



GALWAY COUNTY COUNCIL
Comhairle Chontae na Gaillimhe

**DUNKELLIN RIVER AND AGGARD STREAM
FLOOD RELIEF SCHEME**

WORKS DESCRIPTION DRAWINGS

SEPTEMBER 2014





DUNKELLIN RIVER AND AGGARD STREAM FLOOD RELIEF SCHEME

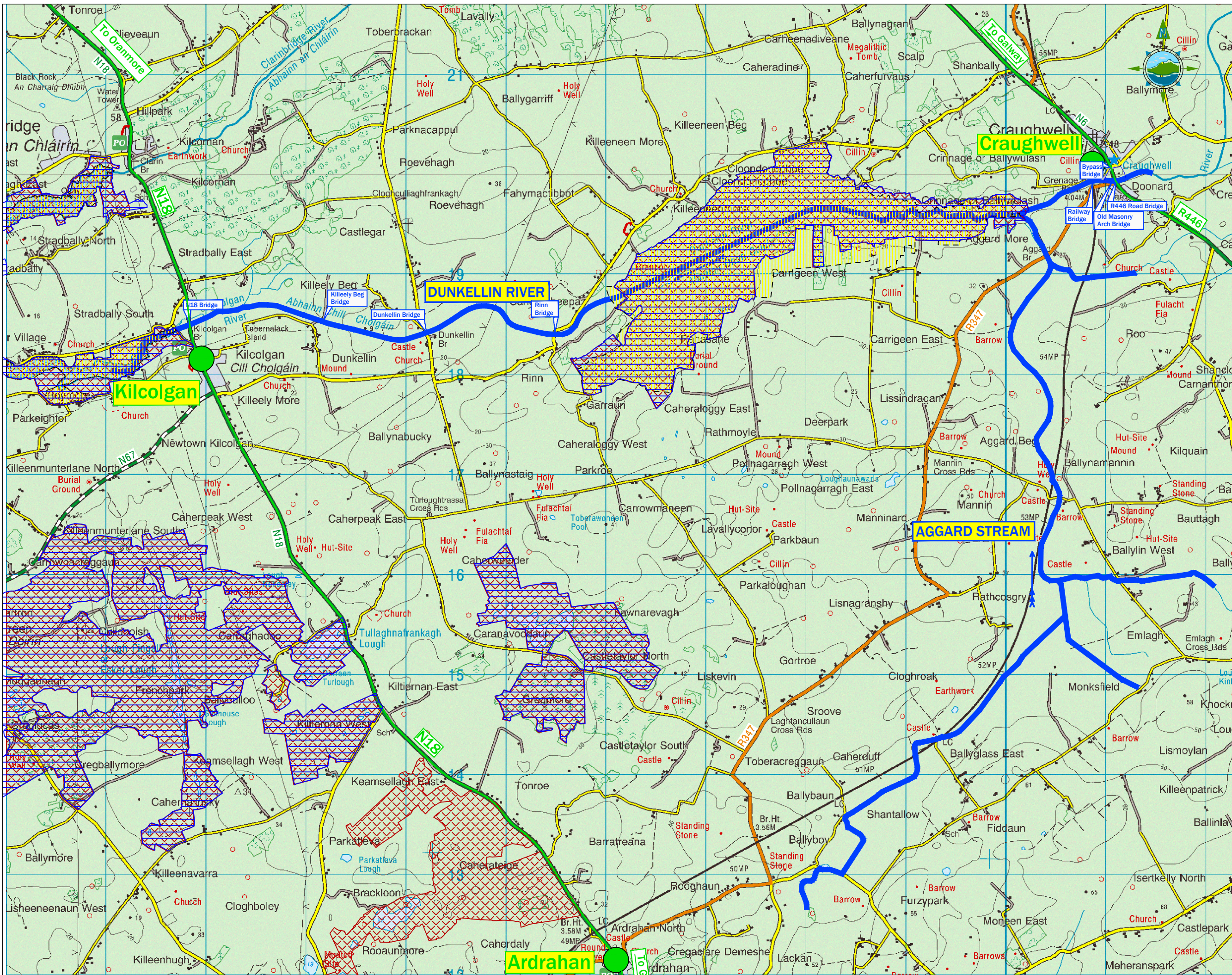
WORKS DESCRIPTION DRAWINGS

SEPTEMBER 2014



TOBIN
Consulting Engineers

| DRAWING | Rev | DESCRIPTION |
|-----------|-----|---|
| 6408-2200 | A | Study Area Location |
| 6408-2201 | B | November 2009 Flood Event Estimated Flood Extents Based on Aerial Photography after the Event |
| 6408-2202 | F | Layout Plan and Longitudinal Section of Existing channel & Proposed Works Sheet 1 of 7 |
| 6408-2203 | G | Layout Plan and Longitudinal Section of Existing channel & Proposed Works Sheet 2 of 7 |
| 6408-2204 | G | Layout Plan and Longitudinal Section of Existing channel & Proposed Works Sheet 3 of 7 |
| 6408-2205 | D | Layout Plan and Longitudinal Section of Existing channel & Proposed Works Sheet 4 of 7 |
| 6408-2206 | C | Layout Plan and Longitudinal Section of Existing channel & Proposed Works Sheet 5 of 7 |
| 6408-2207 | C | Layout Plan and Longitudinal Section of Existing channel & Proposed Works Sheet 6 of 7 |
| 6408-2208 | F | Layout Plan and Longitudinal Section of Existing channel & Proposed Works Sheet 7 of 7 |
| 6408-2210 | C | Proposed Works at Bridges on the Dunkellin River Sheet 1 of 2 |
| 6408-2211 | C | Proposed Works at Bridges on the Dunkellin River Sheet 2 of 2 |
| 6408-2215 | E | Proposed Works at Bridges on the Dunkellin River Sheet |
| 6408-2216 | D | Predicted Water Levels for 5%-ile Flows Pre & Post Flood Alleviation Works |
| 6408-2217 | D | Predicted Water Levels for 10%-ile Flows Pre & Post Flood Alleviation Works |
| 6408-2218 | D | Predicted Water Levels for Mean Annual Flow Conditions Pre & Post Flood Alleviation Works |
| 6408-2220 | A | Layout Plan of Proposed Works Along Aggard Stream |
| 6408-2221 | C | Locations of Proposed Culvert Replacement along Aggard Stream Sheet 1 of 2 |
| 6408-2222 | C | Locations of Proposed Culvert Replacement along Aggard Stream Sheet 2 of 2 |
| 6408-2250 | A | Location of Site Notices |



LEGEND

- RIVER
- SPECIAL PROTECTION AREAS (SPA's)
- PROPOSED NATURAL HERITAGE AREAS (pNHA's)
- NATURAL HERITAGE AREAS (NHA's)
- SPECIAL AREAS OF CONSERVATION (SAC's)

NOTES:

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE.
3. ENGINEER/EMPLOYERS REPRESENTATIVE, AS APPROPRIATE, TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES.
4. THE CONTRACTOR SHALL UNDERTAKE A THOROUGH CHECK FOR THE ACTUAL LOCATION OF ALL SERVICES/UTILITIES, ABOVE AND BELOW GROUND, BEFORE ANY WORK COMMENCES.
5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD.

| Rev | Date | Description | By | Chkd. |
|-----|--------|-------------|-----|-------|
| A | Oct/11 | First Issue | PMF | MMCD |

Client: Galway County Council

Project: Dunkellin River and Aggard Stream Flood Relief Scheme

Title: Study Area Location

Scale @ A1: 1:17,500
Scale @ A3: 1:35,000

Prepared by: PMF
Checked: MMCD
Date: Oct 2011

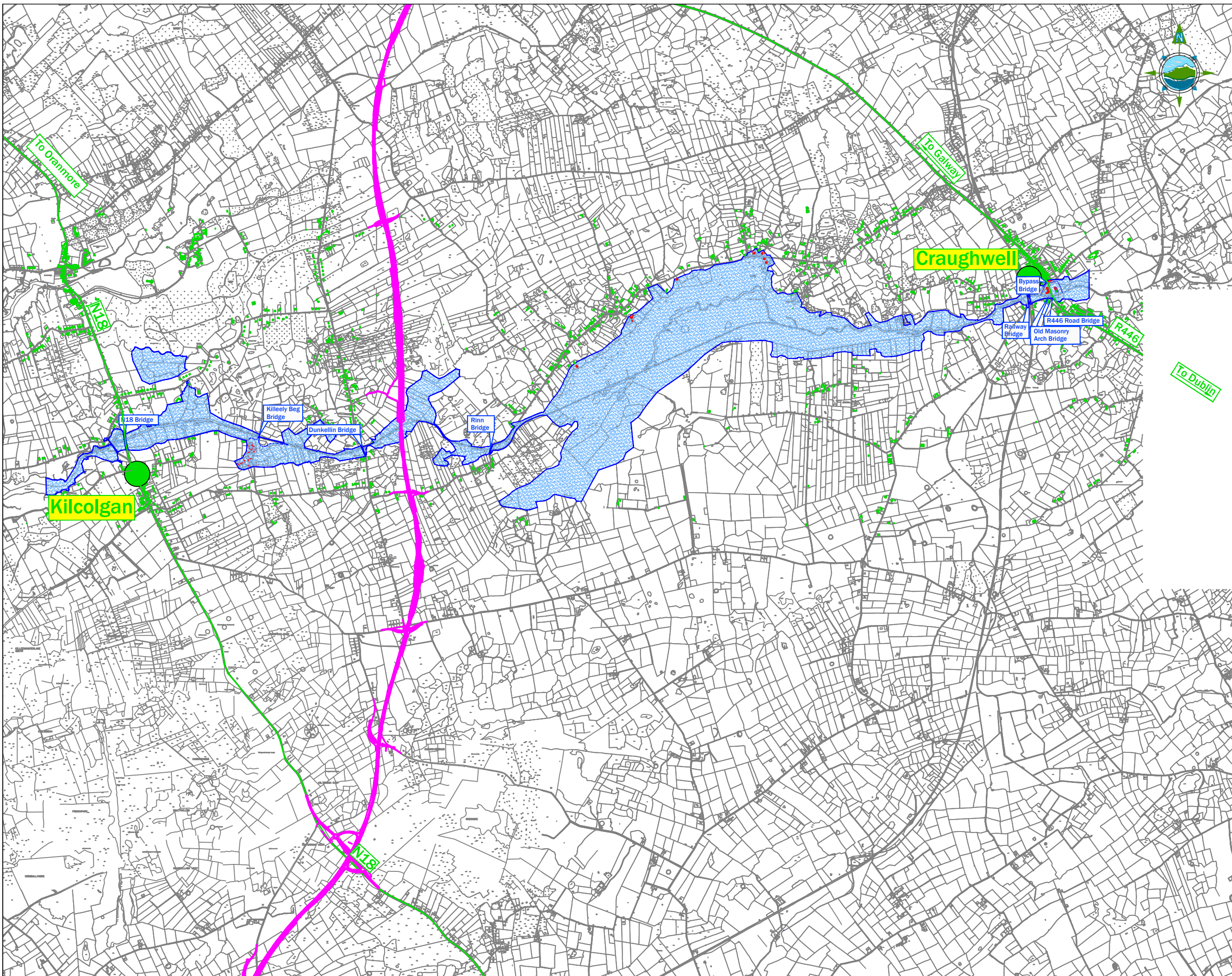
Project Director: Michael Garrick

Drawing Status:



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Fairgreen House, Fairgreen Road,
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www.tobin.ie

Drawing No.: 6408-2200
Revision: A



LEGEND

- Estimated flood extent based on aerial photography after the November 2009 event
- Proposed M18 Motorway

NOTES:

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| Rev | Date | Description | By | Chkd. |
|-----|---------|-------------|----|-------|
| B | July/14 | Issue | CK | MMcD |

Client: Galway County Council

Project: Dunkellin River and Aggard Stream Flood Relief Scheme

Title: November 2009 Flood Event
Estimated Flood Extents
Based on Aerial Photography
after the Event

Scale @ A1: 1:17,500
Scale @ A3: 1:35,000

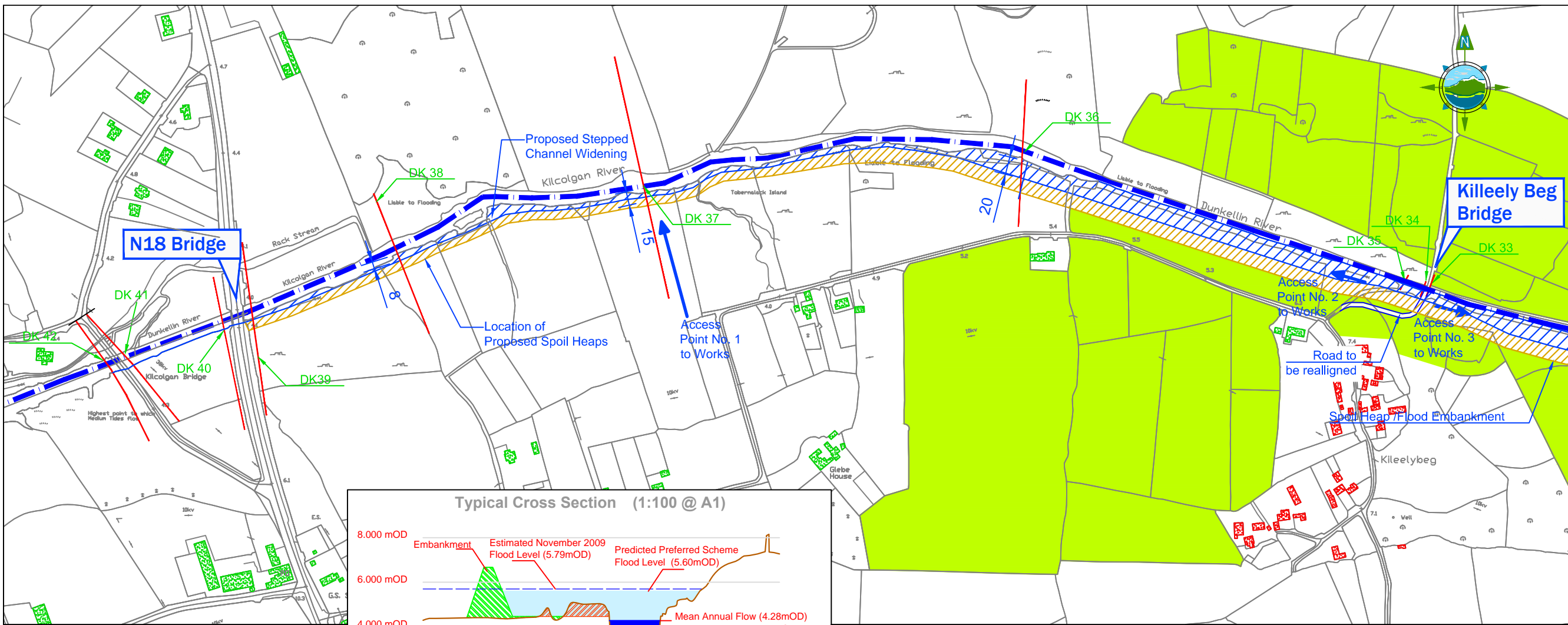
Prepared by: PFM
Checked: MMcD
Date: Oct 2011

