

Welsh Government

**M4 Corridor around Newport**

Environmental Statement  
Supplement

Volume 3: Appendix S2.1  
Supplementary File Note on  
Reen Mitigation Strategy

M4CaN-DJV-HDG\_GEN-FN-CD-0011

At Issue | September 2016

# Supplementary File Note

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Project title    M4 Corridor around Newport

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cc

File reference

M4CaN-DJV-HDG\_GEN-FN-CD-0011

Prepared by

Date

August 2016

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Subject            Supplementary File Note on Reen Mitigation Strategy

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## Purpose of this File Note

The Welsh Government's draft Orders and Environmental Statement for the M4 Corridor around Newport (M4CaN) were published in March 2016. Supplements and Modifications to the draft Orders have been developed by the Welsh Government to be published in September 2016 for the following reasons:

- I.    Amendments to the details of parties in the Schedules to the Compulsory Purchase Order following receipt of further information on title holders, lessees and interested parties.
- II.    Amendments to the project further to matters raised by responses received to the draft Orders.

Supplements to the Environmental Statement and Associated Reporting are also published to consider the changes as well as further information available since preparing the draft Orders, such as further ecological surveys.

The following design changes have been incorporated as part of this supplement:

1.    Minor revisions to the NMU provision at Church Lane and Lighthouse Road.
2.    Docks Way Junction: revised horizontal and vertical alignment to lower the slip and link roads, remove the secondary roundabout and change the form of structure of the mainline viaduct (SBR-0885 Docks Way Junction Viaduct). This also reduced the length and height of the retaining wall along Docks Link Road (SRW-0895 Docks Link Retaining Wall).
3.    Docks Link Road: realignment of Maes Glas Pill Culvert and bridge extension SBR-0925A and retaining wall SRW-0910 added based on outcome of further survey and as-built information provided allowing further design to be undertaken.
4.    Glan Llyn Junction: providing access from Glan Llyn Link Road to the TATA owned land to the east. In addition, providing a retaining wall along the mainline to minimise impact on the existing pylon (SWR-1520 Pylon SE001 Retaining Wall).
5.    J23a to J23 Trunk Road: revised vertical alignment at the west tie-in to lower the trunk road, achieved by matching the headroom of the proposed extension to St Bride's Road Bridge to the headroom of the existing St Bride's Road Bridge.
6.    Magor Interchange (Junction 23) Roundabout: revised vertical alignment to lower part of the roundabout, achieved by realigning Bencroft Lane, removing Bencroft Lane underpasses and providing an overbridge to the east over the M48 (SBR-2340 Windmill Hill Overbridge).
7.    Magor Interchange (Junction 23) Westbound Free-flow Link: revised vertical alignment to lower the free-flow link and height of the associated retaining wall (SRW-2320 Magor Retaining Wall) by

## File Note

introducing a small retaining wall (SRW-2285 Rockfield Lane North Wall) between the link and the J23a to J23 trunk road.

8. Magor Interchange (Water Treatment Area 12B): Further site investigation work has concluded that Vurlong Reen would not be sufficient for discharge of this Water Treatment Area (WTA). An alternative discharge point has been identified, which runs alongside Old Court Farm access drive and from where it would tie into existing drainage arrangements.

This supplementary report provides detail of clarification of the Reen Mitigation Strategy.

### Content of supplement

The following sections have been amended. The paragraph numbering systems from the original document has been maintained.

### 2. The Existing Reen Network

Responsibility for reen maintenance lies with the riparian owners. NRW exercise their permissive powers to undertake maintenance works and water management for reens classified as Main Rivers (generally running north to south) and also all other major reens within the Caldicot and Wentlooge Levels Internal Drainage District (IDD). These two types of reen are subject to differing maintenance regimes which are currently under review. Further information on the reen system is provided in "The Caldicot & Wentlooge Levels Drainage Board Its History, Functions and Water Level Management Plan" (July 1995).

The water levels in the reens are divided into Winter Penning Levels (WPL) and Summer Penning Level (SPL). WPL is the water level in the reen during winter, which is kept lower to provide additional storage capacity. SPL is the water level during summer, which is kept higher for a variety of reasons, including nature conservation within the SSSI and active water management. During extreme storm events it is possible for water levels to rise above these levels.

The un-mown ditch banks and rough grassland areas provide habitat for the shrill carder bee, as they contain the flowers preferred by the bee for sources of nectar and pollen, such as red clover, creeping thistle and black knapweed. The presence of shrill carder bee is also a reason for SSSI designation.

### 3. Scheme Impact on Existing Reens and Field Ditches

The Scheme crosses reens and field ditches at a series of locations (see Appendix A). These reens and field ditches would be infilled as part of the scheme. The estimated length of reens that would be infilled and culverted as part of the Scheme is approximately 2,760m. The estimated length of field ditch crossings that would be infilled as part of the Scheme is approximately 9,370m.

Table 1 (below) breaks down the infilled reens across the scheme.

Chainage	Reen Name	Length infilled (m)	Reason infilled
5+100-5+300	Nant-y-moor Reen	194	Existing reen runs parallel and underneath mainline footprint
5+500-5+750	Percoed Reen and SDR reen	274	Existing reen runs underneath mainline footprint, with junction with SDR reen
6+820-6+900	Morfa Gronw Reen	116	Existing reen runs perpendicular to mainline footprint
7+750	Old Dairy Reen	79	Existing reen runs perpendicular to mainline footprint

## File Note

Chainage	Reen Name	Length infilled (m)	Reason infilled
7+980	Pont-y-Cwcw	74	Existing reen runs perpendicular to mainline footprint
8+050	Pont-y-Cwcw	140	Existing reen runs under footprint of New Dairy Access.
8+400	Sea Wall Reen	190	Existing reen diverted away from Sea Wall to allow construction of bridge abutment over River Ebbw
12+350	Lakes Reen	53	Existing reen runs perpendicular to mainline footprint
12+400	Julians Reen	89	Existing reen runs parallel to existing side road
13+000	Julians Reen	55	Existing reen runs perpendicular to mainline footprint
14+280 – 14+360	Ellen Reen	210	Existing reen runs perpendicular to mainline and slip road footprint
14+650-14+750	Middle Reen	163	Existing reen runs perpendicular to mainline and slip road footprint
14+850	Black Wall Reen	23	Existing reen runs underneath Tata land access
14+880	Black Wall Reen	112	Existing reen runs perpendicular to mainline and slip road footprint
14+880	Monks Ditch	20	Existing reen runs underneath Tata land access
14+900	Monks Ditch	103	Existing reen runs perpendicular to mainline and slip road footprint
16+600	Elver Pill Reen	65	Existing reen runs perpendicular to mainline footprint
17+750	Middle Road Reen Diversion	41	Existing reen runs underneath North Row side road at skew
17+900	Middle Road Reen Diversion	63	Existing reen runs perpendicular to mainline footprint
18+480	Cock Street Reen	60	Existing reen runs perpendicular to mainline footprint
19+250 – 19+410	Petty Reen	198	Existing reen runs perpendicular to mainline footprint
19+600-19+650	Stutwall Reen	81	Existing reen runs perpendicular to mainline footprint
19+650 – 19+750	Stutwall Reen	142	Existing reen runs perpendicular to mainline footprint
19+850 – 20+050	Bareland Street Reen	210	Existing reen runs perpendicular to mainline footprint
<b>Total</b>	2,755m		

Table 2 (below) breaks down the infilled field ditches across the Scheme.



