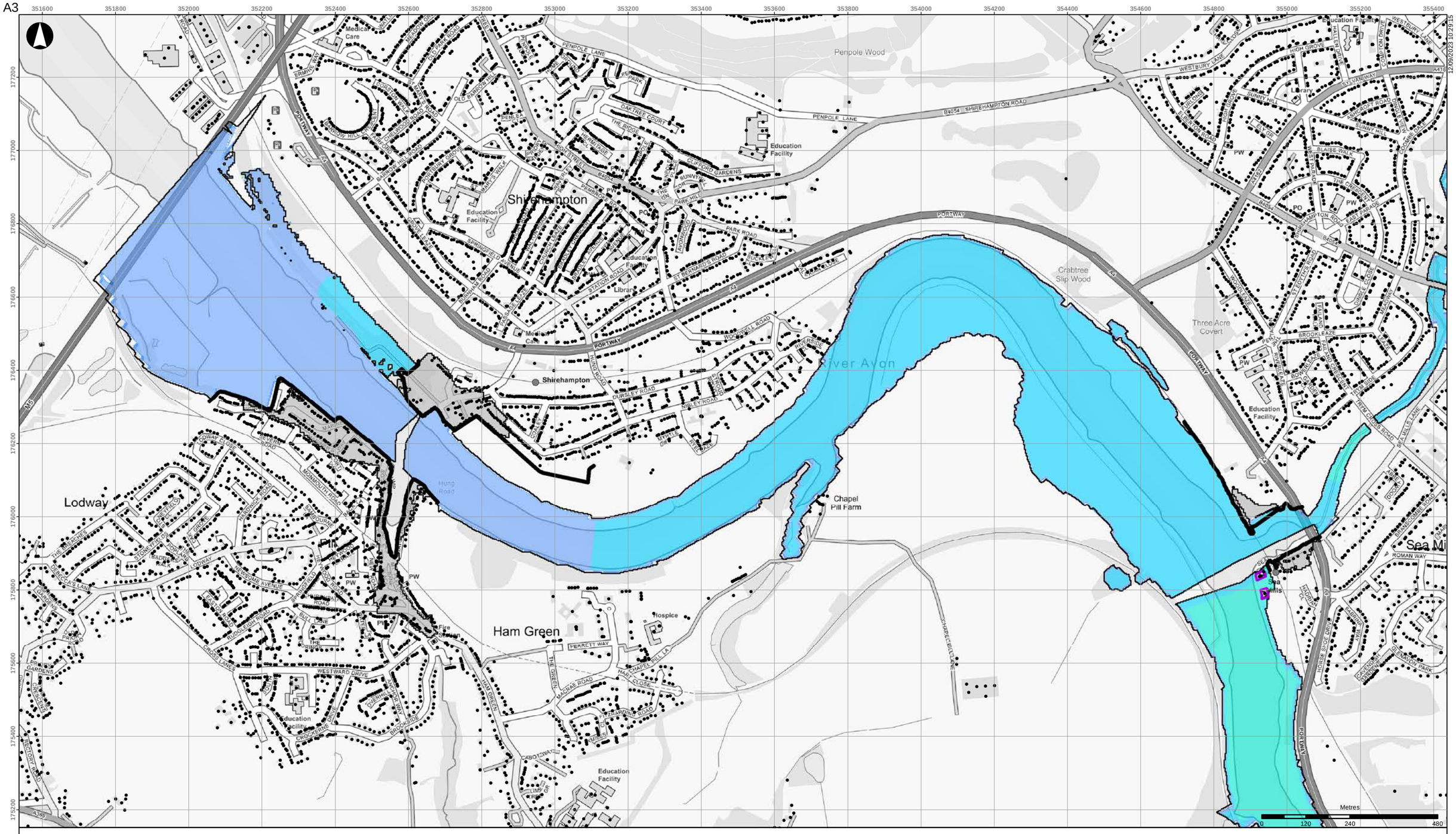
Name

**285982-ARP-XX-DR-MOD-190**

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
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Client
**Bristol City Council**

Project Title
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Drawing Title
**Phase 2 scheme impact**
**2070 tidal 1:20yr event**
**Downstream areas**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

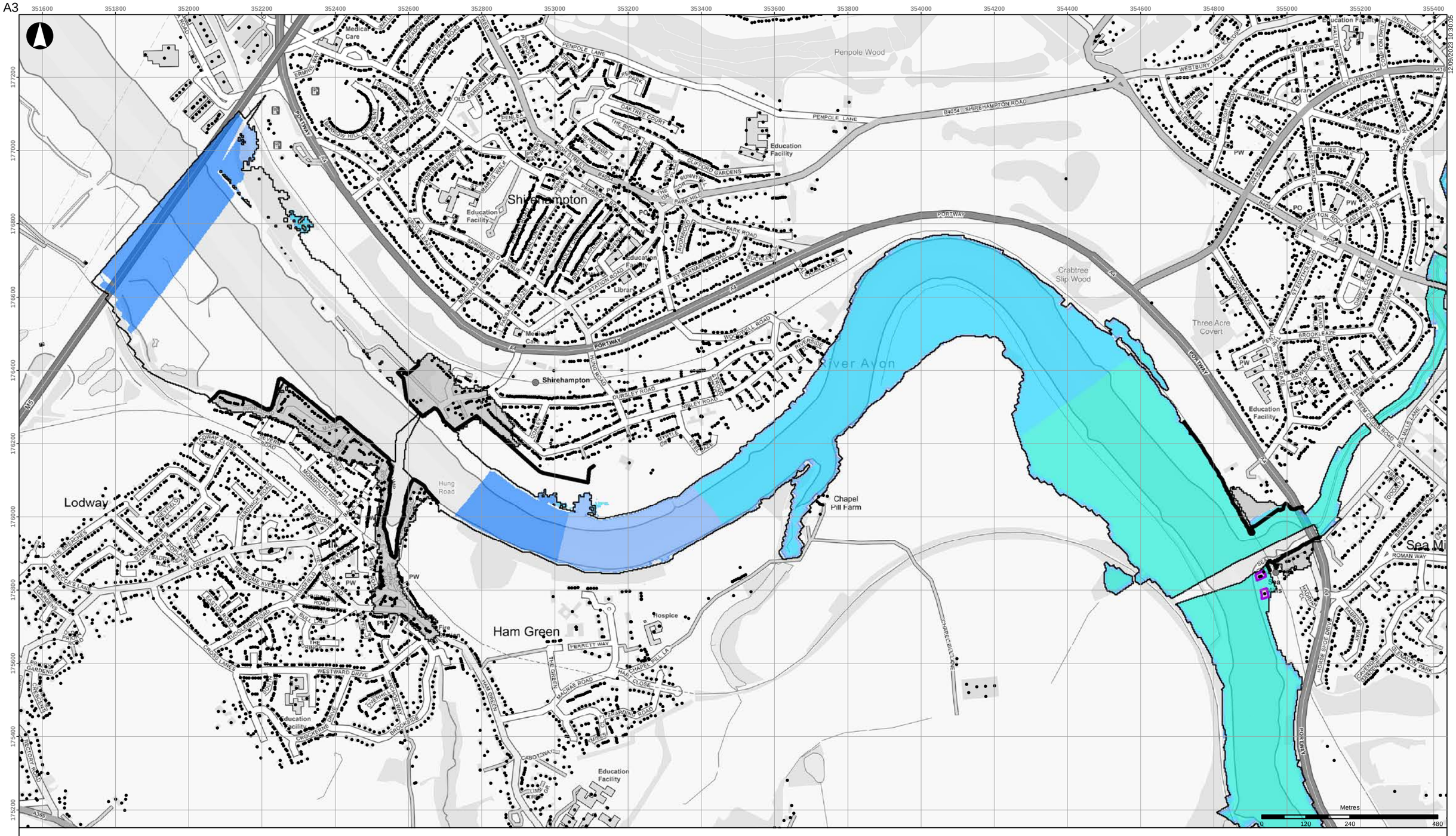
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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

Contains OS data (C) Crown Copyright and database right 2023

Notes:

Based on the BAFS OBC model version v034_27.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

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Client
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Project Title
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Drawing Title
**Phase 2 scheme impact**
**2070 tidal 1:75yr event**
**Downstream areas**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

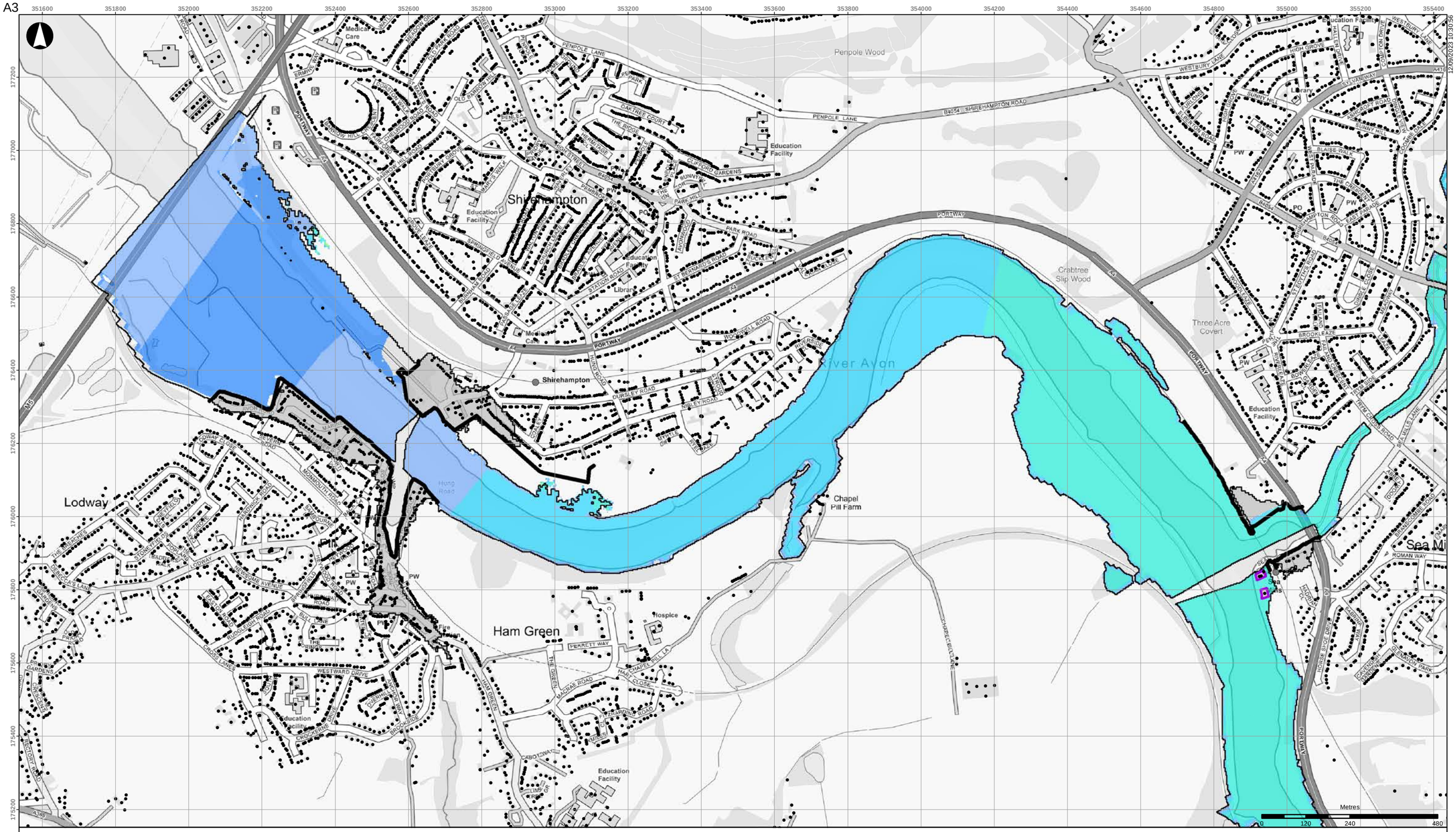
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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
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Project Title

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Drawing Title

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**2070 tidal 1:100yr event**
**Downstream areas**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

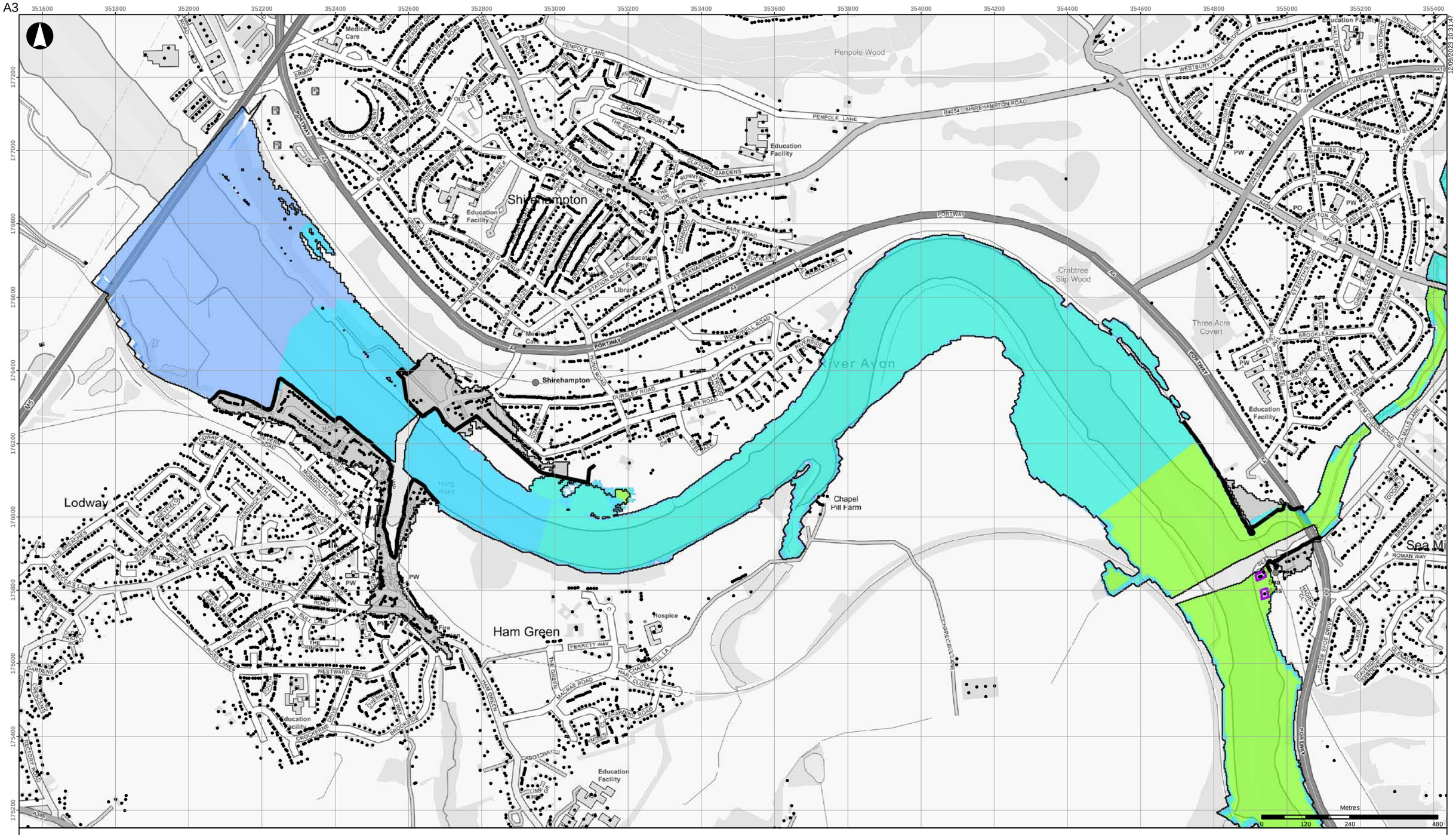
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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
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**Bristol City Council**

Project Title

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Drawing Title

**Phase 2 scheme impact**
**2070 tidal 1:200yr event**
**Downstream areas**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

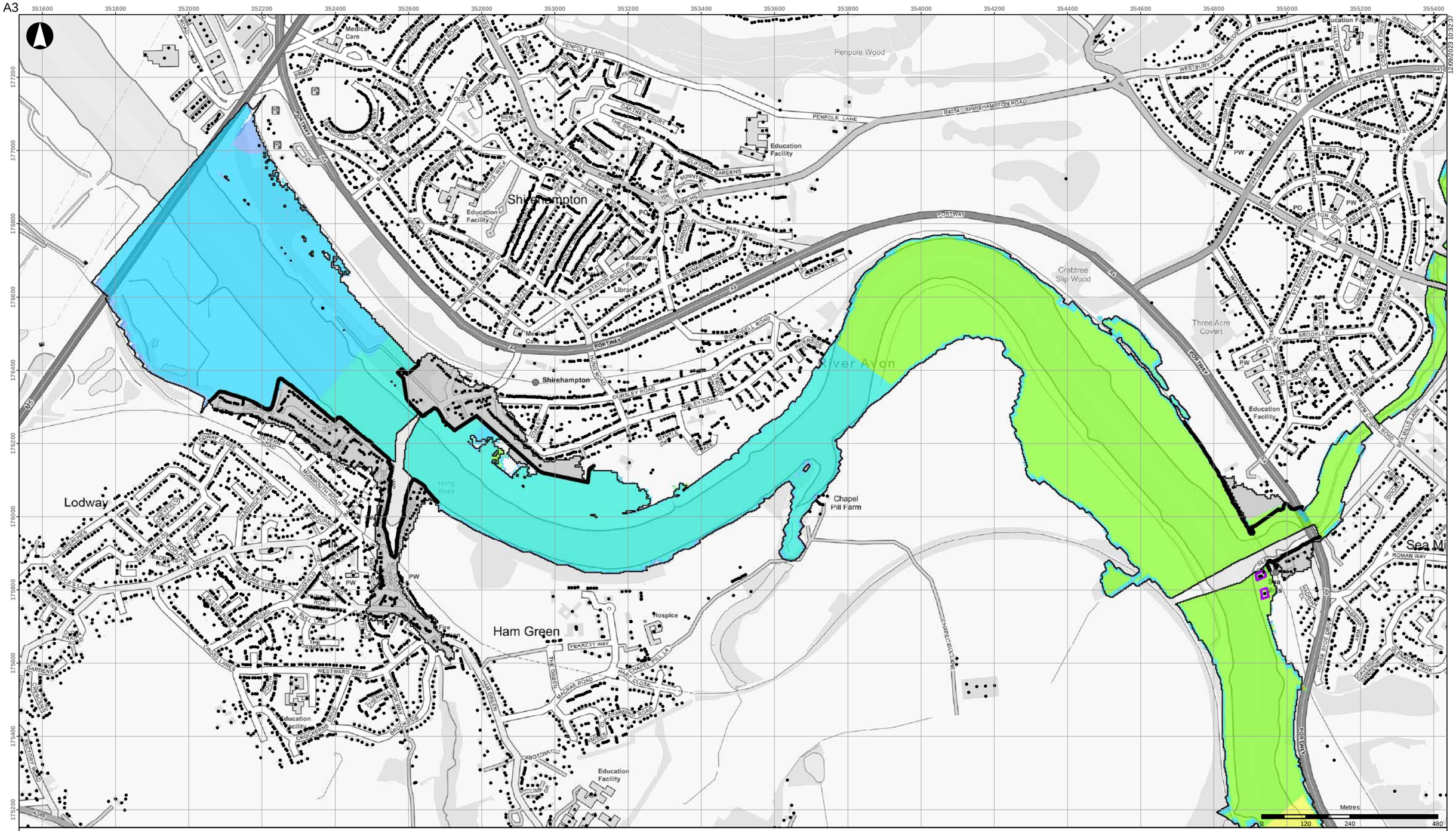
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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

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Project Title
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Drawing Title
**Phase 2 scheme impact**
**2130 tidal 1:20yr event**
**Downstream areas**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

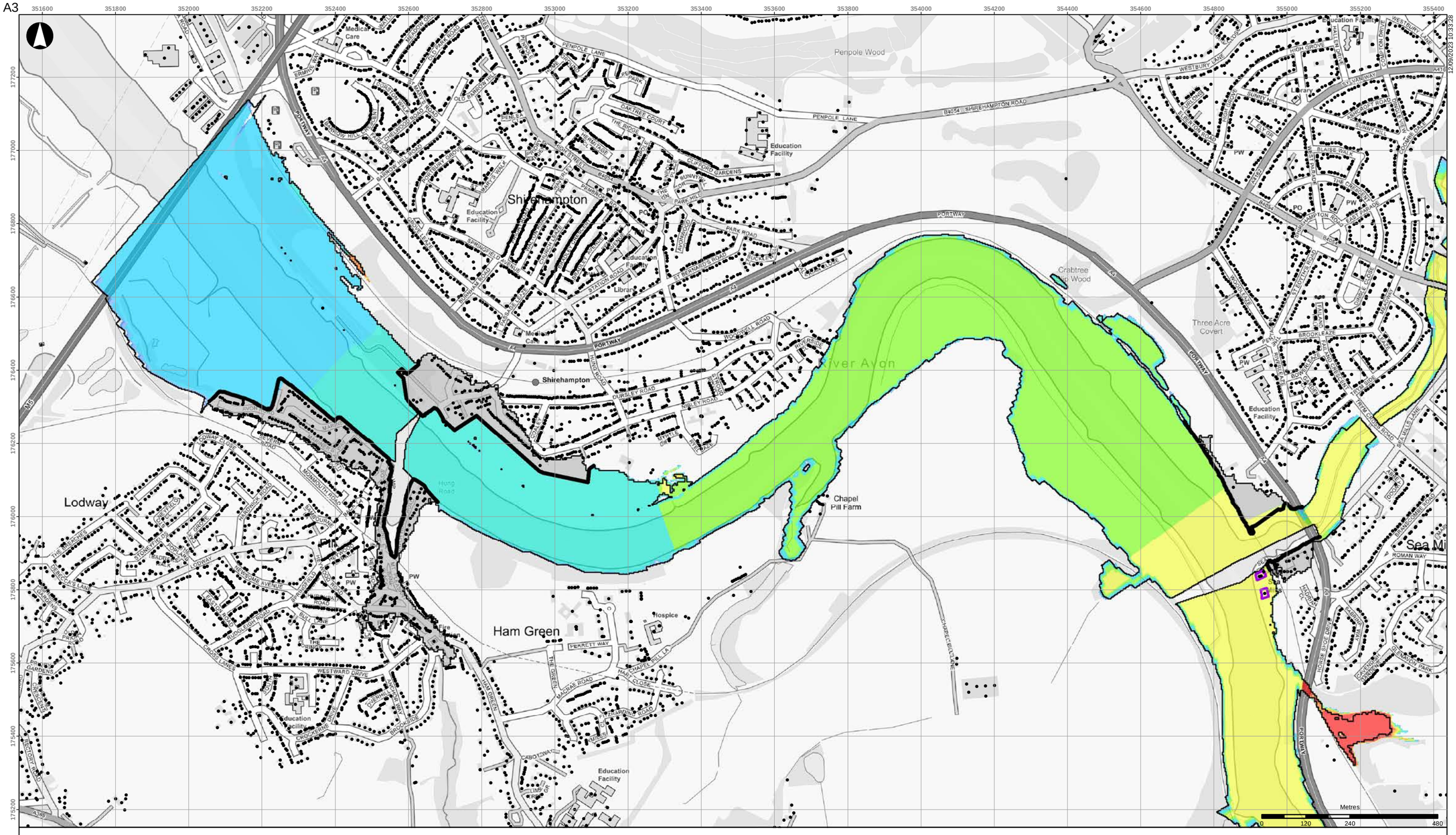
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**285982-ARP-XX-DR-MOD-195**

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A3

12/09/2023 10:33:28




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2130 tidal 1:75yr event**
**Downstream areas**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

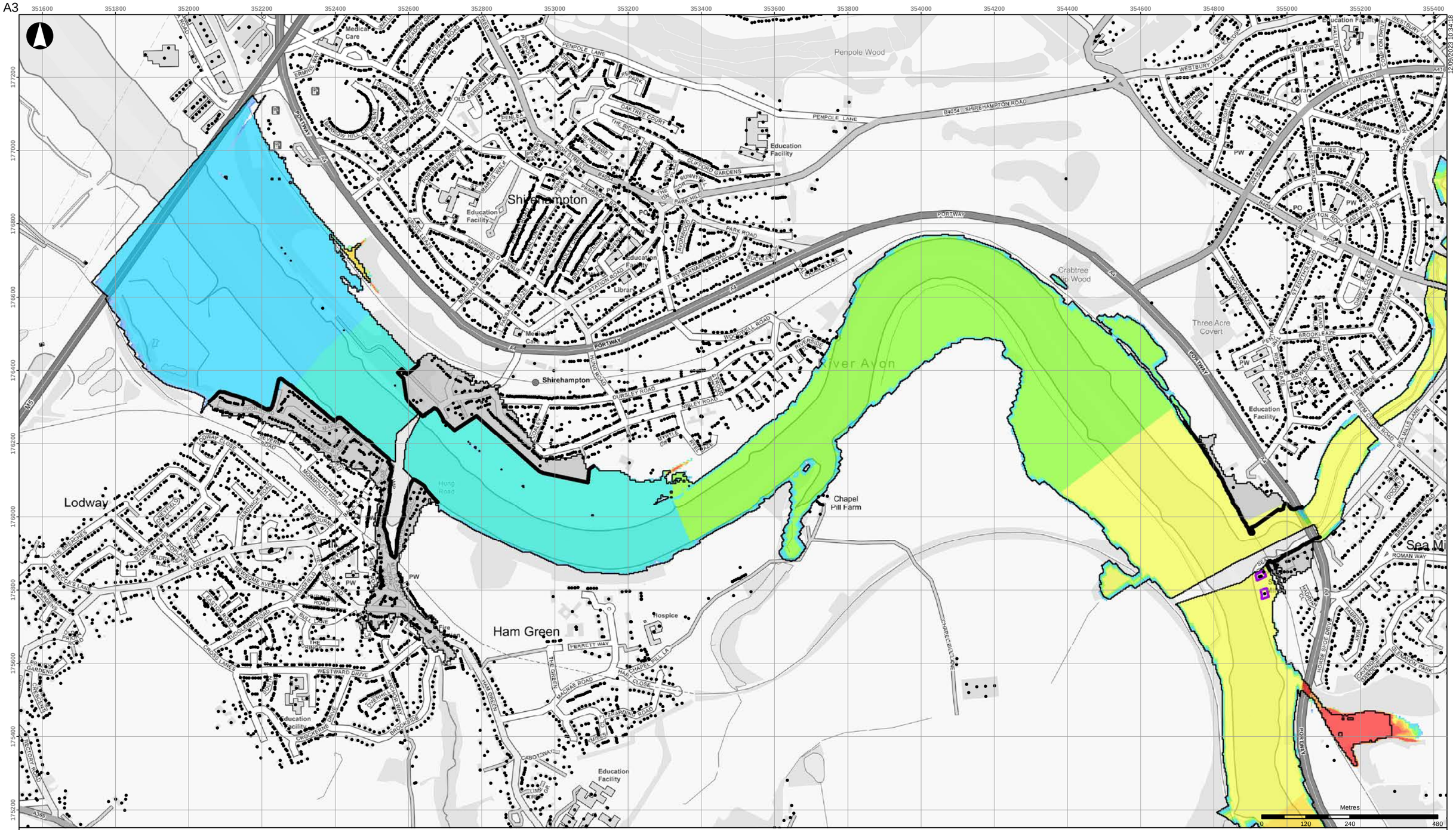
Name

**285982-ARP-XX-DR-MOD-196**

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
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| D1 | 2023-09-12 | DvdL | DvdL | PS |

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63 St Thomas Street
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www.arup.com

Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2130 tidal 1:100yr event**
**Downstream areas**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

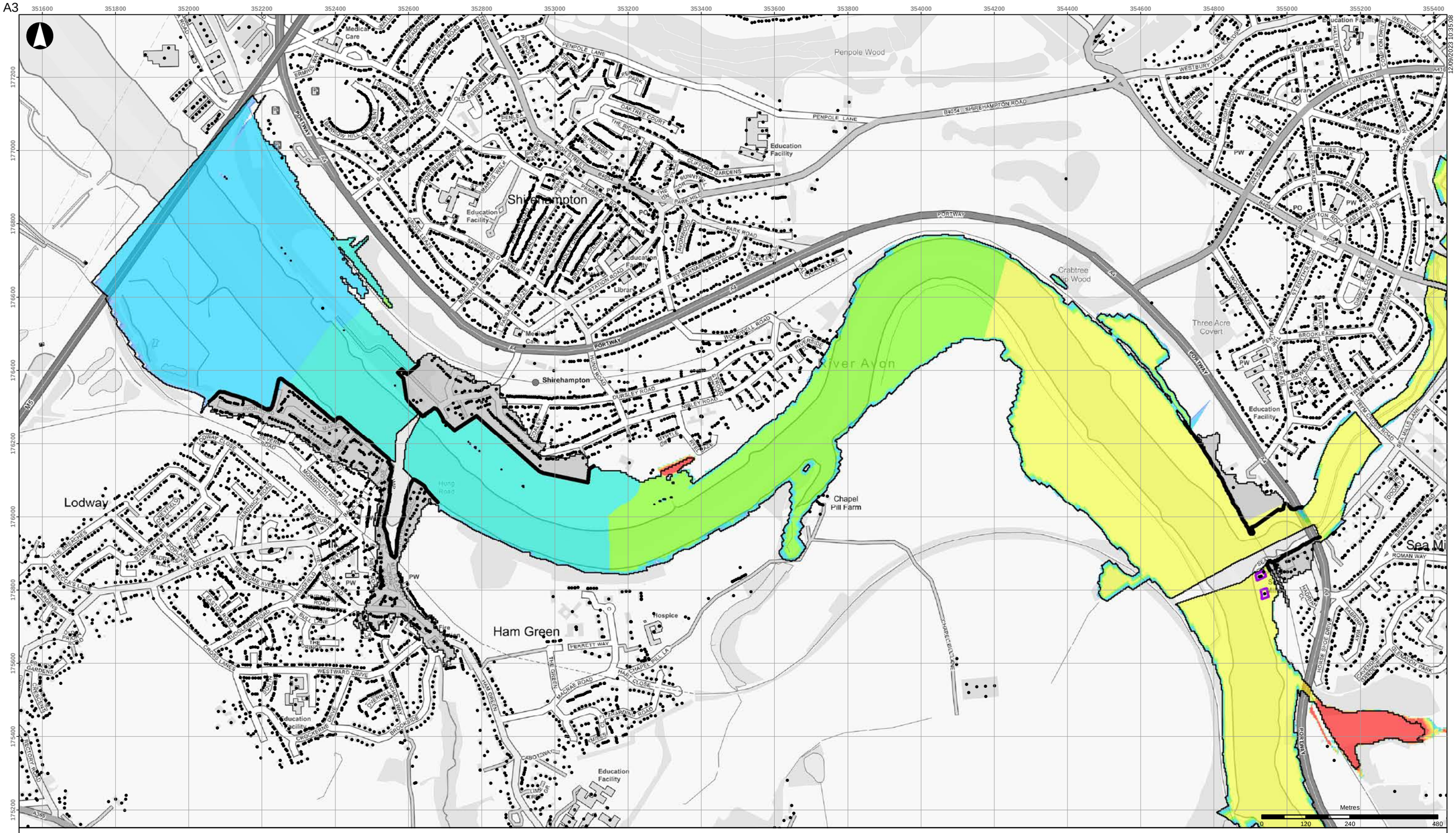
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12/09/2023 10:34:18