Project Director: Michael Garrick
Drawing Status:



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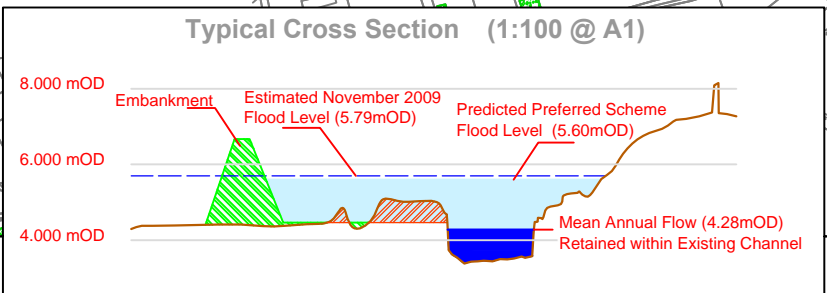
Drawing No.: 6408-2201 B



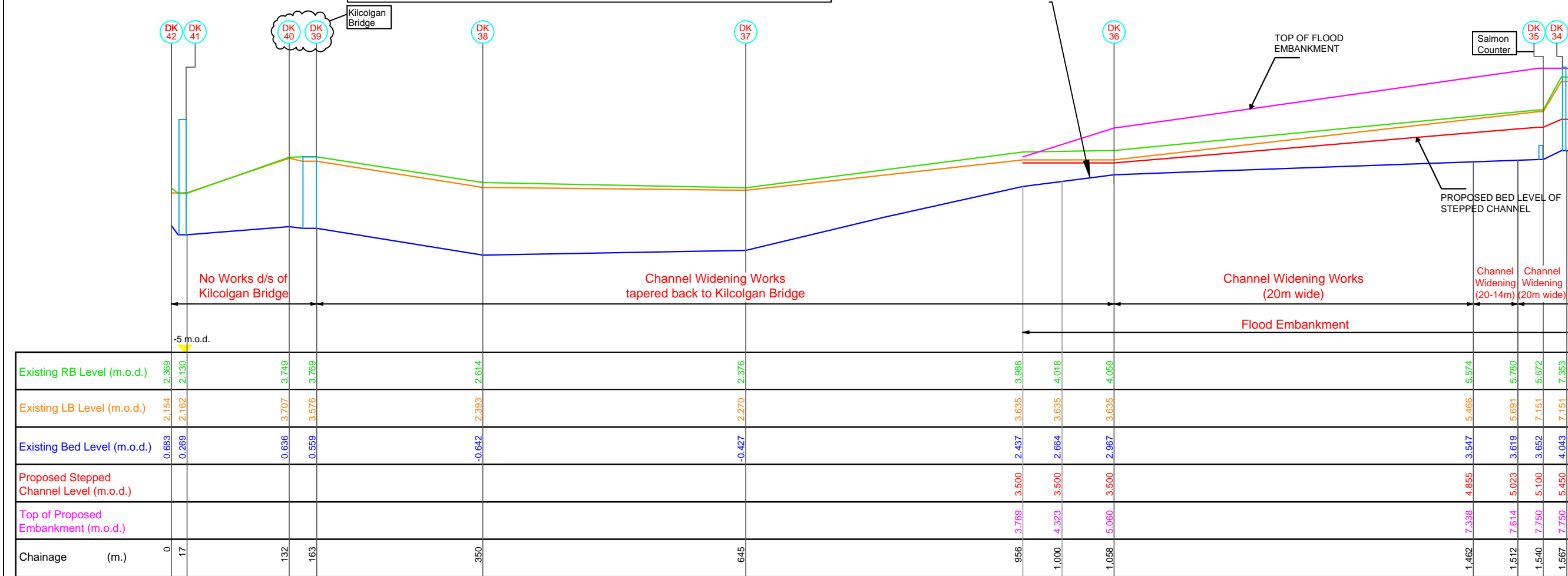
LEGEND

- RIVER: Blue dashed line
- Cross Section Reference: Red line with DK label
- Proposed Stepped Channel Widening: Blue hatched area
- Location of Proposed Spoil Heaps / Flood Embankments: Yellow hatched area
- Location of Proposed Spoil Spreading: Green shaded area

- NOTES:**
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| Rev | Date | Description | By | Chkd. |
|-----|-------|-------------|----|-------|
| F | Sep14 | Issue | CK | MMcD |



Client: Galway County Council

Project: Dunkellin River and Aggard Stream Flood Relief Scheme

Title: Layout Plan & Longitudinal Section of Existing channel and Proposed works
Sheet 1 of 7

Scale @ A1: H - 1:2500 V - 1:100
Scale @ A3: H - 1:5000 V - 1:200

Prepared by: PFM
Checked: MMcD
Date: Oct 2011

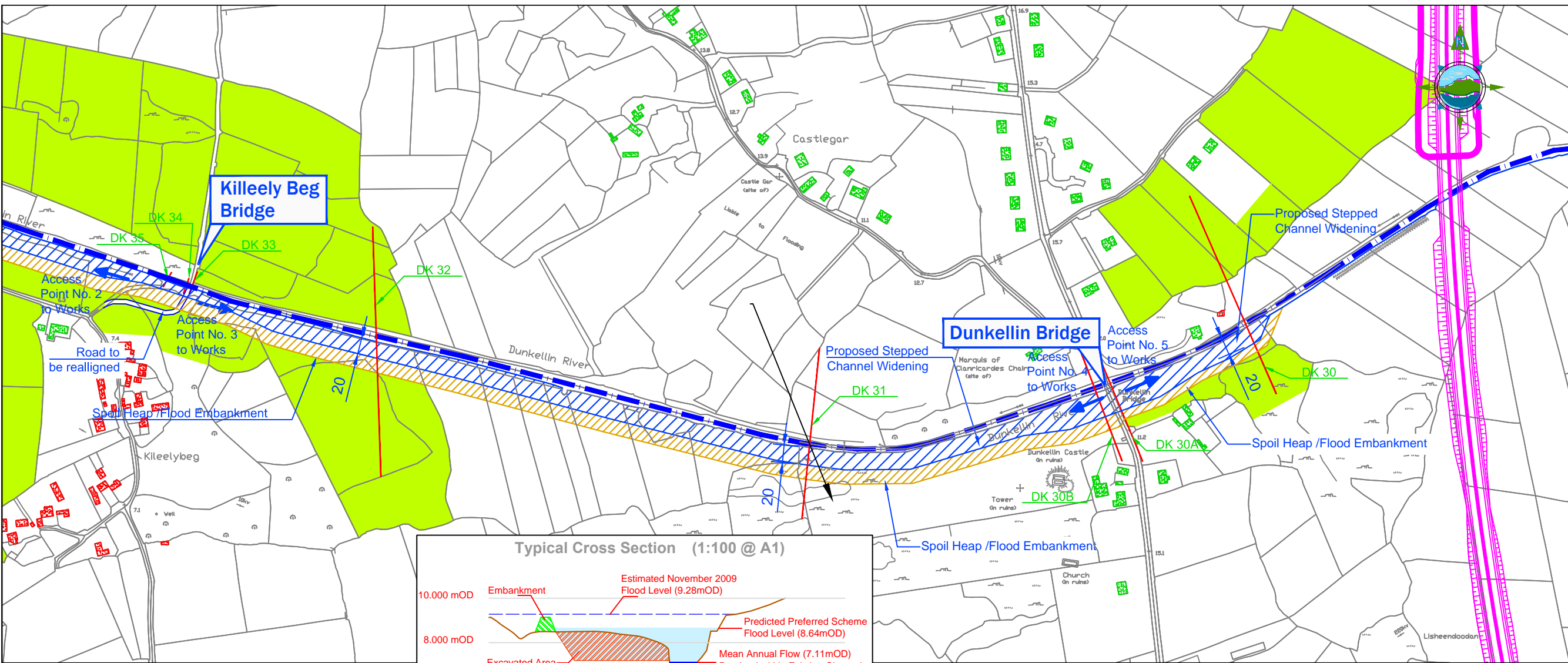
Project Director: Michael Garrick

Drawing Status:

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www.tobin.ie

Drawing No.: 6408-2202

Revision: F

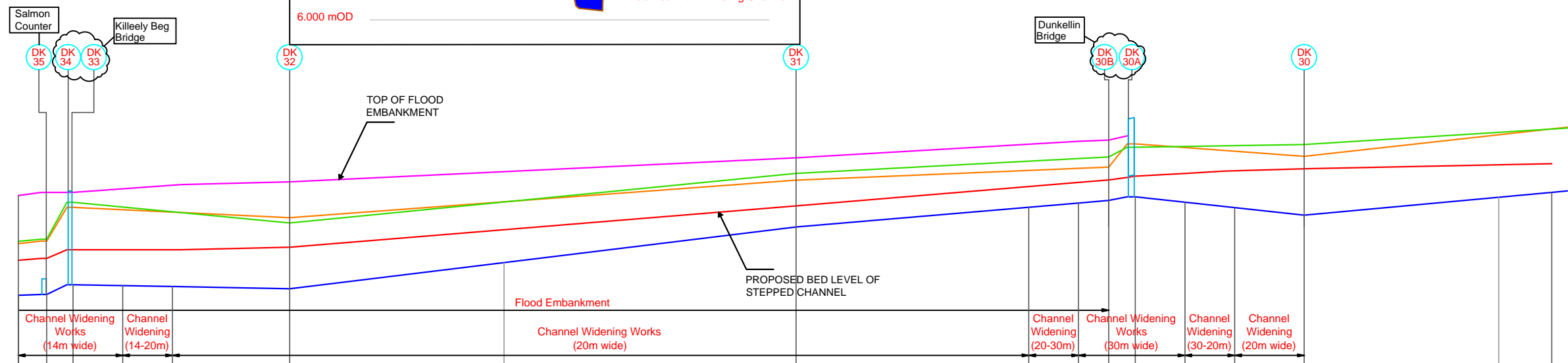
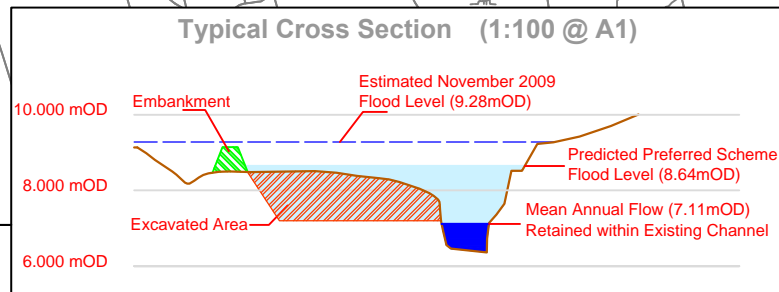


LEGEND

- RIVER: Blue dashed line
- Cross Section Reference: Red line with label (e.g., DK 38)
- Proposed Stepped Channel Widening: Blue hatched area
- Location of Proposed Spoil Heaps / Flood Embankments: Yellow hatched area
- Location of Proposed Spoil Spreading: Green hatched area
- Proposed M18 Motorway: Pink hatched area

- NOTES:**
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| Rev | Date | Description | By | Chkd. |
|-----|---------|-------------|----|-------|
| G | Sept/14 | Issue | CK | MMcD |



| | 1,512 | 1,540 | 1,567 | 1,567 | 1,667 | 1,785 | 2,000 | 2,294 | 2,528 | 2,578 | 2,608 | 2,635 | 2,685 | 2,735 | 2,804 | 3,000 | 3,053 |
|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|
| Existing RB Level (m.o.d.) | 5.780 | 5.872 | 7.353 | 7.182 | 6.971 | 6.521 | 7.364 | 8.513 | 9.002 | 9.107 | 9.170 | 9.593 | 9.595 | 9.627 | 9.671 | 10.063 | 10.298 |
| Existing LB Level (m.o.d.) | 5.691 | 7.151 | 7.151 | 7.056 | 6.960 | 6.735 | 7.364 | 8.237 | 8.631 | 8.716 | 8.766 | 9.699 | 9.552 | 9.405 | 9.200 | 10.063 | 10.298 |
| Existing Bed Level (m.o.d.) | 3.619 | 3.652 | 4.043 | 4.006 | 3.970 | 3.883 | 4.931 | 6.359 | 7.154 | 7.323 | 7.426 | 7.572 | 7.355 | 7.137 | 6.833 | 7.552 | 7.748 |
| Proposed Stepped Channel Level (m.o.d.) | 5.023 | 5.100 | 5.450 | 5.450 | 5.450 | 5.550 | 6.252 | 7.210 | 7.983 | 8.148 | 8.250 | 8.400 | 8.508 | 8.613 | 8.700 | 8.857 | 8.900 |
| Top of Proposed Embankment (m.o.d.) | 7.614 | 7.750 | 7.750 | 7.892 | 8.035 | 8.170 | 8.590 | 9.140 | 9.686 | 9.802 | 9.850 | 10.014 | 10.014 | 10.014 | 10.014 | 10.014 | 10.014 |
| Chainage (m.) | 1,512 | 1,540 | 1,567 | 1,567 | 1,667 | 1,785 | 2,000 | 2,294 | 2,528 | 2,578 | 2,608 | 2,635 | 2,685 | 2,735 | 2,804 | 3,000 | 3,053 |

Client: Galway County Council

Project: Dunkellin River and Aggard Stream Flood Relief Scheme

Title: Layout Plan & Longitudinal Section of Existing channel and Proposed works
Sheet 2 of 7