## File Note

Chainage	Length infilled (m)	Reason infilled
4+420-4+430	64	Existing field ditch under mainline footprint
5+630 – 5+950	376	Existing field ditch under mainline footprint and Percoed NMU bridge approach embankment
5+950 – 6+050	109	Existing field ditch under footprint of WTA 4b
6+050 – 6+100	383	Two existing field ditches under footprint of WTA 4b and mainline
6+120 – 6+280	170	Existing field ditch under mainline footprint
6+250 – 6+350	150	Existing field ditch under mainline footprint
6+400 – 6+550	419	Existing field ditch under mainline and structural embankment footprint
6+550 – 6+650	101	Existing field ditch under mainline footprint
6+900	66	Existing field ditch under mainline footprint connecting to Morfa Gronw Reen
6+930 – 7+400	718	Existing field ditches parallel to mainline footprint and WTA 5.
7+340	20	Existing field ditch under Lighthouse Road South
7+350	26	Existing field ditch under Lighthouse Road North
7+380	106	Existing field ditch parallel to Lighthouse Road Side Road
7+410	61	Existing field ditch under mainline footprint
7+500	99	Existing field ditches under mainline footprint
7+520 – 7+670	184	Existing field ditch parallel to mainline footprint
7+670	18	Existing field ditch under mainline footprint
7+730	68	Existing field ditch perpendicular to mainline footprint
7+880	74	Existing field ditch perpendicular to mainline footprint
7+990	81	Existing field ditch perpendicular to mainline footprint
8+010 – 8+050	46	Existing field ditch under New Dairy Access embankment north
8+010 – 8+050	42	Existing field ditch under New Dairy Access embankment south
8+100 – 8+350	421	Existing field ditches under embankment approach to River Ebbw Crossing
8+060 – 8+100	24	Existing field ditch to be infilled for diversion of Heol Pont-y-Cwch
11+550	67	Existing field ditches under embankment from main bridge crossing
11+640 – 11+760	165	Existing field ditch parallel to mainline footprint
11+800 – 12+000	313	Existing field ditches under mainline footprint
12+070	174	Existing field ditch perpendicular to mainline footprint
12+150 – 12+350	191	Existing field ditch through WTA 6
12+460 – 12+620	245	Existing field ditches under mainline footprint
12+700	80	Existing field ditch under mainline footprint
12+850 – 12+970	271	Existing field ditches under mainline footprint
13+000	60	Existing field ditch perpendicular to mainline footprint
13+000 – 13+100	216	Existing field ditches perpendicular to mainline footprint
13+130 – 13+210	142	Existing field ditches perpendicular to mainline footprint

## File Note

Chainage	Length infilled (m)	Reason infilled
13+240 – 13+330	150	Existing field ditches perpendicular to mainline footprint
13+500 – 13+730	361	Existing field ditch parallel to mainline footprint
13+900	59	Existing field ditch perpendicular to mainline footprint
14+120 – 14+160	80	Existing field ditch perpendicular to mainline footprint
14+280 – 14+360	100	Existing field ditches perpendicular to mainline and Garn Llyn Slip lanes
14+400 – 14+550	296	Existing field ditches perpendicular to mainline and Garn Llyn Slip lanes
16+390	53	Steelworks dedicated reen perpendicular to mainline footprint
16+400 – 16+460	74	Existing field ditch skewed to mainline footprint
16+850 – 17+100	540	Existing field ditches skewed to mainline footprint
17+150	60	Existing field ditch perpendicular to mainline footprint
17+200	59	Existing field ditch perpendicular to mainline footprint
17+500	59	Existing field ditch perpendicular to mainline footprint
17+520 – 17+880	799	Existing field ditches under mainline and WTA 9
17+900	134	Existing field ditches perpendicular to mainline footprint
18+000	69	Existing field ditch perpendicular to mainline footprint
18+150	67	Existing field ditch perpendicular to mainline footprint
18+980	63	Existing field ditch perpendicular to mainline footprint
19+080	67	Existing field ditch perpendicular to mainline footprint
19+130	66	Existing field ditch perpendicular to mainline footprint
19+400	120	Existing field ditch perpendicular to mainline footprint
19+700 – 19+850	347	Existing field ditch parallel to mainline
<b>Total</b>	9,373m	

# File Note

## 4. Mitigation Proposals for Reens and Field Ditches

NRW have advised that once a new reen is excavated, natural habitat will rapidly establish. This is reflected with the reen maintenance programme, which dredges the reen to clear vegetation and allows it to re-establish. An example of vegetation establishment on the reen system on Sea Wall Reen is shown in Figure 1 below, which shows a newly excavated reen, and the same reen 8 months later.



*Figure 1 – Sea Wall Reen diversion – during construction and after 8 months.*

Replacement reens and field ditches will run parallel to the highway. This will improve the connectivity of the existing reen system, and therefore provides additional flexibility for the management of the reen system. The reens and field ditches, where present, will also intercept some water from the highway embankment. This water will not include highway runoff, and will be a small area, as highway embankments will typically be 5m width. The ditches provided are larger than the typical dimensions for a highway cut off ditch (1.8m width), as they will have wider benefits to the surrounding system.

Based on consultation with NRW, and to ensure that there are no adverse effects on the hydrology of the Levels, for the replacement reens and field ditches, an approximately equal length of replacement is provided for the amount lost. This allows for effective water management as there is not a loss of storage within the levels. It also provides an equal amount of new habitat to replace the habitat lost.

Culvert crossings will be provided for each main reen, in order to maintain connectivity within the reen system. For culverts which have no discernible catchment from FEH analysis, these are currently proposed to be 1800 x 1800 concrete box culverts. The invert of these will be installed 150mm below the existing reen bed level to allow a natural bed to form, and then will be partially submerged to allow the water level to be maintained at SPL and WPL. There will be penstock sluices installed at each end, with the facility to completely close the sluice between the culvert and reen in order to allow access for maintenance. There will also be tilting sluices installed along the length of new reens where considered necessary to maintain the extended reen network. Tilting sluices are currently widely used across the Gwent Levels by NRW currently, and have been proposed by NRW. Culverts with a catchment are currently proposed to be 1800mm height. This will be confirmed through further surveys at detailed design.

Drawings M4CaN-DJV-HDG-ZG-GEB-DR-CD-0001 to 0016 in Appendix A show the current proposals for the reen mitigation across the Scheme. Table 3 (below) shows the approximate length of replacement reens provided.

## File Note

Chainage	North or south of carriageway	Length provided (m)	Reason of provision
5+100 – 5+520	North	426	Connect Nant-y-Moor reen to SDR reen to improve water management
5+100 – 5+300	South	194	Diversion of Nant-y-Moor reen
5+520 – 5+760	South	246	Diversion of Percoed reen and connection of SDR reen to Percoed reen
6+000 – 6+700	North	775	Connection of Percoed reen to Morfa Gronw reen to improve water management
6+820 – 6+900	North	91	Diversion of Morfa Gronw reen
7+750 – 7-980	North	259	Connect Old Dairy Reen to Pont-y-Cwcw
8+000	North	142	Divert Pont-y-Cwcw Reen
8+050 – 8+400	North	365	Connect Pont-y-Cwcw reen to Sea Wall reen.
8+400	North	58	Divert Sea Wall Reen
8+400	South	27	Divert Sea Wall Reen
19+120 – 19+300	North	145	Water flows diverted to Cock Street Reen
19+120	South	98	Existing ditch widened to outfall to Rush Wall Reen
<b>Total</b>		2,826m	

Table 4 (below) shows the length of proposed replacement field ditches across the scheme.

Chainage	North or south of carriageway	Length provided (m)	Reason of provision
4+320 – 4+520	North	209	Intercept ditches and transfer flow to culverts
4+420 – 5+100	South	658	Interception and diversion of flows to connect to Nant-y-Moor Reen, including flowing through Church Lane overbridge
5+510 – 5+760	North	219	Intercept ditches and transfer flows to Percoed Reen
5+760 – 6+130	South	472	Field ditch diversion around Water Treatment Area 4b
6+120 – 6+330	South	160	Ditch to intercept flows from drain
6+530 – 6+680	South	122	Intercept highway embankment runoff and direct to existing drains
6+680 – 6+880	South	209	Intercept highway embankment runoff and direct to existing drains
6+900-7+150	North	240	Divert field ditch around Water Treatment Area
6+880 – 7+110	South	247	Intercept highway embankment runoff and direct to existing drains
7+400 – 7+750	North	302	Intercept flows from existing ditches and redirect towards culverts
7+400 7+500	South	90	Intercept highway embankment runoff and direct to existing