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2130 tidal 1:200yr event**
**Downstream areas**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

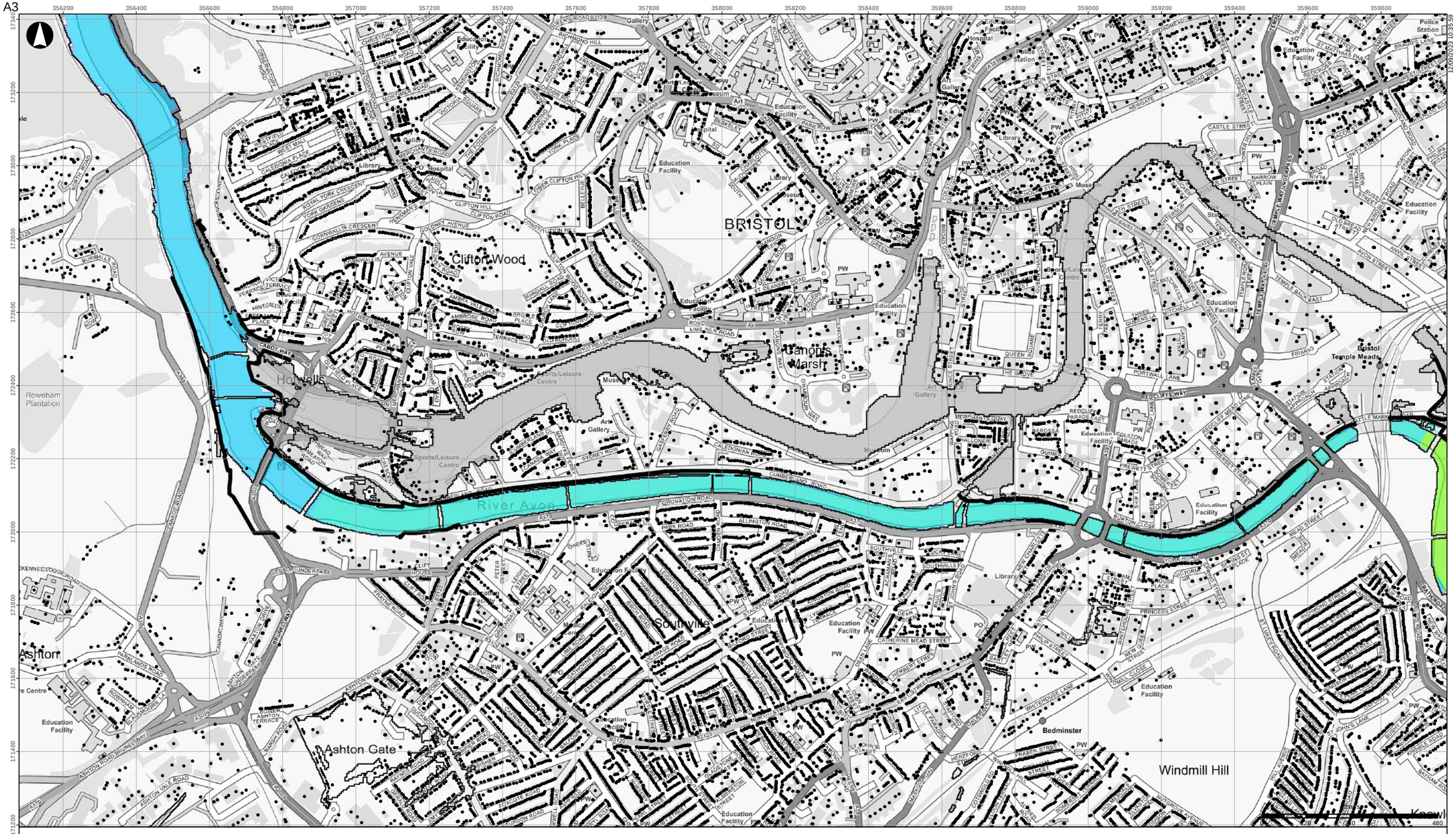
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12/09/2023 10:35:08

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A3




12/09/2023 10:35:59

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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Notes:

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**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2070 fluvial 1:20yr event**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

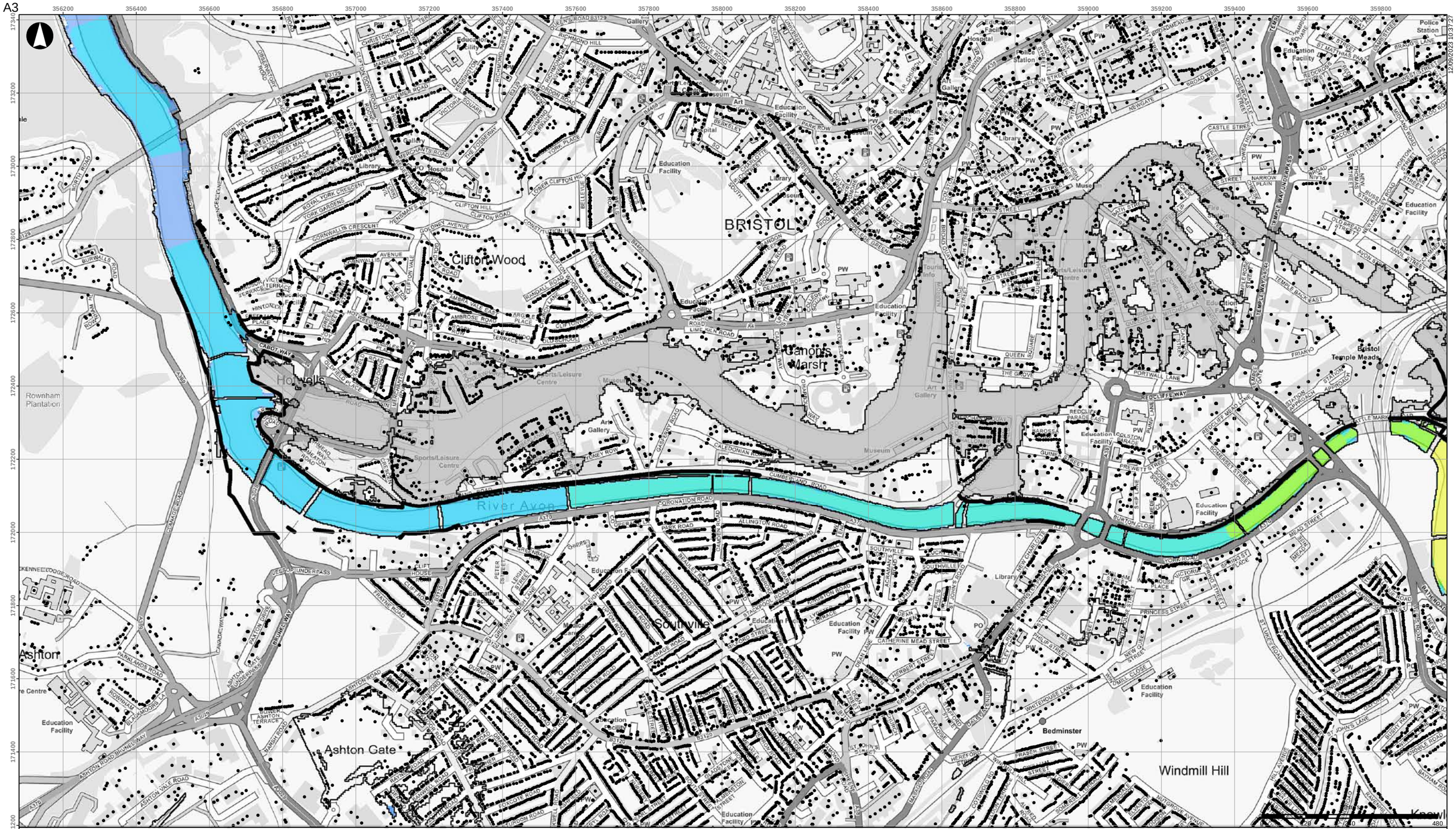
Name

**285982-ARP-XX-DR-MOD-199**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2070 fluvial 1:75yr event**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

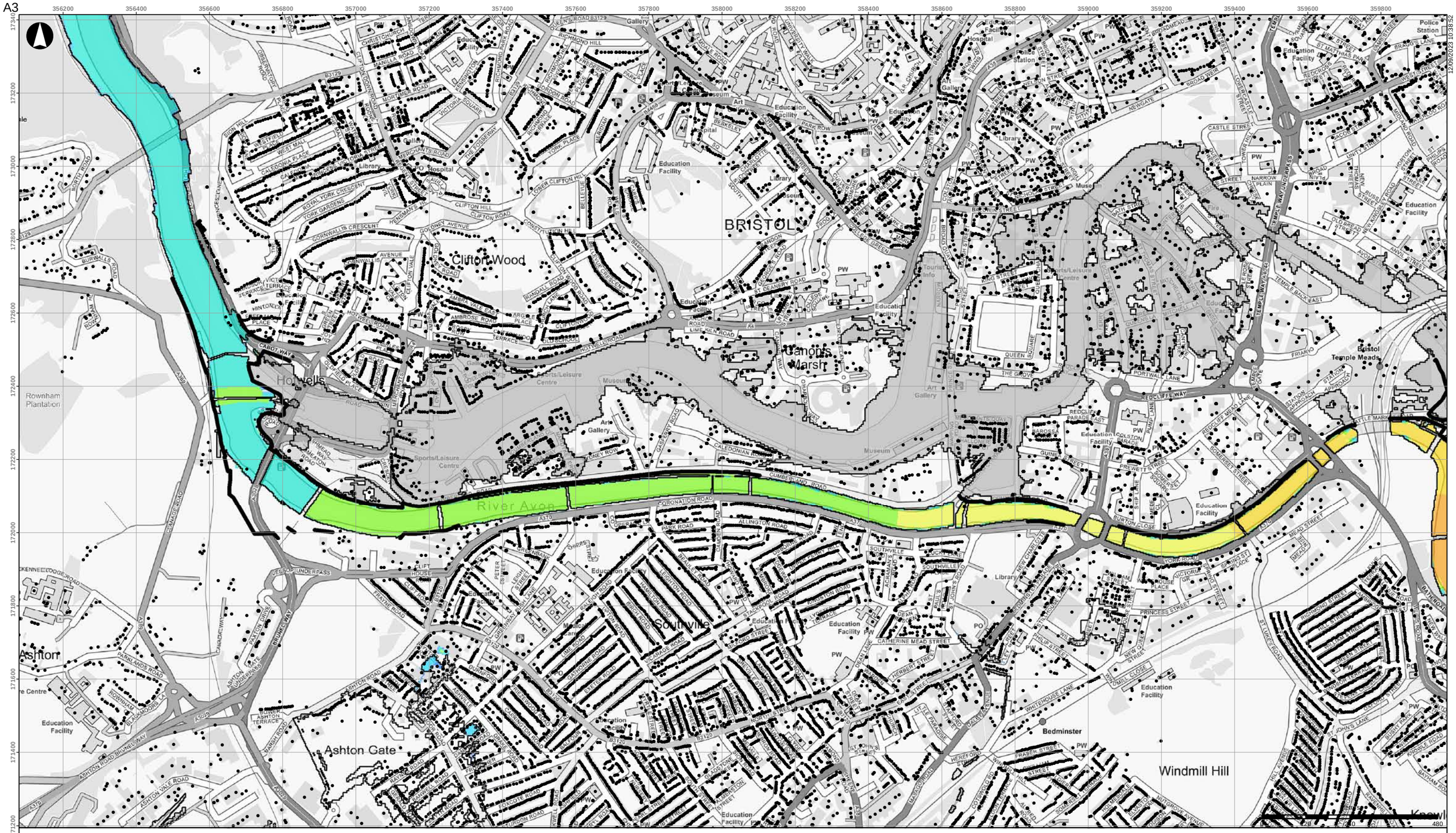
Name

**285982-ARP-XX-DR-MOD-200**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2070 fluvial 1:100yr event**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

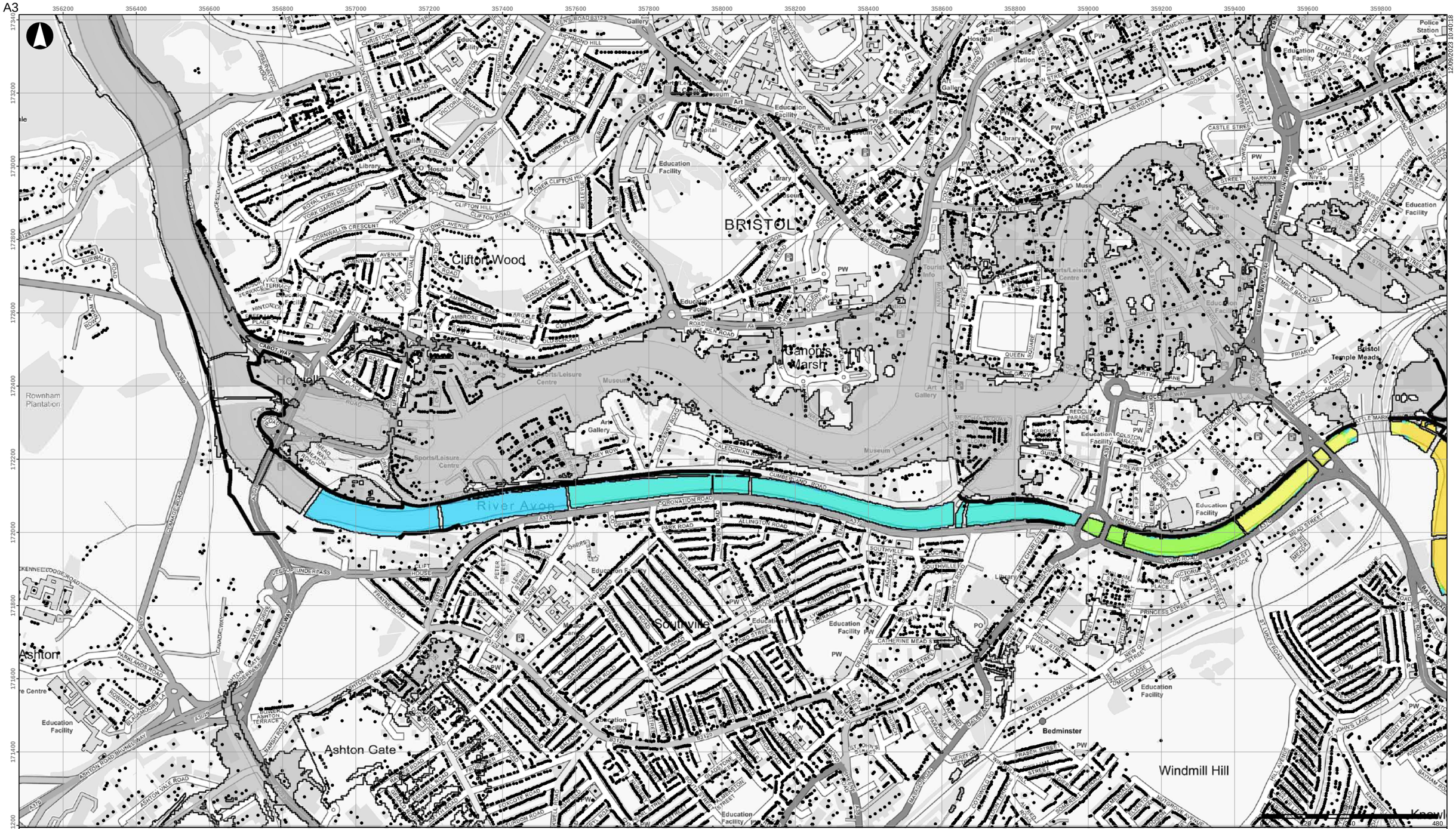
Name

**285982-ARP-XX-DR-MOD-201**

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12/09/2023 10:40:18

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2070 fluvial 1:200yr event**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

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Rev

**D1**

Name

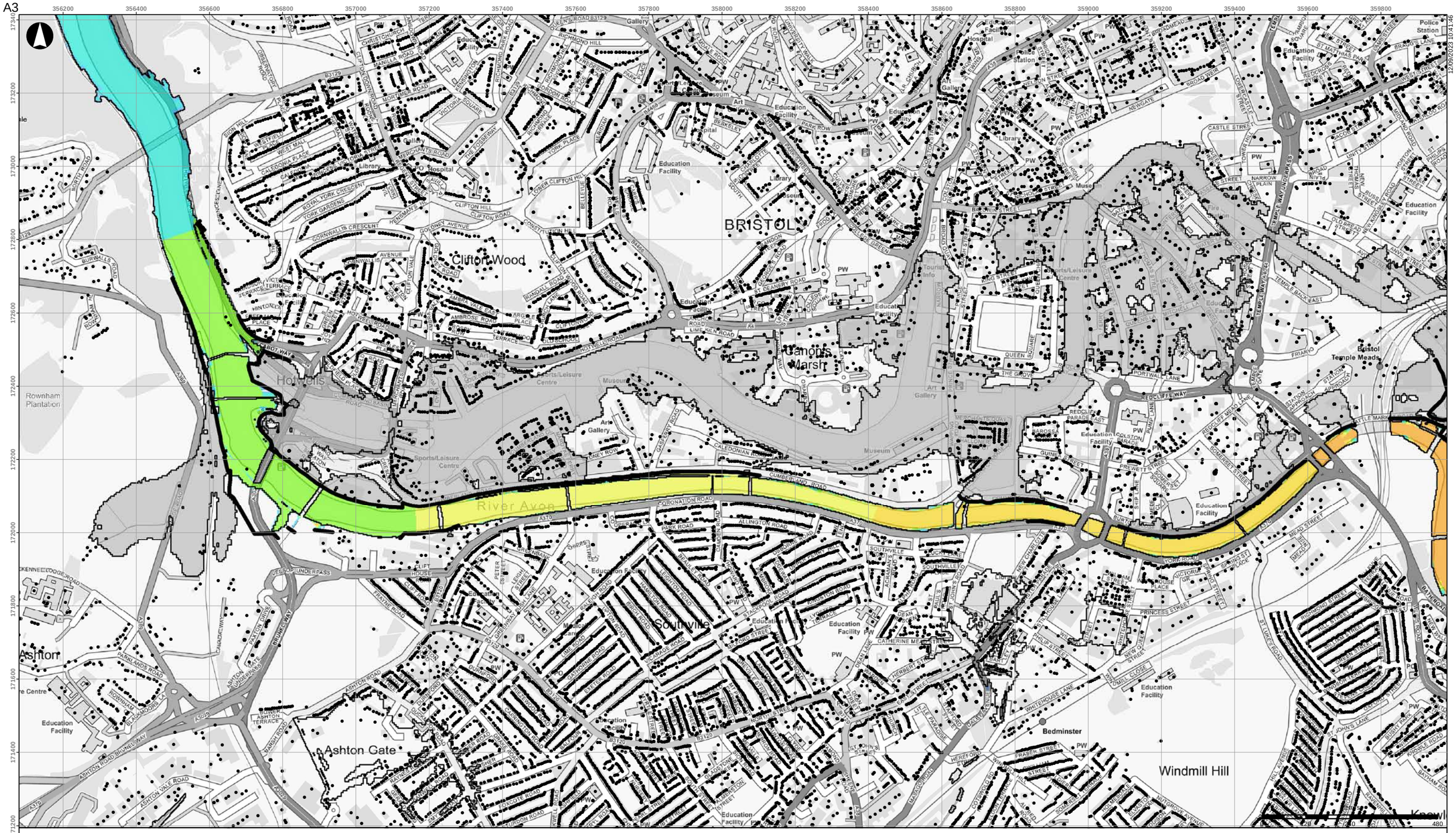
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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2130 fluvial 1:20yr event**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

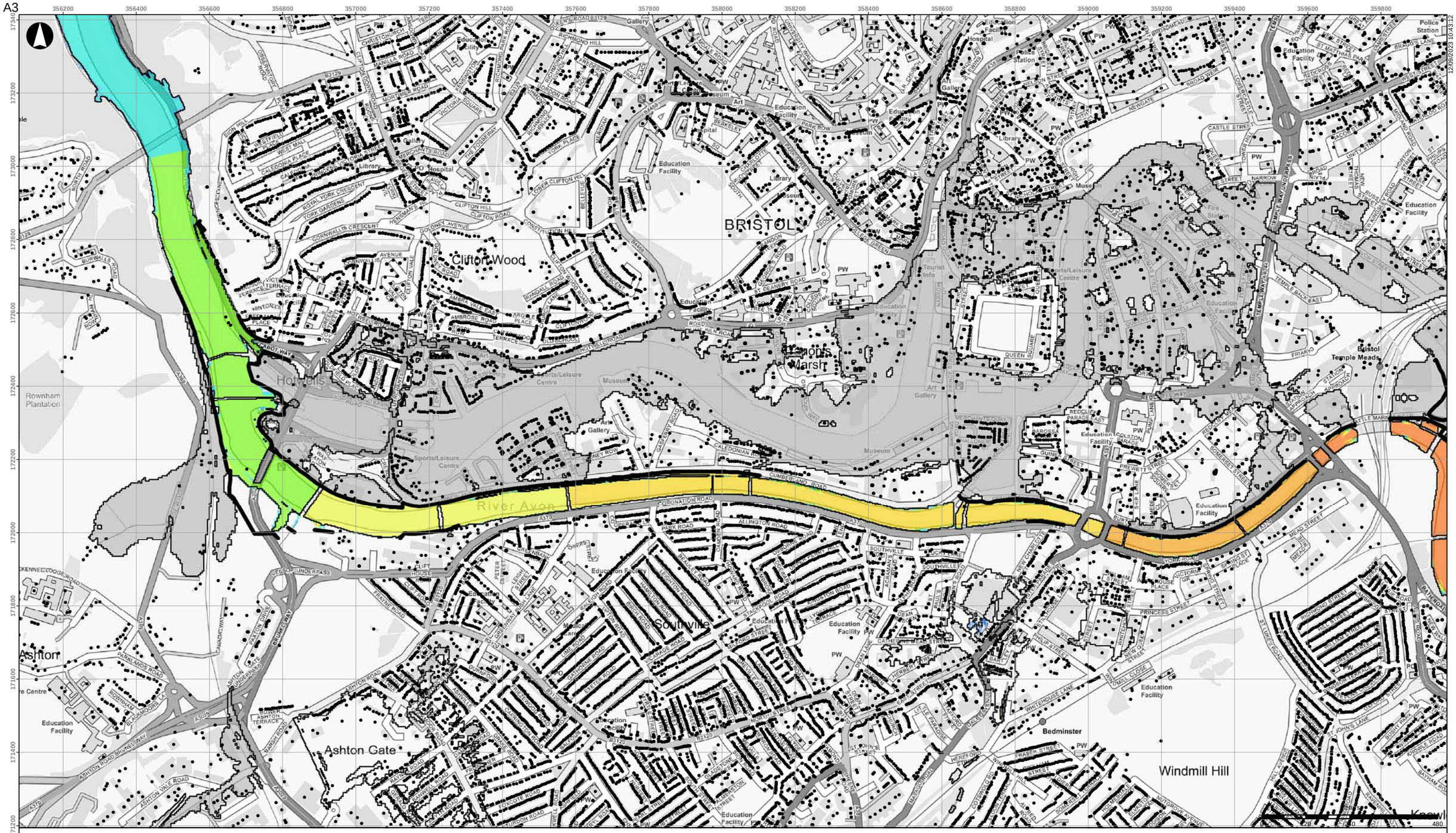
Name

**285982-ARP-XX-DR-MOD-203**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Client
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Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 2 scheme impact**
**2130 fluvial 1:75yr event**
**Bristol area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

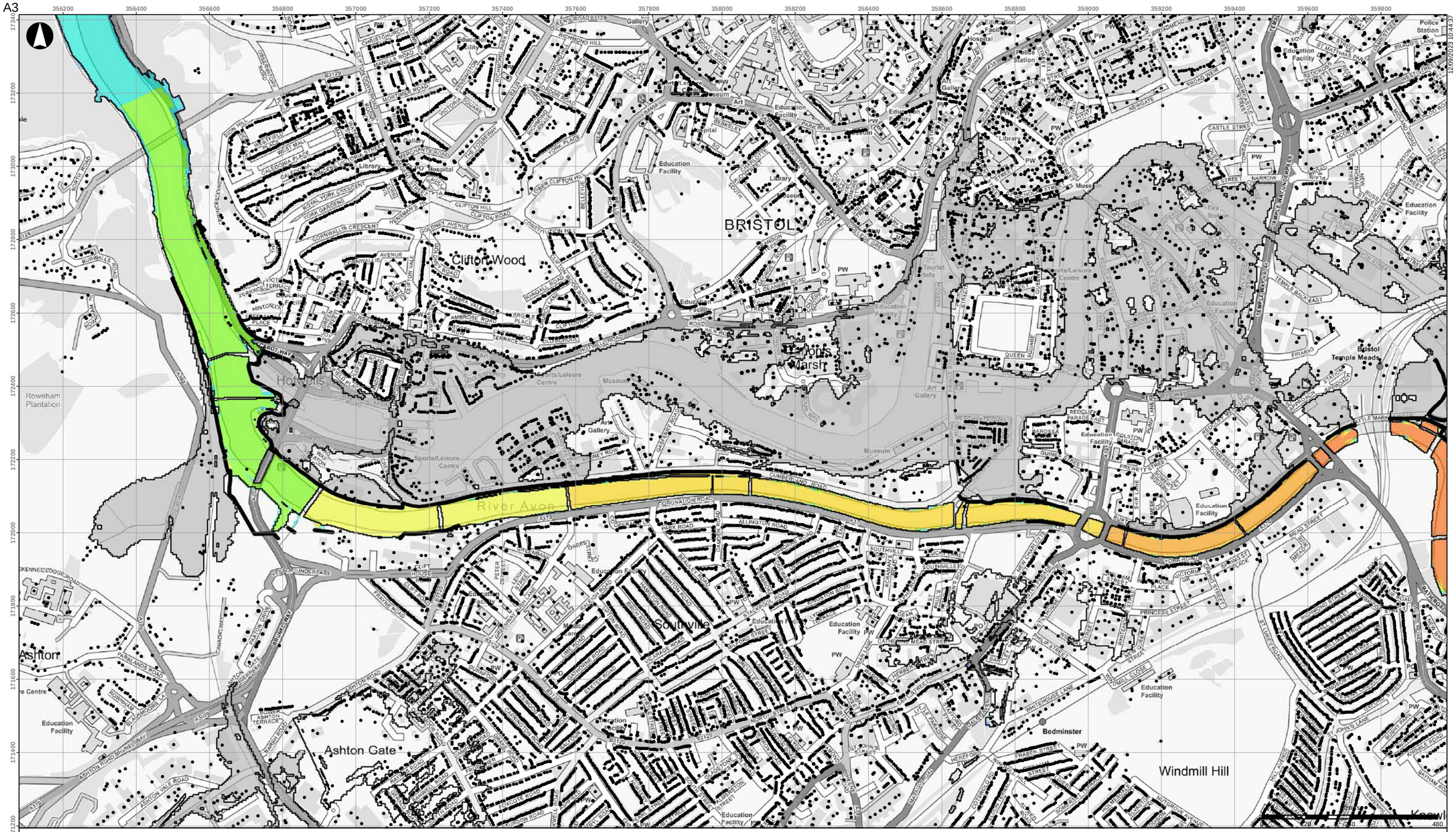
Rev
**D1**

Name
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12/09/2023 10:44:37

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 2 scheme impact**
**2130 fluvial 1:100yr event**
**Bristol area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

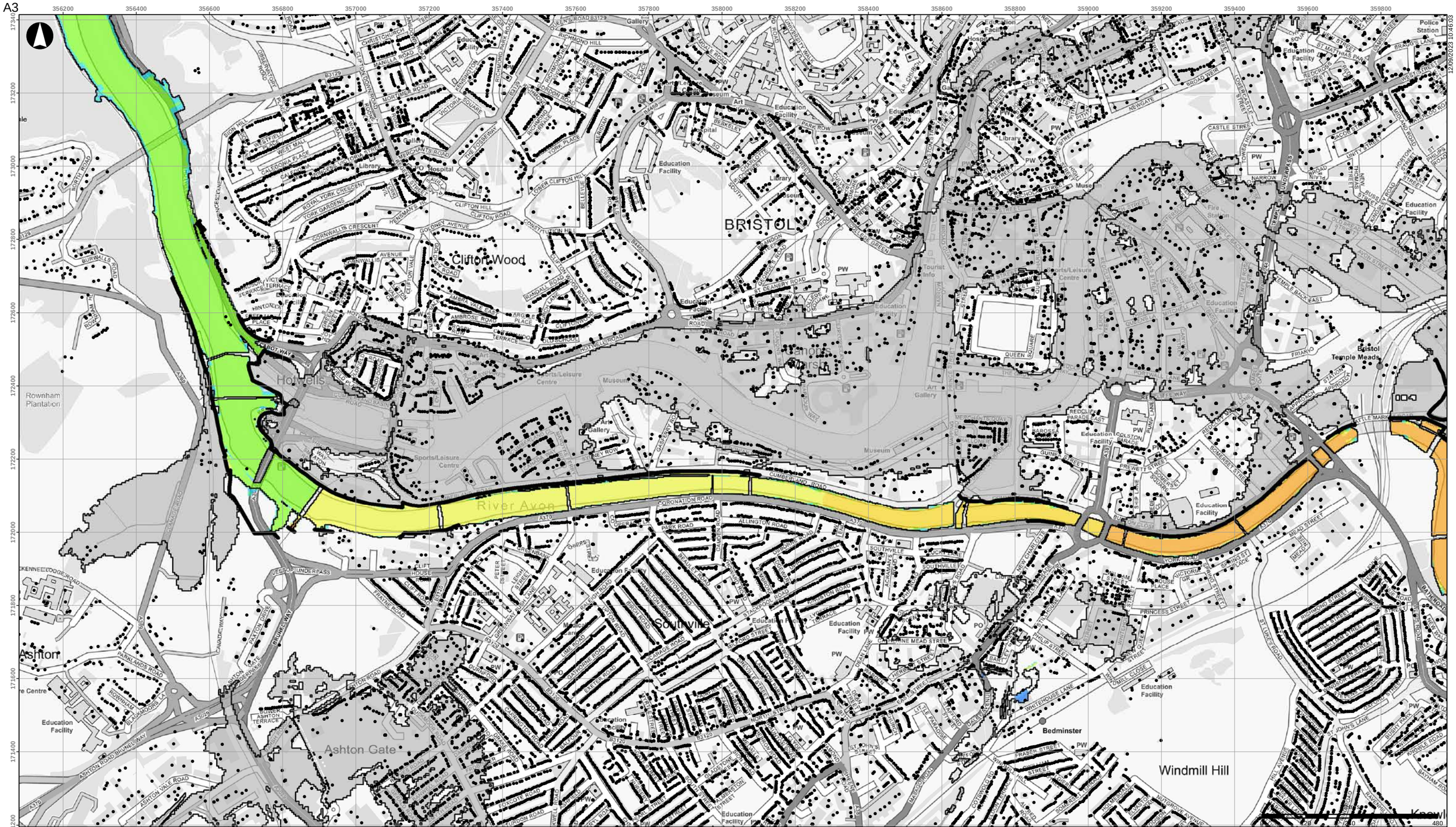
Name
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A3

12/09/2023 10:45:03




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2130 fluvial 1:200yr event**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

**285982-ARP-XX-DR-MOD-206**

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A3

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2070 tidal 1:20yr event**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