Scale @ A1: H - 1:2500 V - 1:100
Scale @ A3: H - 1:5000 V - 1:200

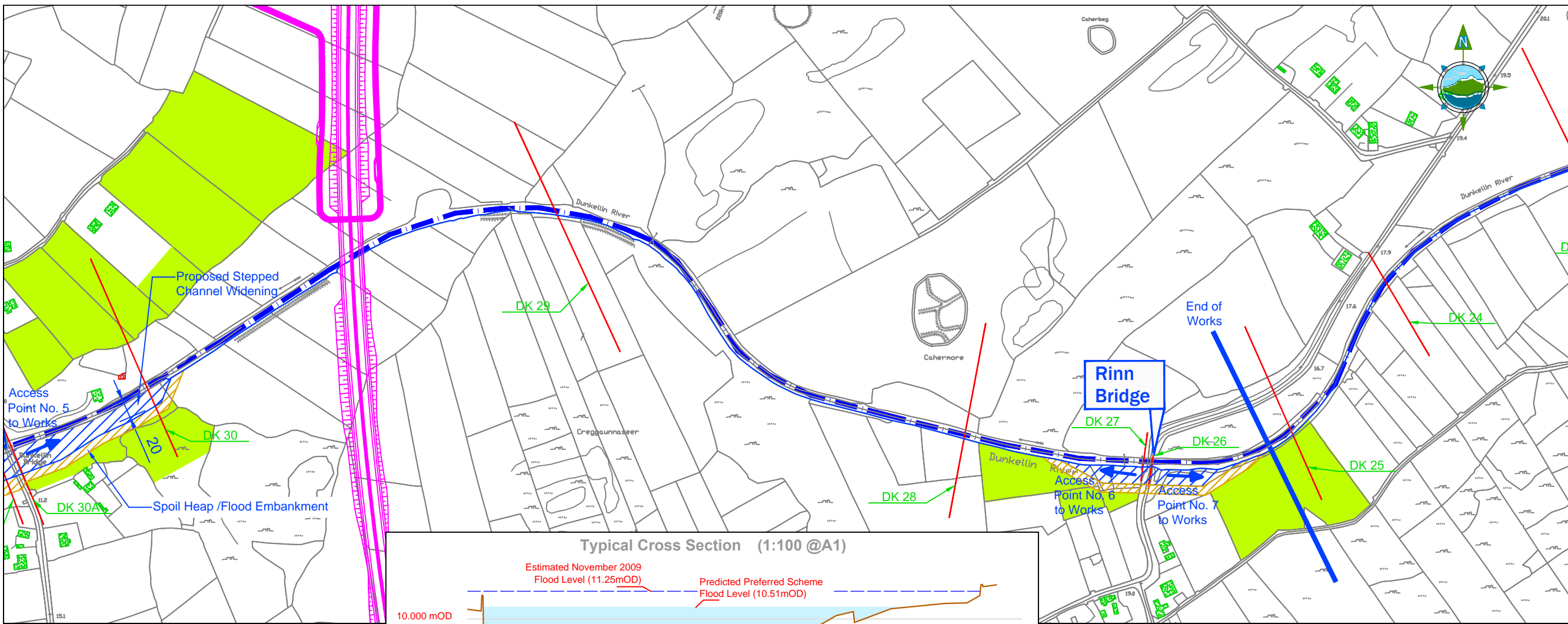
Prepared by: PFM Checked: MMcD Date: Oct 2011

Project Director: Michael Garrick

Drawing Status:

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Galway, Ireland.
tel: +353-(0)91-565211
fax: +353-(0)91-565398
e-mail: galway@tobin.ie
www.tobin.ie

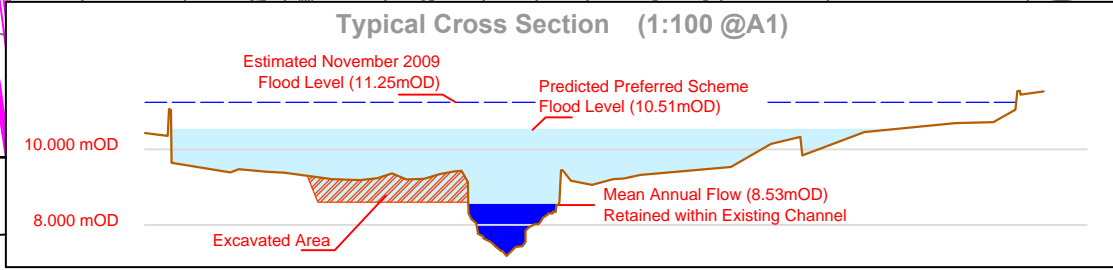
Revision: 6408-2203 G



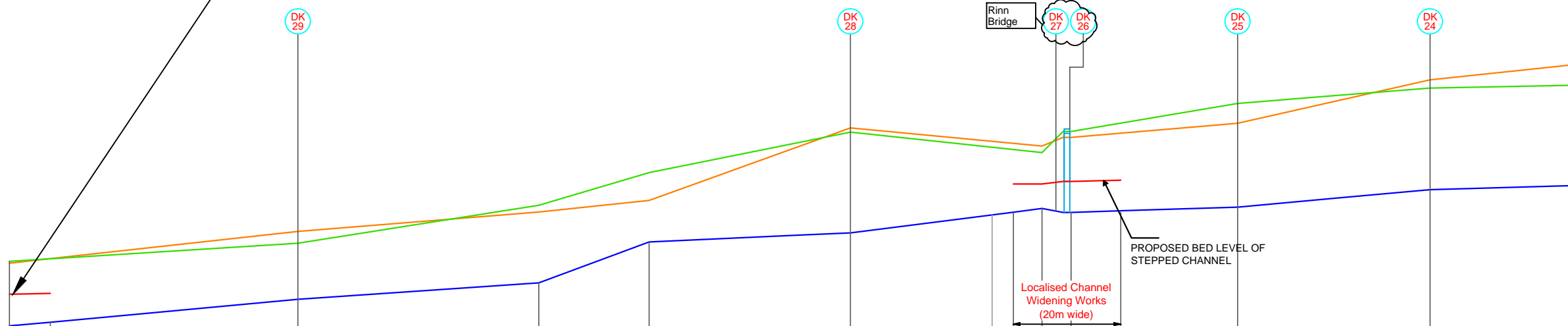
LEGEND

- RIVER
- Cross Section Reference
- Proposed Stepped Channel Widening
- Location of Proposed Spoil Heaps
- Location of Proposed Spoil Spreading
- Proposed M18 Motorway

- NOTES:**
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| Rev | Date | Description | By | Chkd. |
|-----|--------|-------------|----|-------|
| G | Sep/14 | Issue | CK | MMcD |



| | | | | | | | | | | | | |
|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Existing RB Level (m.o.d.) | 10.298 | 10.919 | 12.443 | 13.751 | 15.382 | 15.012 | 14.680 | 14.556 | 15.406 | 15.741 | 16.527 | 17.152 |
| Existing LB Level (m.o.d.) | 10.298 | 11.395 | 12.172 | 12.634 | 15.548 | 15.012 | 14.931 | 14.822 | 15.167 | 15.337 | 15.736 | 17.477 |
| Existing Bed Level (m.o.d.) | 7.748 | 8.664 | 9.323 | 10.969 | 11.333 | 12.052 | 12.160 | 12.312 | 12.155 | 12.220 | 12.370 | 13.070 |
| Proposed Stepped Channel Level (m.o.d.) | 8.900 | | | | | 13.300 | 13.300 | 13.400 | 13.400 | 13.450 | | |
| Chainage (m.) | 3,053 | 3,302 | 3,544 | 3,655 | 3,858 | 4,000 | 4,021 | 4,050 | 4,079 | 4,129 | 4,247 | 4,440 |

Client: Galway County Council

Project: Dunkellin River and Aggard Stream Flood Relief Scheme

Title: Layout Plan & Longitudinal Section of Existing channel and Proposed works
Sheet 3 of 7

Scale @ A1: H - 1:2500 V - 1:100
Scale @ A3: H - 1:5000 V - 1:200

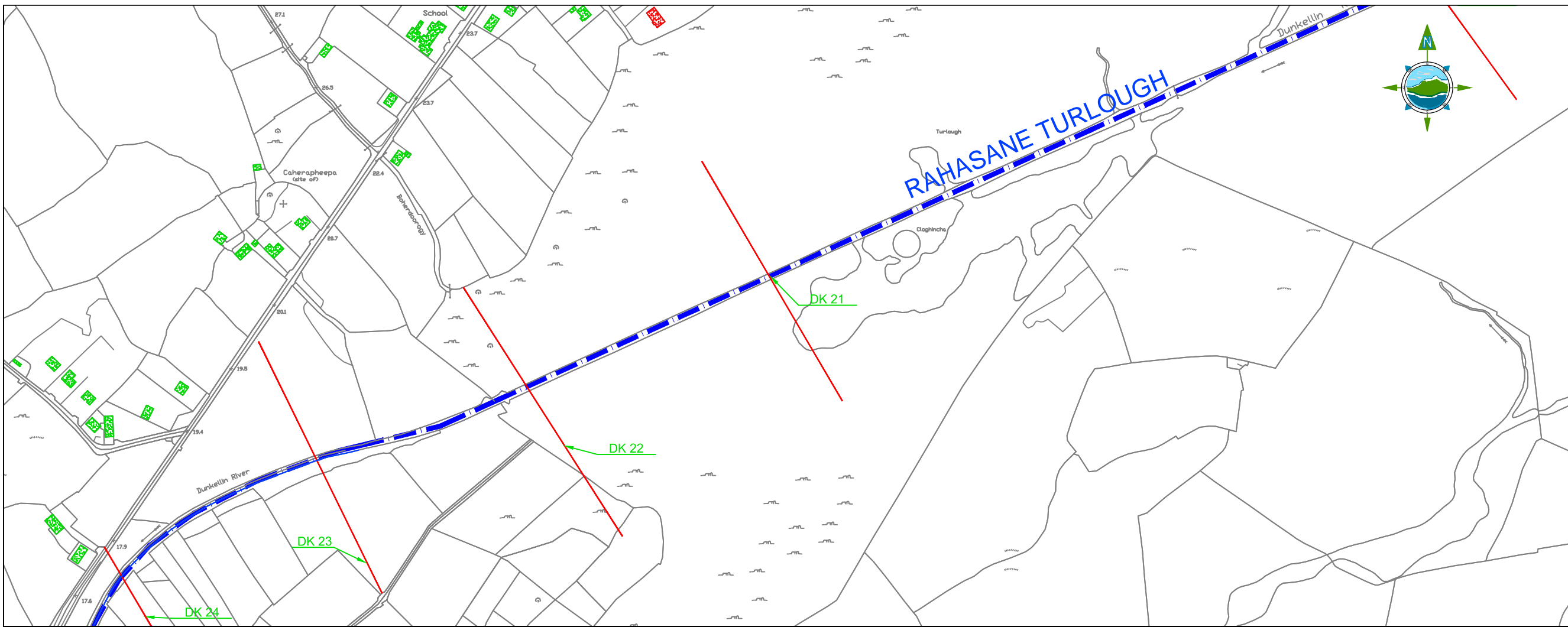
Prepared by: PMF
Checked: MMcD
Date: Oct 2011

Project Director: Michael Garrick

Drawing Status:

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e-mail: galway@tobin.ie
www.tobin.ie

Drawing No.: 6408-2204
Revision: G

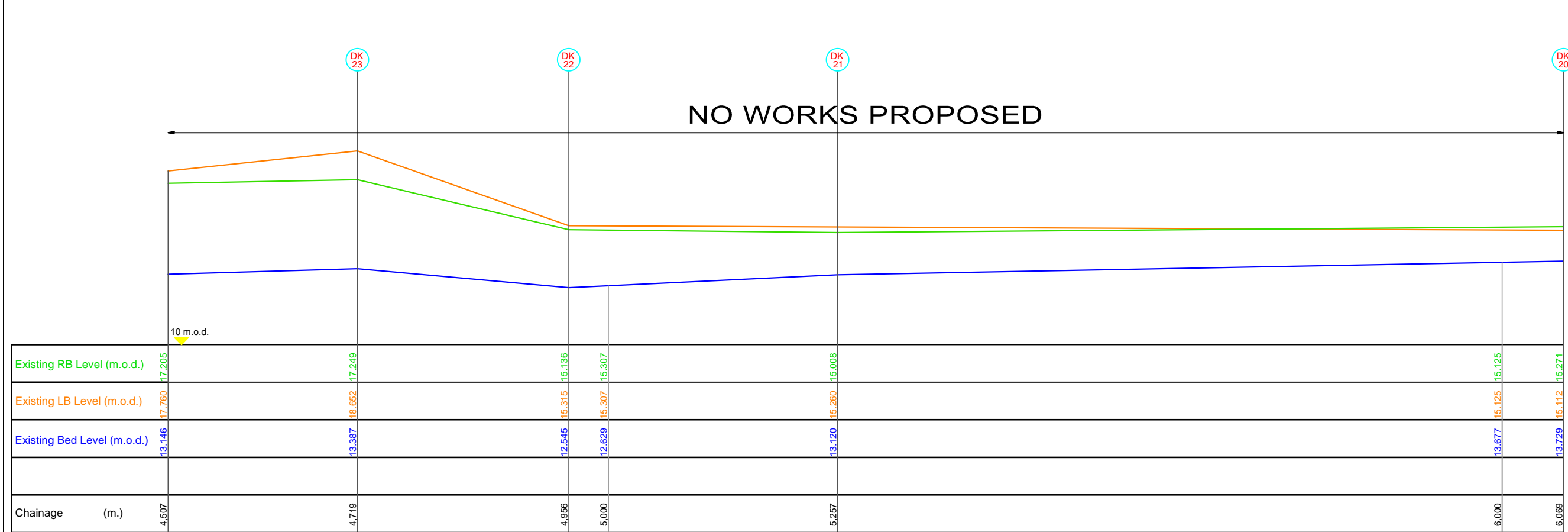


LEGEND

- RIVER
- Cross Section Reference
- Proposed Stepped Channel Widening
- Location of Proposed Spoil Heaps
- Location of Proposed Spoil Spreading

- NOTES:**
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| Rev | Date | Description | By | Chkd. |
|-----|---------|-------------|----|-------|
| D | Sept'13 | Issue | CK | MMcD |



| | 4,507 | 4,719 | 4,956 | 5,000 | 5,257 | 6,000 | 6,069 |
|-----------------------------|--------|--------|--------|--------|--------|--------|--------|
| Existing RB Level (m.o.d.) | 17.205 | 17.249 | 15.136 | 15.307 | 15.008 | 15.125 | 15.271 |
| Existing LB Level (m.o.d.) | 17.760 | 18.652 | 15.315 | 15.307 | 15.260 | 15.125 | 15.112 |
| Existing Bed Level (m.o.d.) | 13.146 | 13.387 | 12.545 | 12.629 | 13.120 | 13.677 | 13.729 |
| Chainage (m.) | 4,507 | 4,719 | 4,956 | 5,000 | 5,257 | 6,000 | 6,069 |

Client: Galway County Council

Project: Dunkellin River and Aggard Stream Flood Relief Scheme

Title: Layout Plan & Longitudinal Section of Existing channel and Proposed works
Sheet 4 of 7