## File Note

Chainage	North or south of carriageway	Length provided (m)	Reason of provision
			drains
7+500 – 7+750	South	233	Intercept highway embankment runoff and direct to existing drains
7+760 – 8+380	South	580	Intercept highway embankment runoff and direct to existing drains
8+080	North	216	Diversion of ditch along Heol Pont-y-Cwch
11+550 – 11+820	North	254	Intercept flows from existing ditches and redirect towards culverts
11+640 – 11+960	South	323	Intercept highway embankment runoff and direct to existing drains
11+810 – 12+350	North	591	Intercept flows from existing ditches and redirect towards Lakes Reen around Water Treatment Area 6
11+960 – 12+090	South	122	Intercept highway embankment runoff and direct to existing drains
12+350 – 12+470	North	97	Intercept flows from existing ditches and redirect towards Lakes Reen
12+670 – 12+910	North	327	Intercept flows from existing ditches and redirect towards Lakes Reen
12+850 – 13+000	South	158	Intercept highway embankment runoff and direct to existing drains
13+000 – 13+310	North	12	Connect existing ditch to Julians Reen
13+000 – 13+050	South	43	Connect existing ditch to Julians Reen
13+050 – 13+580	South	455	Redistribute flows across existing ditches
13+000 – 13+900	North	865	Intercept flows from existing ditches and redirect towards culverts
13+900 – 13+960	South	161	Widen existing ditch to allow flows under new section of motorway
16+600 – 17+230	South	633	Intercept highway embankment runoff and direct to existing drains
17+880 – 17+900	South	33	Intercept highway embankment runoff and direct to existing drains
17+880 – 19+130	North	1217	Intercept flows from existing ditches and redirect towards culverts
18+010 – 18+480	South	462	Intercept highway embankment runoff and direct to existing drains
18+980 – 19+130	South	150	Intercept highway embankment runoff and direct to existing drains
19+300 – 19+800	South	620	Intercept highway embankment runoff and direct to existing drains
19+830 – 19+950	South	114	Intercept highway embankment runoff and direct to existing drains

## File Note

Chainage	North or south of carriageway	Length provided (m)	Reason of provision
Total		10,594m	

Table 5 (below) summarises the ree and field ditch lengths lost and new lengths provided.

Type	Length infilled (m)	New length provided (m)
Reens	2,755	2,826
Field ditches	9,373	10,594

### 5. Conclusion

This note outlines the mitigation for the reens and field ditches for the Scheme. Reen connectivity will be retained with the construction of culverts, and replacement reens will maintain the overall lengths infilled by the scheme.

Field ditches will also be constructed along the edge of the Scheme, maintaining the current length of field ditches infilled by the Scheme.

Side roads design will ensure that maintenance routes currently used by NRW to maintain reens will still be available.

Revised drawings are included in Appendix A.

## Appendix A

# File Note

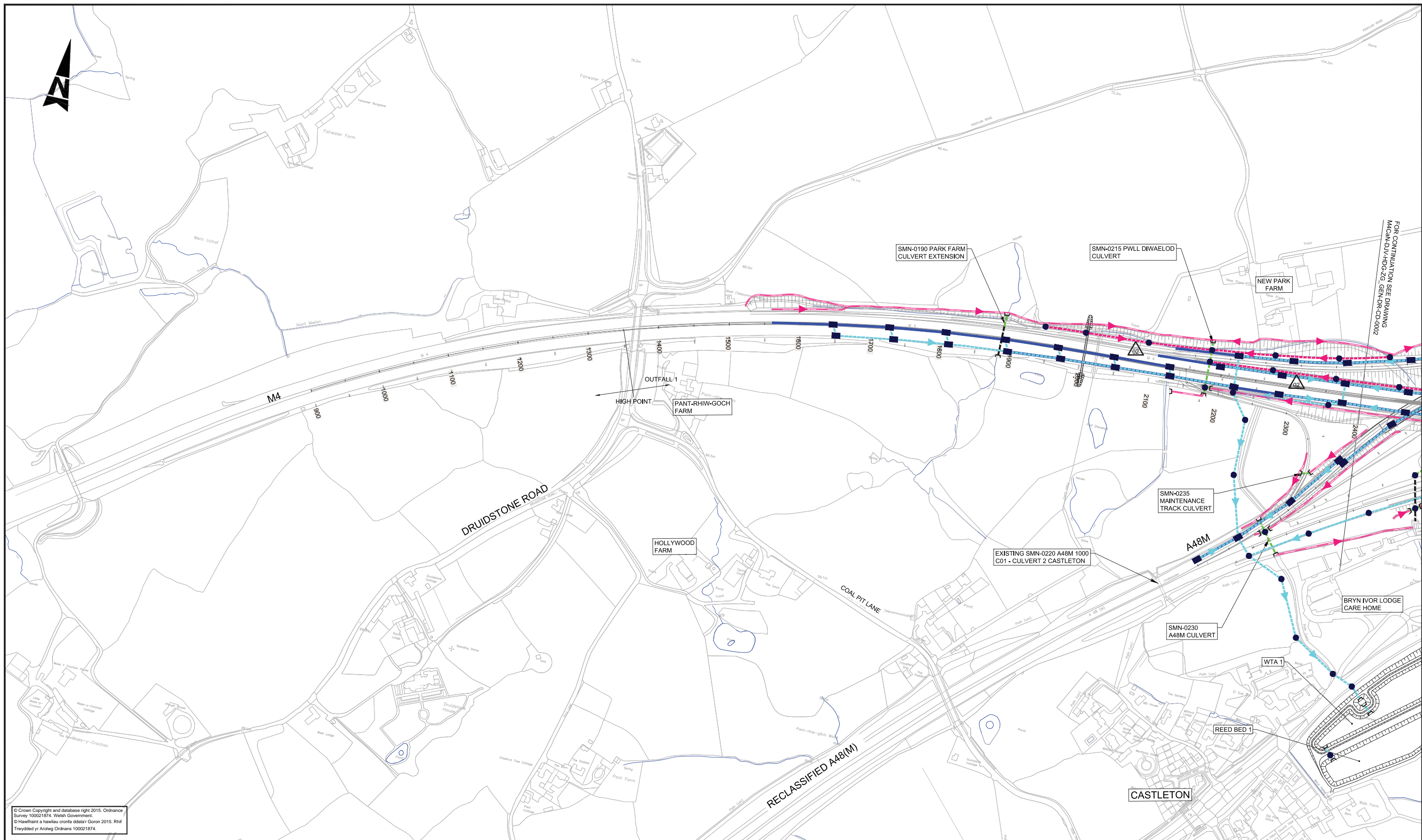
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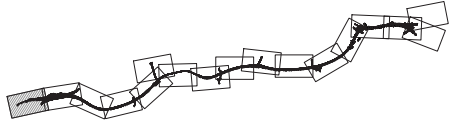
GENERAL NOTES:

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2. ONLY WRITTEN DIMENSIONS SHALL BE USED. DO NOT SCALE.  
3. FIN DRAINS NOT SHOWN FOR CLARITY. TO BE HCD F18 TYPE 7.

**LEGEND:**

- |   |   |   |   |   |
|---|---|---|---|---|
|  | CATCHPIP - HCD F11 / MANHOLE HCD F4, F5, F6 & F7                            |  | REPLACEMENT REEN  |  |
|  | INTAKE CHAMBER - HCD F22 & F24  |  | REPLACEMENT FIELD DITCH                                 |   |
|  | PETROL INTERCEPTOR  |  | HIGHWAY CUT OFF DITCH                                   |   |
|  | CONCRETE HEADWALL   |  | FILTER DRAIN - HCD F2                                   |   |
|  | GRASS LINED DITCH IN BOX CULVERT  |  | EXISTING REEN   |   |
|  | CARRIER PIPE - HCD F1   |  | EXISTING REEN TO BE FILLED                              |   |
|  | CONCRETE CHANNEL - HCD F21 & B3 & B7 & B12                                  |  | EXISTING FIELD DITCH TO BE FILLED                       |   |
|  | CONCRETE CHANNEL - HCD F21 & B3 & B7 & B12 WITH CARRIER PIPE - HCD F1 BELOW |  | EXISTING CULVERT TO BE RETAINED                         |   |
|  | CONCRETE LINER CHANNEL  |  | PROPOSED CULVERT  |   |
|  | COMBINED KERB DRAINAGE  |  | COMBINED KERB DRAINAGE WITH CARRIER PIPE - HCD F1 BELOW |   |
|   |   |  | EXISTING NRW EXISTING                                   |  |
|   |   |  | PROPOSED NRW TILTING WEIR / PENSTOCK                    |   |
|   |   |  | POTENTIAL NRW ACCESS (IN ABYANCE)                       |   |
|   |   |  | INDIRECT LOSS FIELD DITCHES                             |   |
|   |   |  | SITE OF SPECIAL SCIENTIFIC INTEREST BOUNDARY            |   |