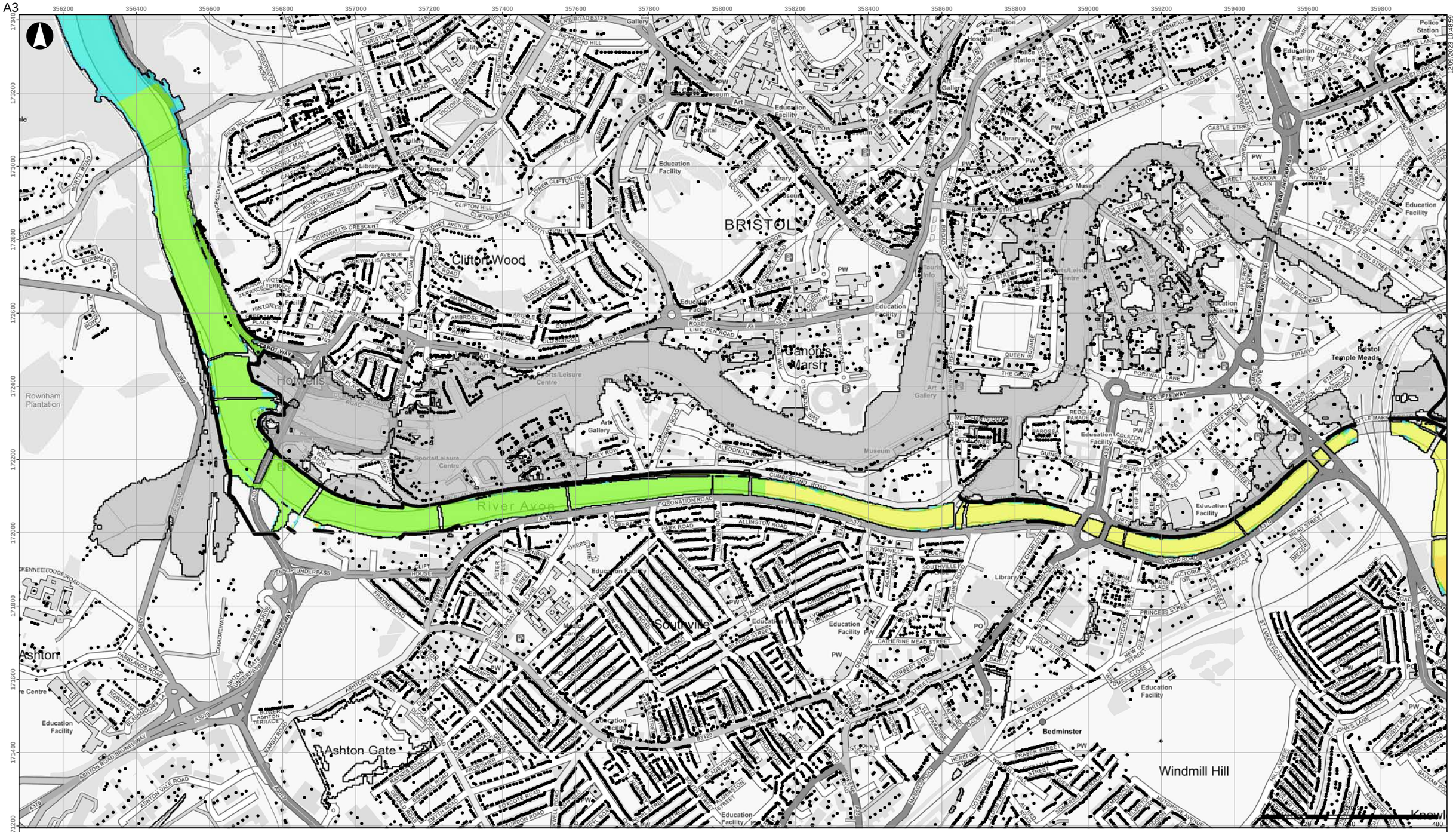
Name

**285982-ARP-XX-DR-MOD-207**

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2070 tidal 1:75yr event**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

**285982-ARP-XX-DR-MOD-208**

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A3

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
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Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 2 scheme impact**
**2070 tidal 1:100yr event**
**Bristol area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

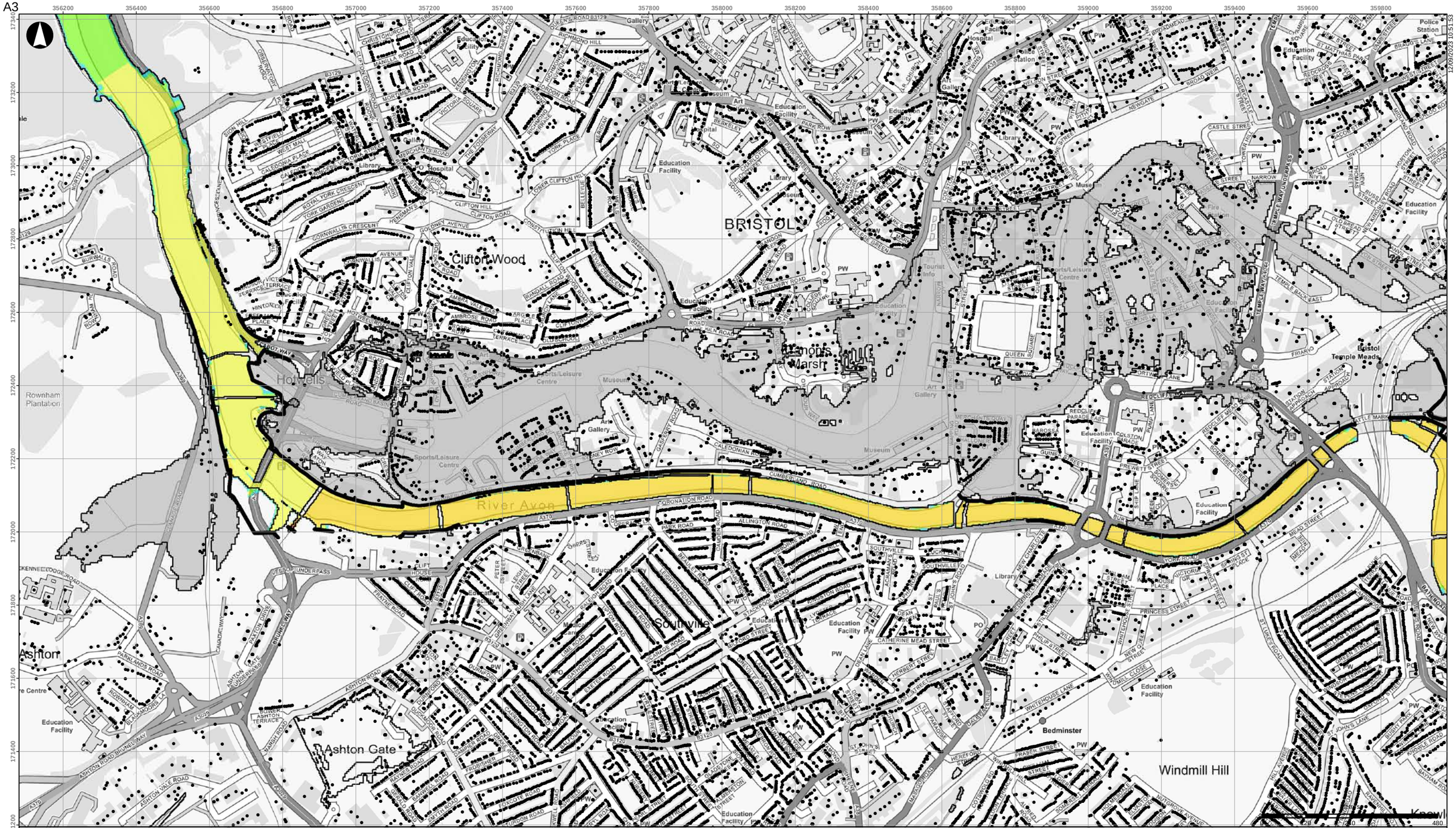
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-209**

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12/09/2023 10:51:53

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2070 tidal 1:200yr event**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

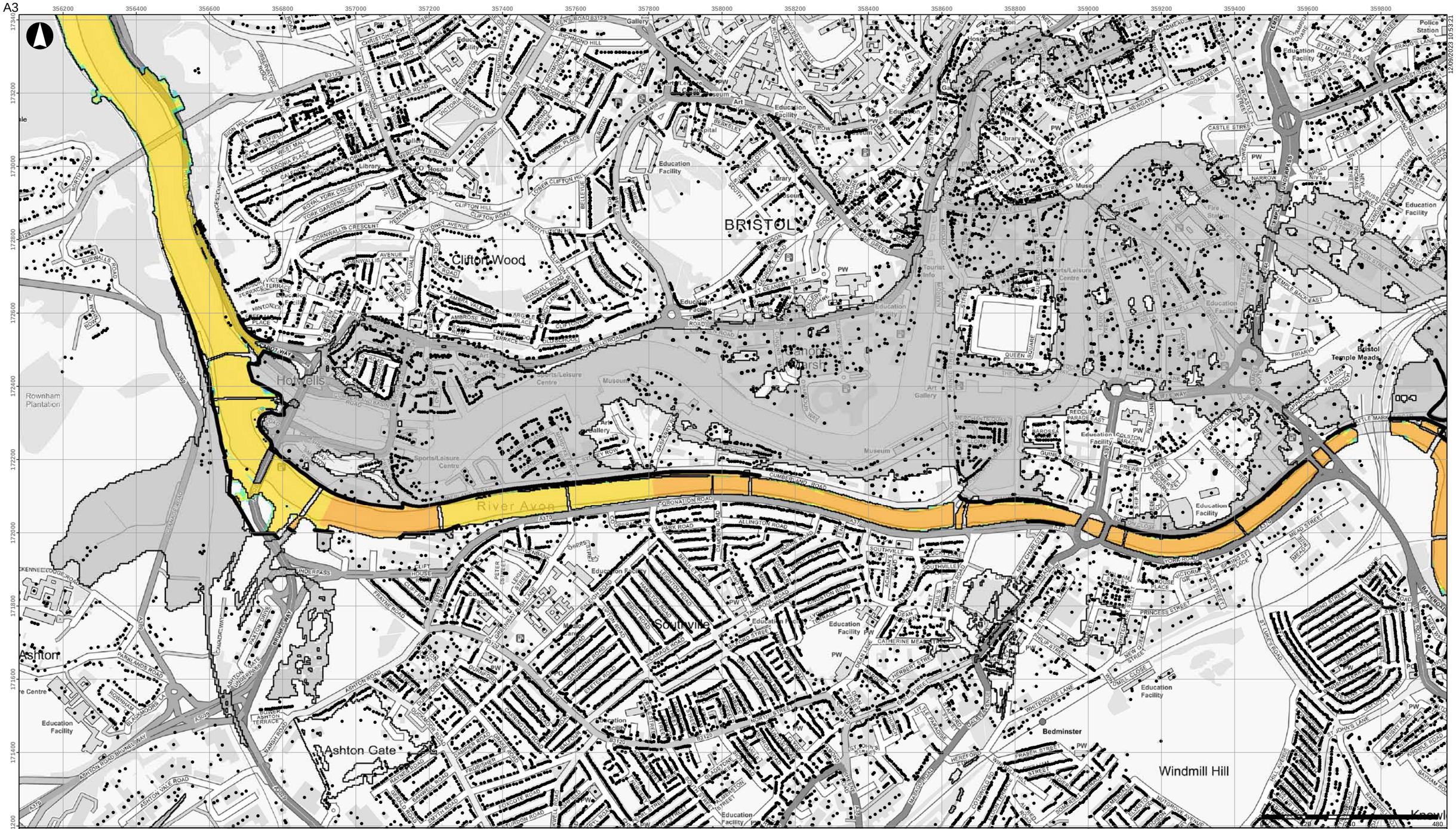
Name

**285982-ARP-XX-DR-MOD-210**

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

Based on the BAFS OBC model version v034_27.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

ARUP

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www.arup.com

Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 2 scheme impact**
**2130 tidal 1:20yr event**
**Bristol area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-211**

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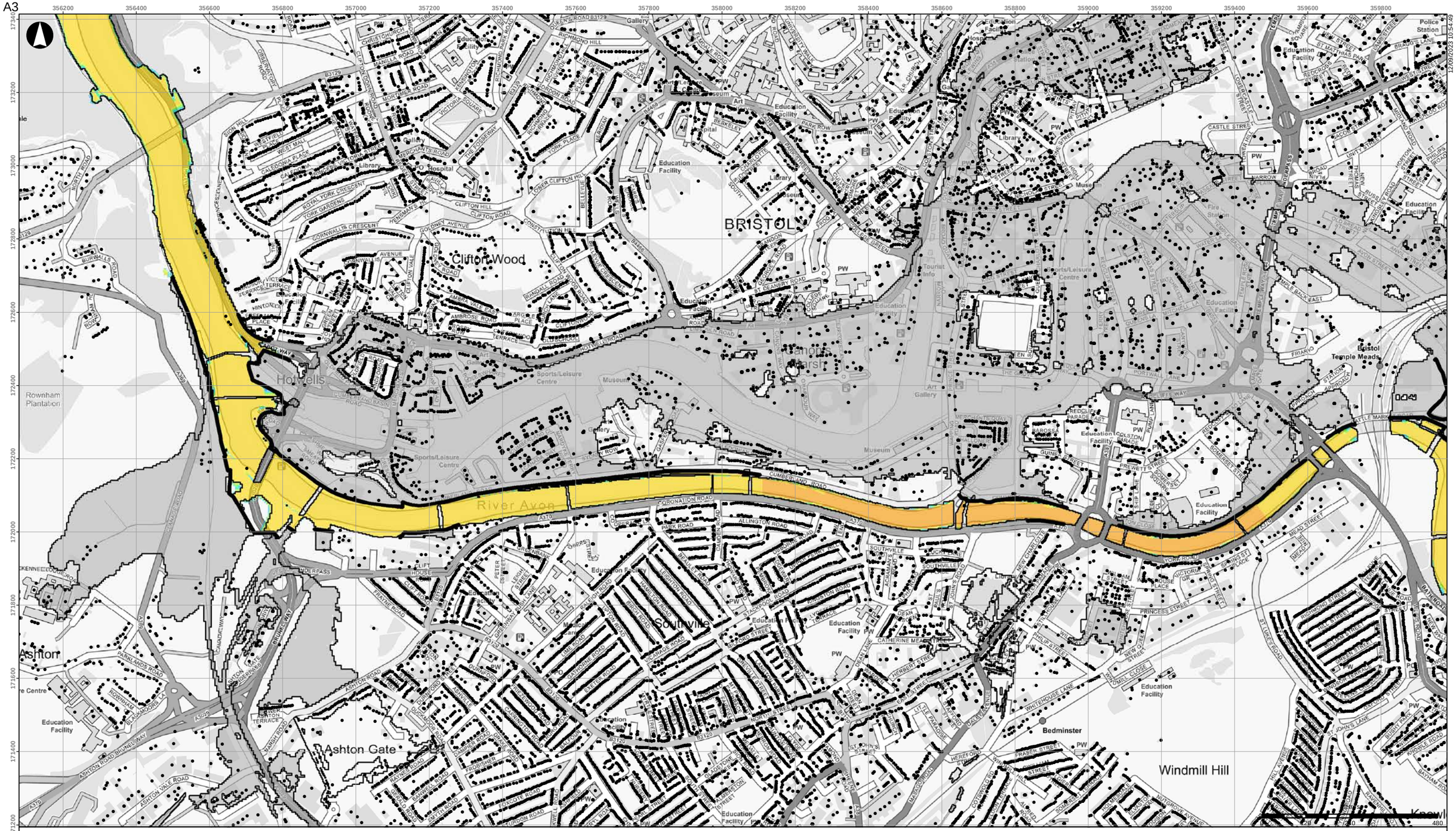
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A3

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12/09/2023 10:54:49




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 2 scheme impact**
**2130 tidal 1:75yr event**
**Bristol area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

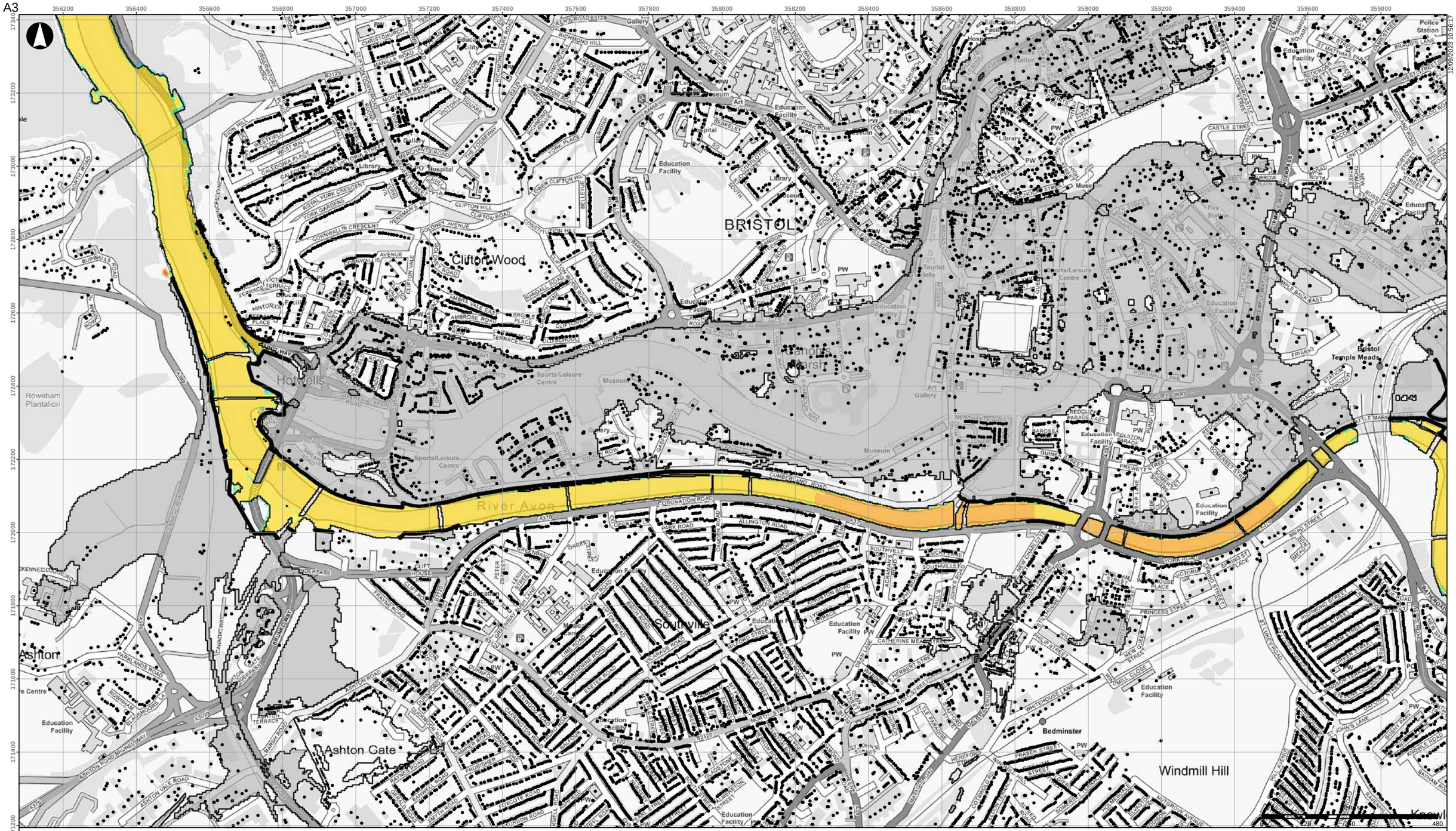
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-212**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

Contains OS data (C) Crown Copyright and database right 2023

Notes:

Based on the BAFS OBC model version v034_27.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2130 tidal 1:100yr event**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

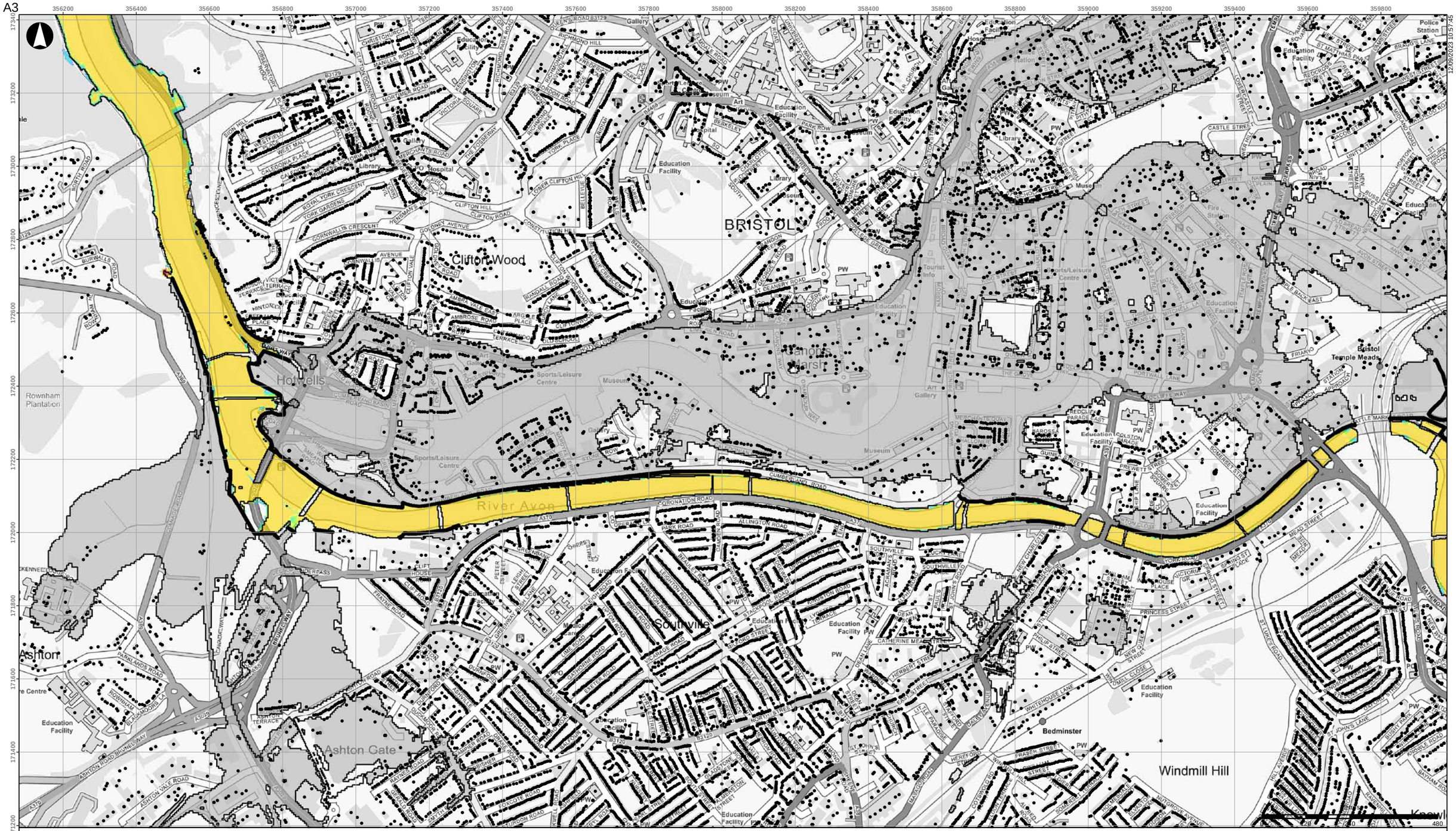
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12/09/2023 10:57:45




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

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Project Title

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Drawing Title

**Phase 2 scheme impact**
**2130 tidal 1:200yr event**
**Bristol area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

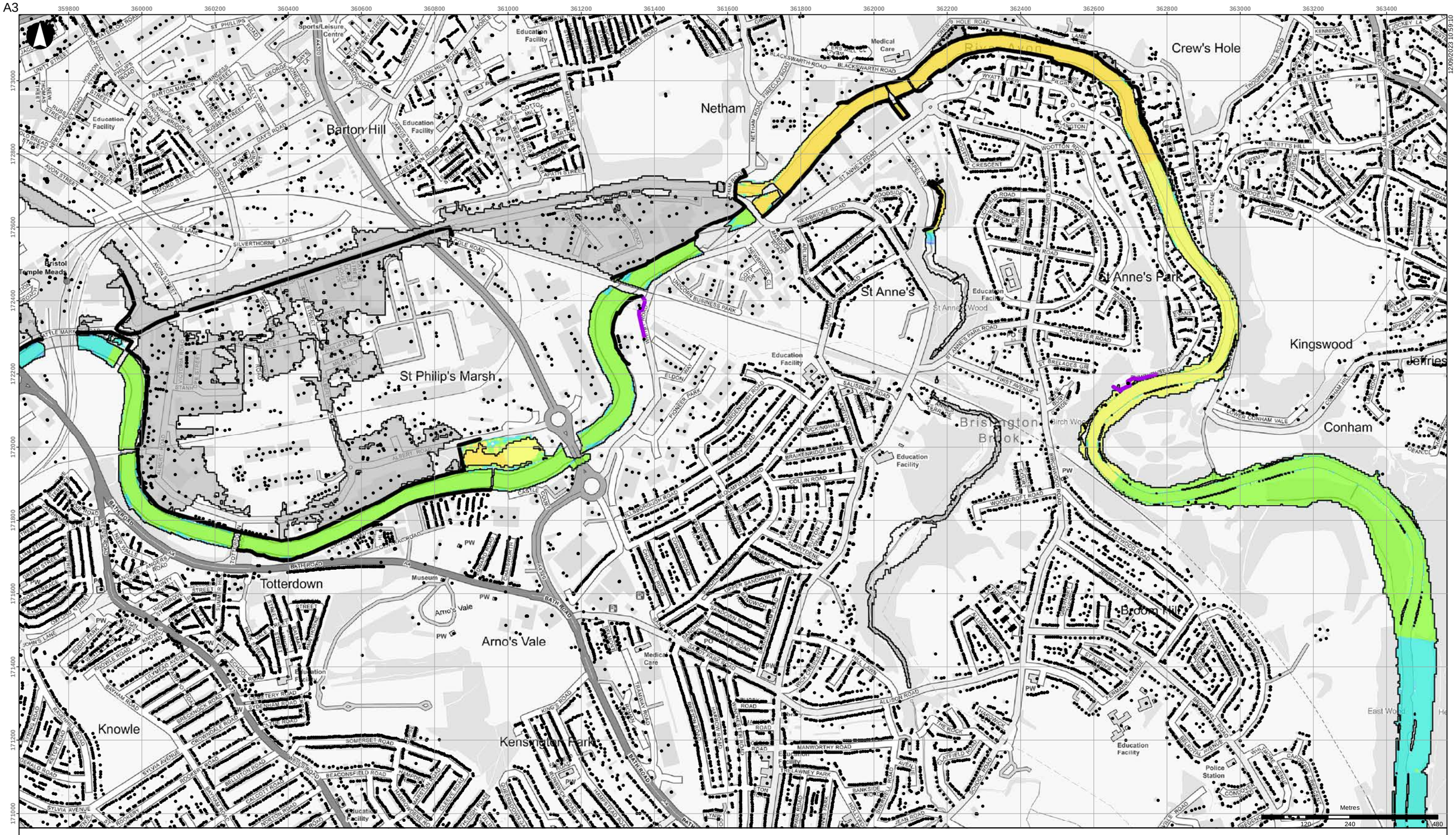
Name

**285982-ARP-XX-DR-MOD-214**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

Based on the BAFS OBC model version v034_27.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2070 fluvial 1:20yr event**
**Netham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

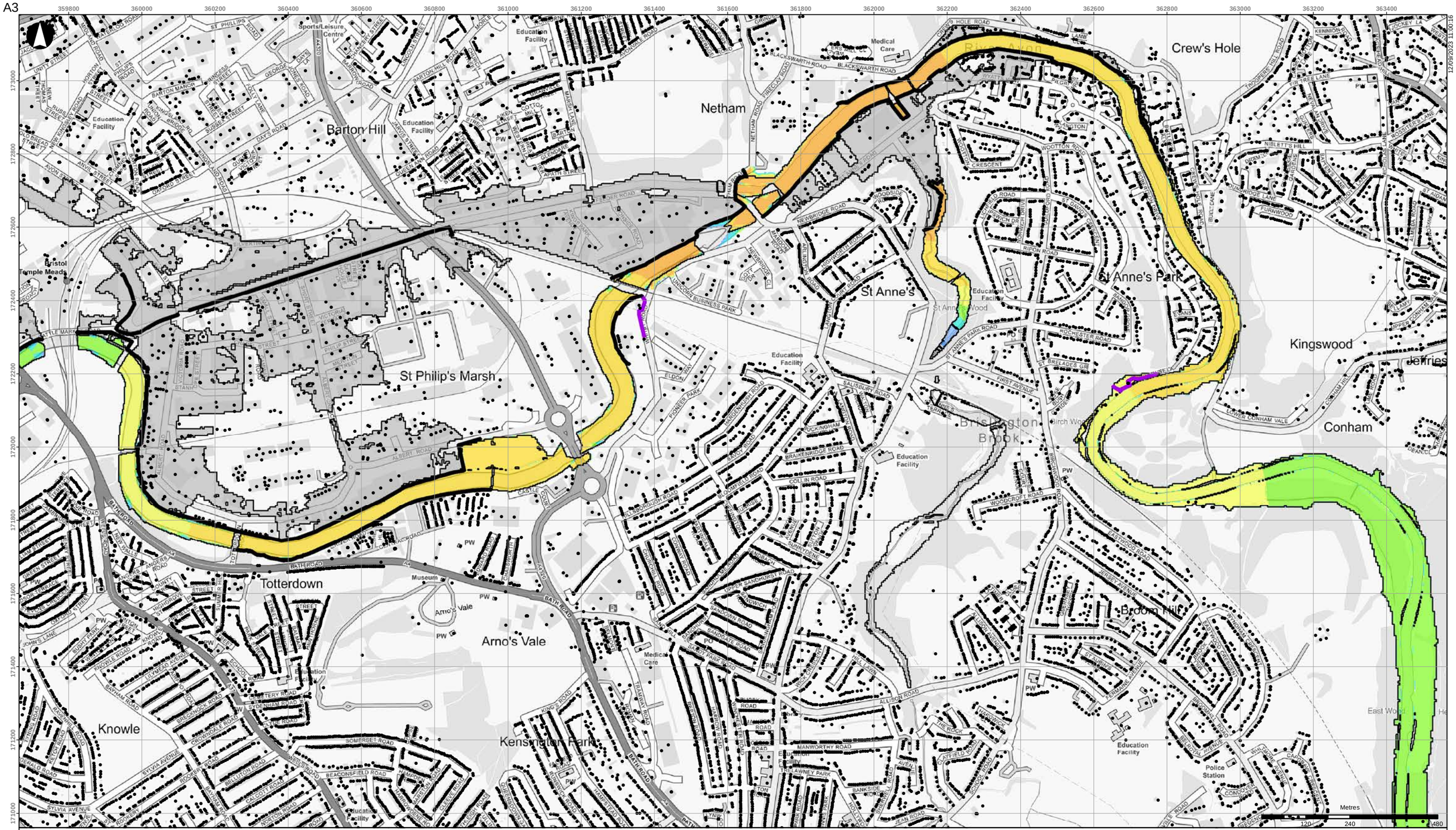
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**285982-ARP-XX-DR-MOD-215**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| D1 | 2023-09-12 | DvdL | DvdL | PS |