Scale @ A1: H - 1:2500 V - 1:100
Scale @ A3: H - 1:5000 V - 1:200

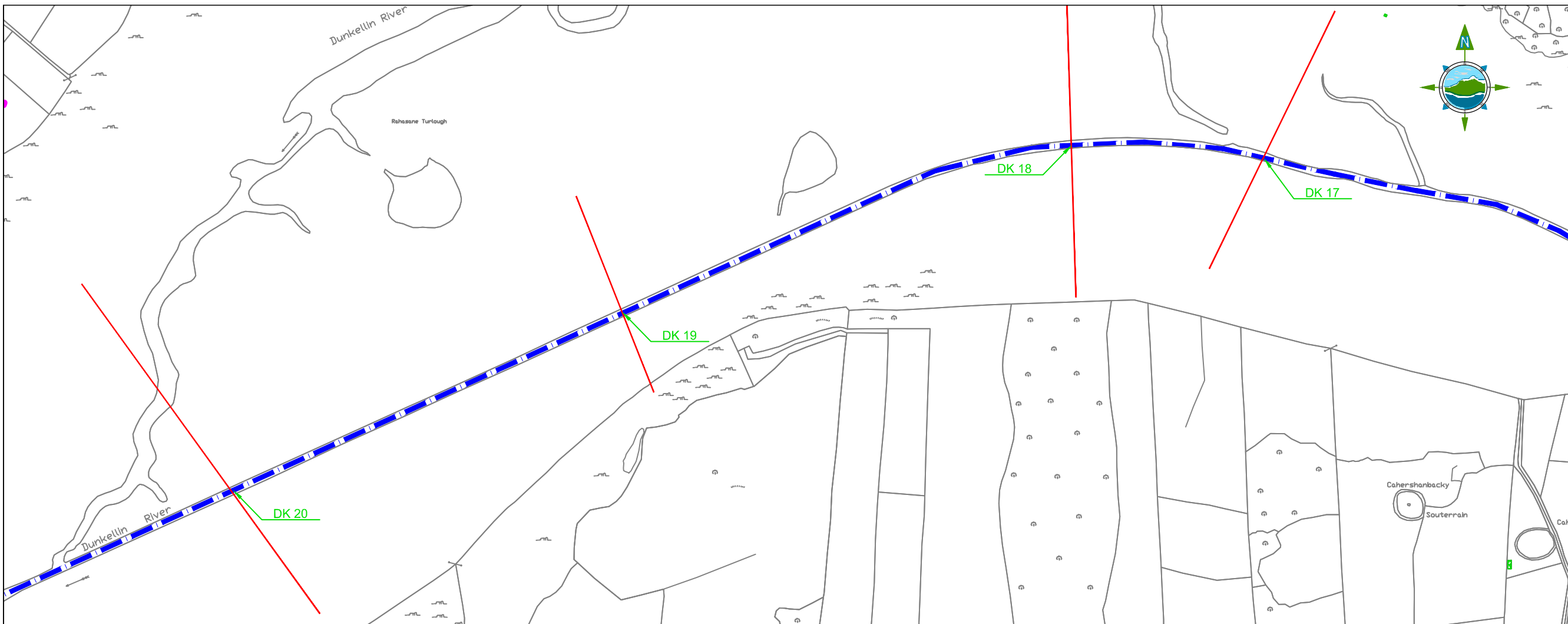
Prepared by: PMF
Checked: MMcD
Date: Oct 2011

Project Director: Michael Garrick

Drawing Status:

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Drawing No.: 6408-2205 D



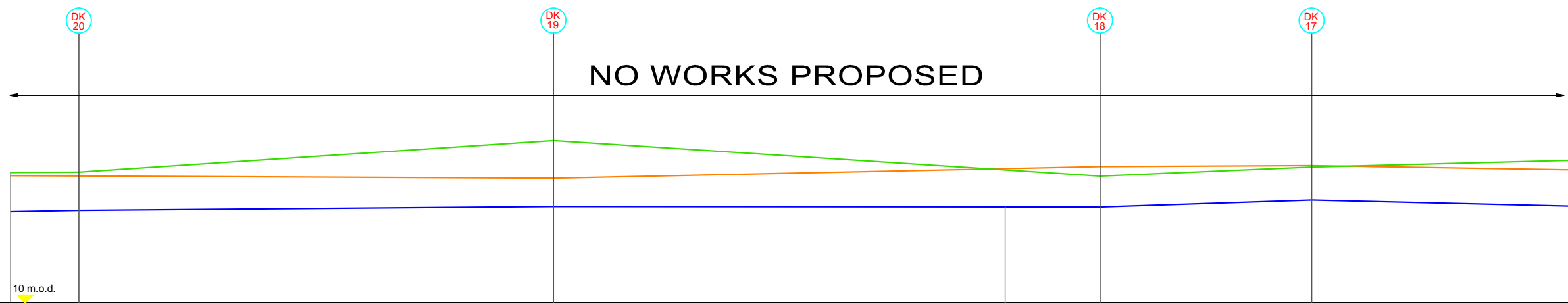
LEGEND

RIVER

Cross Section Reference

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| Rev | Date | Description | By | Chkd. |
|-----|---------|-------------|----|-------|
| C | Sept'13 | Issue | CK | MMcD |



| Chainage (m.) | Existing RB Level (m.o.d.) | Existing LB Level (m.o.d.) | Existing Bed Level (m.o.d.) |
|---------------|----------------------------|----------------------------|-----------------------------|
| 6,000 | 15.125 | 15.125 | 13.677 |
| 6,069 | 15.271 | 15.112 | 13.729 |
| 6,546 | 16.534 | 17.249 | 13.878 |
| 7,000 | 15.410 | 15.410 | 13.865 |
| 7,095 | 15.103 | 15.491 | 13.862 |
| 7,308 | 15.474 | 15.526 | 14.146 |

Client: Galway County Council

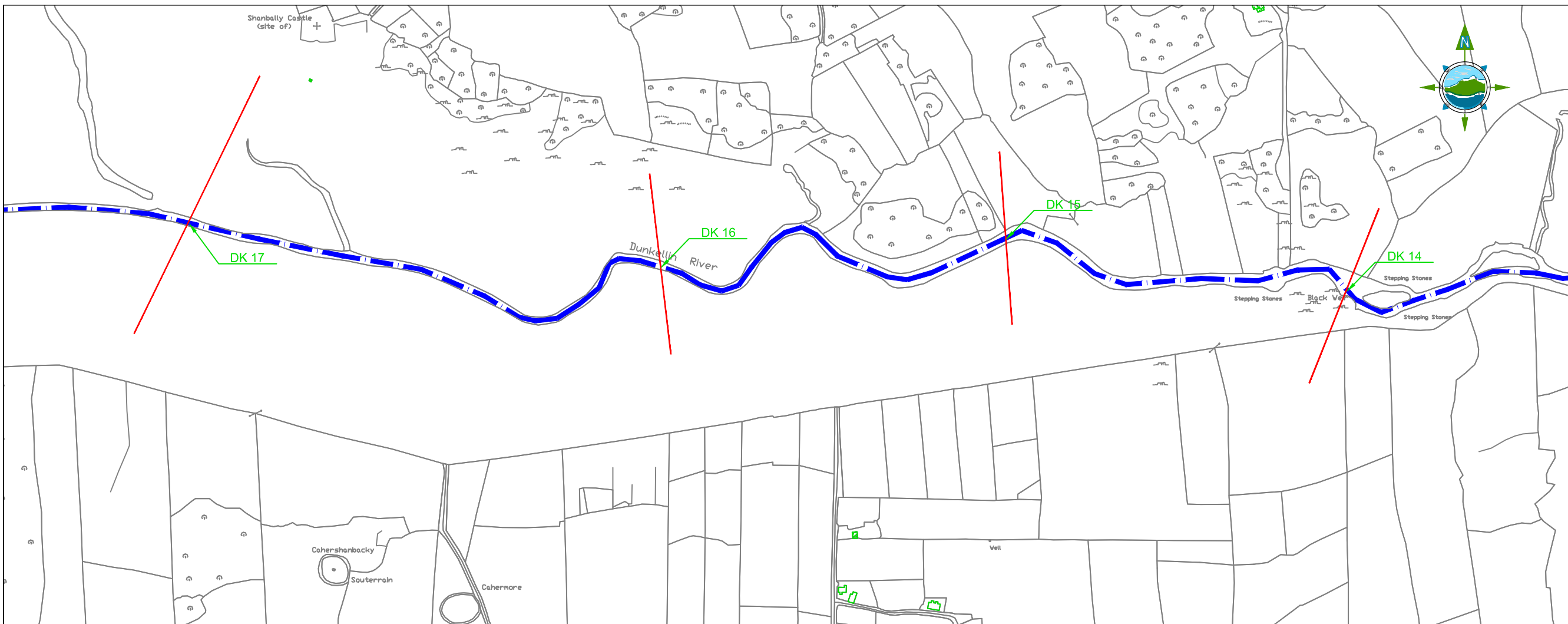
Project: Dunkellin River and Aggard Stream Flood Relief Scheme

Title: Layout Plan & Longitudinal Section of Existing channel and Proposed works
Sheet 5 of 7

| | | |
|-------------------|-----------------|-----------|
| Scale @ A1: | H - 1:2500 | V - 1:100 |
| Scale @ A3: | H - 1:5000 | V - 1:200 |
| Prepared by: | Checked: | Date: |
| PMF | MMcD | Oct 2011 |
| Project Director: | Michael Garrick | |
| Drawing Status: | | |

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Drawing No.: **6408-2206** **C**



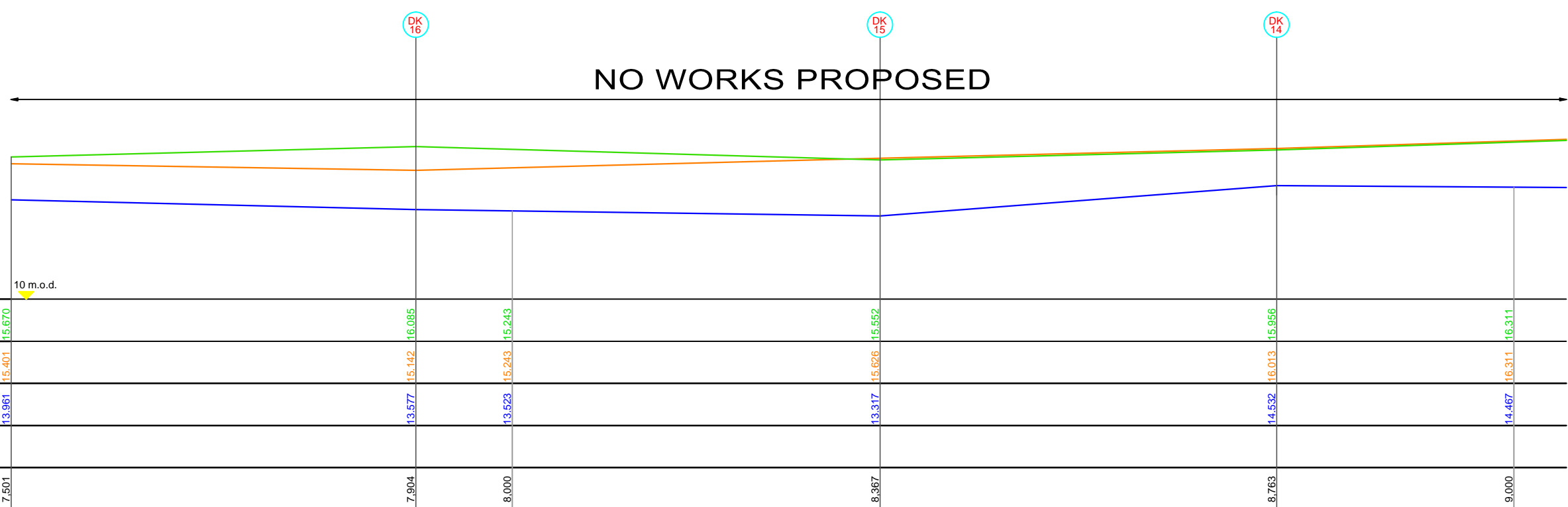
LEGEND

RIVER

Cross Section Reference

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| Rev | Date | Description | By | Chkd. |
|-----|---------|-------------|----|-------|
| C | Sept'13 | Issue | CK | MMcD |



Client: Galway County Council

Project: Dunkellin River and Aggard Stream Flood Relief Scheme

Title: Layout Plan & Longitudinal Section of Existing channel and Proposed works
Sheet 6 of 7

Scale @ A1: H - 1:2500 V - 1:100
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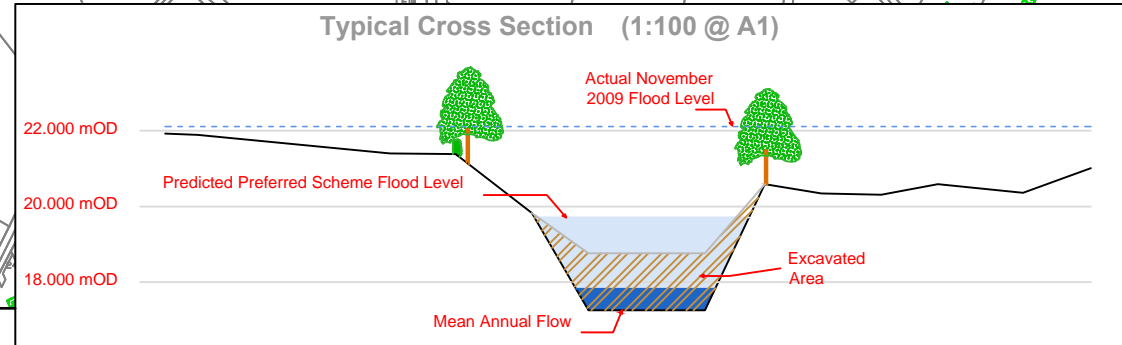
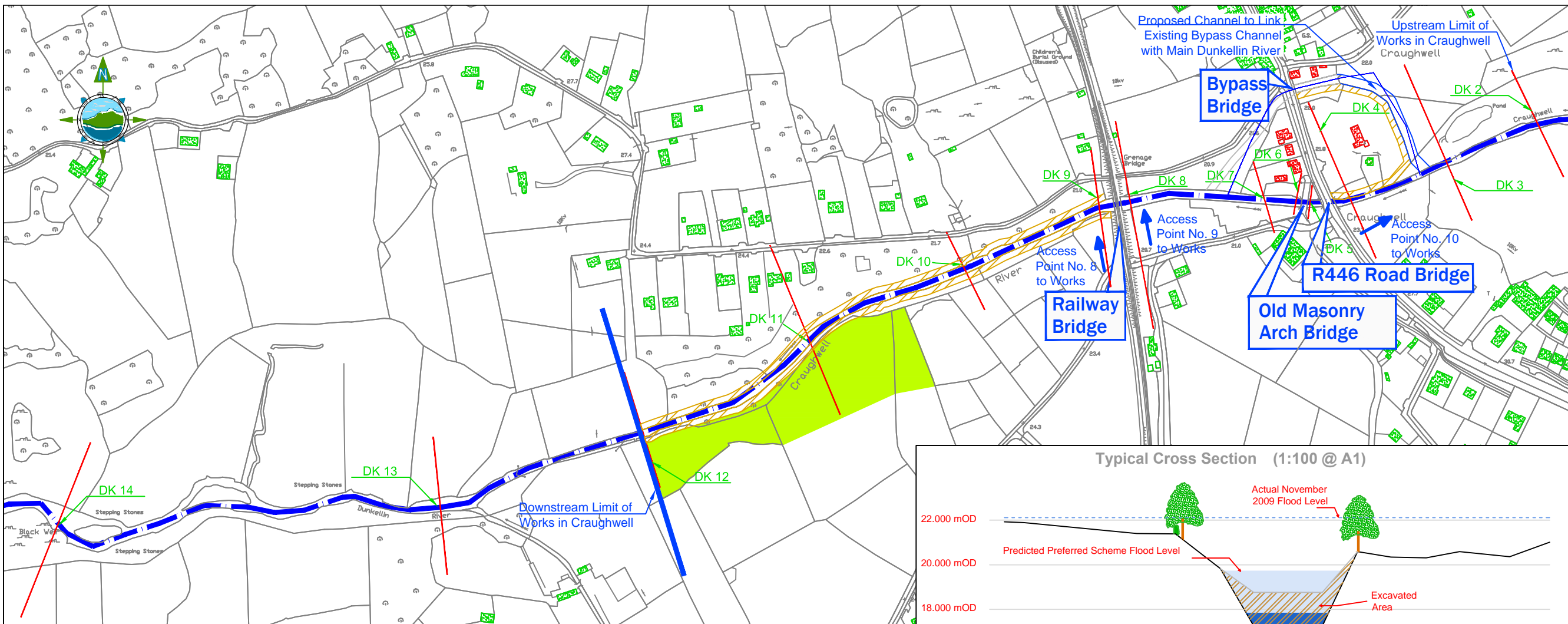
Prepared by: PMF
Checked: MMcD
Date: Oct 2011