## KEY PLAN



## SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).

Construction
No exceptional risks

Maintenance / Cleaning

No exceptional risks

Use
No exceptional risks

Decommissioning / Demolition

No exceptional risks

[illegible]

Drawing Status

## Project Team

Client



Suitability	
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Project Title	M4 CORRIDOR AROUND NEWPORT
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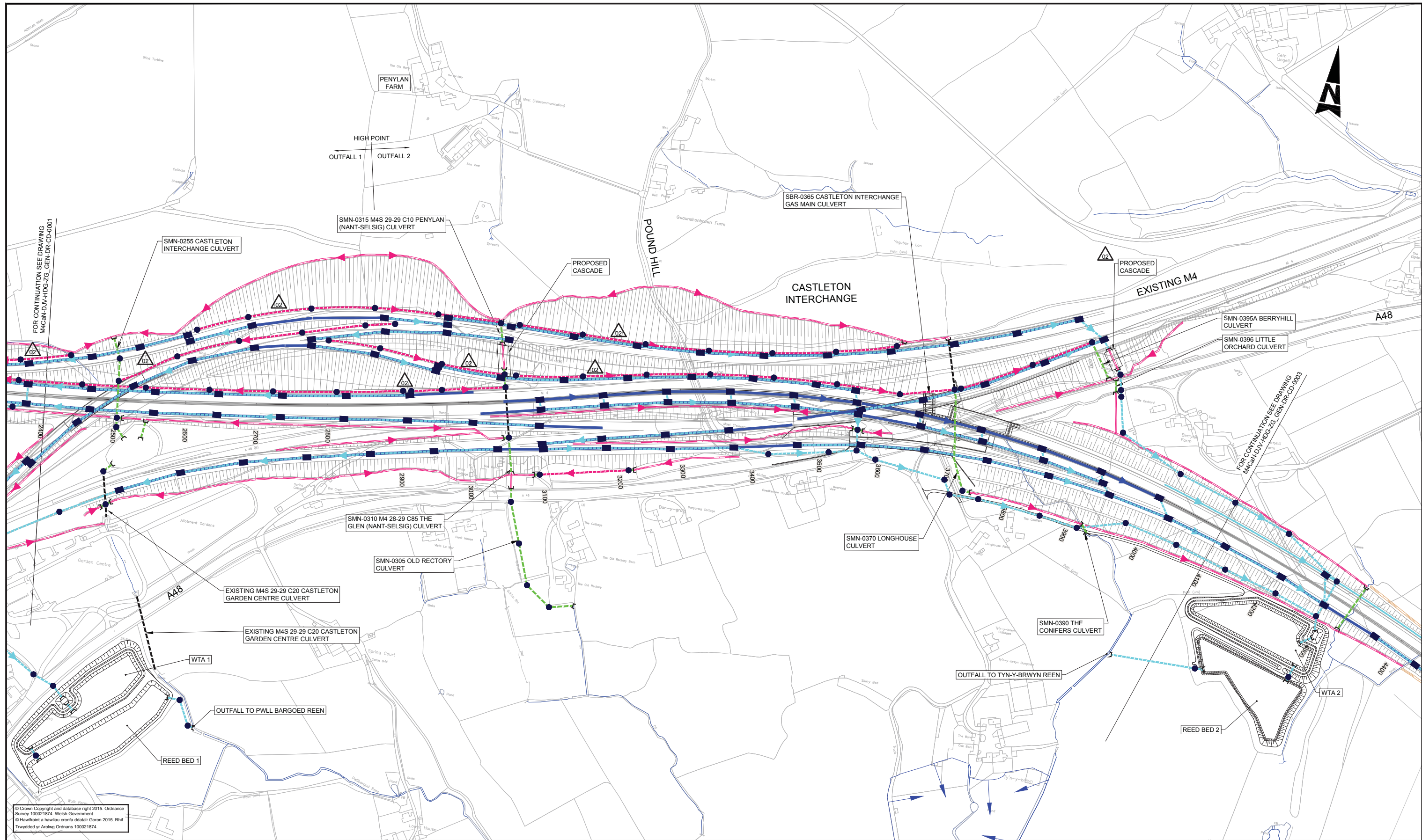
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HIGHWAY DRAINAGE AND REEN MITIGATION  
SHEET 1 OF 16

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Original Size <b>A1</b>	Date 25/08/16	Date 25/08/16	Date 25/08/16	Date 26/08/16
Drawing Number Project   Originator   Volume <b>M4CaN - DJV - HDG - ZG_GEN - DR - CD - 0001</b>				Revision <b>ISSUE</b>
Location   Type   Role   Number				



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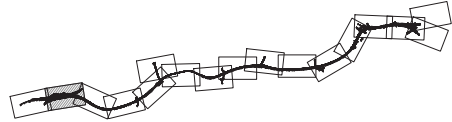
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LEGEND:

- |   |   |  |
|---|---|--|
| CATCHPIT - HCD F11 / MANHOLE - HCD F4, F5, F6 & F7                          | REPLACEMENT REEN  | EXISTING NRW SLUICE                          |
| INTAKE CHAMBER - HCD F22 & F24  | REPLACEMENT FIELD DITCH                                 | PROPOSED NRW TILTING WEIR / PENSTOCK         |
| PETROL INTERCEPTOR  | HIGHWAY CUT OFF DITCH                                   | POTENTIAL NRW ACCESS (IN ABEYANCE)           |
| CONCRETE HEADWALL   | FILTER DRAIN - HCD F2                                   | EXISTING CULVERT TO BE RETAINED              |
| GRASS LINED DITCH IN BOX CULVERT  | EXISTING REEN   | PROPOSED CULVERT                             |
| CARRIER PIPE - HCD F1   | EXISTING REEN TO BE FILLED                              | INDIRECT LOSS FIELD DITCHES                  |
| CONCRETE CHANNEL - HCD F21 & B3 & B7 & B12                                  | EXISTING FIELD DITCH TO BE FILLED                       | SITE OF SPECIAL SCIENTIFIC INTEREST BOUNDARY |
| CONCRETE CHANNEL - HCD F21 & B3 & B7 & B12 WITH CARRIER PIPE - HCD F1 BELOW | PROPOSED CULVERT  |  |
| GRASS LINED CHANNEL   | COMBINED KERB DRAINAGE WITH CARRIER PIPE - HCD F1 BELOW |  |
| COMBINED KERB DRAINAGE  |   |  |

KEY PLAN



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

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Construction  
No exceptional risks

Maintenance / Cleaning  
No exceptional risks

Use  
No exceptional risks

Decommissioning / Demolition  
No exceptional risks

Rev.	Date	Description	By	Chk'd	App'd
ISSUE 1	27/01/16	FINAL ISSUE TO WG	DJW	TJD	HR
ISSUE 2	26/08/16	SUPPLEMENTARY ISSUE	DJW	WBO	HR