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Project Title

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Drawing Title

**Phase 2 scheme impact**
**2070 fluvial 1:75yr event**
**Netham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

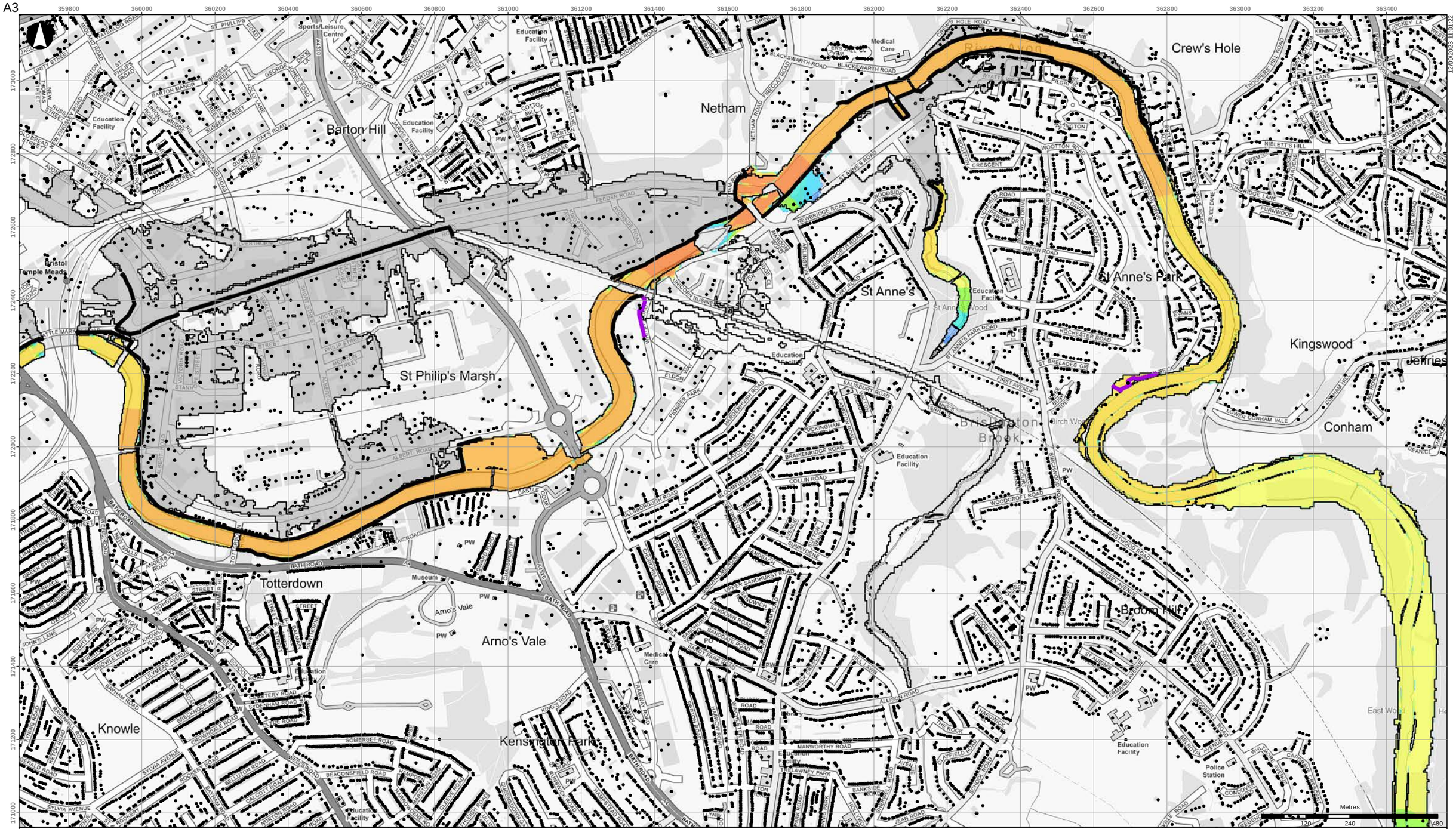
Name

**285982-ARP-XX-DR-MOD-216**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2070 fluvial 1:100yr event**
**Netham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

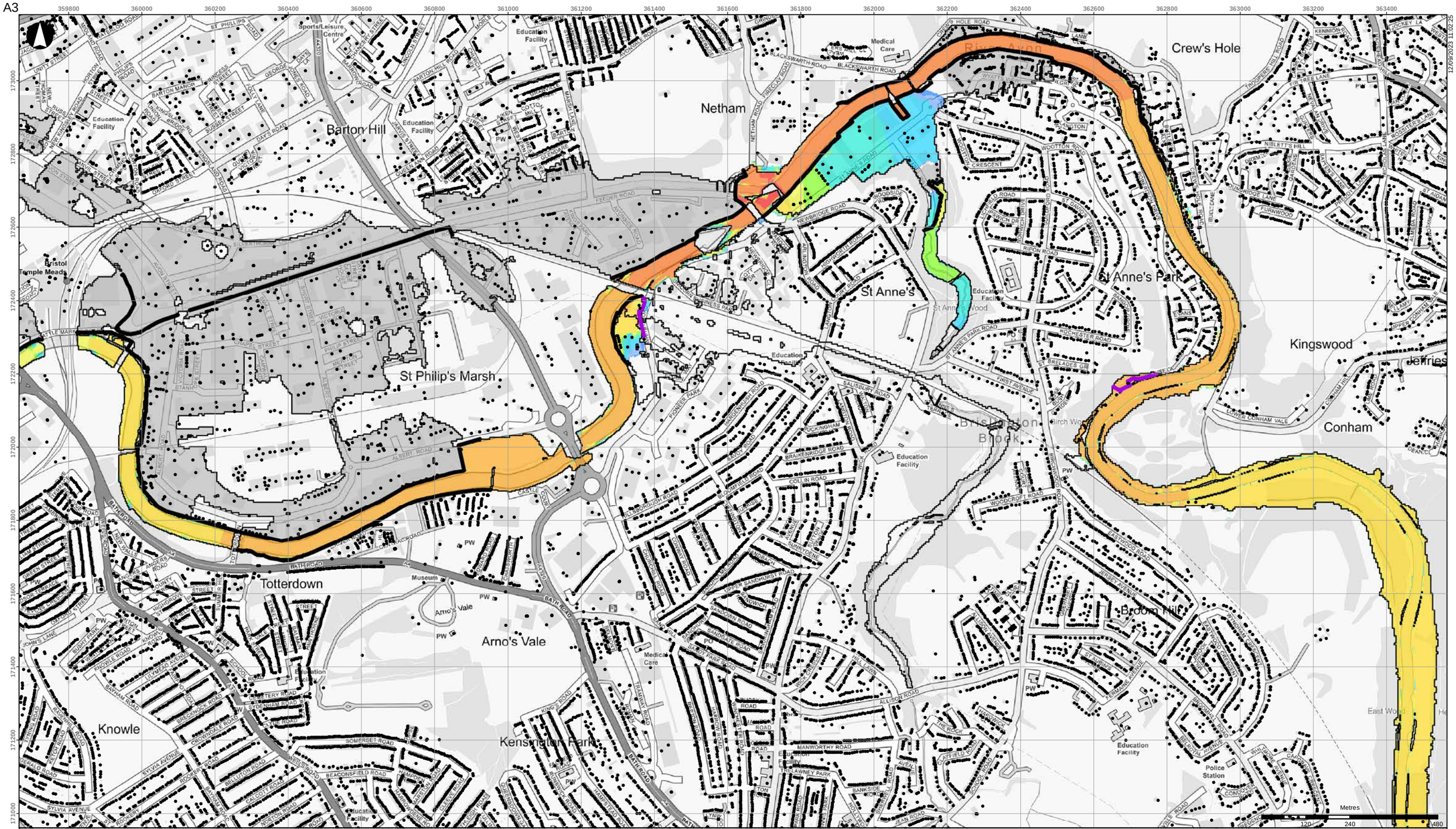
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**285982-ARP-XX-DR-MOD-217**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 2 scheme impact**
**2070 fluvial 1:200yr event**
**Netham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

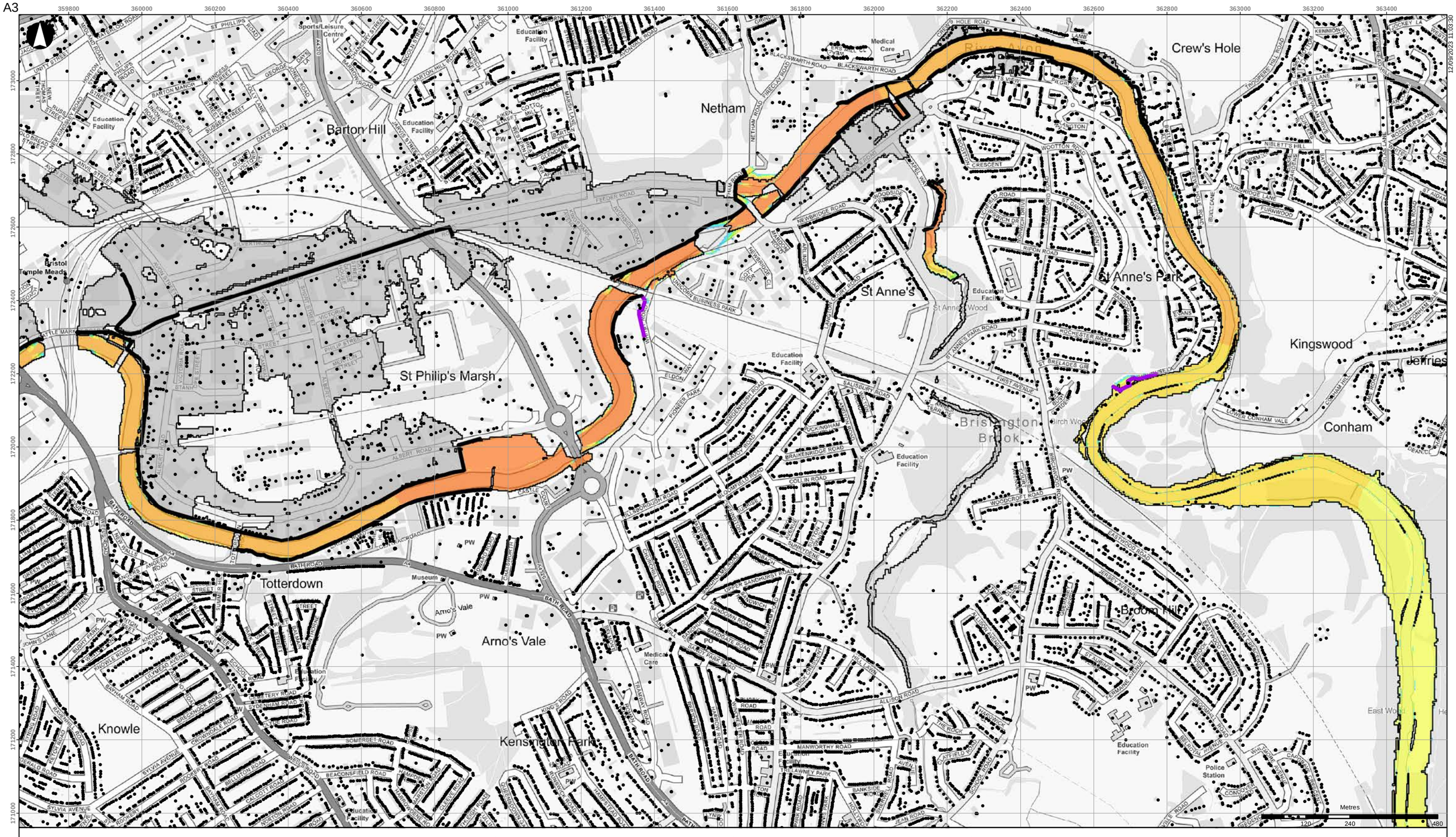
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**D1**

Name
**285982-ARP-XX-DR-MOD-218**

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 2 scheme impact**
**2130 fluvial 1:20yr event**
**Netham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

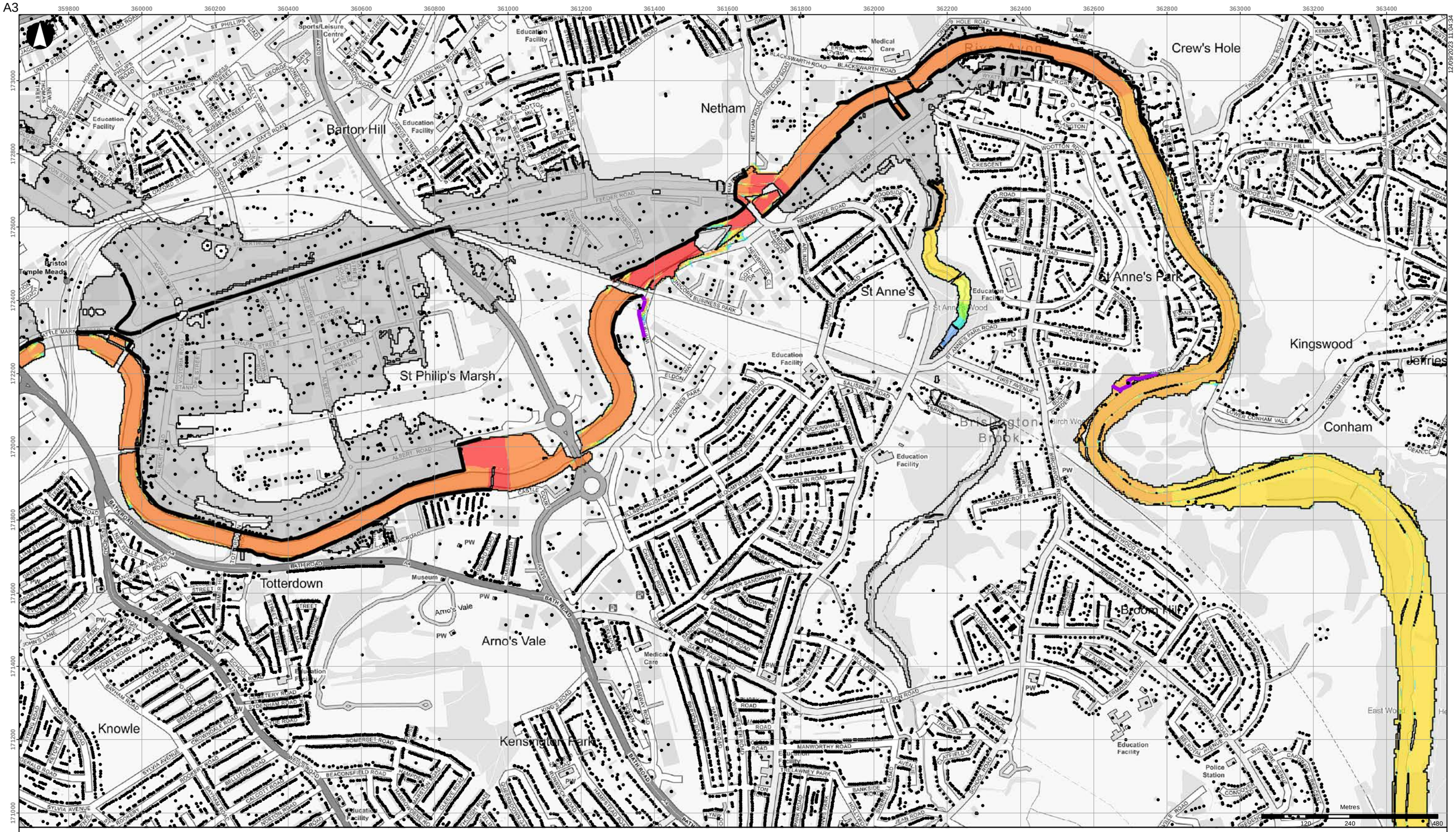
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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 2 scheme impact**
**2130 fluvial 1:75yr event**
**Netham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

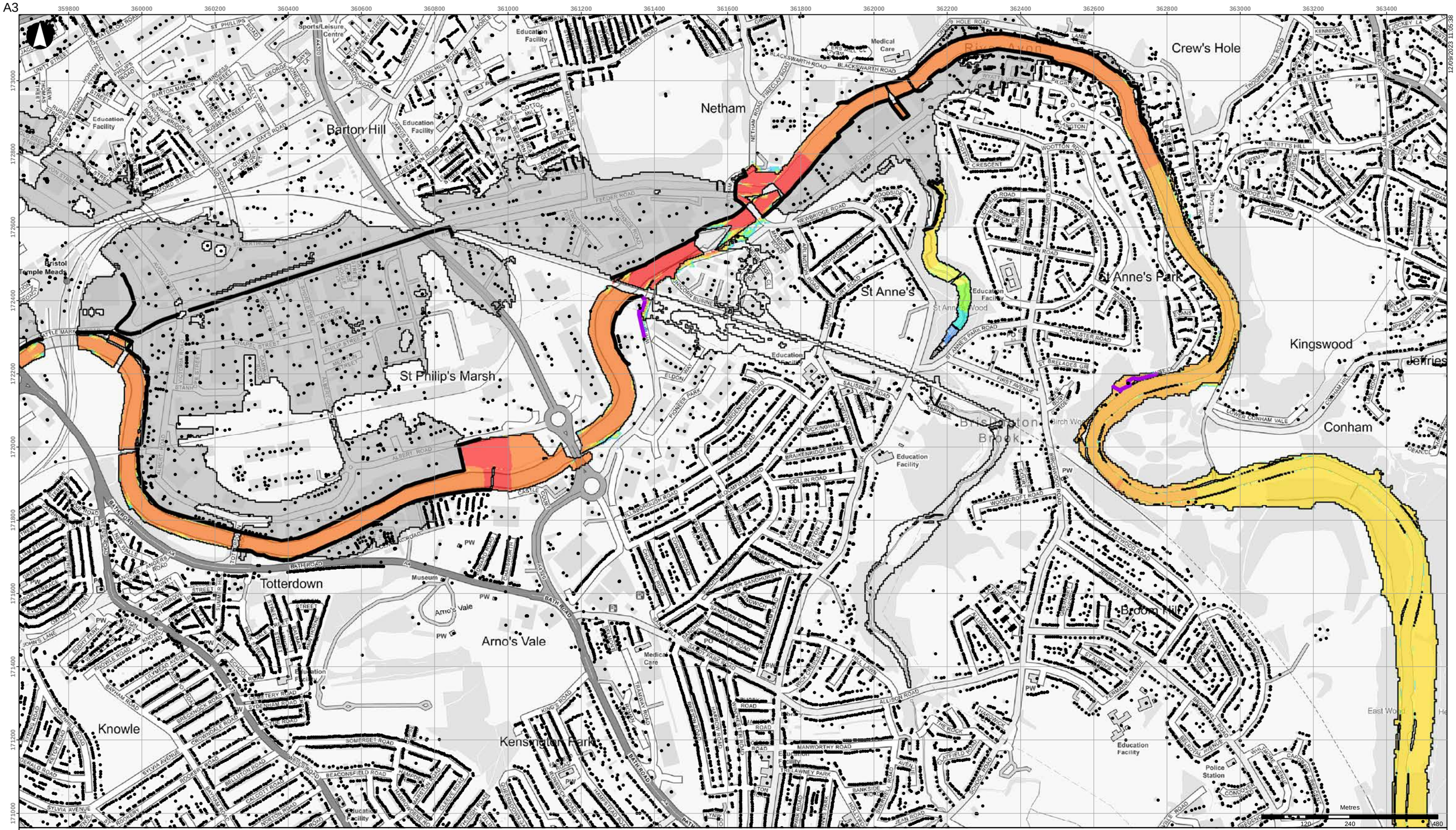
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-220**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

Contains OS data (C) Crown Copyright and database right 2023

Notes:

Based on the BAFS OBC model version v034_27.

| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2130 fluvial 1:100yr event**
**Netham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

**285982-ARP-XX-DR-MOD-221**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2130 fluvial 1:200yr event**
**Netham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

**285982-ARP-XX-DR-MOD-222**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

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Client

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Project Title

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Drawing Title

**Phase 2 scheme impact**
**2070 tidal 1:20yr event**
**Netham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

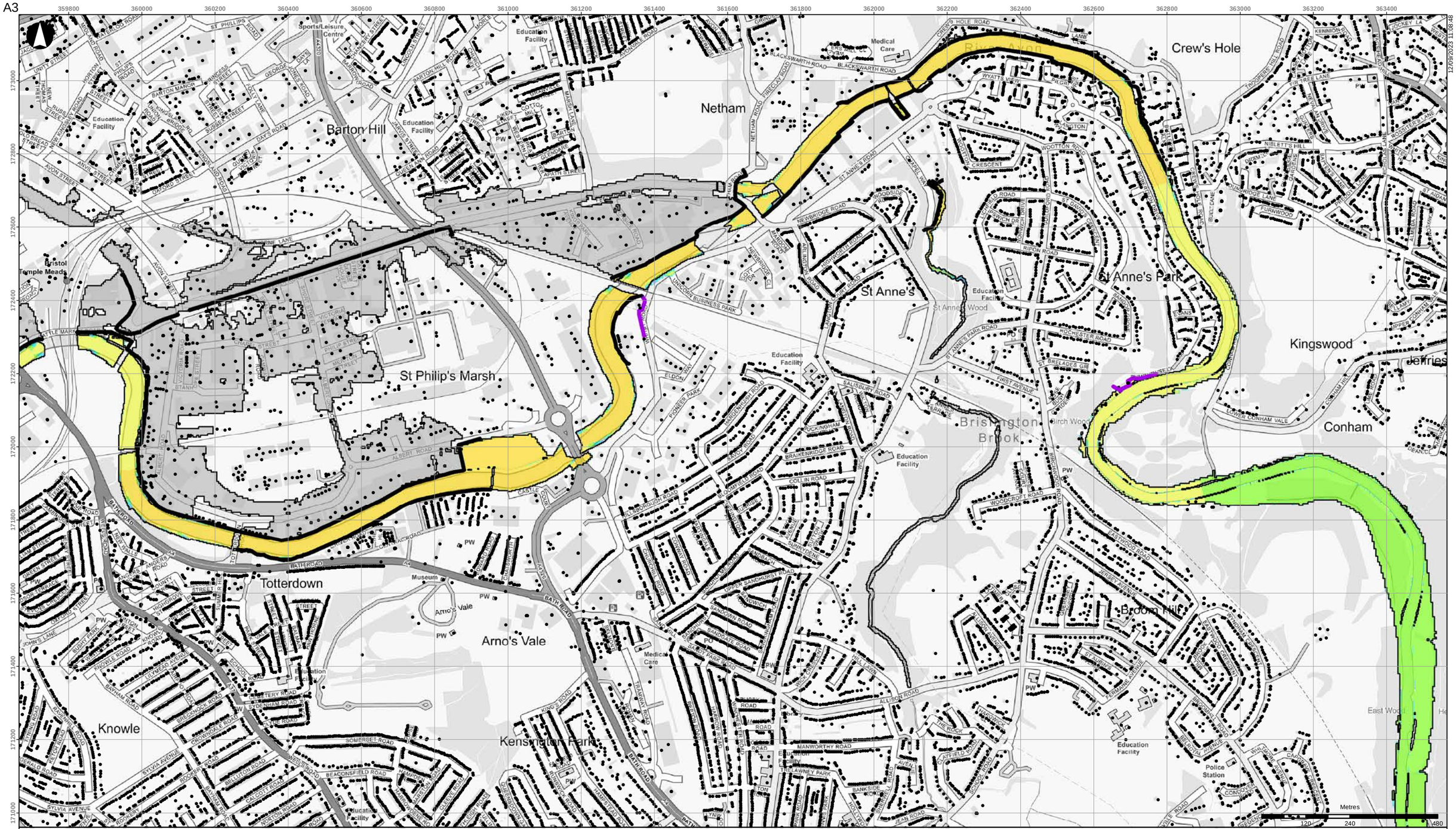
Name

**285982-ARP-XX-DR-MOD-223**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

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63 St Thomas Street
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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 2 scheme impact**
**2070 tidal 1:75yr event**
**Netham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

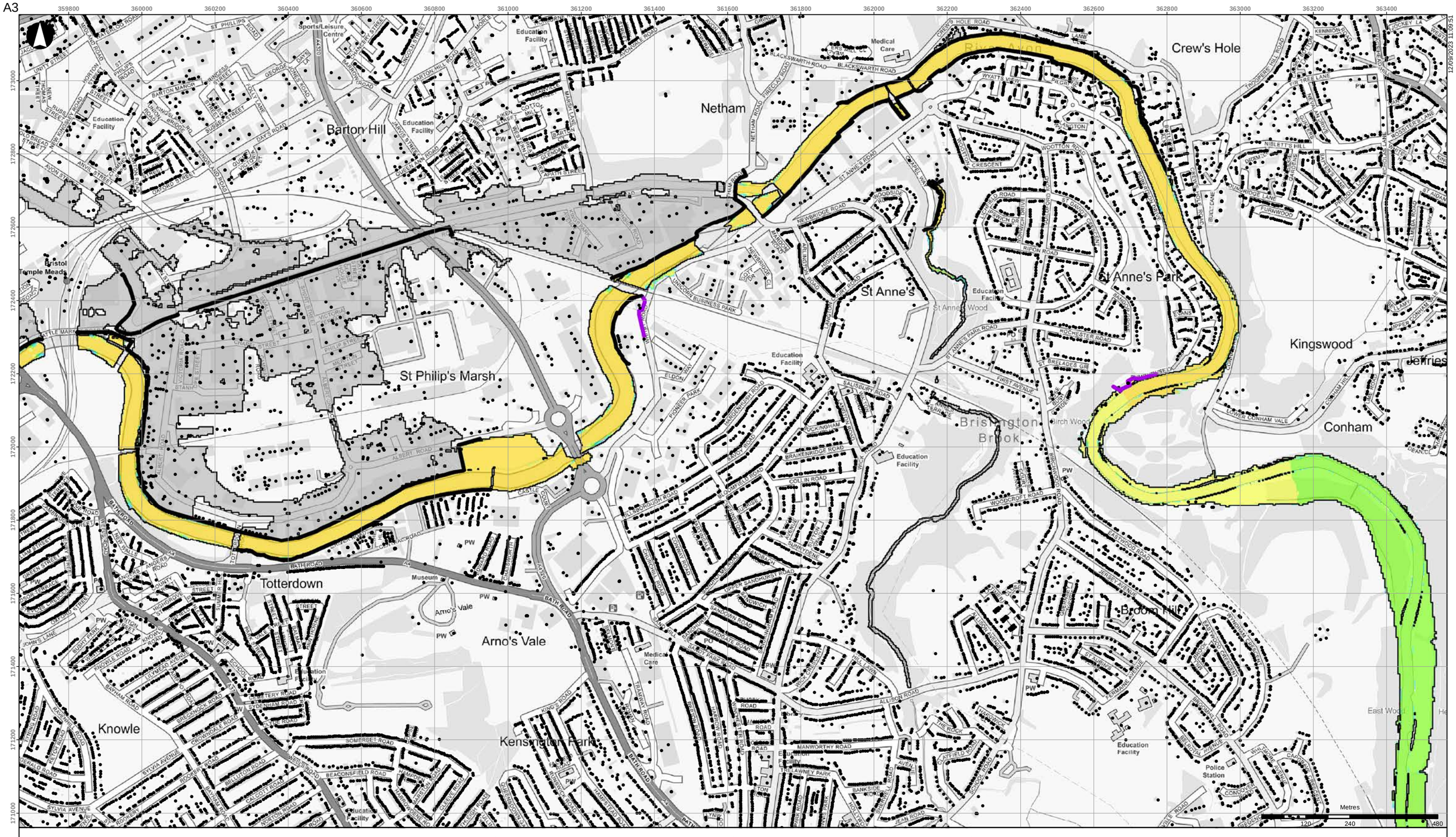
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-224**

\\global\europe\Bristol\Jobs\285xxx\285982-00\4.30_Drgs\2_GIS\04_Map Documents\WAT_Water\2023-09-12_Phase2_SchemeImpact_Rev0.mxd

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

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**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2070 tidal 1:100yr event**
**Netham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

**285982-ARP-XX-DR-MOD-225**

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A3

12/09/2023 11:10:55

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2070 tidal 1:200yr event**
**Netham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

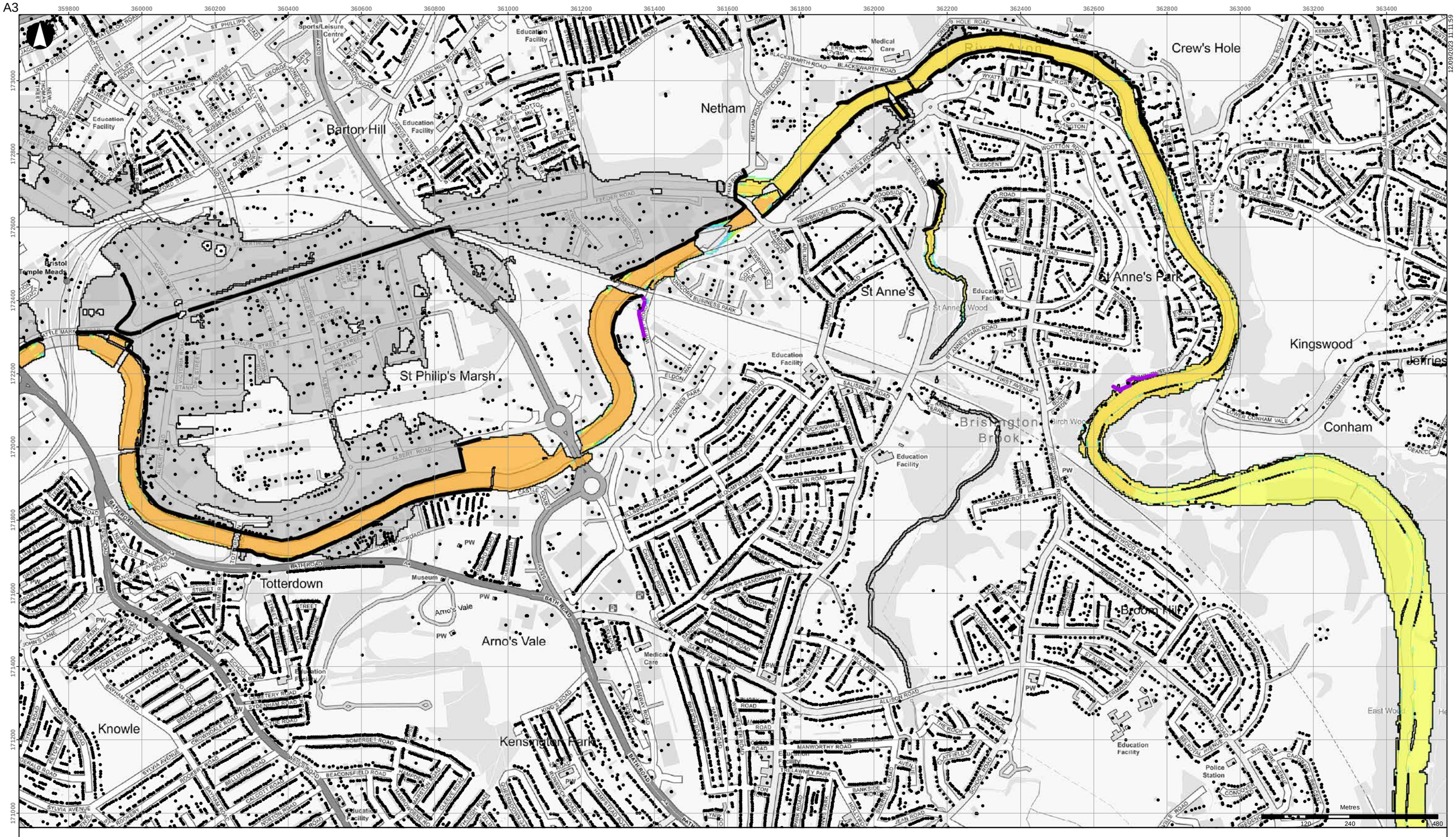
Name

**285982-ARP-XX-DR-MOD-226**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

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Client

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2130 tidal 1:20yr event**
**Netham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