Project Director: Michael Garrick

Drawing Status:

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Drawing No.: **6408-2207** **C**

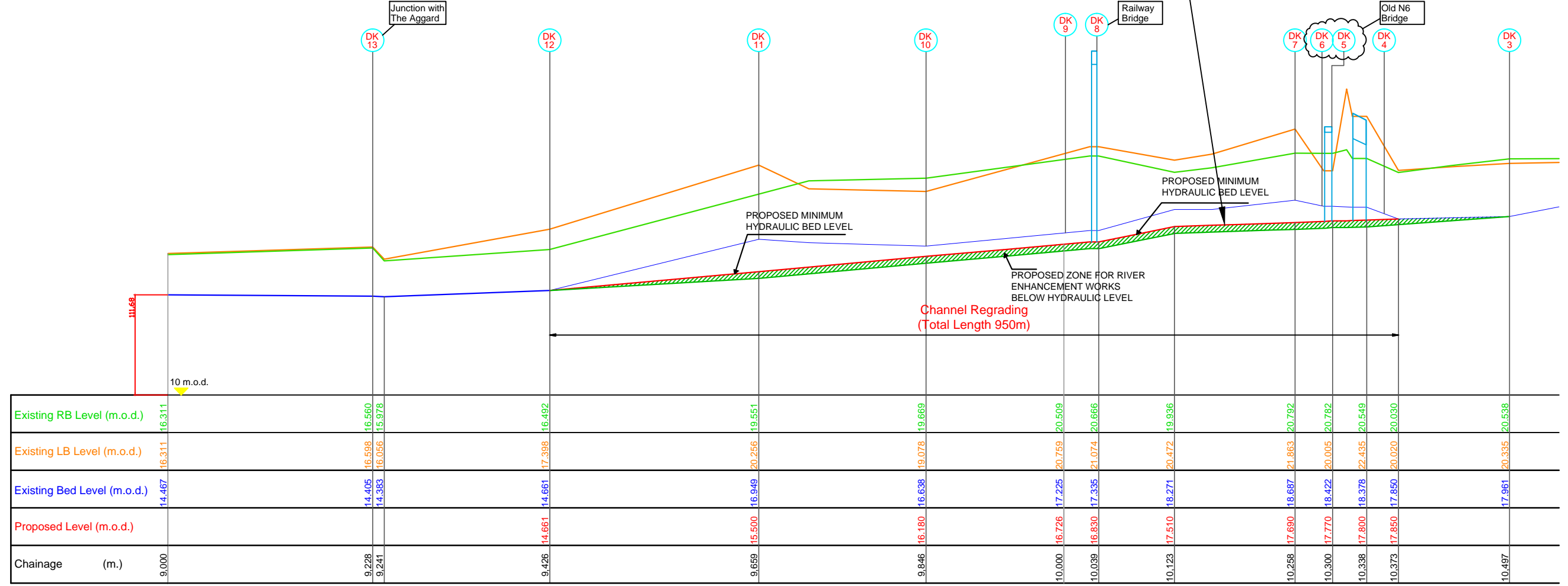


LEGEND

| | |
|--------------------------------------|--|
| RIVER | |
| Cross Section Reference | |
| Location of Proposed Spoil Heaps | |
| Location of Proposed Spoil Spreading | |

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|-----|---------|-------------|----|-------|
| F | Sept'14 | Issue | DC | MMcD |



Client: Galway County Council

Project: Dunkellin River and Aggard Stream Flood Relief Scheme

Title: Layout Plan & Longitudinal Section of Existing channel and Proposed works Sheet 7 of 7

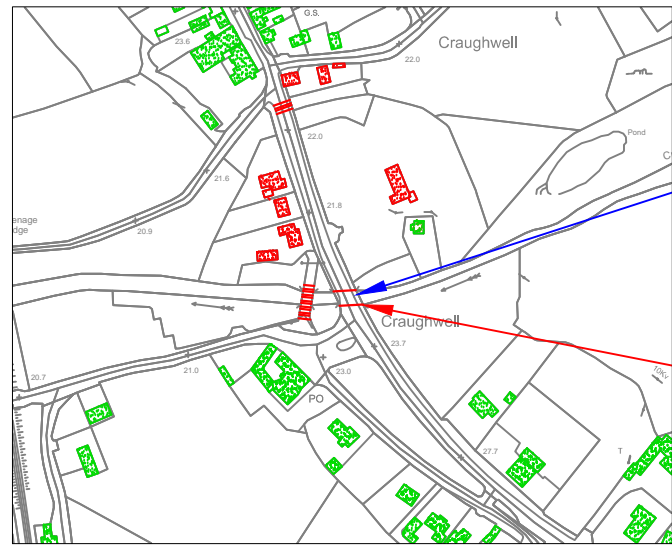
Scale @ A1: H - 1:2500 V - 1:100
Scale @ A3: H - 1:5000 V - 1:200

Prepared by: PMF
Checked: MMcD
Date: Oct 2011

Project Director: Michael Garrick

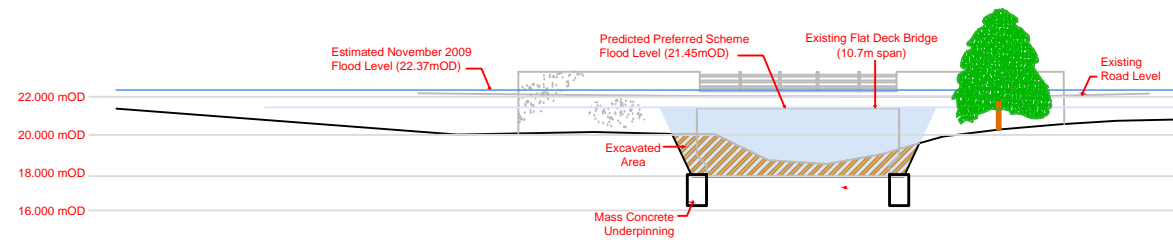
TOBIN
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fax: +353-(0)91-565398
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www.tobin.ie

Drawing No.: 6408-2208 F



Main R446 Bridge

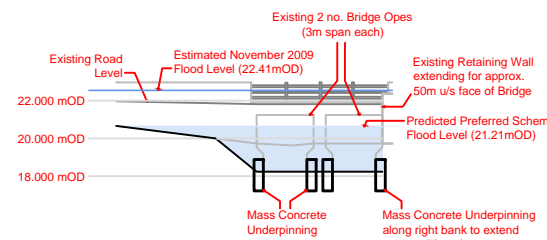
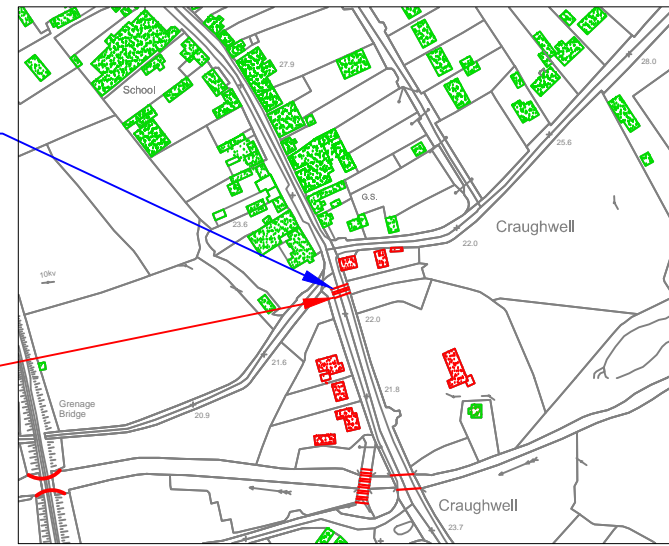
Mass Concrete Underpinning



Main R446 Bridge

Bypass Bridge

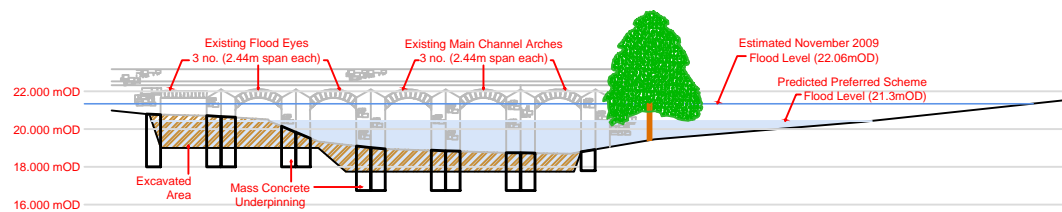
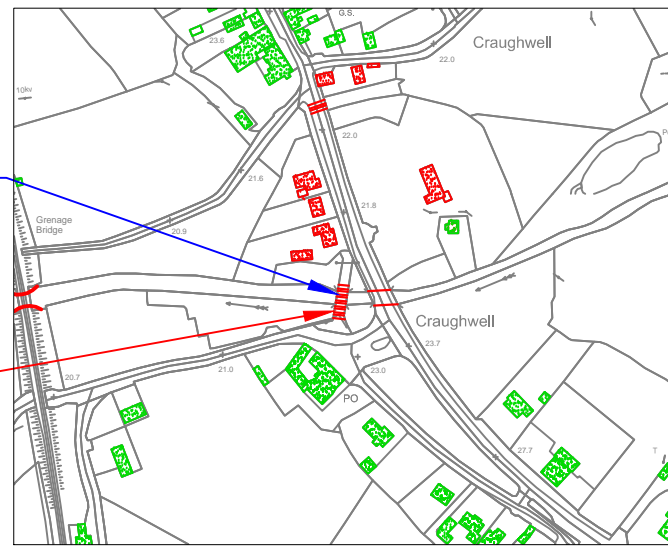
Mass Concrete Underpinning



Bypass Channel Bridge

Old Masonry Arch Bridge

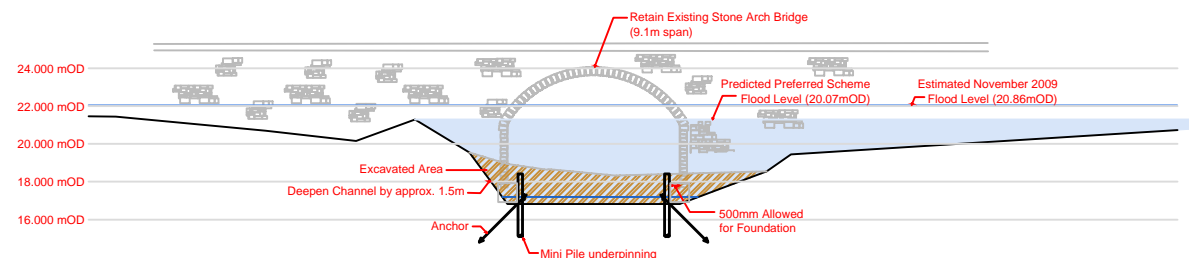
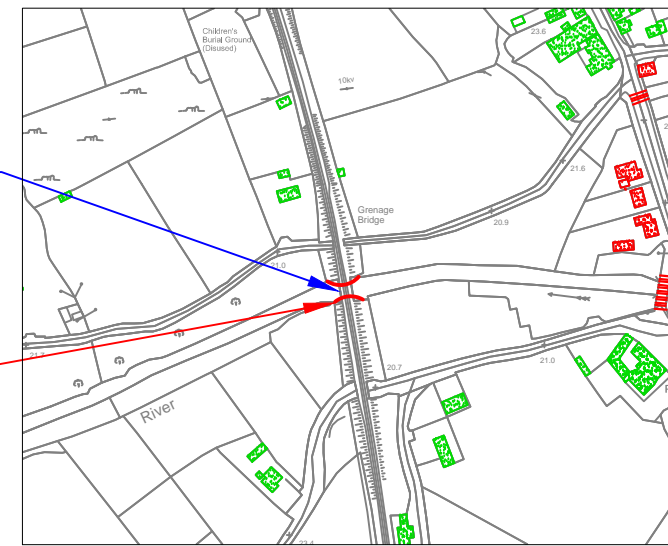
Mass Concrete Underpinning



Old Masonry Arch Pedestrian Bridge

Railway Bridge

Mini Pile Underpinning



Railway Bridge

NOTES:

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| Rev | Date | Description | By | Chkd. |
|-----|--------|-------------|----|-------|
| C | Sept14 | Issue | CK | MMcD |