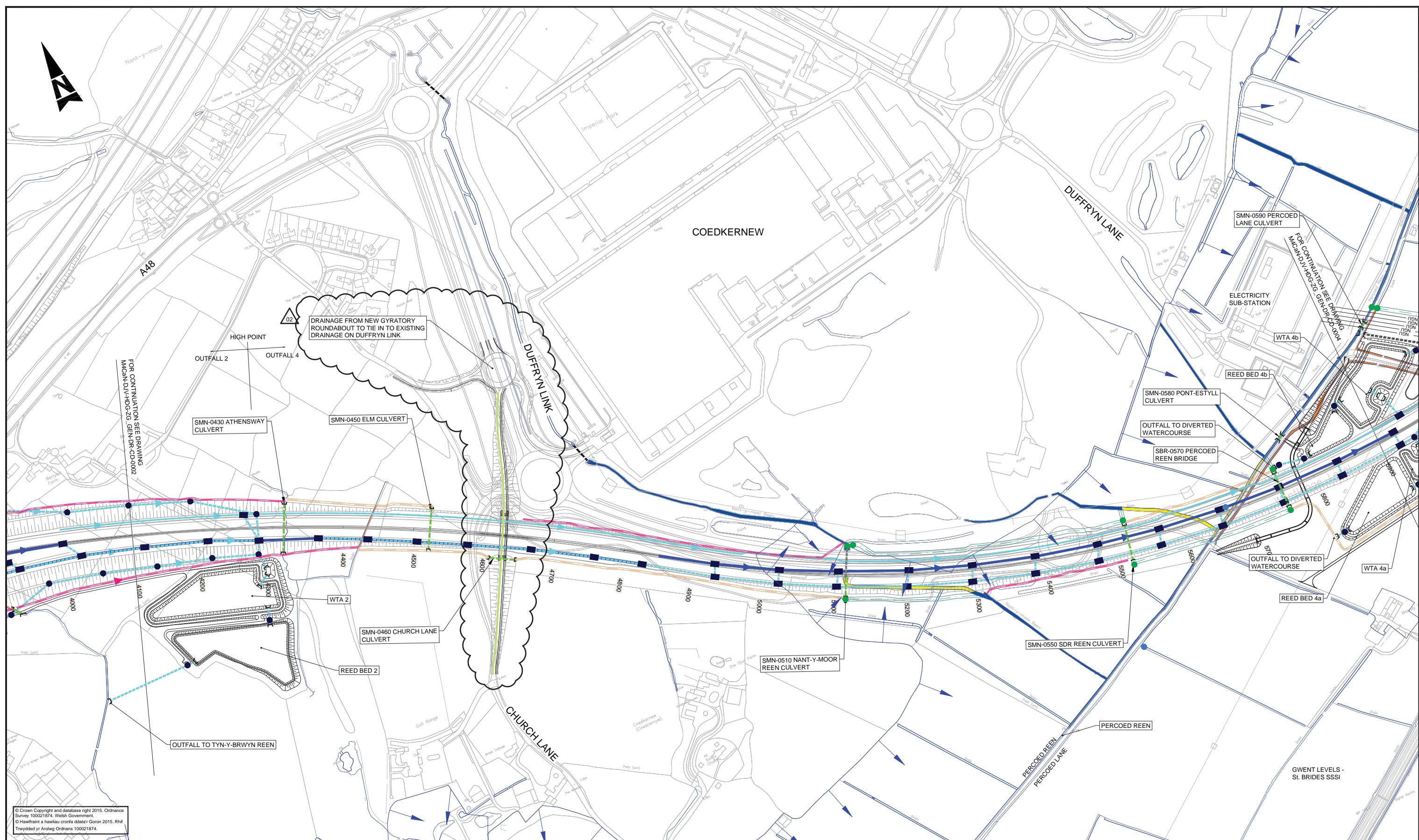
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Project Team				Drawing Title HIGHWAY DRAINAGE AND REEN MITIGATION SHEET 2 OF 16				
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				Original Size A1	Date 25/08/16	Date 25/08/16	Date 25/08/16	Date 26/08/16
Client		 Llywodraeth Cymru Welsh Government		Drawing Number Project M4CaN - DJV - HDG - ZG_GEN - DR - CD - 0002			Revision Volume ISSUE 2	
				Location Type Role Number				



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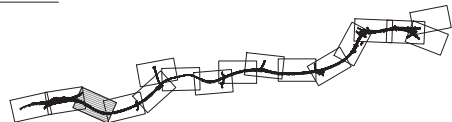
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- |   |   |   |  |   |
|---|---|---|--|---|
|  | CATCHPIT - HCD F11 / MANHOLE - HCD F4, F5, F6 & F7                          |  | REPLACEMENT REEN   |  |
|  | INTAKE CHAMBER - HCD F22 & F24  |  | REPLACEMENT FIELD DITCH                                  |   |
|  | PETROL INTERCEPTOR  |  | HIGHWAY CUT OFF DITCH                                    |   |
|  | CONCRETE HEADWALL   |  | FILTER DRAIN - HCD F2                                    |   |
|  | GRASS LINED DITCH IN BOX CULVERT  |  | EXISTING REEN  |   |
|  | CARRIER PIPE - HCD F1   |  | EXISTING REEN TO BE FILLED                               |   |
|  | CONCRETE CHANNEL - HCD F21 & B3 & B7 & B12                                  |  | EXISTING FIELD DITCH TO BE FILLED                        |   |
|  | CONCRETE CHANNEL - HCD F21 & B3 & B7 & B12 WITH CARRIER PIPE - HCD F1 BELOW |  | EXISTING CULVERT TO BE RETAINED                          |   |
|  | GRASS LINED CHANNEL   |  | PROPOSED CULVERT   |   |
|  | COMBINED KERBS DRAINAGE   |  | COMBINED KERBS DRAINAGE WITH CARRIER PIPE - HCD F1 BELOW |   |
|  | EXISTING NRW SLUICE   |  | POTENTIAL NRW ACCESS (IN ABEYANCE)                       |  |
|  | PROPOSED NRW TILTING WEIR / PENSTOCK  |  | INDIRECT LOSS FIELD DITCHES                              |   |
|  | SITE OF SPECIAL SCIENTIFIC INTEREST BOUNDARY                                |   |  |   |

## KEY PLAN



## SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).

Construction
No exceptional risks

Maintenance / Cleaning
------------------------

Use	
-----	--

Decommissioning / Demolition

No exceptional risks

[illegible]

Drawing Status	
1	1
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	Suitability
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Project Title	M4 CORRIDOR AROUND NEWPORT
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Drawing Title
HIGHWAY DRAINAGE AND REEN MITIGATION
SHEET 3 OF 16

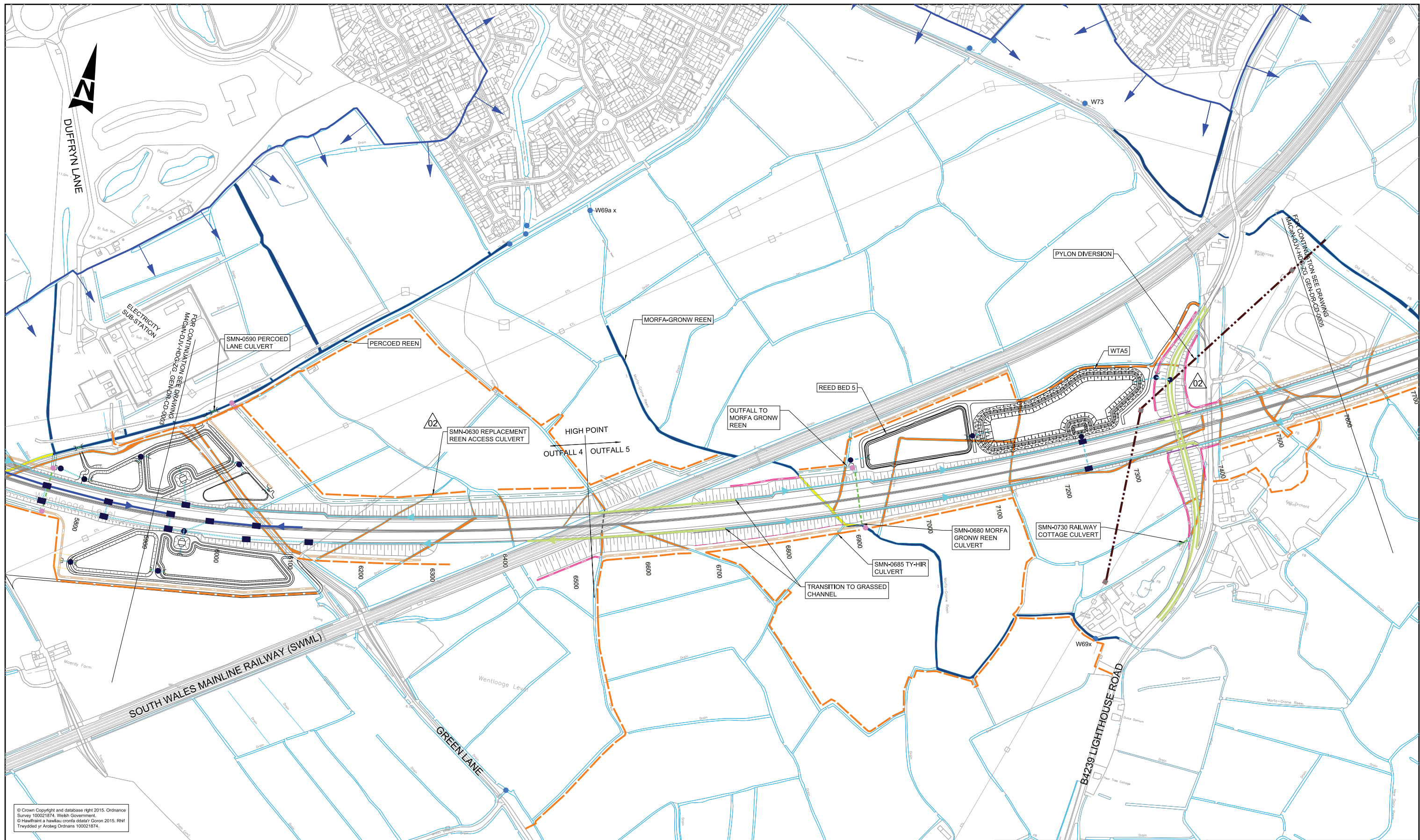
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Drawing Number _____ Project _____ <div style="text-align: center;">             Originator _____ Volume _____  <b>M4CaN - DJV - HDG -</b>  <b>ZG_GEN - DR - CD - 0003</b> </div>				Revision
Location _____	Type _____	Role _____	Number _____	<b>ISSUE 2</b>