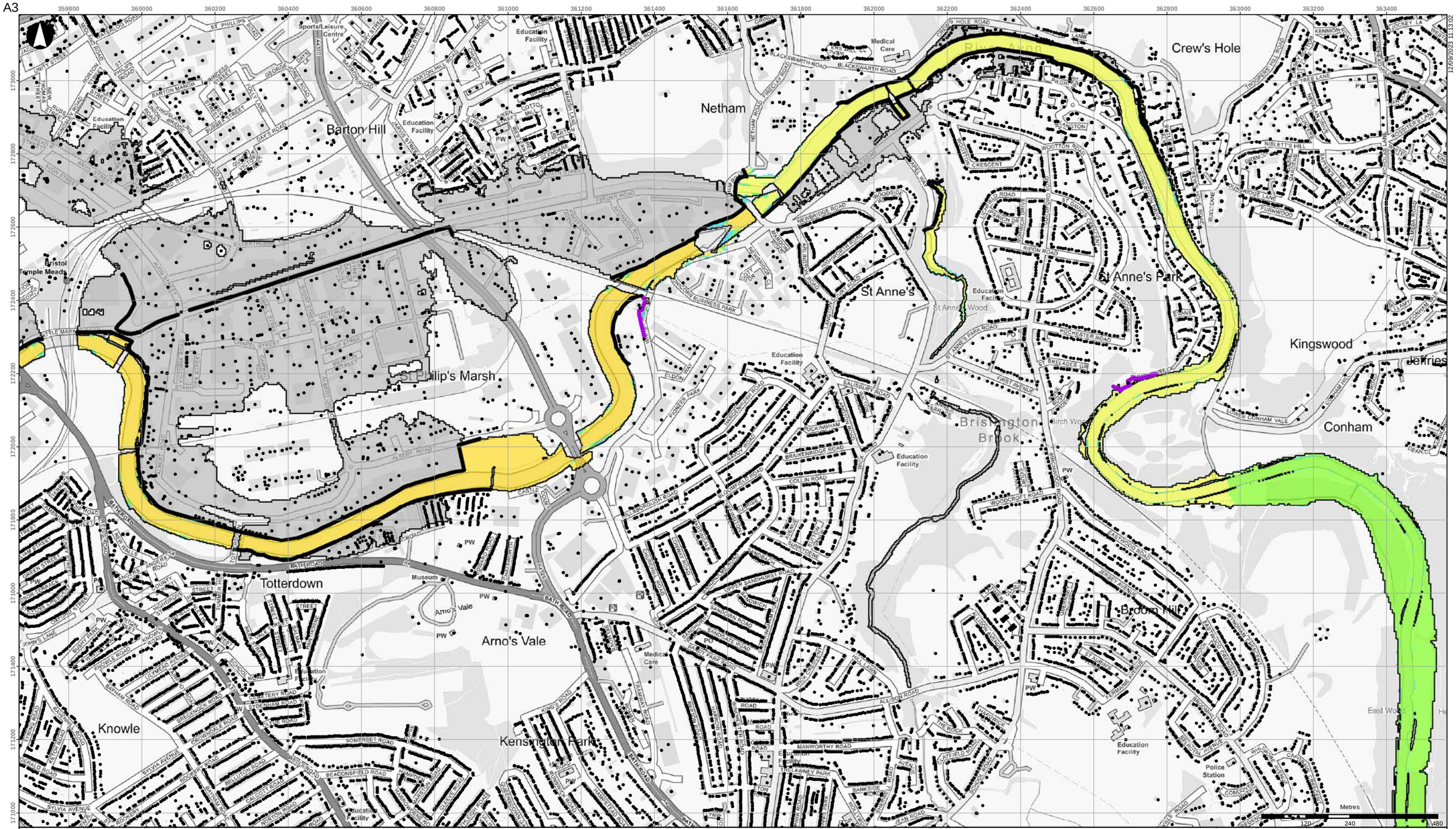
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12/09/2023 11:11:59

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

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Project Title

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Drawing Title

**Phase 2 scheme impact**
**2130 tidal 1:75yr event**
**Netham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

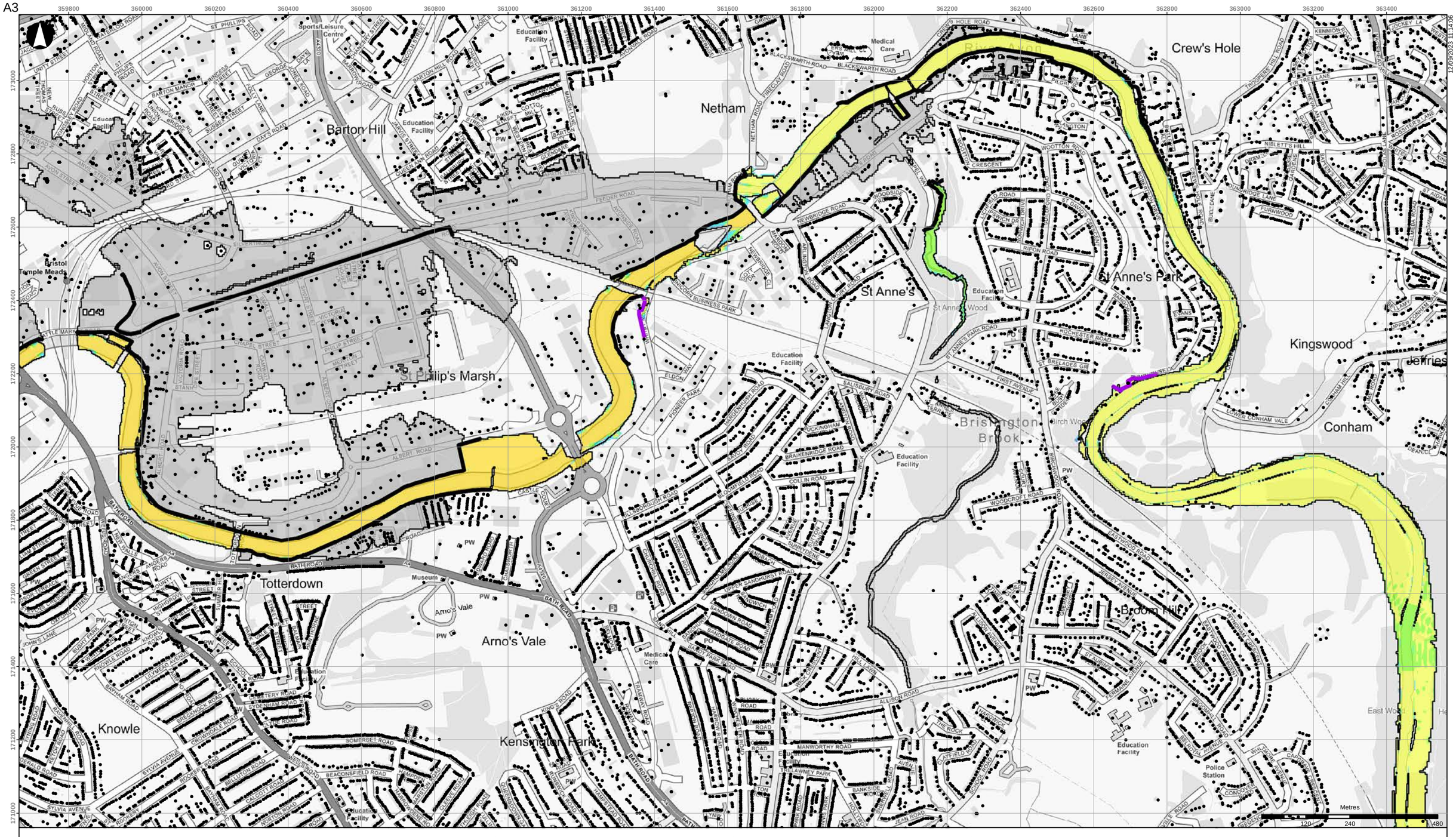
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12/09/2023 11:13:02

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
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Drawing Title

**Phase 2 scheme impact**
**2130 tidal 1:100yr event**
**Netham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

**285982-ARP-XX-DR-MOD-229**

12/09/2023 11:14:06

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12/09/2023 11:15:09

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Project Title

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Drawing Title

**Phase 2 scheme impact**
**2130 tidal 1:200yr event**
**Netham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

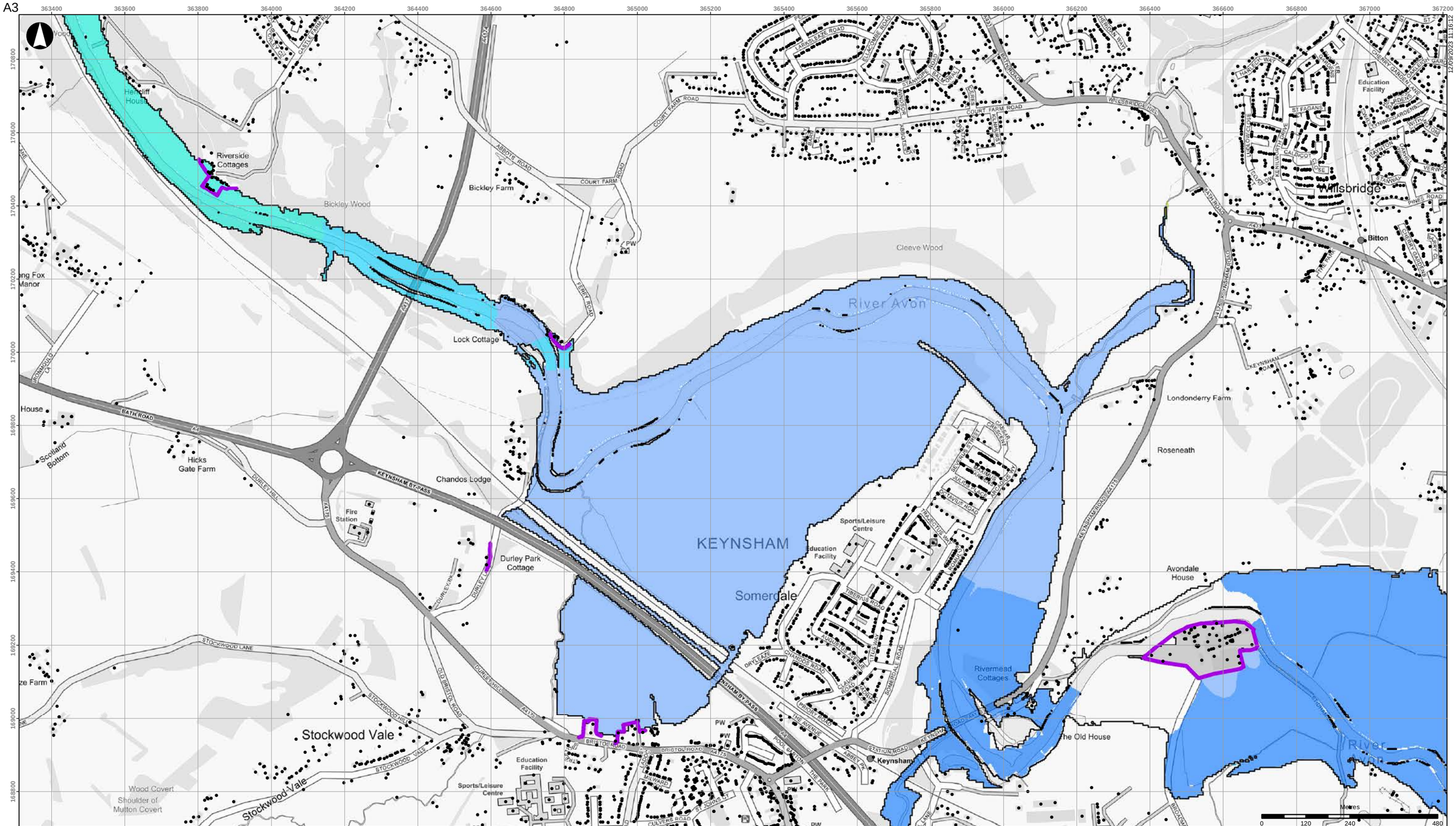
Name

**285982-ARP-XX-DR-MOD-230**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2070 fluvial 1:20yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

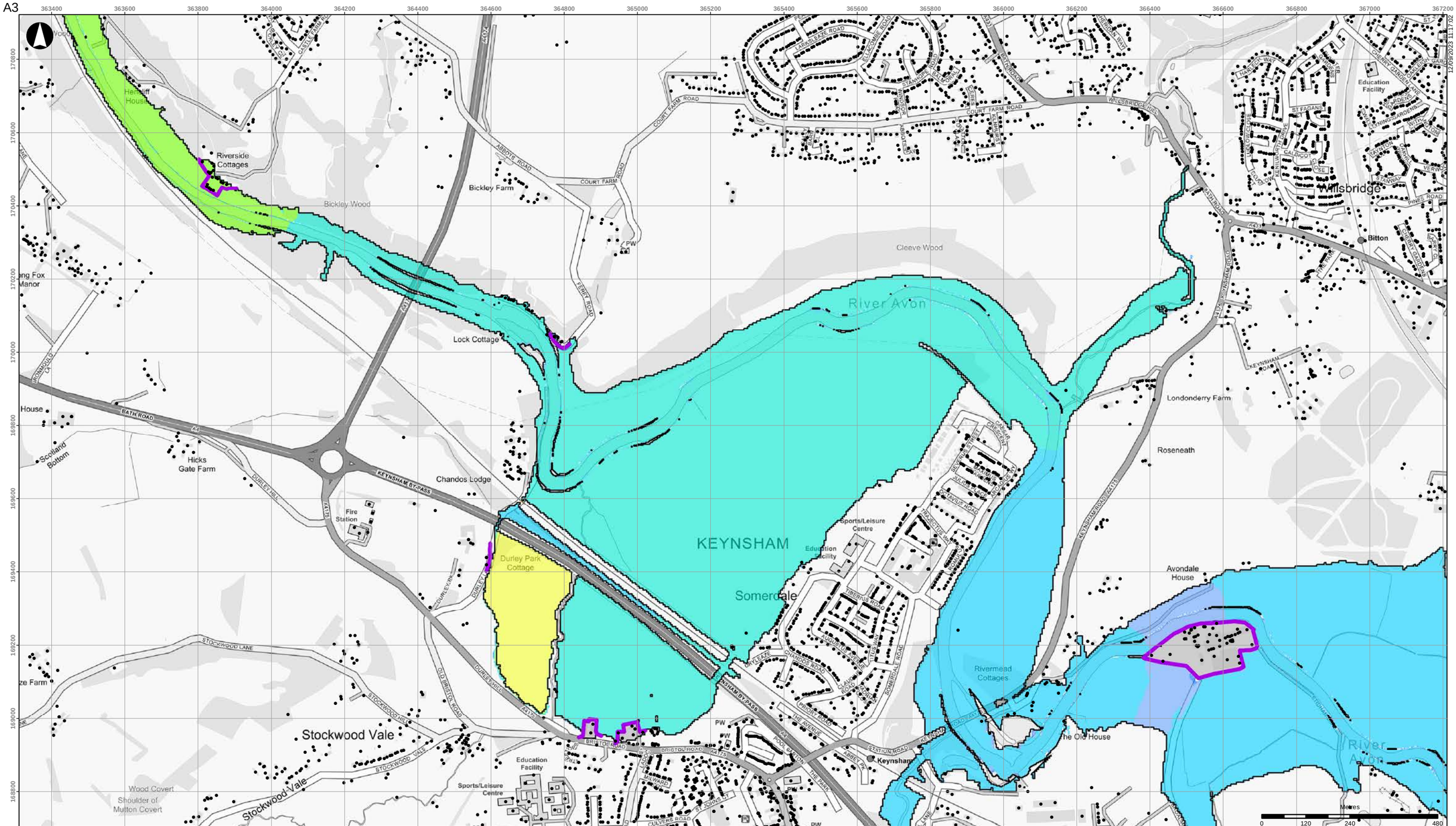
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12/09/2023 11:16:12

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2070 fluvial 1:75yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

**285982-ARP-XX-DR-MOD-232**

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363400 363600 363800 364000 364200 364400 364600 364800 365000 365200 365400 365600 365800 366000 366200 366400 366600 366800 367000 367200

170800 170600 170400 170200 170000 169800 169600 169400 169200 169000 168800

Riverside Cottages
Bickley Wood
Bickley Farm
Cleeve Wood
River Avon
Lock Cottage
KEYNSHAM
Somerdale
Chandos Lodge
Durley Park Cottage
Stockwood Vale
Wood Covert
Shoulder of Mutton Covert
Londonderry Farm
Roseneath
Avondale House
Rivermead Cottages
Wilsbridge
Bitton
Education Facility
Sports/Leisure Centre
Fire Station
Hicks Gate Farm
Scotland Bottom
Keynsham

Meters
0 120 240 480

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

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Client
**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 2 scheme impact**
**2070 fluvial 1:100yr event**
**Keynsham area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-233**

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2070 fluvial 1:200yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

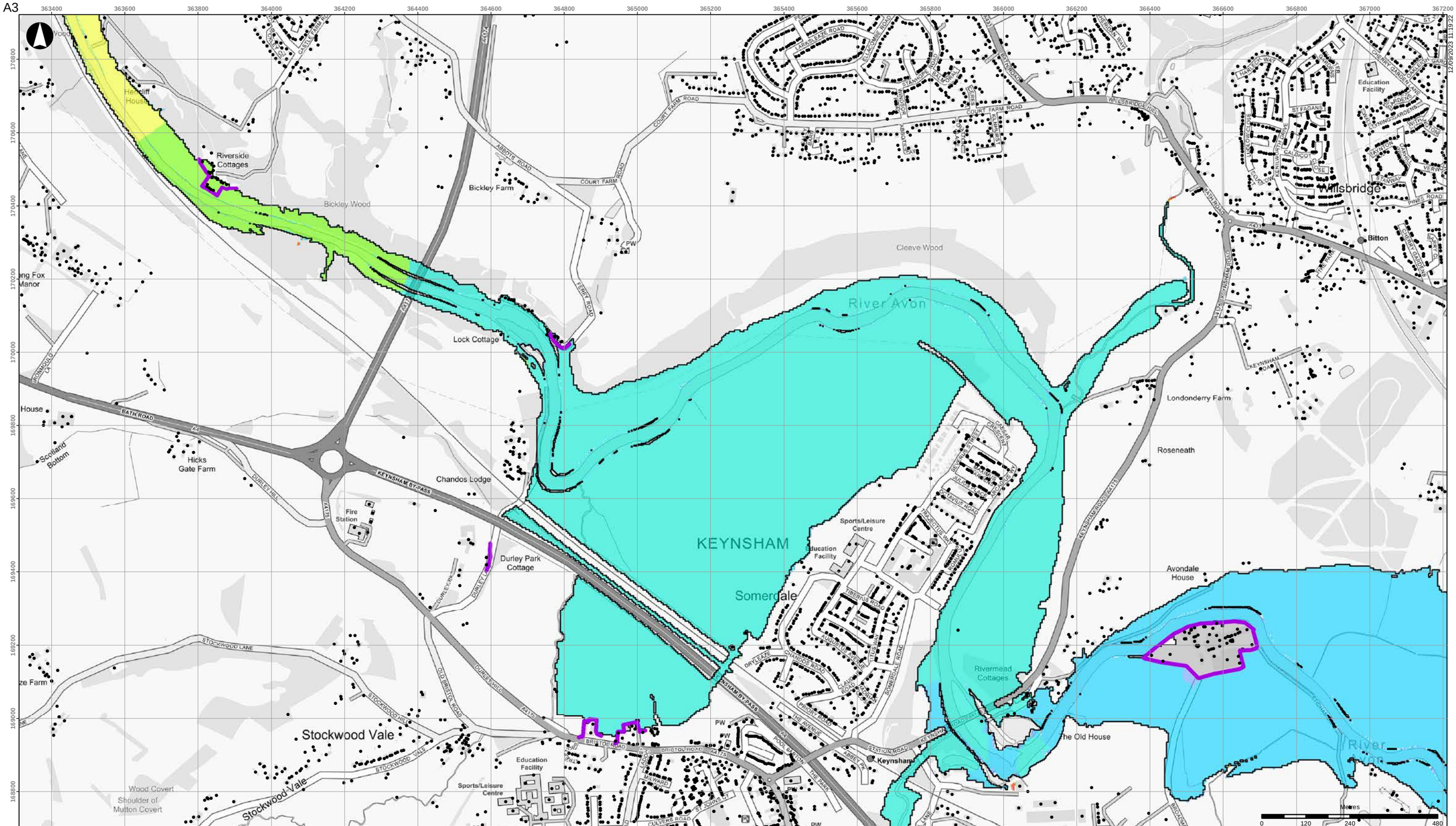
Name

**285982-ARP-XX-DR-MOD-234**

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

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**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2130 fluvial 1:20yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

| Arup Job No | Rev |
|---|---|
| **285982-00** | **D1** |

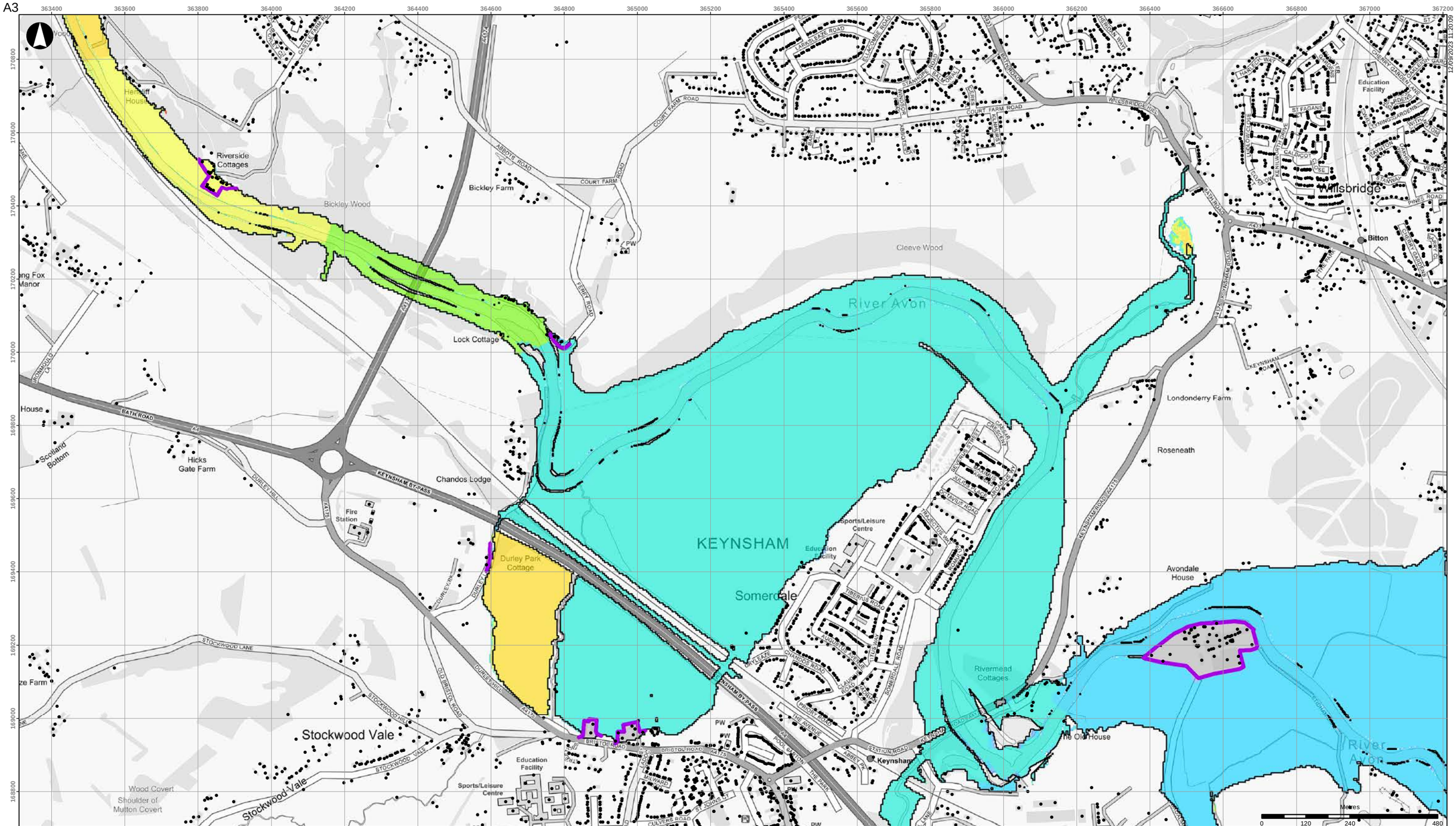
Name

**285982-ARP-XX-DR-MOD-235**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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Notes:

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| Rev | Date | By | Chkd | Appd |
|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

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Drawing Title

**Phase 2 scheme impact**
**2130 fluvial 1:75yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

**285982-ARP-XX-DR-MOD-236**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

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Project Title

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Drawing Title

**Phase 2 scheme impact**
**2130 fluvial 1:100yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

**285982-ARP-XX-DR-MOD-237**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| D1 | 2023-09-12 | DvdL | DvdL | PS |

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2130 fluvial 1:200yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

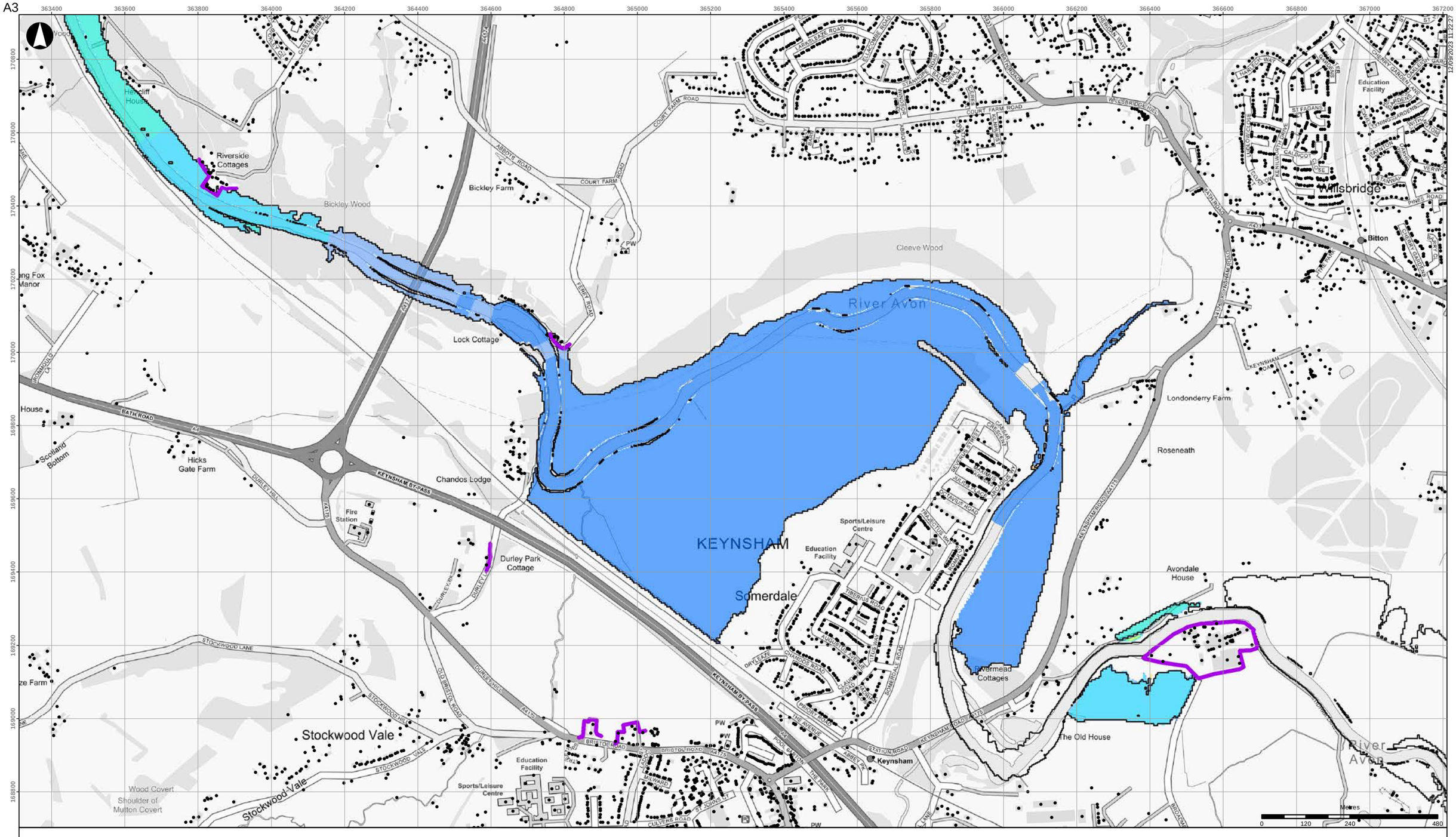
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**285982-ARP-XX-DR-MOD-238**