Client: Galway County Council

Project: Dunkellin River and Aggard Stream Flood Relief Scheme

Title: Proposed Works at Bridges on the Dunkellin River Sheet 1 of 2

Scale @ A1: Elevation 1:200 Plan 1:2500
Scale @ A3: Elevation 1:400 Plan 1:5000

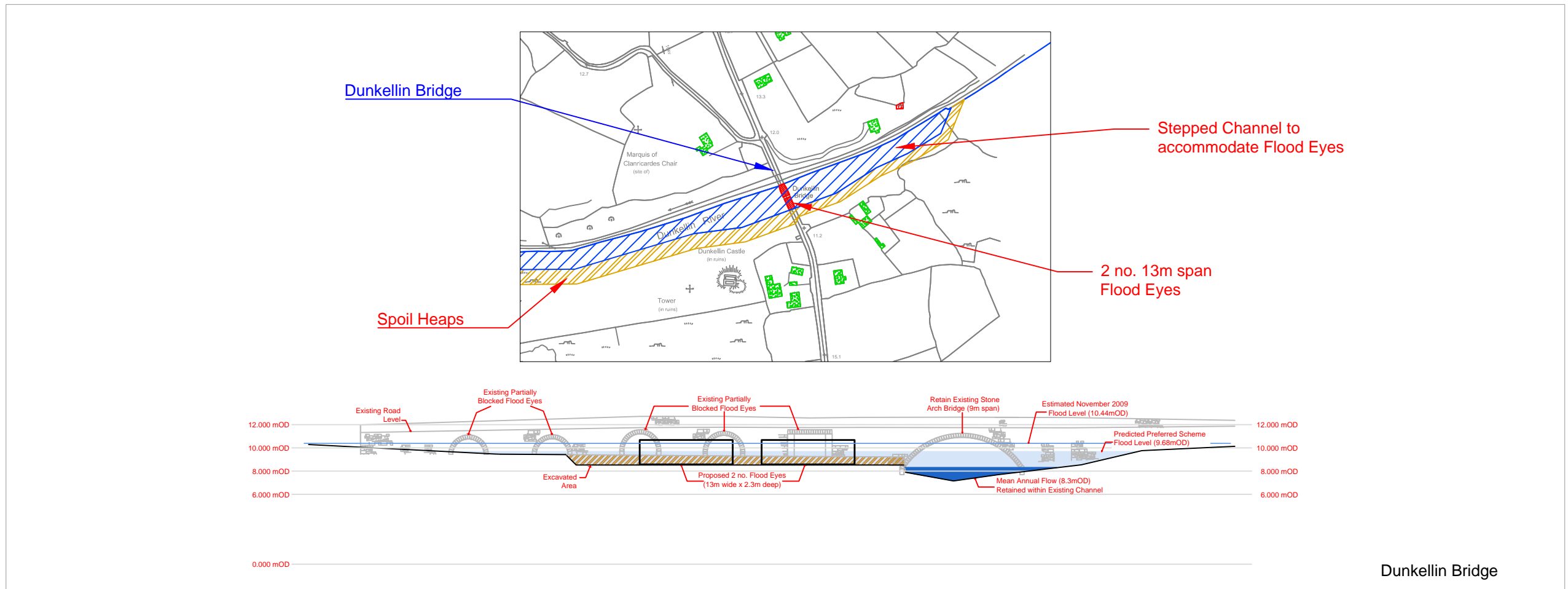
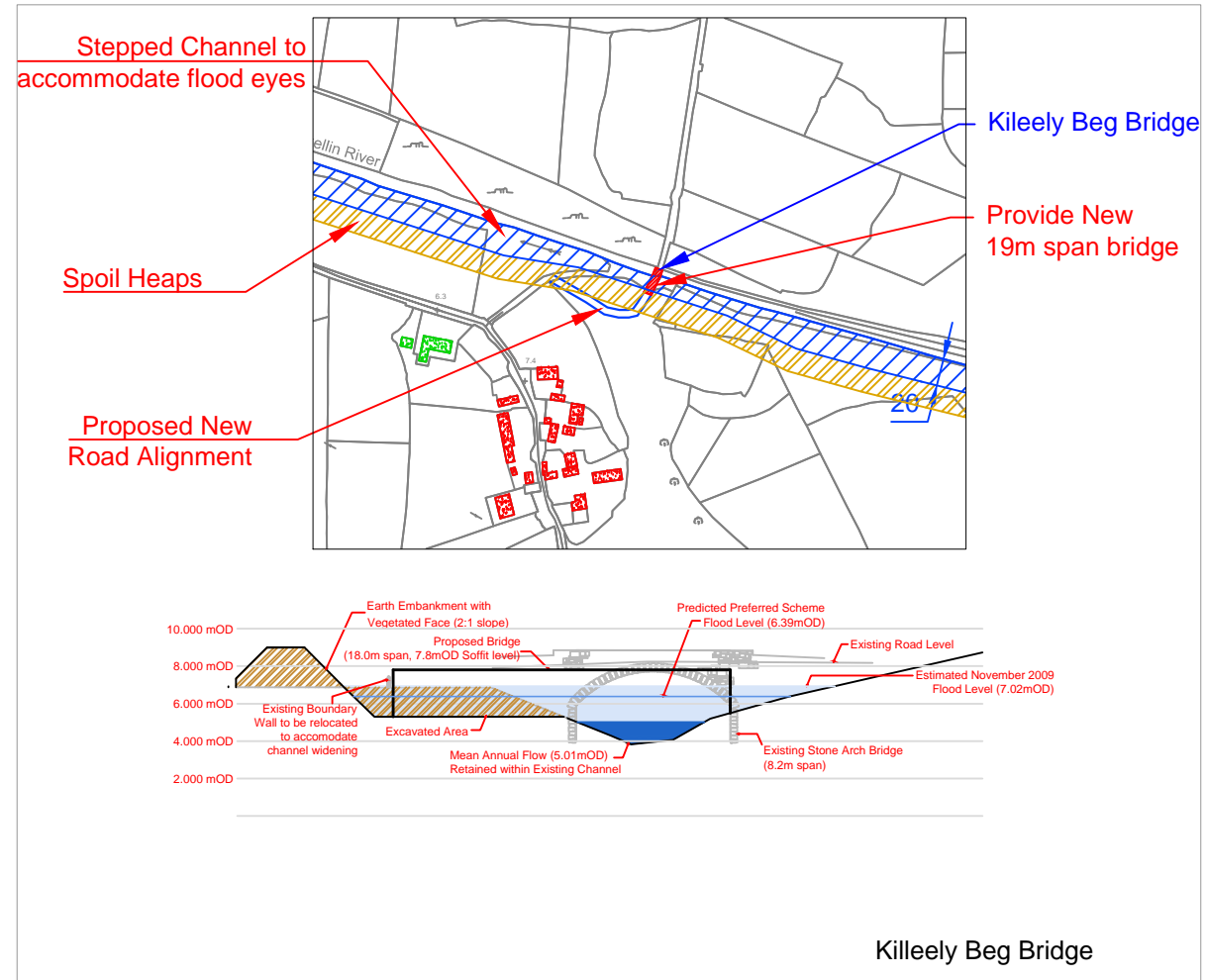
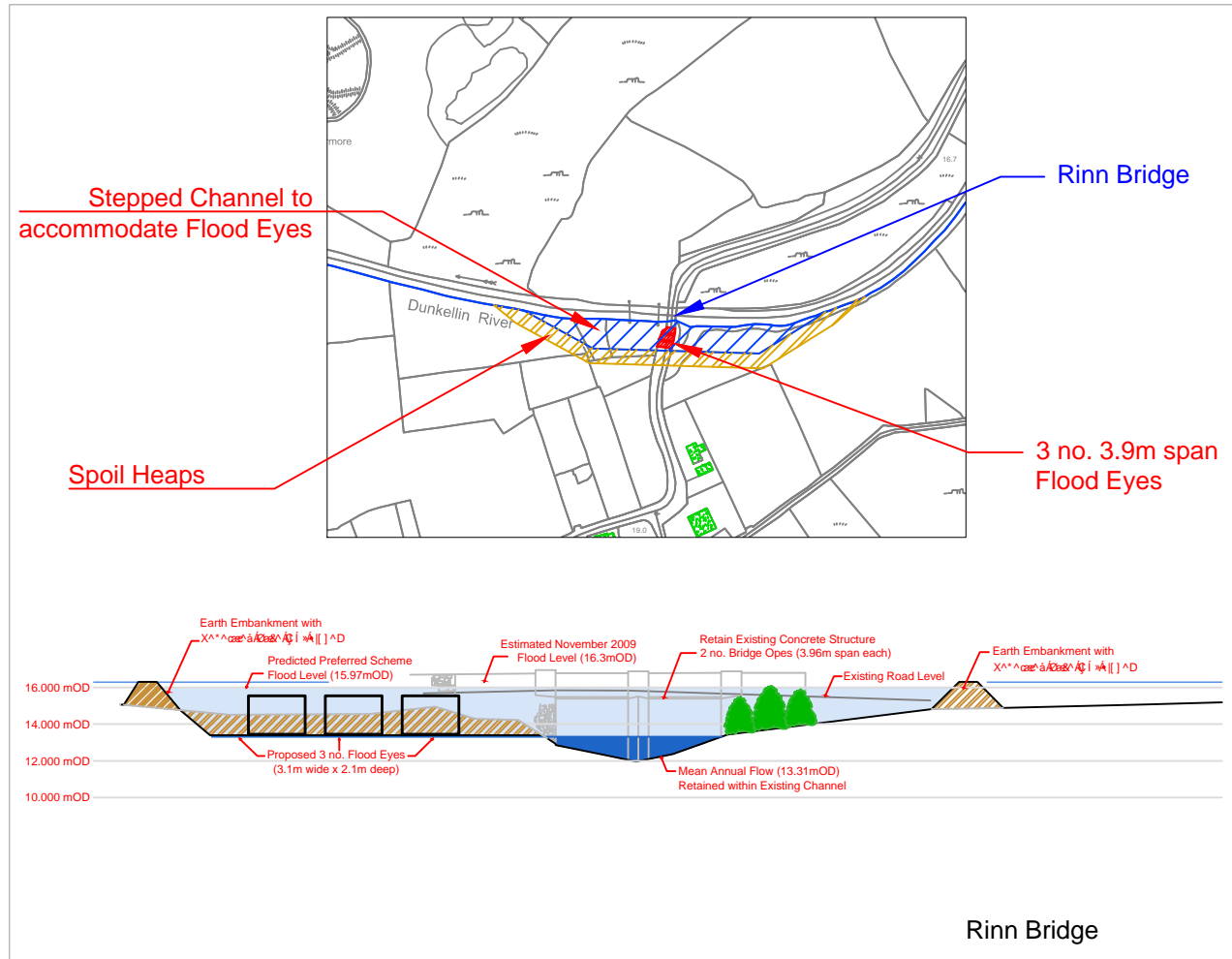
Prepared by: PMF Checked: MMcD Date: Oct 2011

Project Director: Michael Garrick

Drawing Status:

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Drawing No.: 6408-2210 Revision: C



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 - ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD.

| Rev | Date | Description | By | Chkd. |
|-----|---------|-------------|----|-------|
| C | Sept/14 | Issue | CK | MMcD |

Client: Galway County Council

Project: Dunkellin River and Aggard Stream Flood Relief Scheme

Title: Proposed Works at Bridges on the Dunkellin River Sheet 2 of 2

Scale @ A1: Elevation 1:200 Plan 1:2500
 Scale @ A3: Elevation 1:400 Plan 1:5000

Prepared by: PMF
 Checked: MMcD
 Date: Oct 2011

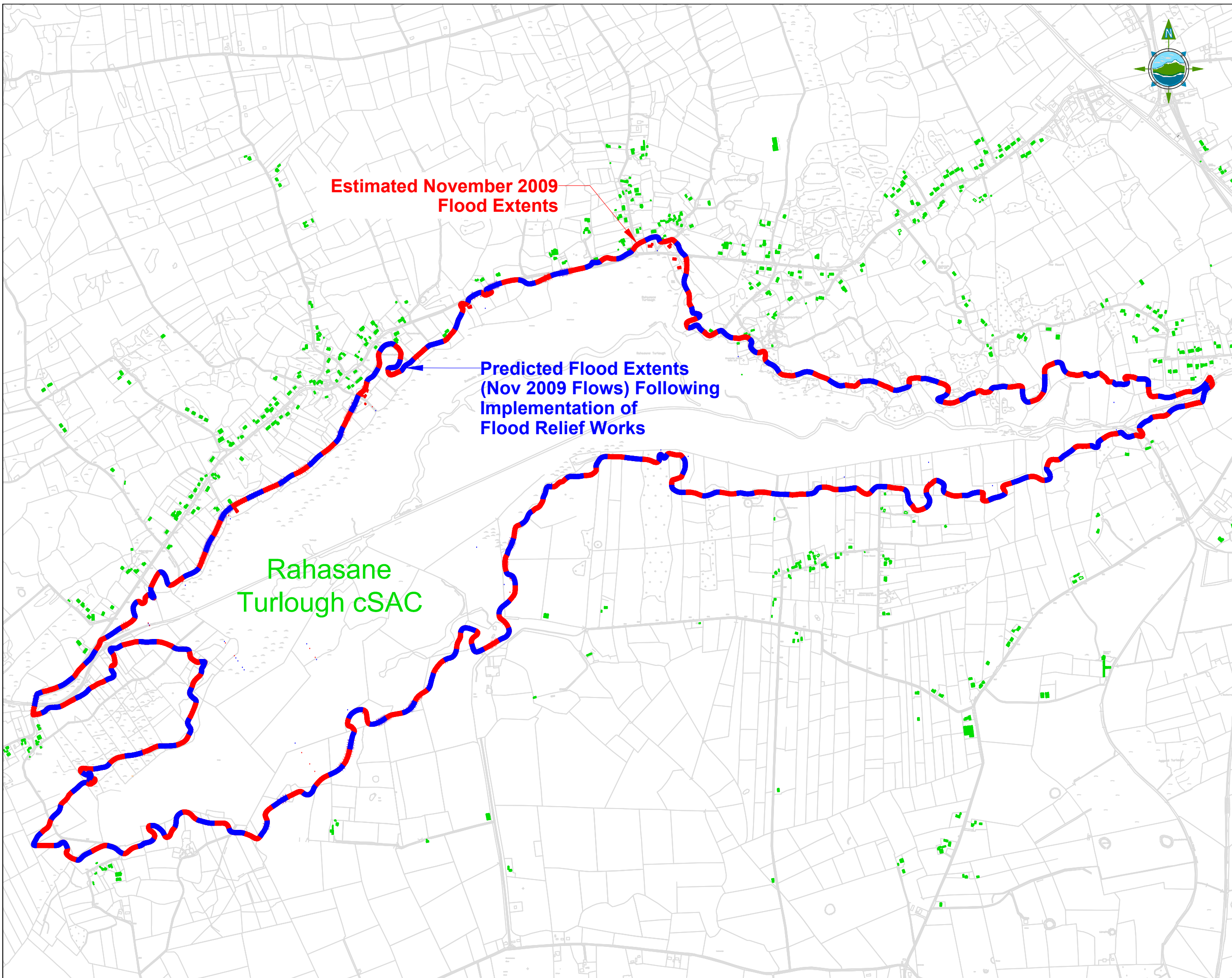
Project Director: Michael Garrick

Drawing Status:

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Drawing NO.: 6408-2211

Revision: C



**Estimated November 2009
Flood Extents**

**Predicted Flood Extents
(Nov 2009 Flows) Following
Implementation of
Flood Relief Works**

**Rahasane
Turlough cSAC**

NOTES:

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2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE.
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5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD.

| Rev | Date | Description | By | Chkd. |
|-----|---------|-------------|----|-------|
| E | July/14 | Issue | CK | MMcD |

Client: Galway County Council

Project: Dunkellin River and Aggard Stream Flood Relief Scheme

Title: Predicted Water Levels for November 2009 flood event Pre & Post Flood Alleviation Works