DO NOT SCALE

Millimetres  
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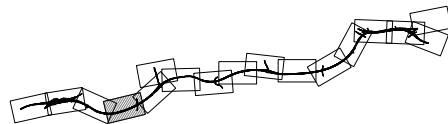
#### GENERAL NOTES:

1. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
2. ONLY WRITTEN DIMENSIONS SHALL BE USED, DO NOT SCALE.
3. FIN DRAINS NOT SHOWN FOR CLARITY. TO BE HCD F16 TYPE 7

#### LEGEND:

- CATCHPIT - HCD F11 / MANHOLE - HCD F4, F5, F6 & F7
- INTAKE CHAMBER - HCD F22 & F24
- PETROL INTERCEPTOR
- CONCRETE HEADWALL
- GRASSED CHANNEL IN BOX CULVERT
- CARRIER PIPE - HCD F1
- CONCRETE CHANNEL - HCD F21 & B3 & B7 & B12
- CONCRETE CHANNEL - HCD F21 & B3 & B7 & B12 WITH CARRIER PIPE - HCD F1 BELOW
- GRASSED CHANNEL
- COMBINED KERB DRAINAGE
- REPLACEMENT REEN
- REPLACEMENT FIELD DITCH
- HIGHWAY CUT OFF DITCH
- FILTER DRAIN - HCD F2
- EXISTING REEN
- EXISTING REEN TO BE FILLED
- EXISTING FIELD DITCH TO BE FILLED
- EXISTING CULVERT TO BE RETAINED
- PROPOSED CULVERT
- COMBINED KERB DRAINAGE WITH CARRIER PIPE - HCD F1 BELOW

#### KEY PLAN:



- EXISTING NRW SLUICE
- PROPOSED NRW TILTING WEIR/PENSTOCK
- POTENTIAL NRW ACCESS (IN ABEYANCE)
- INDIRECT LOSS FIELD DITCHES
- PROPOSED CULVERT
- COMBINED KERB DRAINAGE WITH CARRIER PIPE - HCD F1 BELOW
- SITE OF SPECIAL SCIENTIFIC INTEREST BOUNDARY

#### SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).

Construction  
No exceptional risks

Maintenance / Cleaning  
Culverts partially submerged

Use  
No exceptional risks

Decommissioning / Demolition  
No exceptional risks

Rev.	Date	Description	By	Chk'd	App'd
ISSUE 1	27/01/16	FINAL ISSUE TO WG	AC	DOL	HR
ISSUE 2	26/08/16	SUPPLEMENTARY ISSUE	AC	DOL	HR

Drawing Status	Suitability
Project Team	
Client	



Project Title					
M4 CORRIDOR AROUND NEWPORT					
Drawing Title					
HIGHWAY DRAINAGE AND REEN MITIGATION					
SHEET 4 OF 16					
Scale	Designed / Drawn	Checked	Approved	Authorised	
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Original Size	Date	Date	Date	Date	Date
A1	25/08/16	25/08/16	26/08/16		26/08/16
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Location	Type	Role	Number		

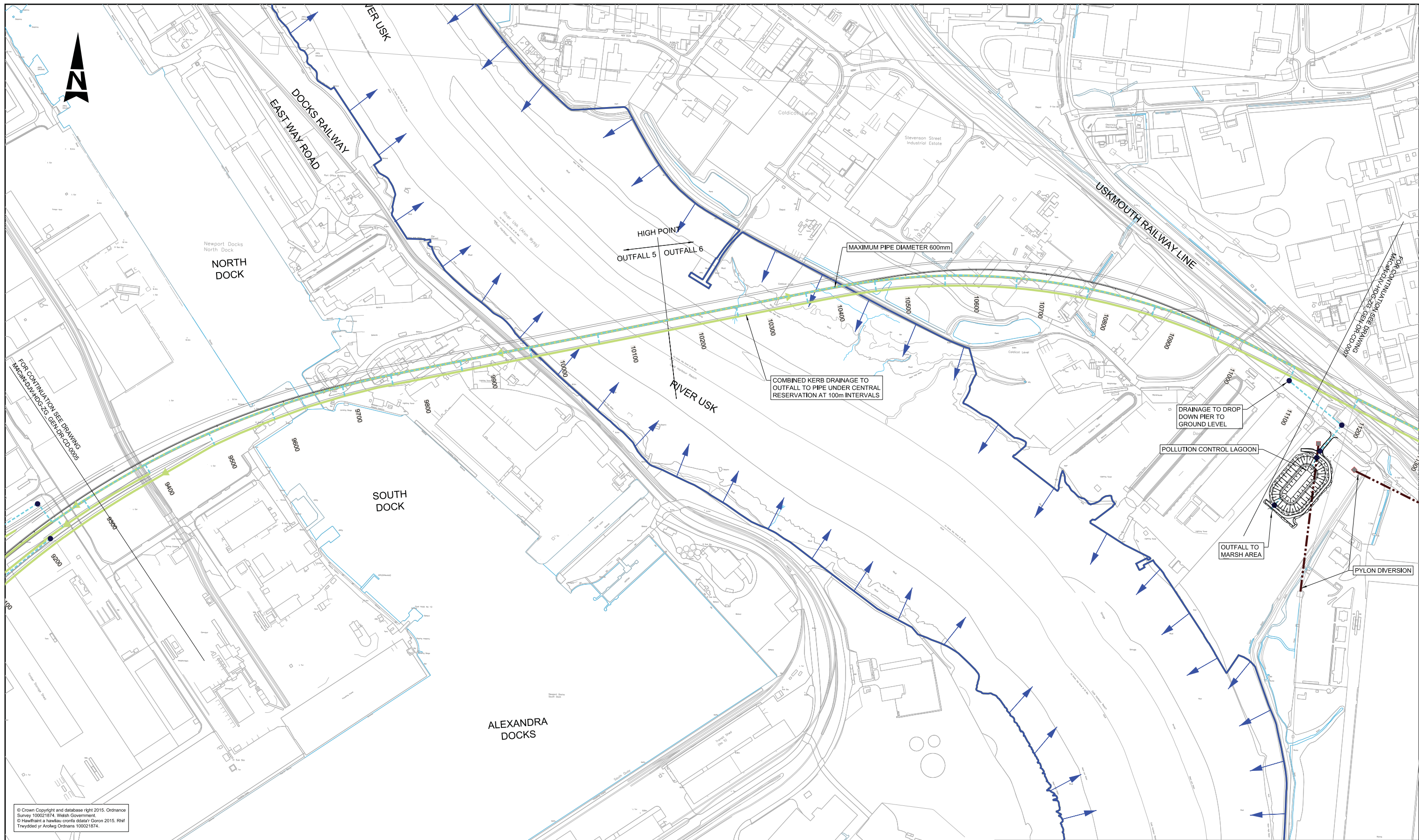






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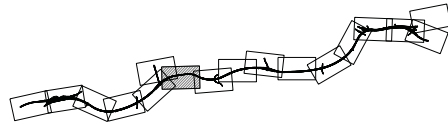
GENERAL NOTES:

1. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
2. ONLY WRITTEN DIMENSIONS SHALL BE USED. DO NOT SCALE.
3. FIN DRAIN NOT SHOWN FOR CLARITY. TO BE HCD F18 TYPE 7.