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Drawing Title

**Phase 2 scheme impact**
**2070 tidal 1:20yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

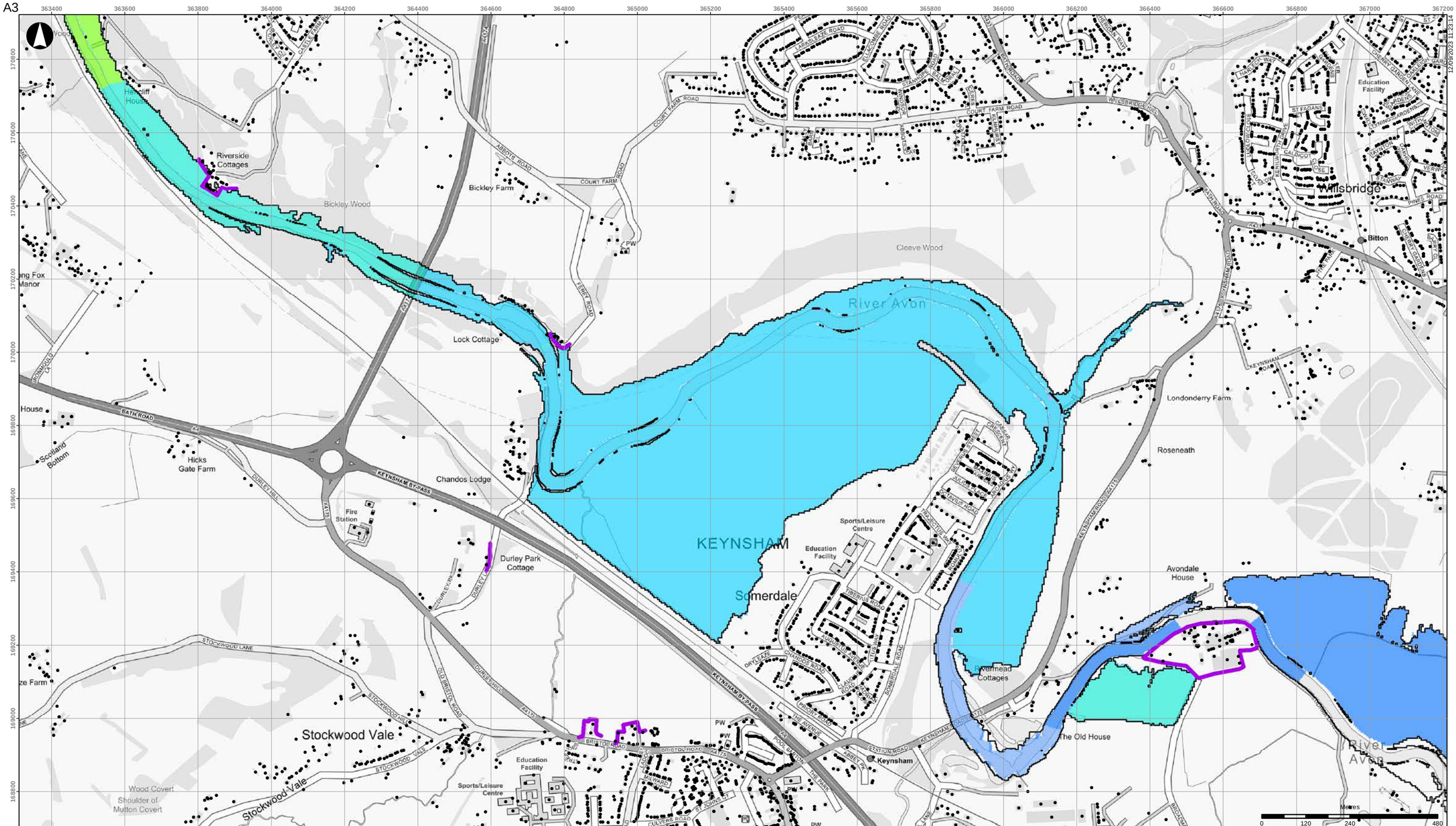
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**285982-ARP-XX-DR-MOD-239**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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**Phase 2 scheme impact**
**2070 tidal 1:75yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

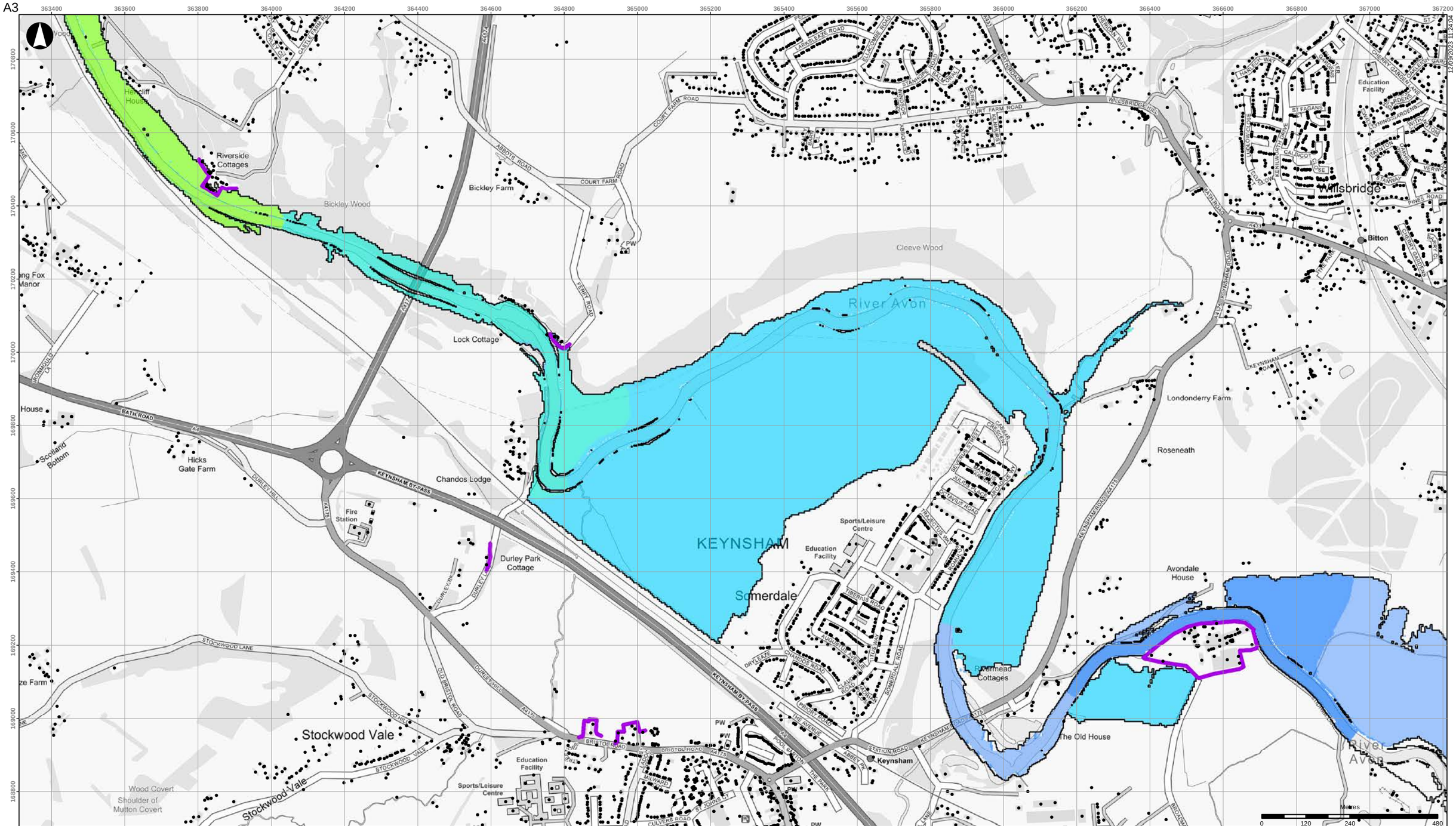
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**285982-ARP-XX-DR-MOD-240**

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**Phase 2 scheme impact**
**2070 tidal 1:100yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

| Arup Job No | Rev |
|---|---|
| **285982-00** | **D1** |

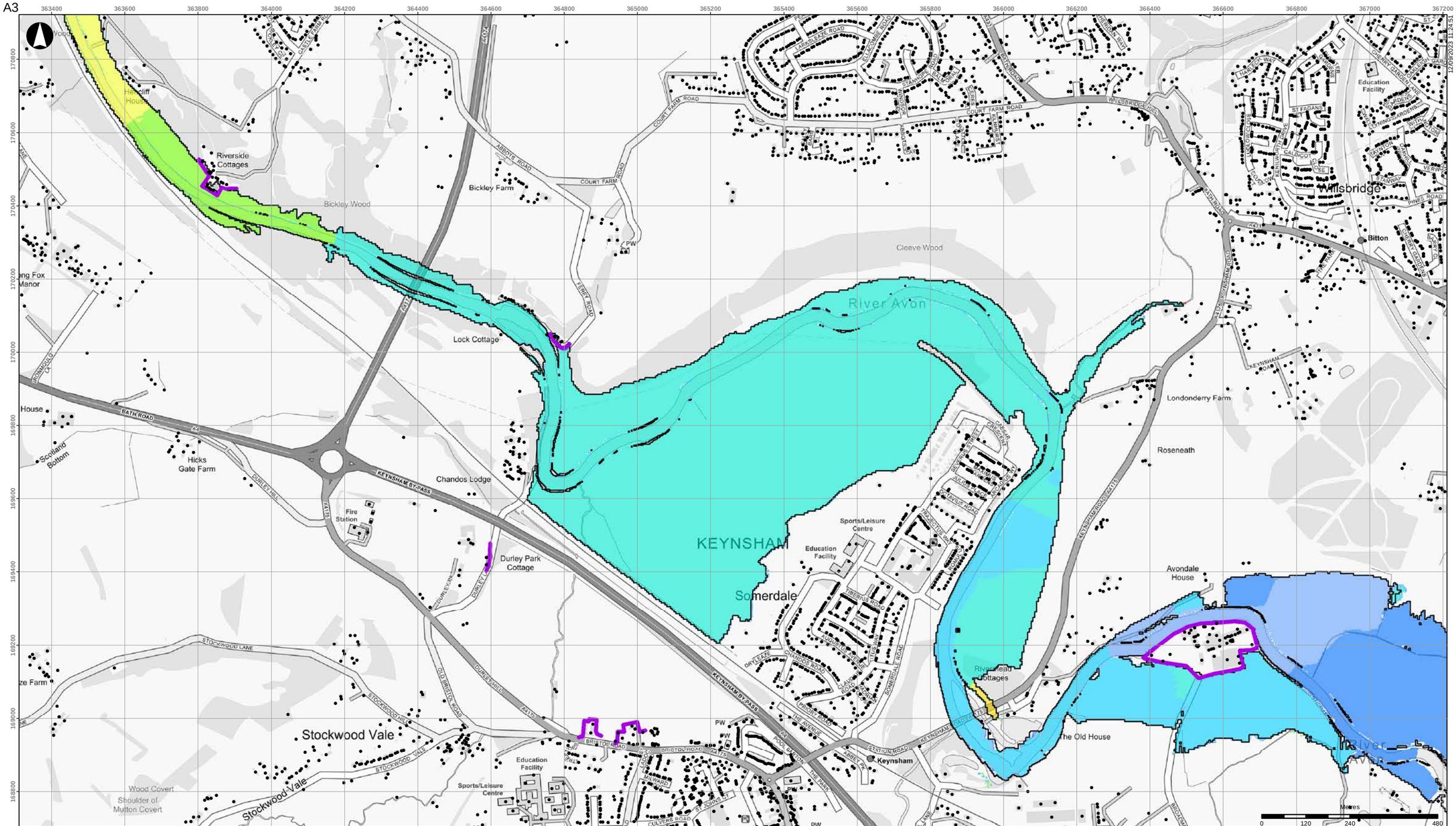
Name

**285982-ARP-XX-DR-MOD-241**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

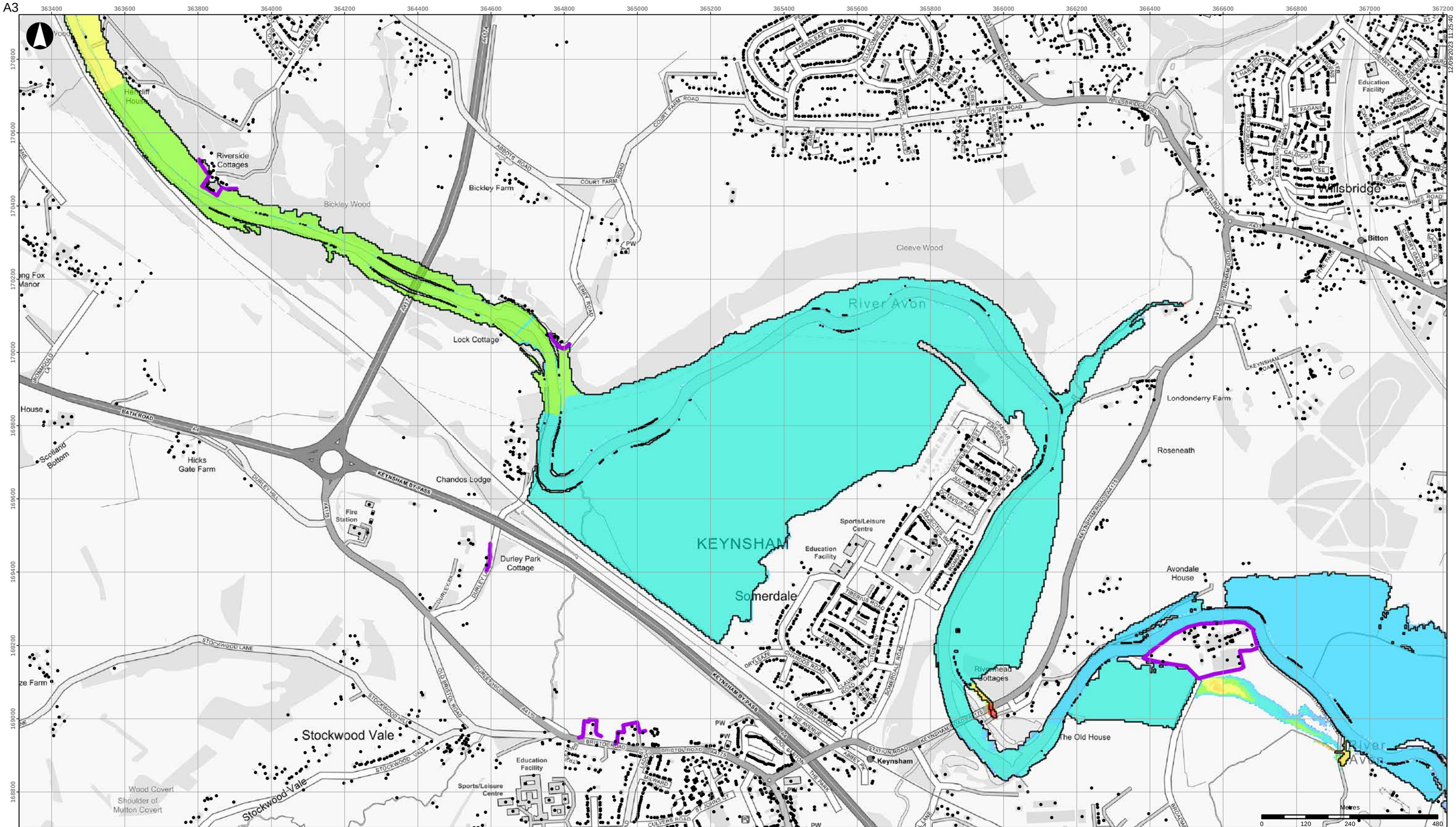
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**285982-ARP-XX-DR-MOD-242**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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**Phase 2 scheme impact**
**2130 tidal 1:20yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

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**D1**

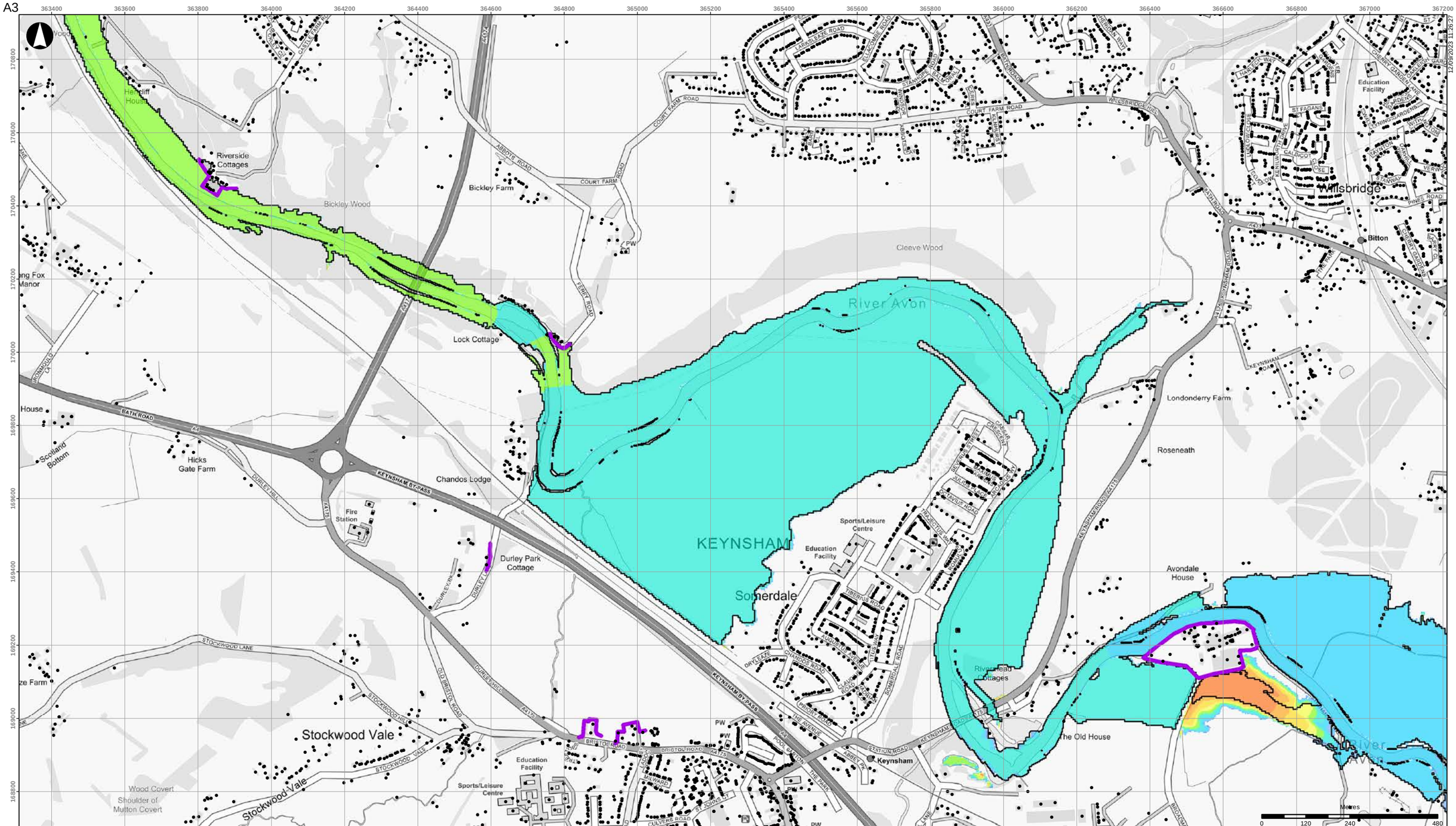
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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

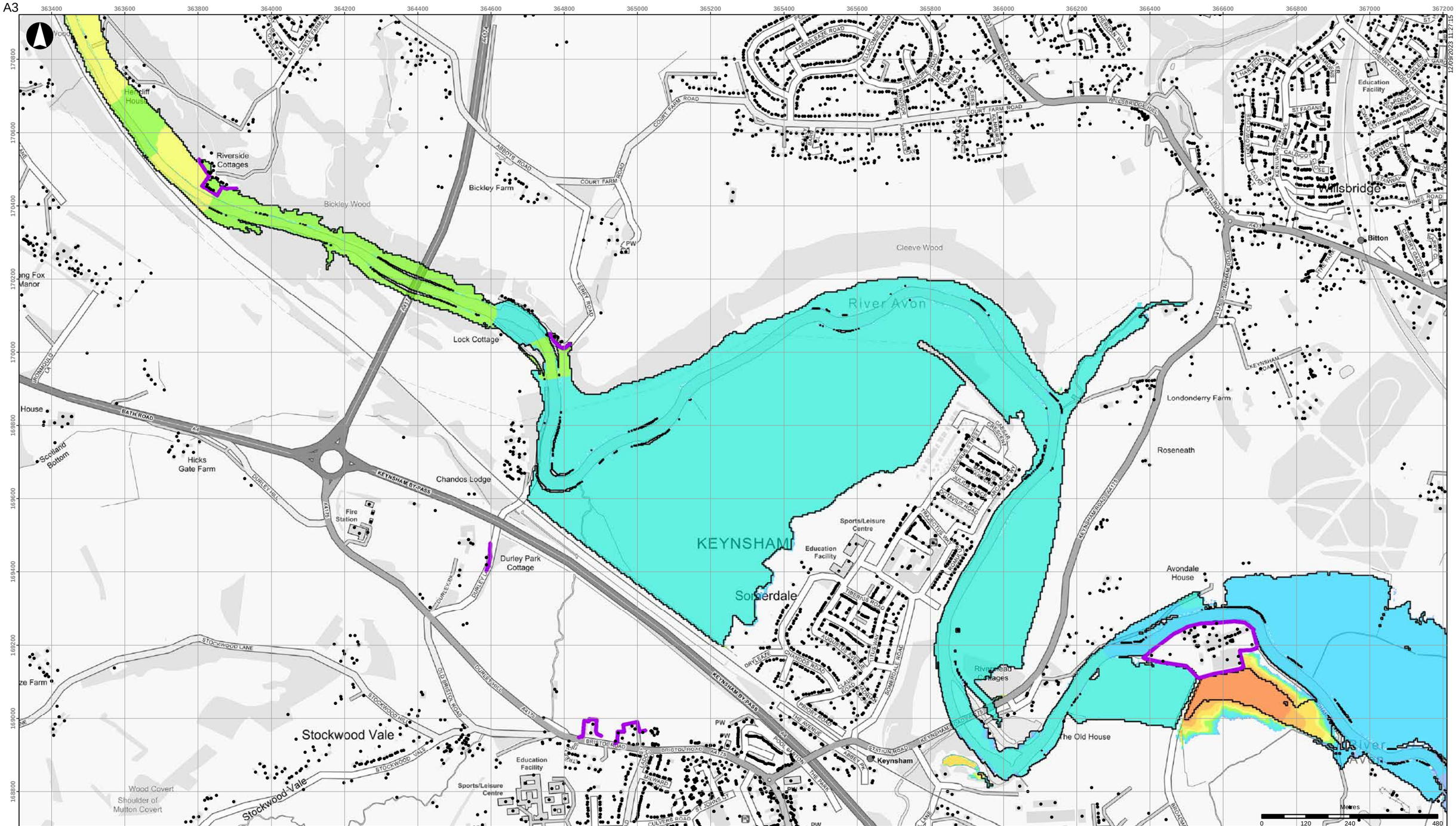
Name

**285982-ARP-XX-DR-MOD-244**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Project Title

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Drawing Title

**Phase 2 scheme impact**
**2130 tidal 1:100yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

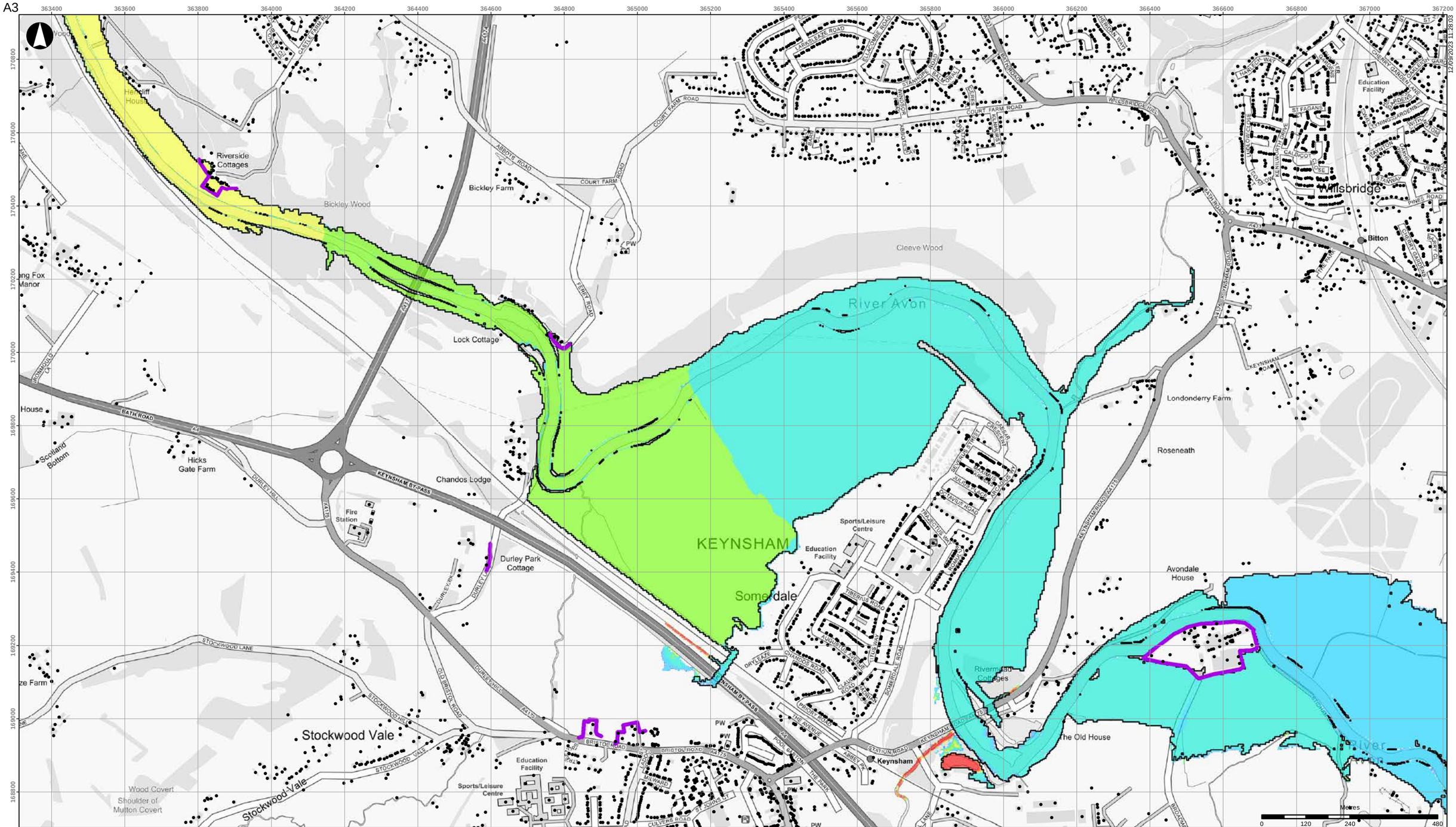
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**285982-ARP-XX-DR-MOD-245**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

| | |
|---|---|
| Betterment | 0.10 - 0.15 |
| Within +/-0.01m | 0.15 - 0.20 |
| 0.01 - 0.015 | 0.20 - 0.30 |
| 0.015 - 0.025 | 0.30 - 0.40 |
| 0.025 - 0.05 | 0.40 - 0.50 |
| 0.05 - 0.10 | > 0.50 |

Coordinate System: British National Grid

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Drawing Title

**Phase 2 scheme impact**
**2130 tidal 1:200yr event**
**Keynsham area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

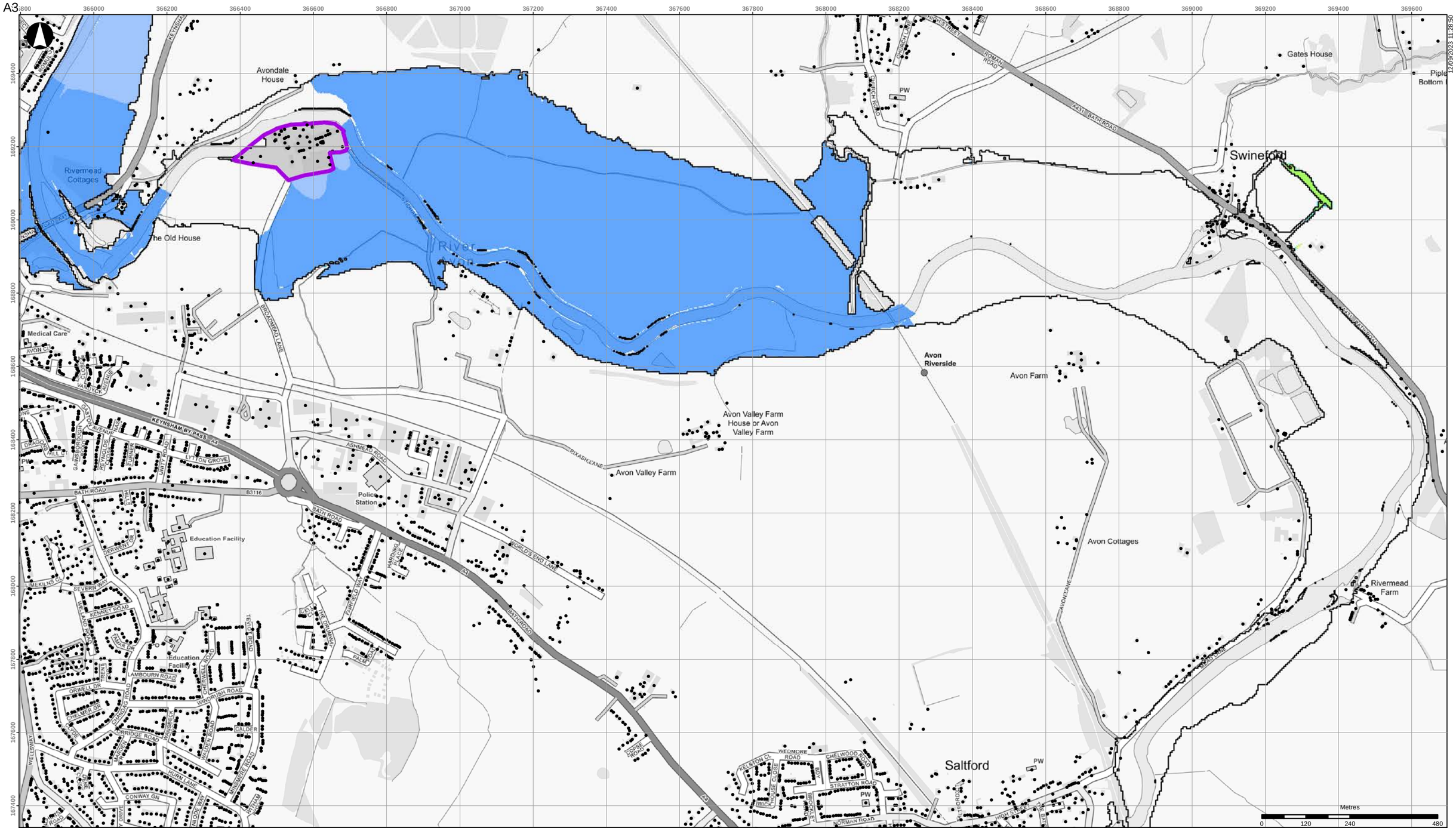
Name

**285982-ARP-XX-DR-MOD-246**

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- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2070 fluvial 1:20yr event**
**Swineford area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

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Rev

**D1**

Name

**285982-ARP-XX-DR-MOD-247**

12/09/2023 11:28:50

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A3

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Avondale House
Rivermead Cottages
The Old House
River Avon
Gates House
Swineford
Avon Riverside
Avon Farm
Avon Valley Farm House or Avon Valley Farm
Avon Valley Farm
Police Station
Education Facility
Education Facility
Avon Cottages
Rivermead Farm
Saltford
Medical Care
KEYNSHAM BY-PASS A4
BATH ROAD
B3116
A3
ROMAN ROAD
A431 BATH ROAD
RIXASH LANE
ASHMEAD ROAD
WORLD'S END LANE
HARDING PARK
FORRESTERS WAY
KEYNSHAM
SEVERN WAY
KENNET ROAD
AMBOURN ROAD
ORWELL DR
CHELMER DR
WINDRUSH ROAD
CHERWELL ROAD
CHRISTOW ROAD
HURN LANE
CONWAY GN
CALDER
WELLSWAY
WEDMORE ROAD
CHELWOOD ROAD
STRATTON ROAD
NORMAN ROAD
HIGH STREET
AVONLEAZE
AVONLANE
PW

Metres
0 120 240 480

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 2 scheme impact**
**2070 fluvial 1:75yr event**
**Swineford area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