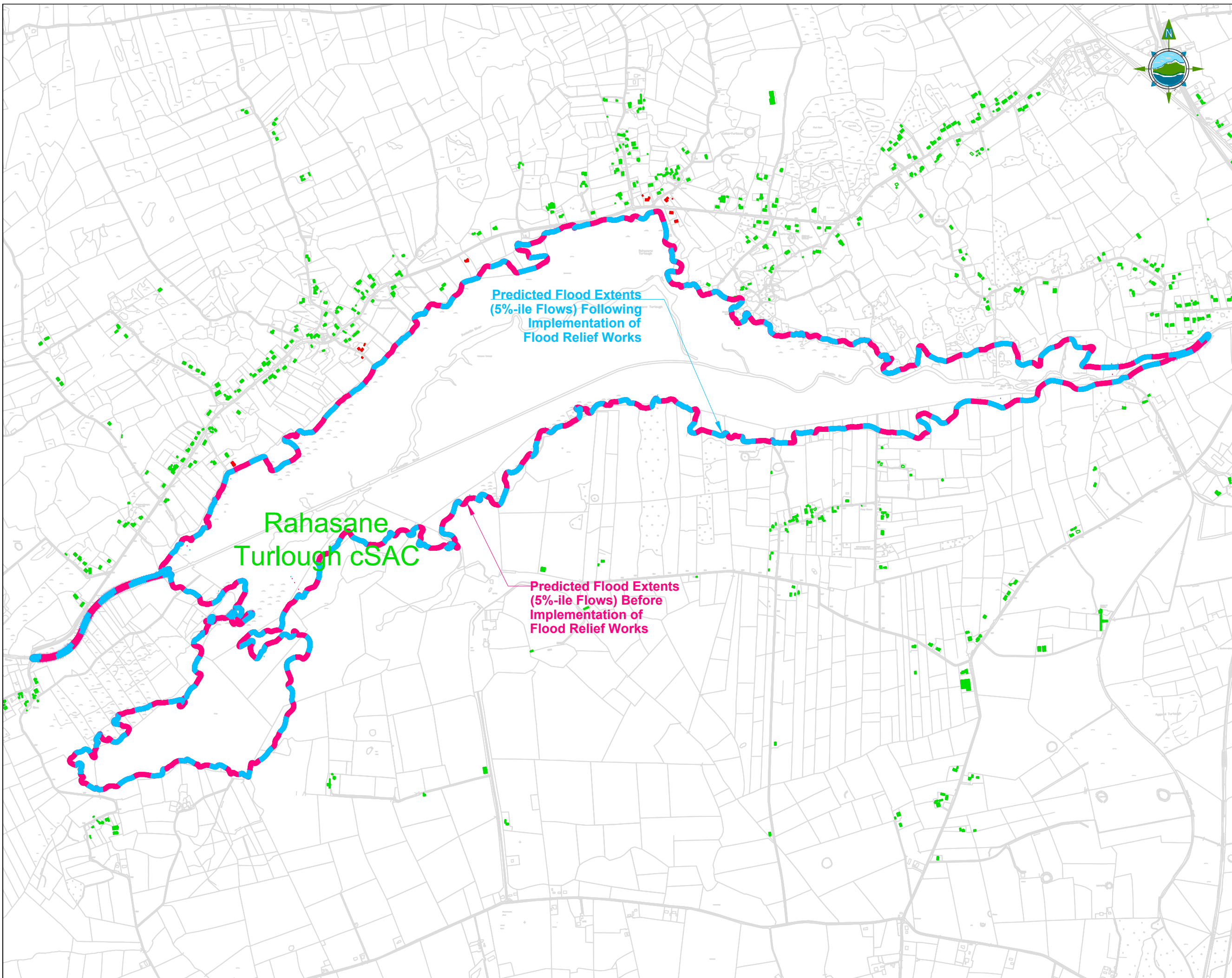
Scale @ A1: 7,500
Scale @ A3: 15,000

Prepared by: PMF
Checked: MMcD
Date: October 2011

Project Director: Michael Garrick
Drawing Status:

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Drawing No.: **6408-2215** E



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5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD.

| Rev | Date | Description | By | Chkd. |
|-----|---------|-------------|----|-------|
| D | July/14 | Issue | CK | MMcD |

Client: Galway County Council

Project: Dunkellin River and Aggard Stream Flood Relief Scheme

Title: Predicted Water Levels for 5%-ile Flows Pre & Post Flood Alleviation Works

Scale @ A1: 7,500
Scale @ A3: 15,000

Prepared by: PMF
Checked: MMcD
Date: October 2011

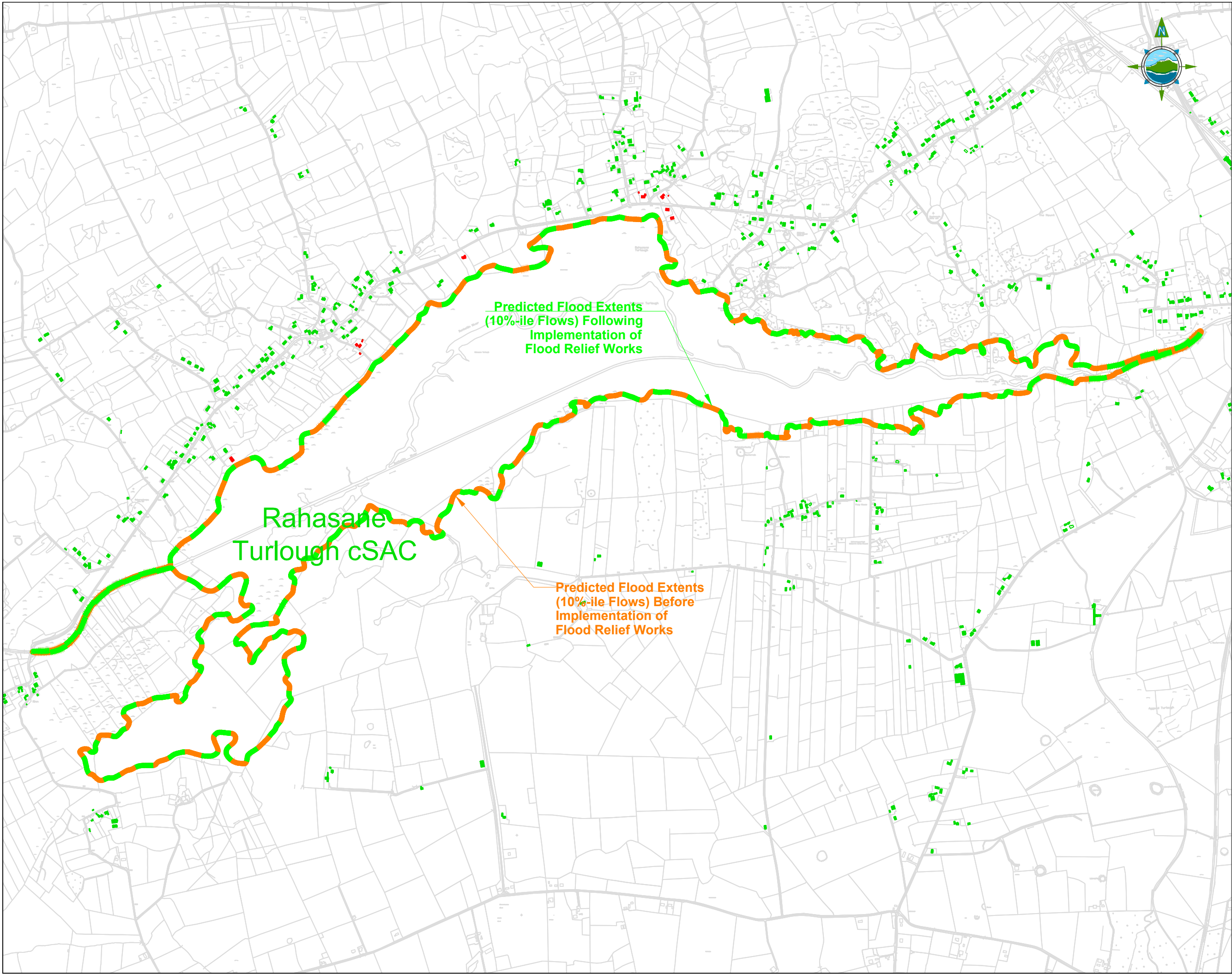
Project Director: Michael Garrick

Drawing Status:

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Drawing No.: 6408-2216

Revision: D



Predicted Flood Extents
(10%ile Flows) Following
Implementation of
Flood Relief Works

Rahasane
Turlough cSAC

Predicted Flood Extents
(10%ile Flows) Before
Implementation of
Flood Relief Works

NOTES:

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5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD.

| Rev | Date | Description | By | Chkd. |
|-----|---------|-------------|----|-------|
| D | July/14 | Issue | CK | MMcD |

Client: Galway County Council

Project: Dunkellin River and Aggard Stream Flood Relief Scheme

Title: Predicted Water Levels for 10%ile Flows Pre & Post Flood Alleviation Works

Scale @ A1: 7,500
Scale @ A3: 15,000

Prepared by: PMF
Checked: MMcD
Date: October 2011

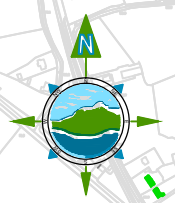
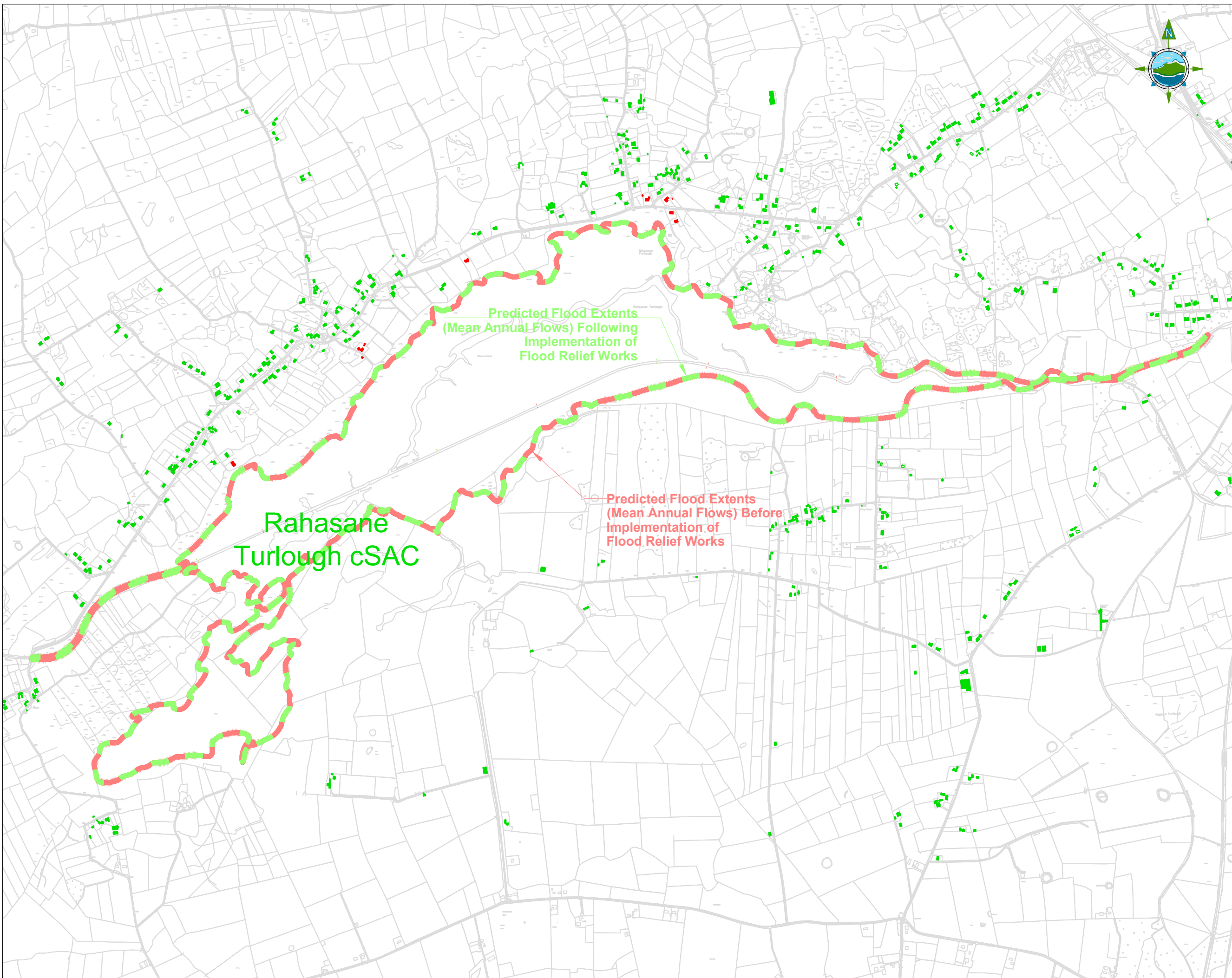
Project Director: Michael Garrick

Drawing Status:

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Drawing No.: **6408-2217** **D**



Predicted Flood Extents
(Mean Annual Flows) Following
Implementation of
Flood Relief Works

Predicted Flood Extents
(Mean Annual Flows) Before
Implementation of
Flood Relief Works

Rahasane
Turlough cSAC

NOTES:

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5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

| Rev | Date | Description | By | Chkd. |
|-----|---------|-------------|----|-------|
| D | July/14 | Issue | CK | MMcD |

Client: Galway County Council

Project: Dunkellin River and Aggard Stream Flood Relief Scheme

Title: Predicted Water Levels for Mean Annual Flow Conditions Pre & Post Flood Alleviation Works