LEGEND:

- |   |   |
|---|---|
| ● CATCHPIT - HCD F11 / MANHOLE - HCD F4, F5, F6 & F7                          | REPLACEMENT REEM  |
| ■ INTAKE CHAMBER - HCD F22 & F24  | REPLACEMENT FIELD DITCH                                 |
| ■ PETROL INTERCEPTOR  | HIGHWAY CUT OFF DITCH                                   |
| — CONCRETE HEADWALL   | FILTER DRAIN - HCD F2                                   |
| — GRASSED CHANNEL IN BOX CULVERT  | EXISTING REEM   |
| — CARRIER PIPE - HCD F1   | EXISTING REEM TO BE FILLED                              |
| — CONCRETE CHANNEL - HCD F21 & B3 & B7 & B12                                  | EXISTING FIELD DITCH TO BE FILLED                       |
| — CONCRETE CHANNEL - HCD F21 & B3 & B7 & B12 WITH CARRIER PIPE - HCD F1 BELOW | EXISTING CULVERT TO BE RETAINED                         |
| — GRASSED CHANNEL   | PROPOSED CULVERT  |
| — COMBINED KERB DRAINAGE  | COMBINED KERB DRAINAGE WITH CARRIER PIPE - HCD F1 BELOW |

KEY PLAN:



- |  |                                      |
|--|--------------------------------------|
| ● EXISTING NRW SLUICE                          | — POTENTIAL NRW ACCESS (IN ABEYANCE) |
| ● PROPOSED NRW TILTING WEIR/PENSTOCK           | — INDIRECT LOSS FIELD DITCHES        |
| — SITE OF SPECIAL SCIENTIFIC INTEREST BOUNDARY |                                      |

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).

Construction  
Large diameter pipe underneath bridge deck

Maintenance / Cleaning  
Large diameter pipe underneath bridge deck

Use  
No exceptional risks

Decommissioning / Demolition  
No exceptional risks


Drawing Status	Suitability	Project Title
Project Team		M4 CORRIDOR AROUND NEWPORT
Client		HIGHWAY DRAINAGE AND REEM MITIGATION SHEET 6 OF 16



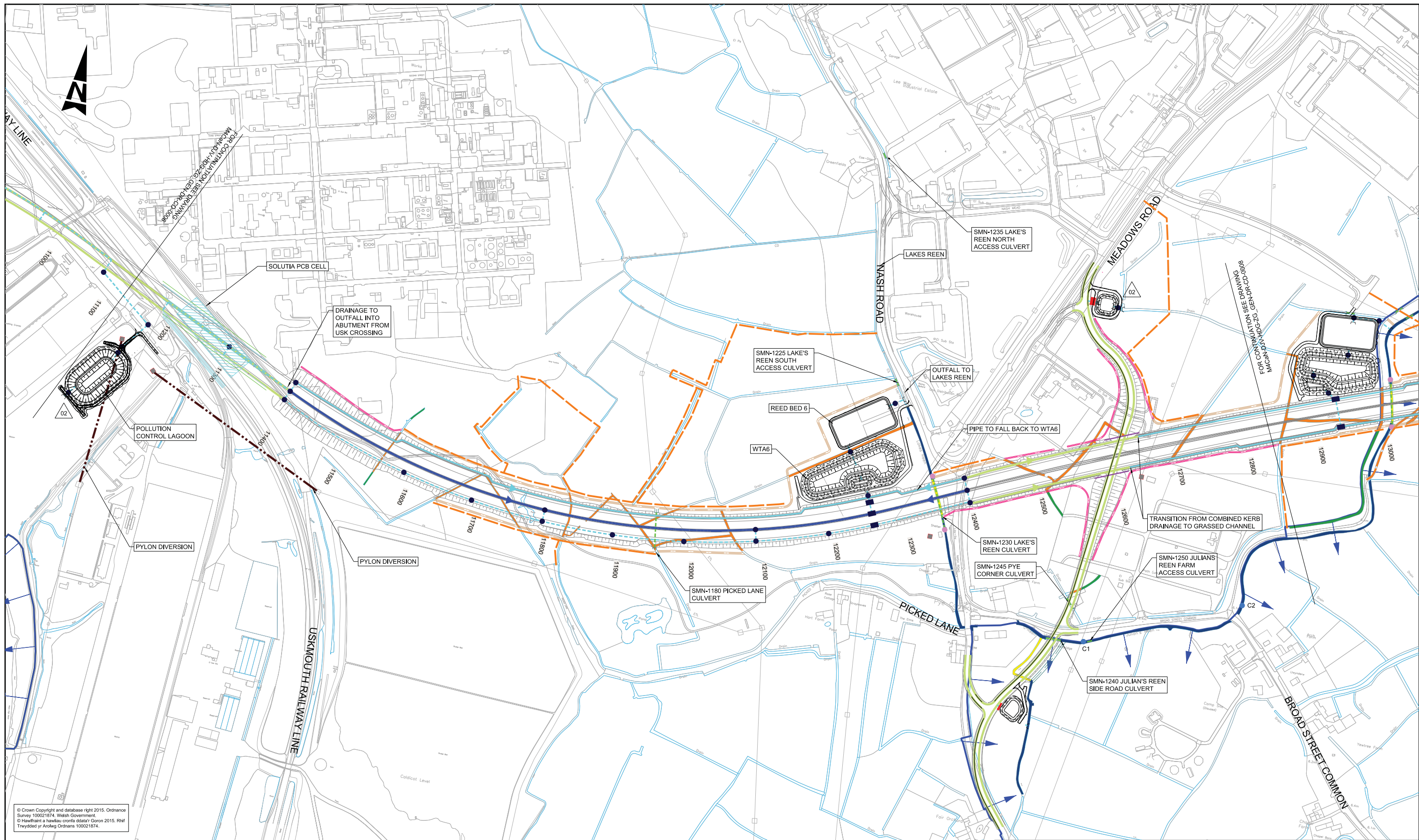
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Drawing Number	Project	Originator	Volume	Revision
M4CaN - DJV - HDG - ZG_GEN - DR - CD - 0006				ISSUE 2



DO NOT SCALE

Millimetres

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GENERAL NOTES:

1. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
2. ONLY WRITTEN DIMENSIONS SHALL BE USED. DO NOT SCALE.
3. FIN DRAINS NOT SHOWN FOR CLARITY. TO BE HCD F16 TYPE 7.