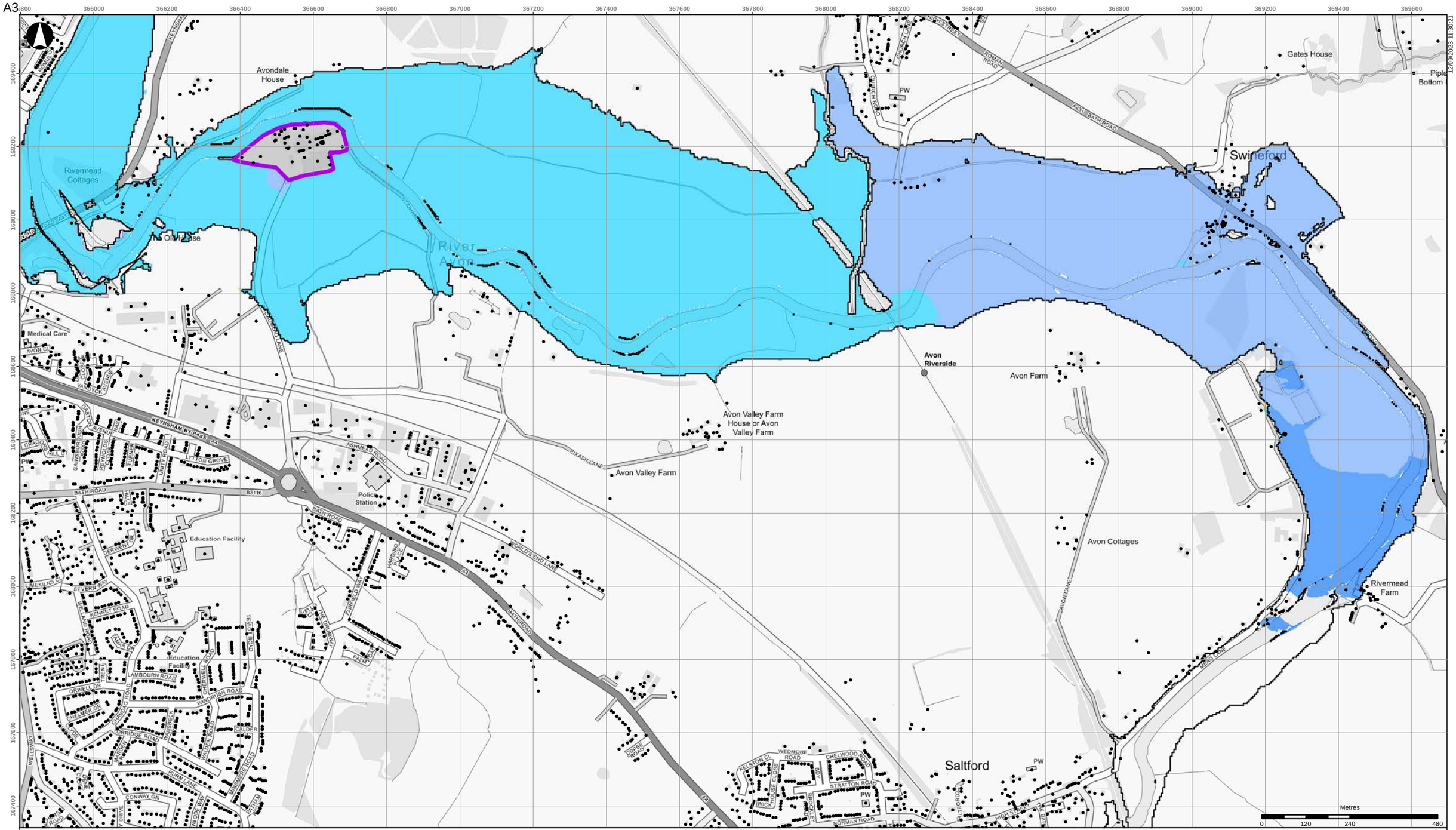
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-248**

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A3




12/09/2023 11:30:21

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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|---|---|---|---|---|
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Project Title

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Drawing Title

**Phase 2 scheme impact**
**2070 fluvial 1:100yr event**
**Swineford area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

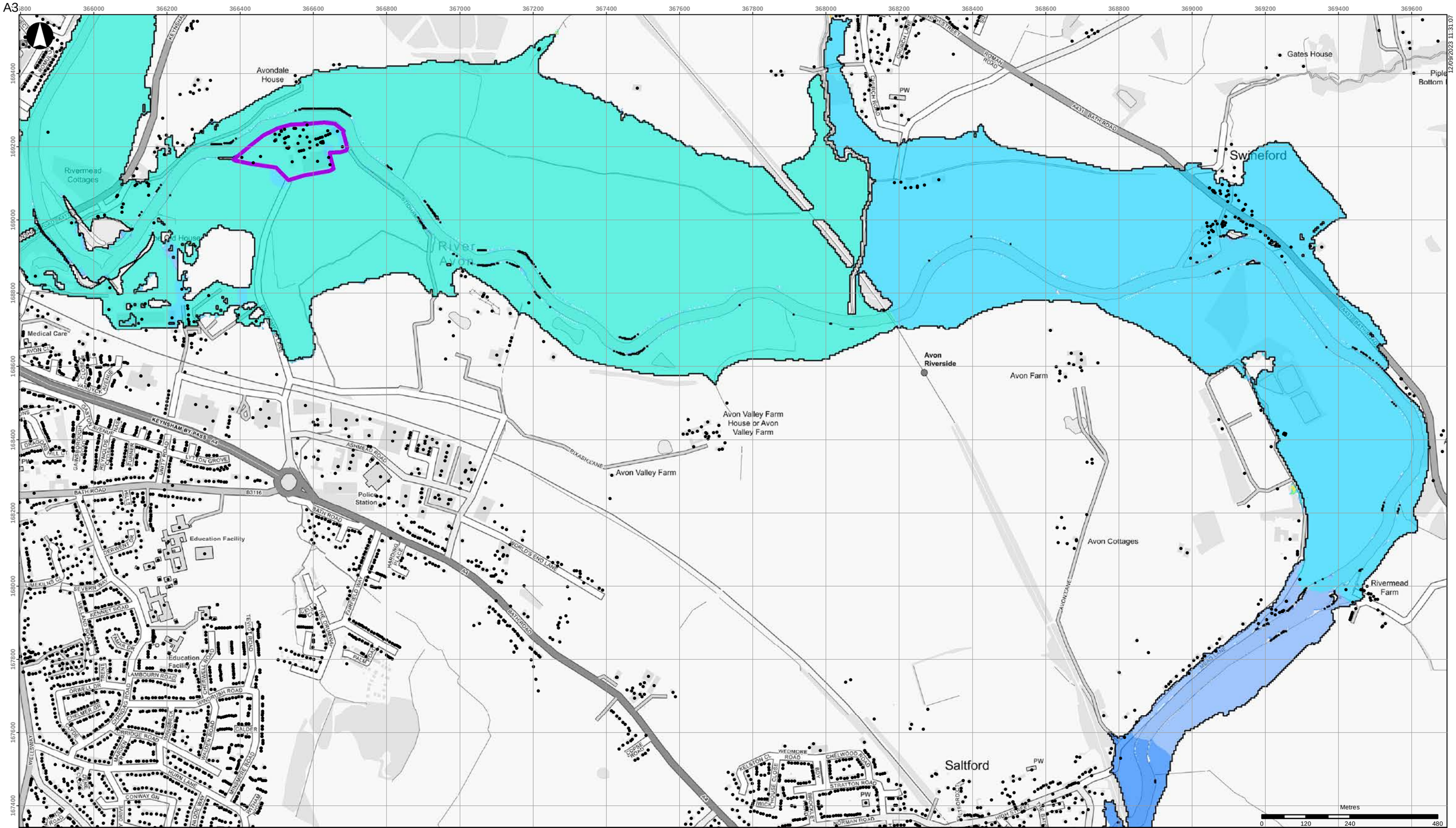
Name

**285982-ARP-XX-DR-MOD-249**

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2070 fluvial 1:200yr event**
**Swineford area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

**285982-ARP-XX-DR-MOD-250**

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A3

12/09/2023 11:31:52

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2130 fluvial 1:20yr event**
**Swineford area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

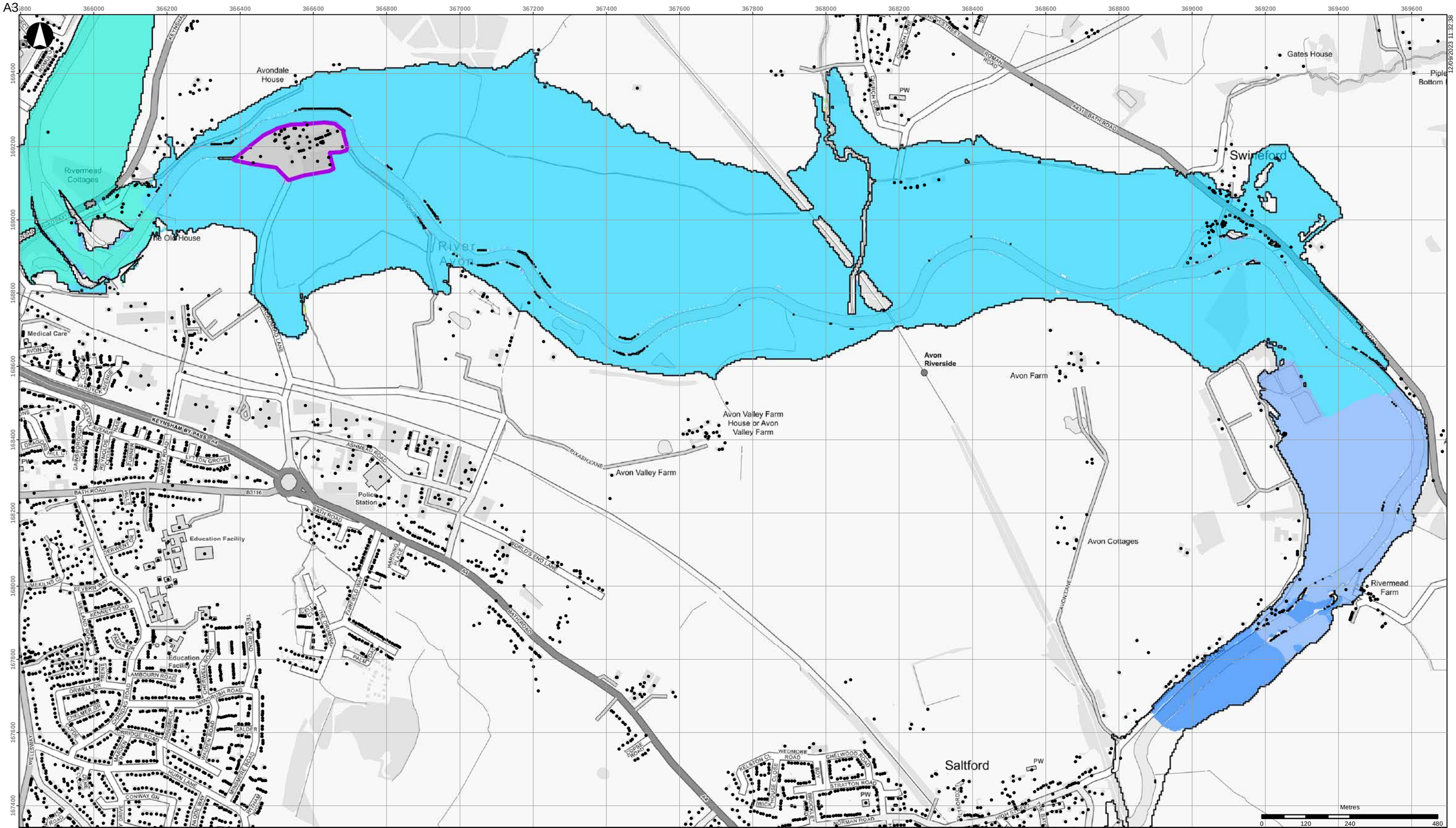
Name

**285982-ARP-XX-DR-MOD-251**

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

Based on the BAFS OBC model version v034_27.

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|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2130 fluvial 1:75yr event**
**Swineford area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

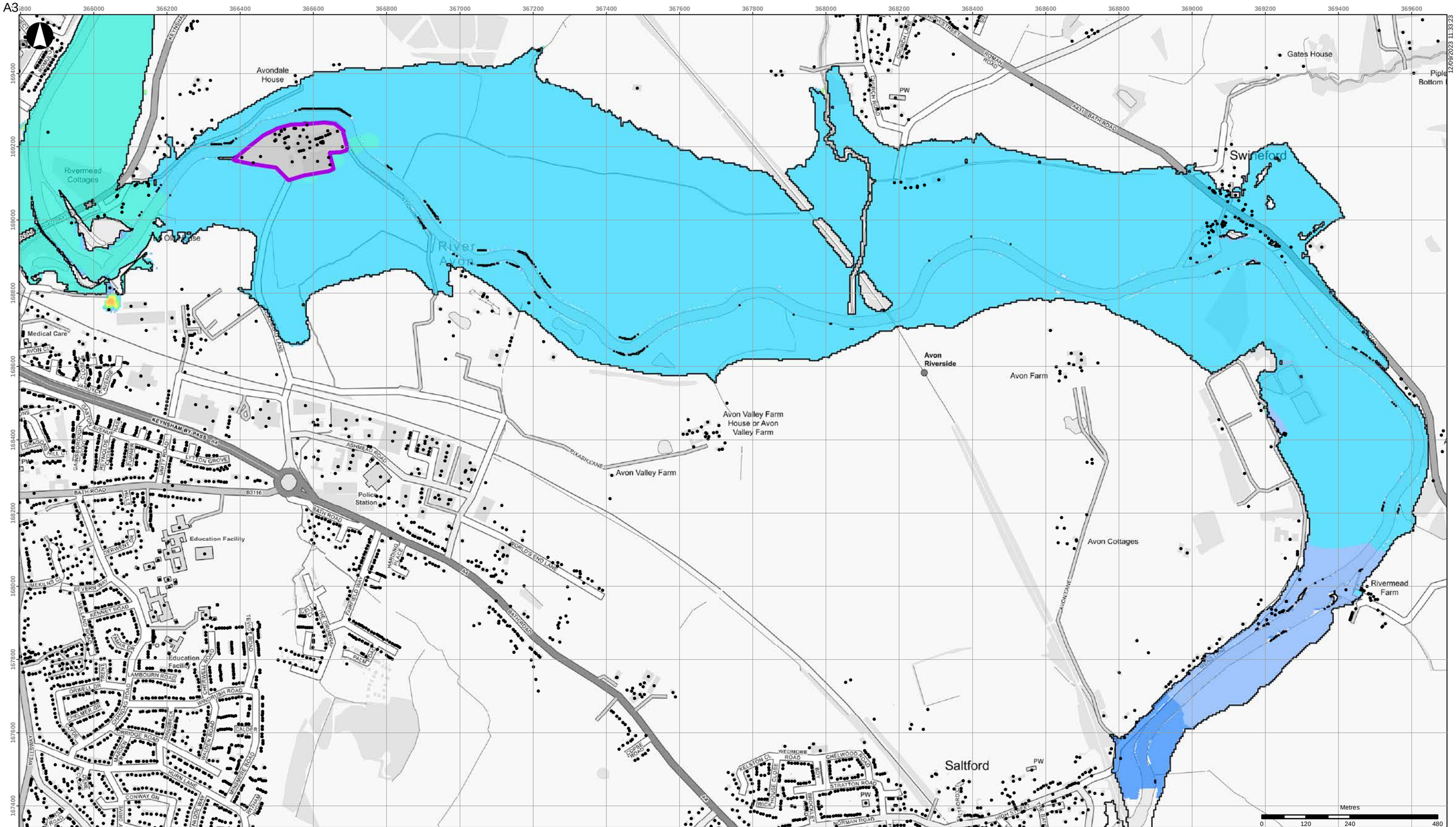
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A3




12/09/2023 11:33:23

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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Client

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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2130 fluvial 1:100yr event**
**Swineford area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

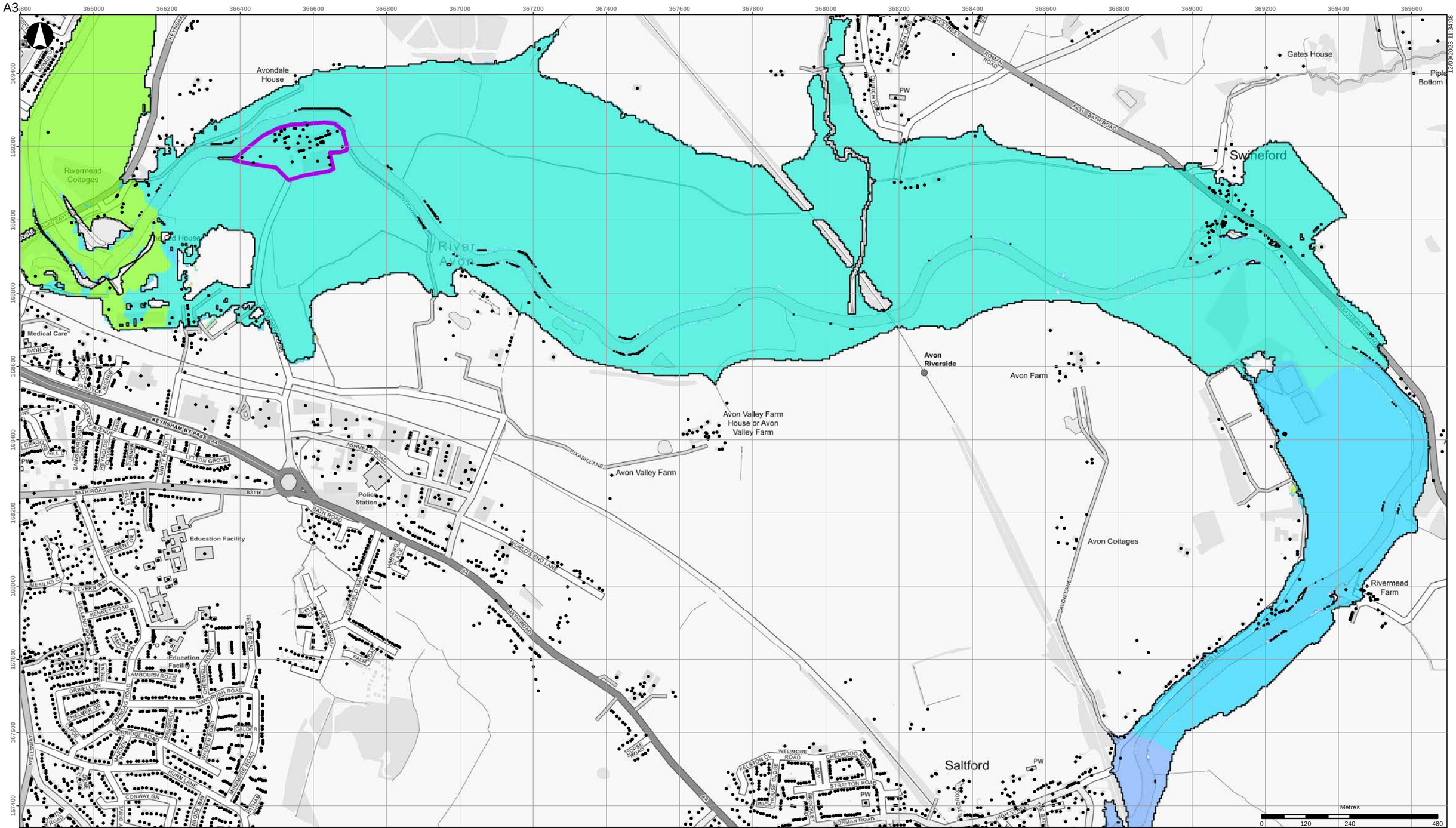
Name

**285982-ARP-XX-DR-MOD-253**

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A3




- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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| D1 | 2023-09-12 | DvdL | DvdL | PS |

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Project Title

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Drawing Title

**Phase 2 scheme impact**
**2130 fluvial 1:200yr event**
**Swineford area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

**285982-ARP-XX-DR-MOD-254**

12/09/2023 11:34:08

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Avondale House
Avermead Cottages
The Old House
River Avon
Gates House
Swineford
Avon Riverside
Avon Farm
Avon Valley Farm House or Avon Valley Farm
Avon Valley Farm
Avon Cottages
Rivermead Farm
Saltford
Police Station
Education Facility
Education Facility
Medical Care
KEYNSHAM BY-PASS A4
BATH ROAD
B3116
A431 BATH ROAD
A3
BROADMEAD LANE
PIXASH LANE
ASHMEAD ROAD
WORLD'S END LANE
ROMAN ROAD
AVON LANE
WEDMORE ROAD
CHELWOOD ROAD
STRATTON ROAD
NORMAN ROAD
HIGH STREET
KEYNSHAM ROAD A4175
PW

Metres
0 120 240 480

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

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**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 2 scheme impact**
**2070 tidal 1:20yr event**
**Swineford area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-255**

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A3

12/09/2023 11:35:39

Avondale House
Avonmead Cottages
The Old House
River Avon
Gates House
Swineford
Avon Riverside
Avon Farm
Avon Valley Farm House or Avon Valley Farm
Avon Valley Farm
Avon Cottages
Rivermead Farm
Saltford
Police Station
Education Facility
Education Facility
Medical Care
KEYNSHAM BY-PASS A4
BATH ROAD
B3116
A431 BATH ROAD
A3
BROADMEAD LANE
ASHMEAD ROAD
PIXASH LANE
WORLD'S END LANE
ROMAN ROAD
AVON LANE
WEDMORE ROAD
CHELWOOD ROAD
STRATTON ROAD
NORMAN ROAD
HIGH STREET
PW

Metres
0 120 240 480

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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|---|---|---|---|---|
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Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 2 scheme impact**
**2070 tidal 1:75yr event**
**Swineford area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-256**

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A3

12/09/2023 11:36:25

Avondale House
Rivermead Cottages
The Old House
River Avon
Gates House
Swineford
Avon Riverside
Avon Farm
Avon Valley Farm House or Avon Valley Farm
Avon Valley Farm
Avon Cottages
Rivermead Farm
Saltford
Police Station
Education Facility
Education Facility
Medical Care
PW
PW
PW
PW
Metres
0 120 240 480

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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|---|---|---|---|---|
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Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 2 scheme impact**
**2070 tidal 1:100yr event**
**Swineford area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

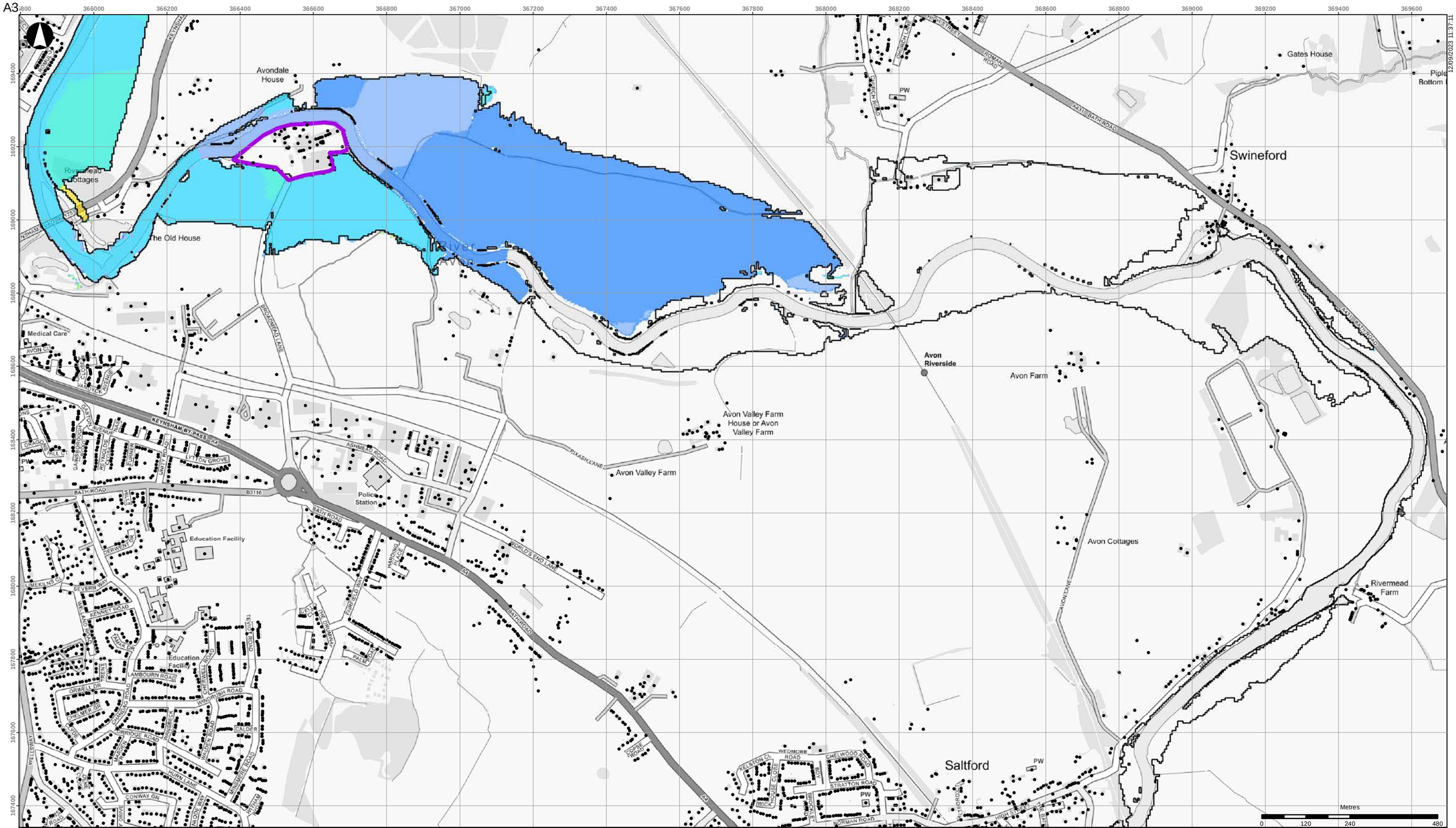
Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-257**

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A3




12/09/2023 11:37:11

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

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Project Title

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Drawing Title

**Phase 2 scheme impact**
**2070 tidal 1:200yr event**
**Swineford area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

**285982-ARP-XX-DR-MOD-258**

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A3

12/09/2023 11:37:56

Avondale House
Riverhead Cottages
The Old House
Gates House
Swineford
Avon Riverside
Avon Farm
Avon Valley Farm House or Avon Valley Farm
Avon Valley Farm
Avon Cottages
Rivermead Farm
Saltford
Police Station
Education Facility
Education Facility
Medical Care
PW
PW
PW
PW
River Avon
KEYNSHAM BY-PASS A4
BATH ROAD
B3116
A431 BATH ROAD
A3
BROADMEAD LANE
PIXASH LANE
ASHMEAD ROAD
WORLD'S END LANE
ROMAN ROAD
CHURCH ROAD
HIGH STREET
AVON LANE
LYTTON GROVE
KEYNSHAM
SOMERSET
Metres
0
120
240
480

| | |
|---|---|
| • | Buildings |
| ▬ | Scheme defences |
| ▬ | Detriment mitigation |
| ▭ | Baseline flood outline |

**Scheme impact (m)**

| | |
|---|---|
| | Betterment |
| | Within +/-0.01m |
| | 0.01 - 0.015 |
| | 0.015 - 0.025 |
| | 0.025 - 0.05 |
| | 0.05 - 0.10 |
| | 0.10 - 0.15 |
| | 0.15 - 0.20 |
| | 0.20 - 0.30 |
| | 0.30 - 0.40 |
| | 0.40 - 0.50 |
| | > 0.50 |

Coordinate System: British National Grid

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|---|---|---|---|---|
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**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 2 scheme impact**
**2130 tidal 1:20yr event**
**Swineford area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-259**

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12/09/2023 11:38:42

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

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|---|---|---|---|---|
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Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2130 tidal 1:75yr event**
**Swineford area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

**285982-ARP-XX-DR-MOD-260**

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12/09/2023 11:39:28

366000 366200 366400 366600 366800 367000 367200 367400 367600 367800 368000 368200 368400 368600 368800 369000 369200 369400 369600

169400 169200 169000 168800 168600 168400 168200 168000 167800 167600 167400

Avondale House
Riverhead Stages
The Old House
River Avon
Gates House
Swineford
PW
ROMAN ROAD
A431 BATH ROAD
Avon Riverside
Avon Farm
Avon Valley Farm House or Avon Valley Farm
Avon Valley Farm
PIXASH LANE
BROADMEAD LANE
Medical Care
KEYNSHAM BY-PASS A4
LYSTON GROVE
BATH ROAD
B3116
Police Station
ASHMEAD ROAD
Education Facility
WORLD'S END LANE
A3
BATH ROAD
Education Facility
Avon Cottages
AVON LANE
Rivermead Farm
Saltford
WEDMORE ROAD
CHELWOOD ROAD
STRATTON ROAD
NORMAN ROAD
HIGH STREET
PW

Metres
0 120 240 480

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

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**Bristol City Council**

Project Title
**Bristol Avon Flood Strategy OBC**

Drawing Title
**Phase 2 scheme impact**
**2130 tidal 1:100yr event**
**Swineford area**

Scale at A3
**1:10,000**

Role

Suitability
**Draft**

Arup Job No
**285982-00**

Rev
**D1**

Name
**285982-ARP-XX-DR-MOD-261**

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12/09/2023 11:40:14

- Buildings
- Scheme defences
- Detriment mitigation
- Baseline flood outline

**Scheme impact (m)**

- Betterment
- Within +/-0.01m
- 0.01 - 0.015
- 0.015 - 0.025
- 0.025 - 0.05
- 0.05 - 0.10
- 0.10 - 0.15
- 0.15 - 0.20
- 0.20 - 0.30
- 0.30 - 0.40
- 0.40 - 0.50
- > 0.50

Coordinate System: British National Grid

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Notes:

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|---|---|---|---|---|
| D1 | 2023-09-12 | DvdL | DvdL | PS |

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Client

**Bristol City Council**

Project Title

**Bristol Avon Flood Strategy OBC**

Drawing Title

**Phase 2 scheme impact**
**2130 tidal 1:200yr event**
**Swineford area**

Scale at A3

**1:10,000**

Role

Suitability

**Draft**

Arup Job No

**285982-00**

Rev

**D1**

Name

**285982-ARP-XX-DR-MOD-262**

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# Bristol Avon Flood Strategy OBC

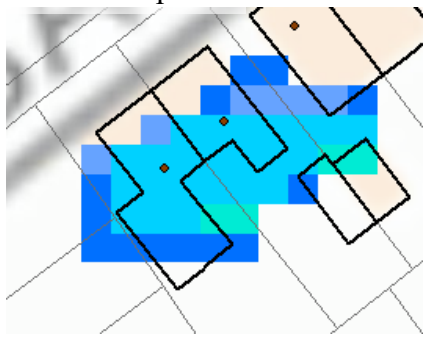
## Phase 1 Impact mapping

## Investigation of Ashton area impacts

11/09/2023

# 2030 Fluvial 100yr (1 of 2)

Scheme Impact



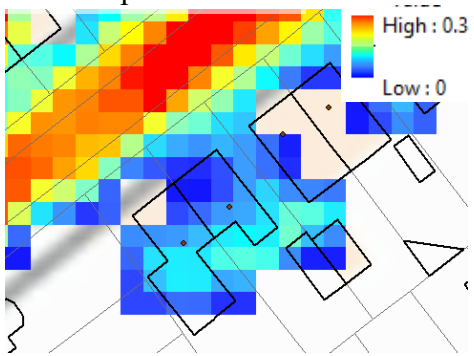
28mm detriment at 2 properties (approx 50% of property footprints > 25mm).