Scale @ A1: 7,500
Scale @ A3: 15,000

Prepared by: PMF
Checked: MMcD
Date: October 2011

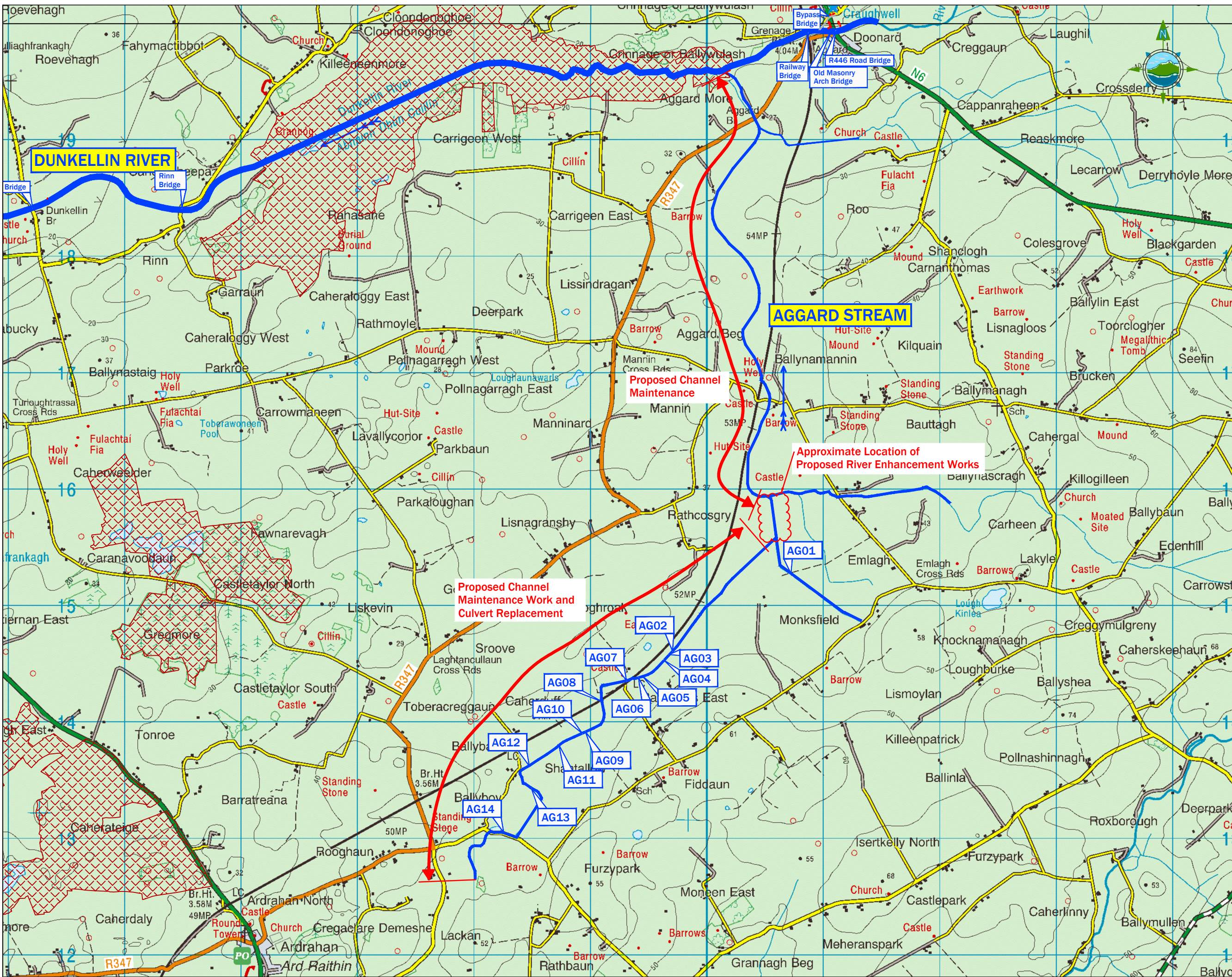
Project Director: Michael Garrick

Drawing Status:

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Drawing No.: 6408-2218

Revision: D



LEGEND

- RIVER
- SAC's, pNHA's, & SPA

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| Rev | Date | Description | By | Chkd. |
|-----|--------|-------------|-----|-------|
| A | Nov/11 | First Issue | PMF | MMcD |

Client: Galway County Council

Project: Dunkellin River and Aggard Stream Flood Relief Scheme

Title: Layout Plan of Proposed Works along Aggard Stream

Scale @ A1: 15,000
Scale @ A3: 30,000

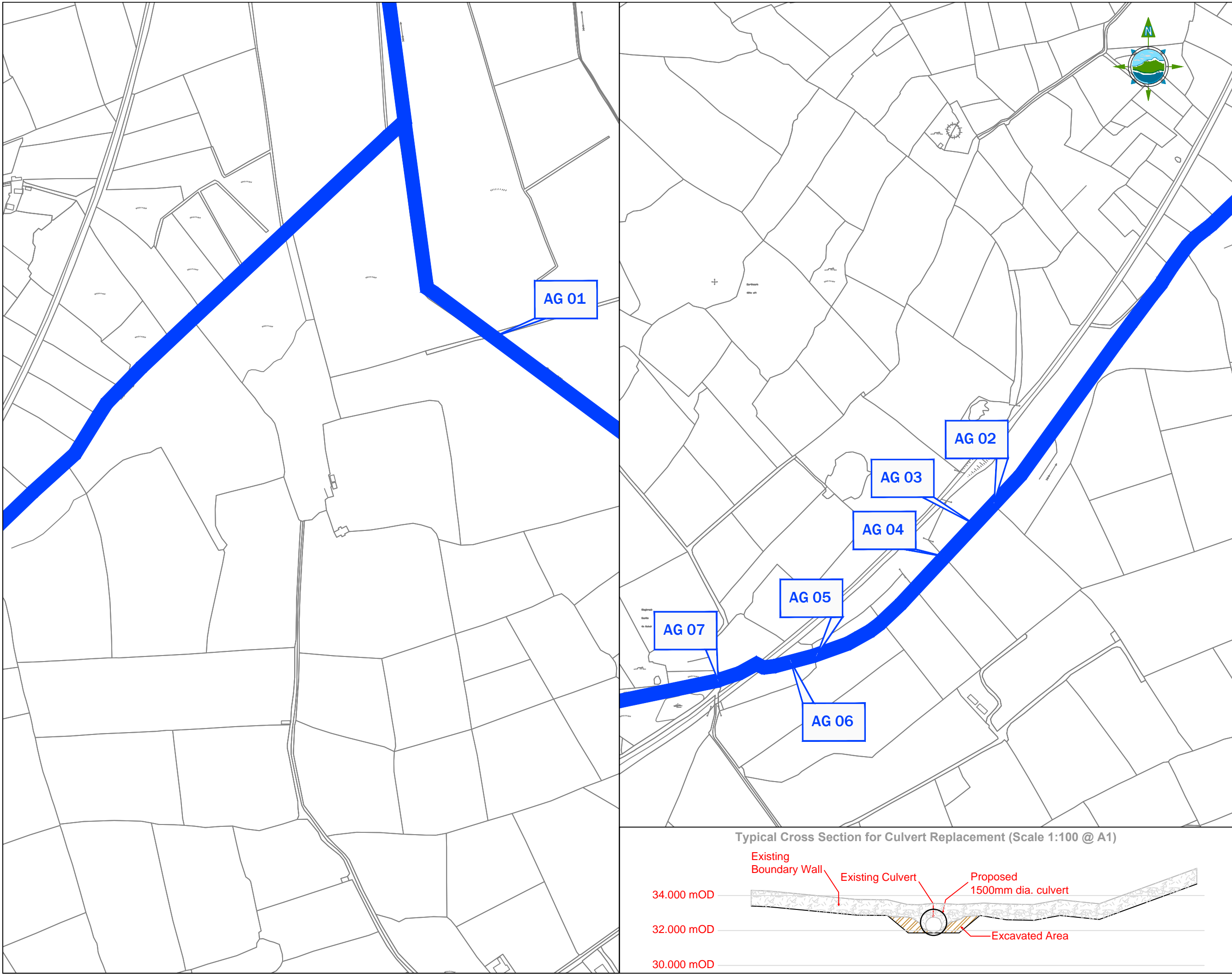
Prepared by: PMF Checked: MMcD Date: Nov 2011

Project Director: Michael Garrick

Drawing Status:

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Drawing No.: 6408-2220 A



LEGEND

RIVER

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| Rev | Date | Description | By | Chkd. |
|-----|---------|-------------|----|-------|
| C | Sept'14 | Issue | CK | PC |

Client: Galway County Council

Project: Dunkellin River and Aggard Stream Flood Relief Scheme

Title: Locations of Proposed Culvert Replacement along Aggard Stream Sheet 1 of 2

Scale @ A1: 2500
Scale @ A3: 5000

Prepared by: PMF
Checked: MMCD
Date: Nov 2011

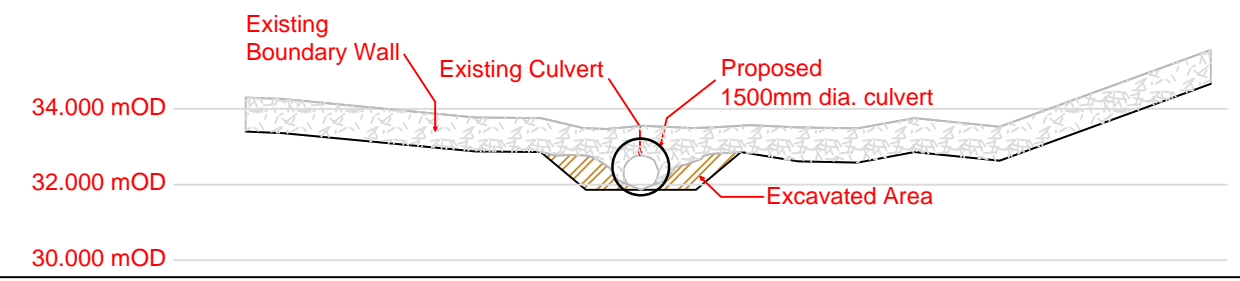
Project Director: Michael Garrick
Drawing Status:

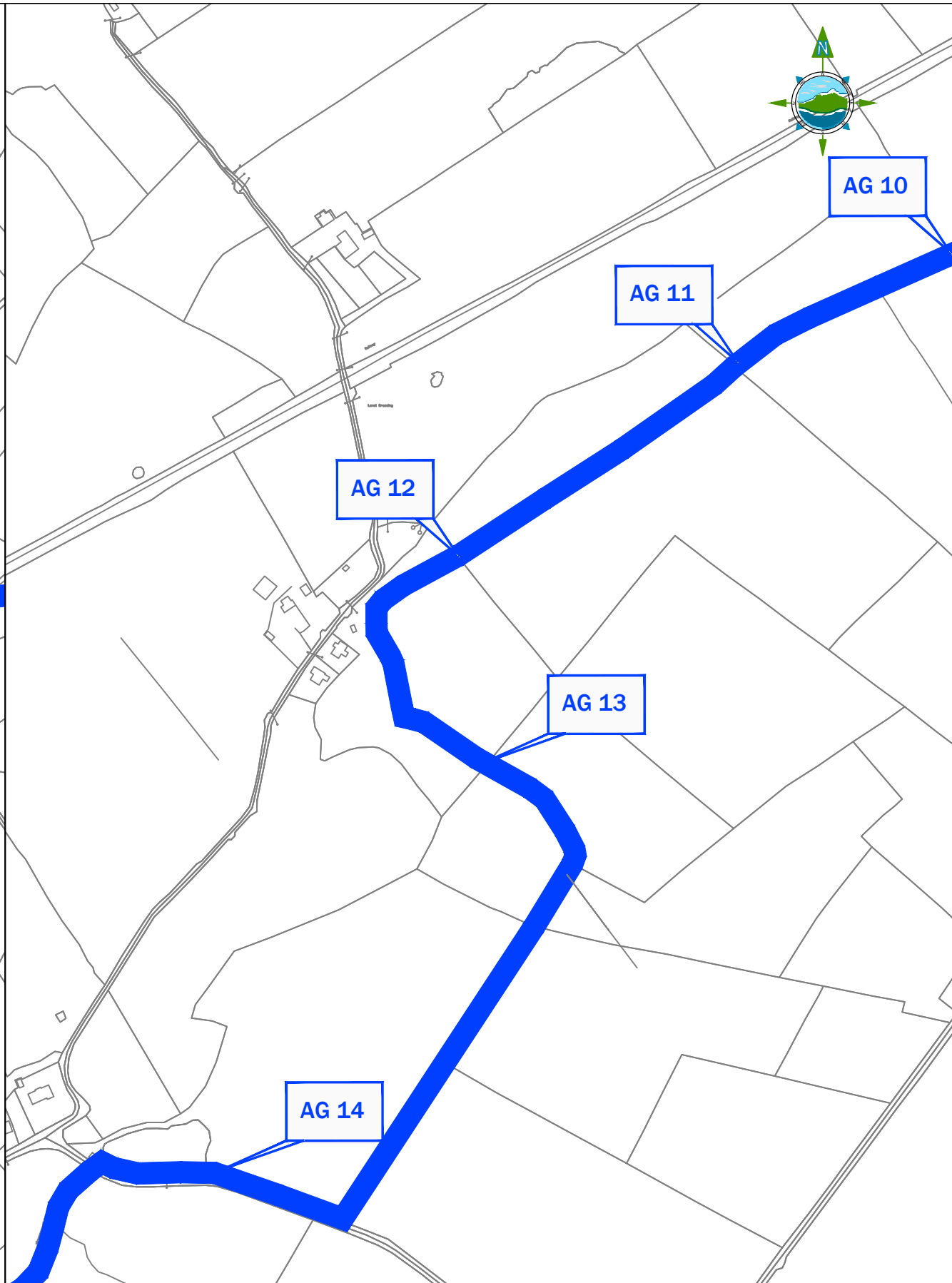


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Drawing No.: **6408-2221** **C**

Typical Cross Section for Culvert Replacement (Scale 1:100 @ A1)





LEGEND

RIVER

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| Rev | Date | Description | By | Chkd. |
|-----|---------|-------------|----|-------|
| C | Sept'14 | Issue | CK | PC |

Client: Galway County Council

Project: Dunkellin River and Aggard Stream Flood Relief Scheme

Title: Locations of Proposed Culvert Replacement along Aggard Stream Sheet 2 of 2

Scale @ A1: 2500
Scale @ A3: 5000

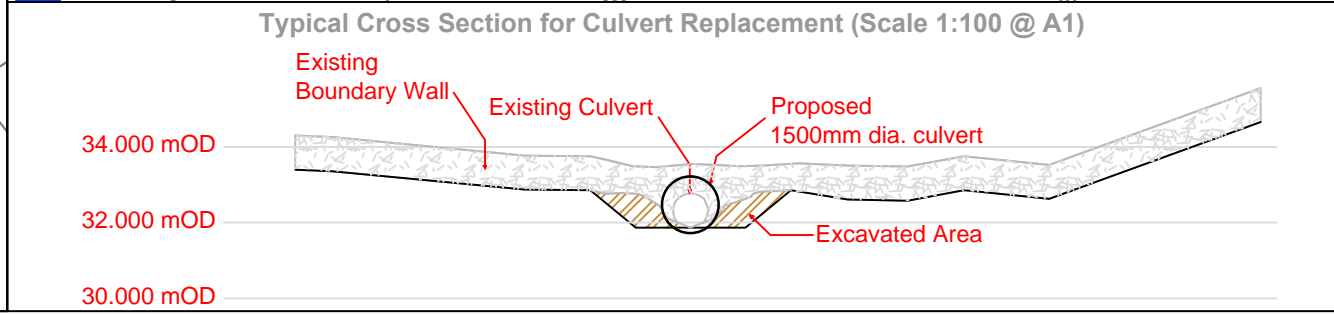
Prepared by: PMF
Checked: MMCD
Date: Nov 2011

Project Director: Michael Garrick

Drawing Status:

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Drawing No.: 6408-2222
Revision: C





LEGEND

RIVER

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| Rev | Date | Description | By | Chkd. |
|-----|---------|-------------|----|-------|
| A | Sept/14 | First Issue | CK | PC |

Client: Galway County Council

Project: Dunkellin River and Aggard Stream Flood Relief Scheme

Title: Location of Site Notices

Scale @ A1: 1:17,500
Scale @ A3: 1:35,000

Prepared by: CK Checked: PC Date: Sept 14

Project Director: Michael Garrick

Drawing Status:

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Drawing No.: 6408-2250 Revision: A