Max flood depth = 98mm

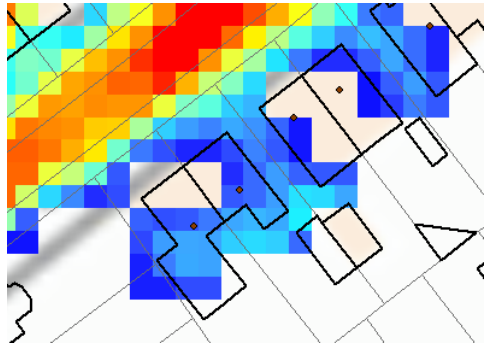
Likely due to anomaly in LIDAR – see below.

Streetview shows raised threshold at front of properties.

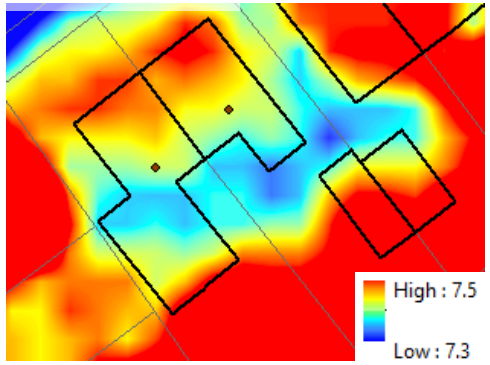
Flood depth - scheme



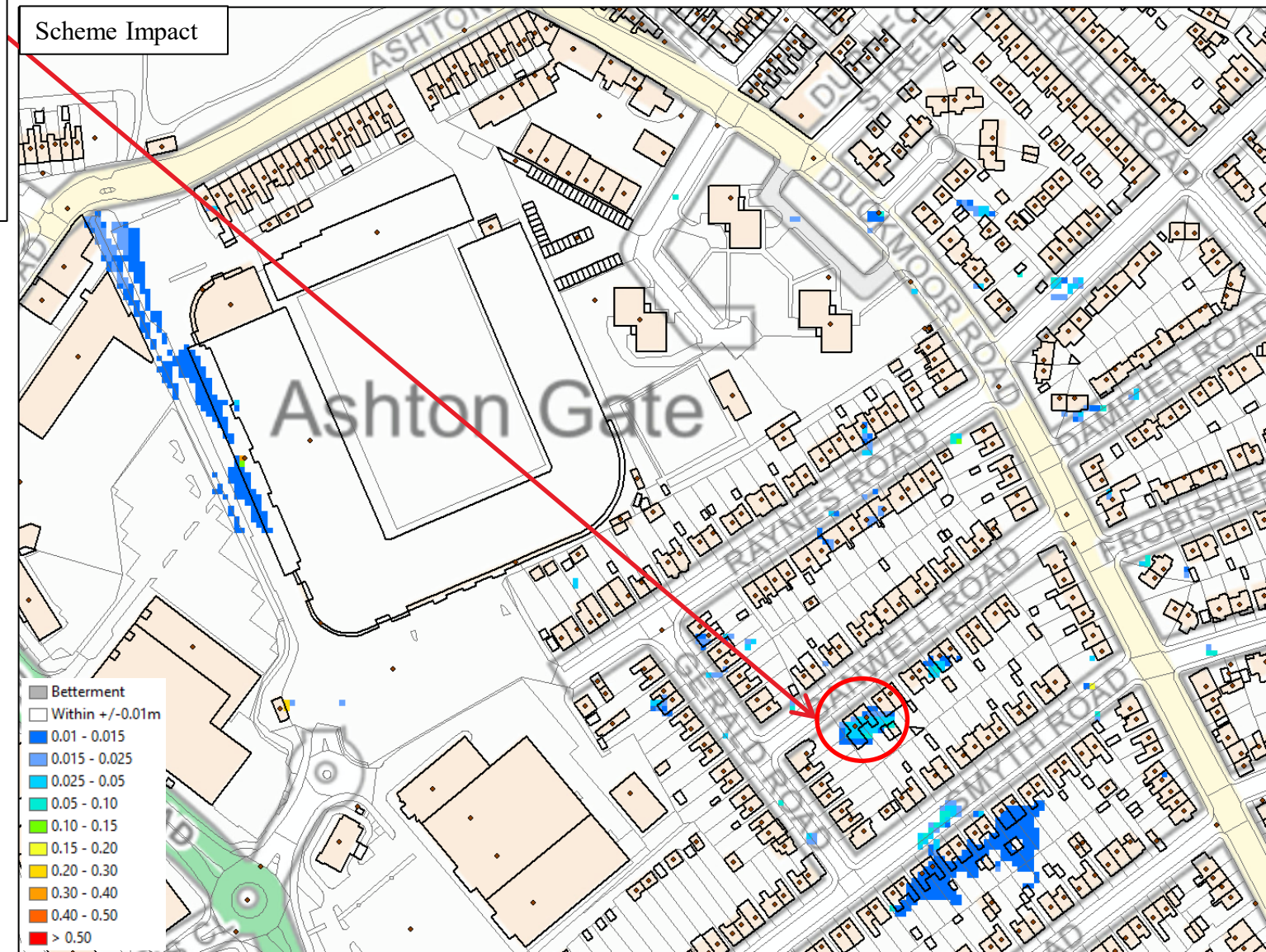

Flood depth - baseline



LIDAR

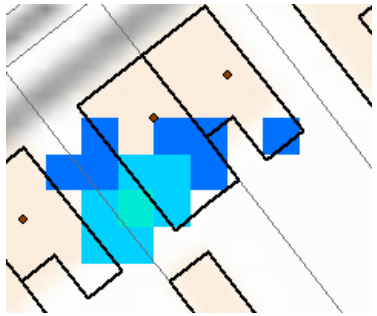



Scheme Impact



# 2030 Fluvial 100yr (2 of 2)

Scheme Impact

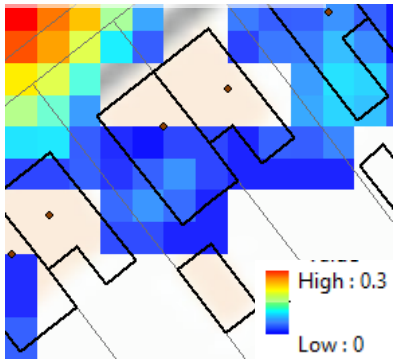


35mm detriment at 1 grid cell at 1 property (approx 25% of property footprint > 25mm).

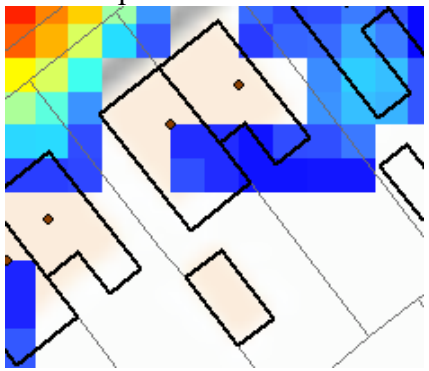
Max flood depth = 56mm

Likely due to anomaly in LIDAR – see below.

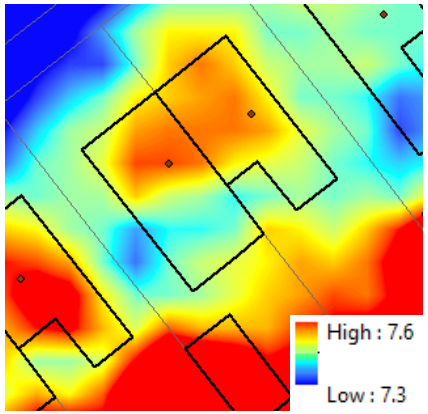
Flood depth - scheme



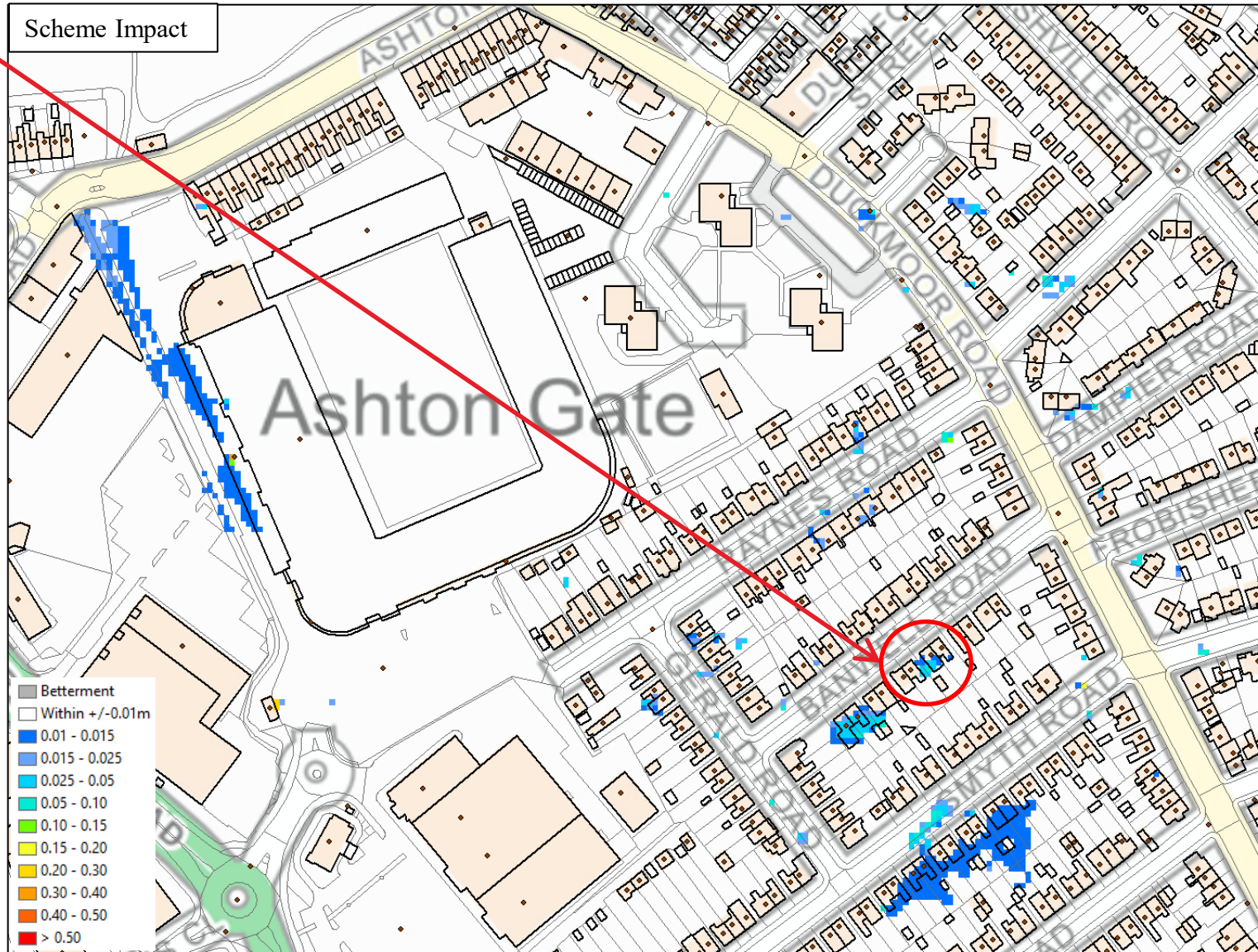

Flood depth - baseline



LIDAR




Scheme Impact



# 2069 Fluvial 20yr (1 of 1)

Scheme Impact

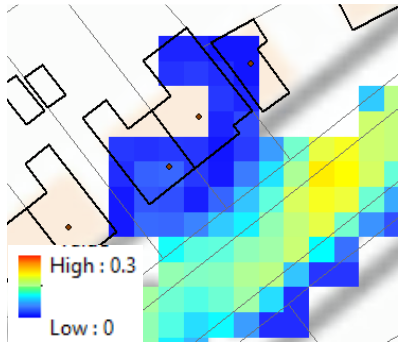


37mm detriment at 1 grid cell at property (approx quarter of property footprint).

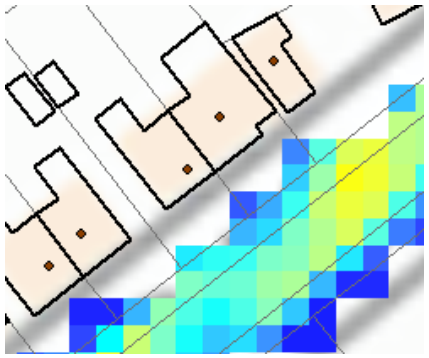
Max flood depth – 37mm

Due to anomaly in LIDAR – see below.

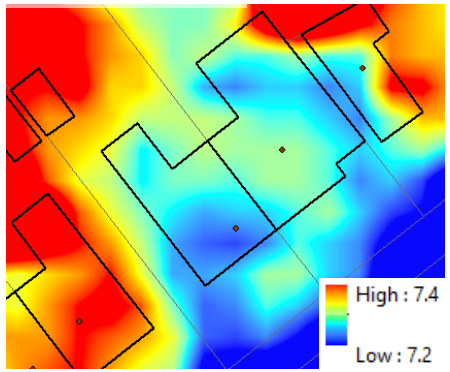
Flood depth - scheme



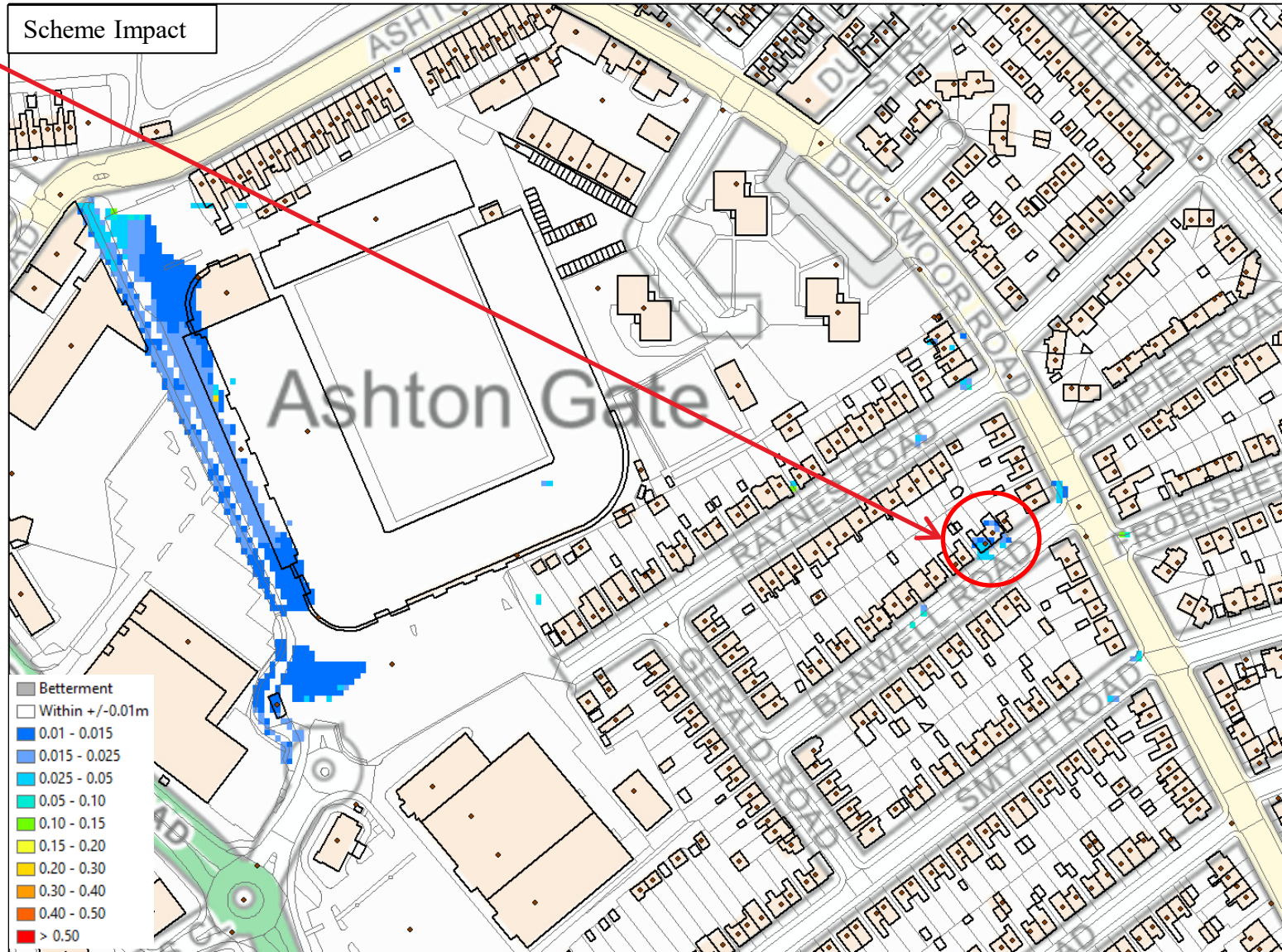

Flood depth - baseline



LIDAR

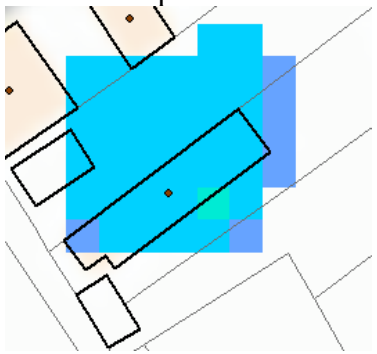



Scheme Impact



# 2069 Fluvial 100yr (1 of 3)

Scheme Impact

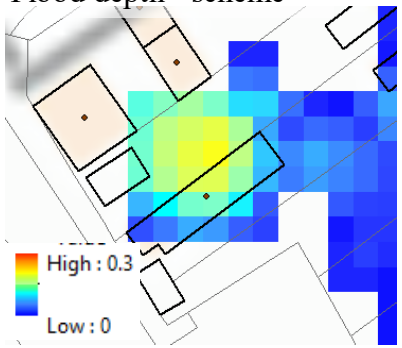


46mm detriment at outbuilding

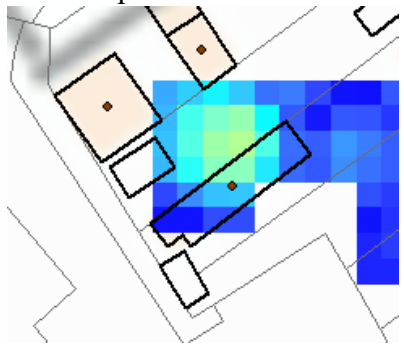
Max flood depth – 176mm

Due to anomaly in LIDAR – see below.

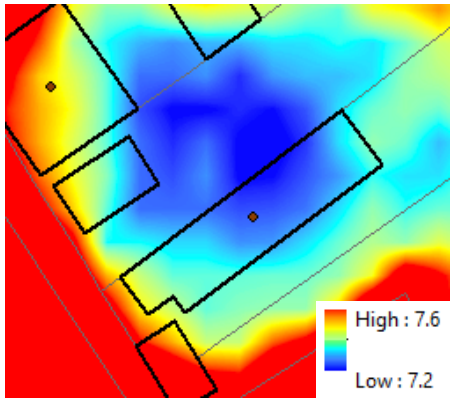
Flood depth - scheme

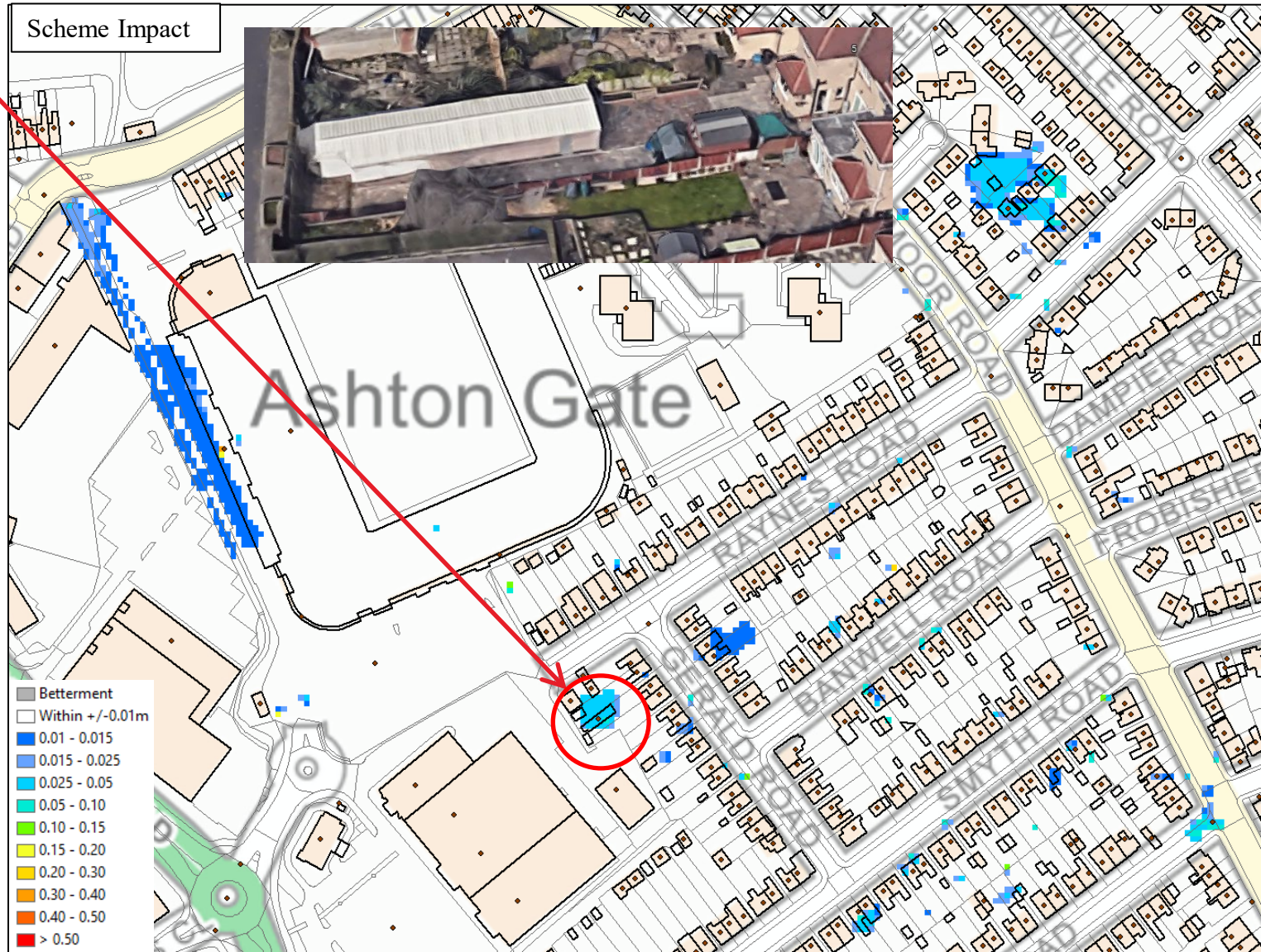



Flood depth - baseline



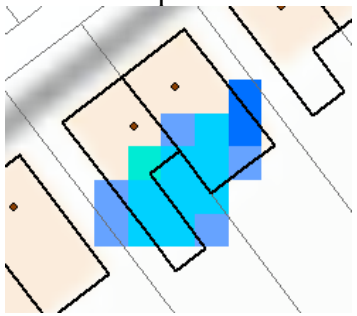
LIDAR



# 2069 Fluvial 100yr (2 of 3)

Scheme Impact

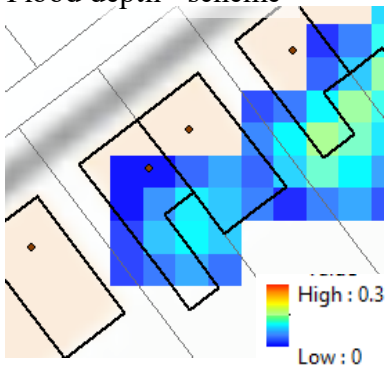


27 - 40mm detriment at 2 properties (approx 25% of property footprints > 25mm).

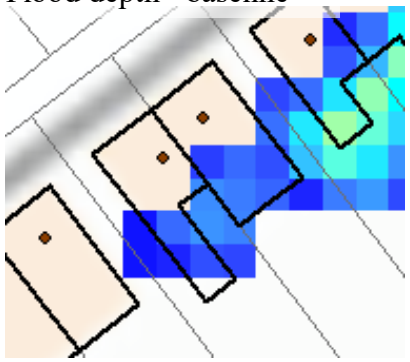
Max flood depth – 78mm

Due to anomaly in LIDAR – see below.

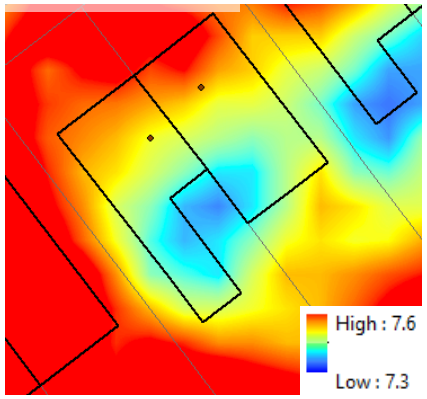
Flood depth - scheme



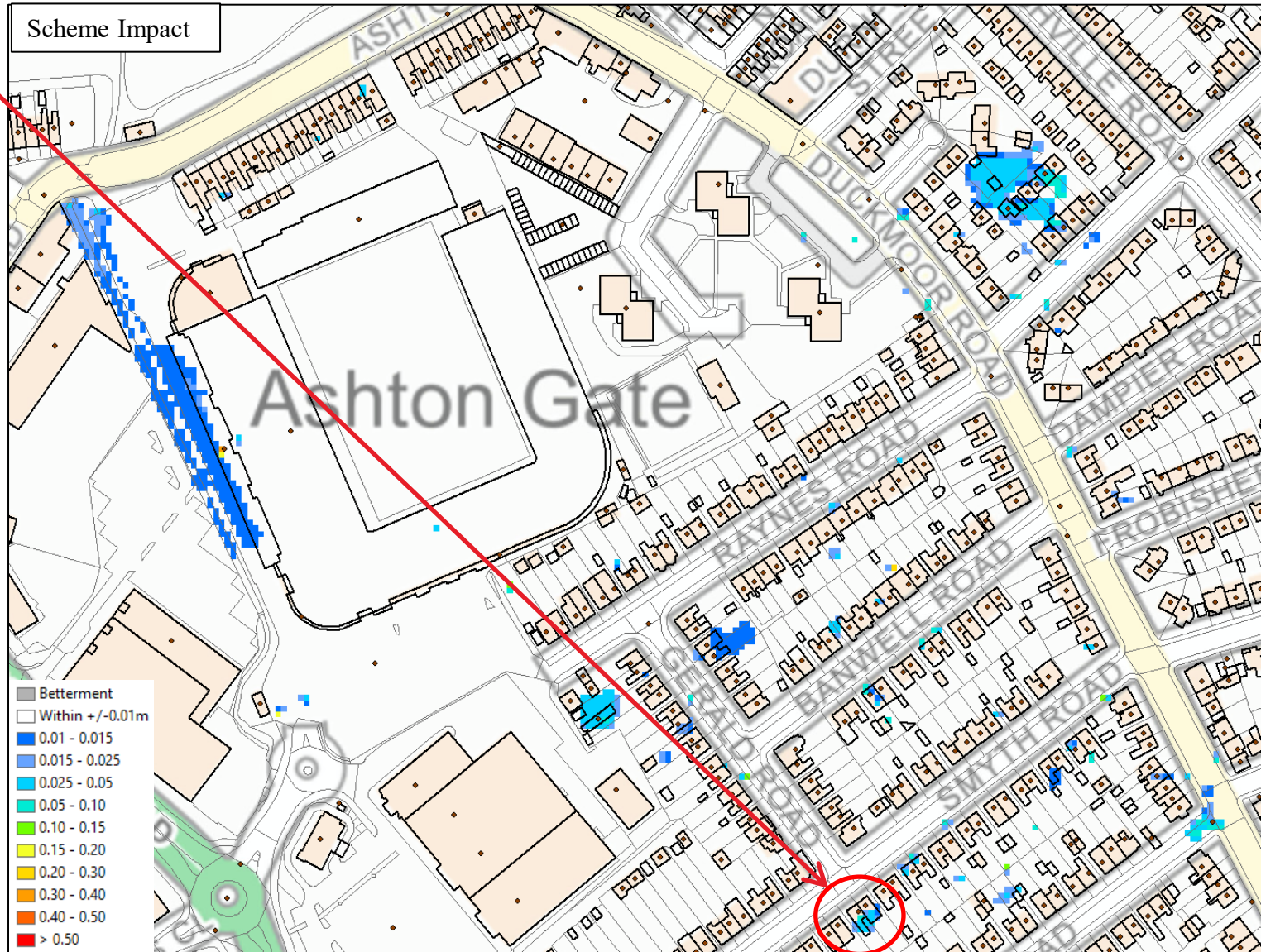

Flood depth - baseline



LIDAR



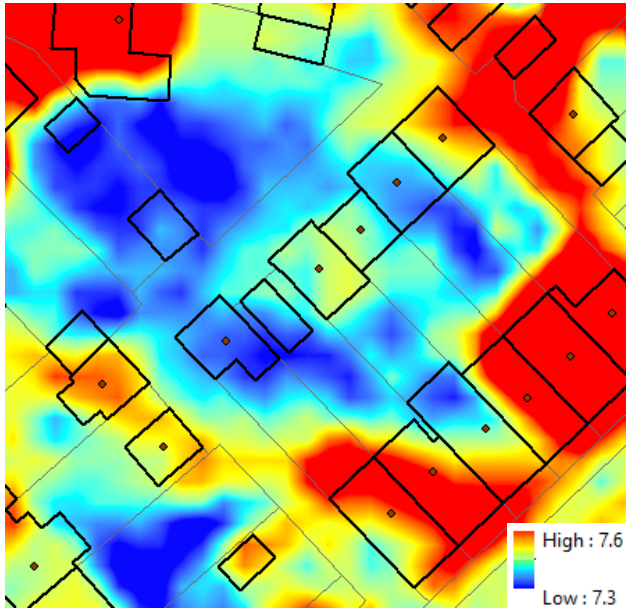

Scheme Impact



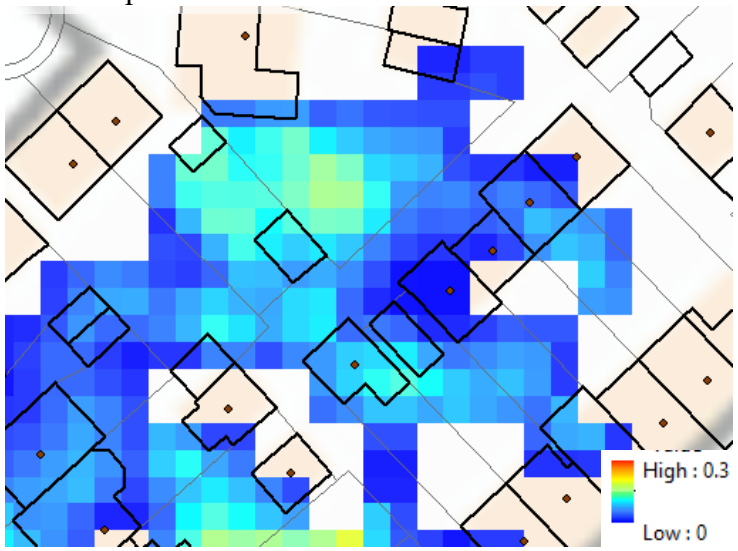
# 2069 Fluvial 100yr (3 of 3)




LIDAR




Flood depth - scheme




Flood depth - baseline