LEGEND:

- CATCHPIT - HCD F11 / MANHOLE - HCD F4, F5, F6 & F7
- INTAKE CHAMBER - HCD F22 & F24
- PETROL INTERCEPTOR
- CONCRETE HEADWALL
- GRASSSED CHANNEL IN BOX CULVERT
- CARRIER PIPE - HCD F1
- CONCRETE CHANNEL - HCD F21 & B3 & B7 & B12
- CONCRETE CHANNEL - HCD F21 & B3 & B7 & B12 WITH CARRIER PIPE - HCD F1 BELOW
- GRASSSED CHANNEL
- COMBINED KERB DRAINAGE
- REPLACEMENT REEN
- REPLACEMENT FIELD DITCH
- HIGHWAY CUT OFF DITCH
- FILTER DRAIN - HCD F2
- EXISTING REEN
- EXISTING REEN TO BE FILLED
- EXISTING FIELD DITCH TO BE FILLED
- EXISTING CULVERT TO BE RETAINED
- PROPOSED CULVERT
- COMBINED KERB DRAINAGE WITH CARRIER PIPE - HCD F1 BELOW

KEY PLAN:


- EXISTING NRW SLUICE
- PROPOSED NRW TILTING WEIR/PENSTOCK
- POTENTIAL NRW ACCESS (IN ABEYANCE)
- INDIRECT LOSS FIELD DITCHES
- PROPOSED CULVERT
- COMBINED KERB DRAINAGE WITH CARRIER PIPE - HCD F1 BELOW
- SITE OF SPECIAL SCIENTIFIC INTEREST BOUNDARY

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).

Construction	
Large diameter pipe underneath bridge deck	
Maintenance / Cleaning	
Culverts partially submerged	
Large diameter pipe underneath bridge deck	
Main bridge drainage to outfalls at bridge abutment	
Use	
No exceptional risks	
Decommissioning / Demolition	
No exceptional risks	

ISSUE	27/01/16	FINAL ISSUE TO WG	AC	DOL	HR
ISSUE 2	26/08/16	SUPPLEMENTARY ISSUE	AC	DOL	HR
Rev.	Date	Description	By	Chk'd	App'd

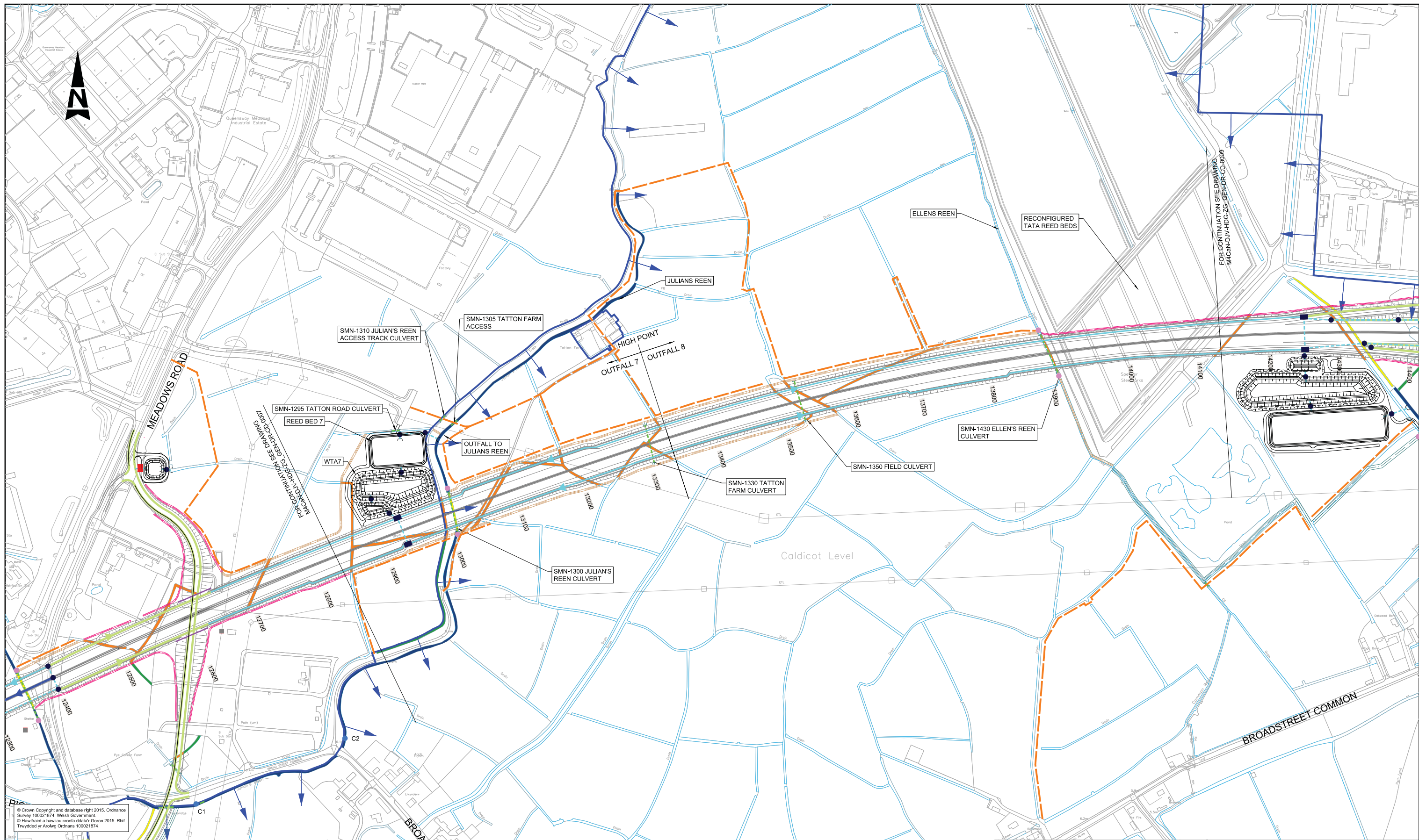
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Project Team				Drawing Title									
				HIGHWAY DRAINAGE AND REEN MITIGATION SHEET 7 OF 16									
Client				Scale		Designed / Drawn		Checked		Approved		Authorised	
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				Original Size		Date		Date		Date		Date	
		A1		25/08/16		25/08/16		26/08/16		26/08/16			
 Llywodraeth Cymru				Drawing Number		Revision							
				Project		Originator		Volume					
						M4CaN - DJV - HDG - ZG_GEN - DR - CD - 0007		ISSUE 2					





DO NOT SCALE

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Millimetres



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GENERAL NOTES:

- ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
- ONLY WRITTEN DIMENSIONS SHALL BE USED. DO NOT SCALE.
- FIN DRAINS NOT SHOWN FOR CLARITY. TO BE HCD F18 TYPE 7.

LEGEND:

● CATCHPIT - HCD F11 / MANHOLE - HCD F4, F5, F6 & F7	REPLACEMENT REEN
■ INTAKE CHAMBER - HCD F22 & F24	REPLACEMENT FIELD DITCH
■ PETROL INTERCEPTOR	HIGHWAY CUT OFF DITCH
— CONCRETE HEADWALL	FILTER DRAIN - HCD F2
— GRASSSED CHANNEL IN BOX CULVERT	EXISTING REEN
— CARRIER PIPE - HCD F1	EXISTING REEN TO BE FILLED
— CONCRETE CHANNEL - HCD F21 & B3 & B7 & B12	EXISTING FIELD DITCH TO BE FILLED
— CONCRETE CHANNEL - HCD F21 & B3 & B7 & B12 WITH CARRIER PIPE - HCD F1 BELOW	EXISTING CULVERT TO BE RETAINED
— GRASSSED CHANNEL	PROPOSED CULVERT
— COMBINED KERB DRAINAGE	COMBINED KERB DRAINAGE WITH CARRIER PIPE - HCD F1 BELOW

KEY PLAN:

● EXISTING NRW SLUICE	● PROPOSED NRW TILTING WEIR/PENSTOCK
— POTENTIAL NRW ACCESS (IN ABEYANCE)	— INDIRECT LOSS FIELD DITCHES
— EXISTING CULVERT TO BE RETAINED	— SITE OF SPECIAL SCIENTIFIC INTEREST BOUNDARY

**SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION**

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).


Construction	No exceptional risks
Maintenance / Cleaning	Culverts partially submerged
Use	No exceptional risks
Decommissioning / Demolition	No exceptional risks

ISSUE	27/01/16	FINAL ISSUE TO WG	AC	DOL	HR
ISSUE 2	26/08/16	SUPPLEMENTARY ISSUE	AC	DOL	HR
Rev.	Date	Description	By	Chk'd	App'd

Drawing Status

Project Team

Client

  
Llywodraeth Cymru  
Welsh Government

Suitability

Project Title

**M4 CORRIDOR AROUND NEWPORT**

Drawing Title

**HIGHWAY DRAINAGE AND REEN MITIGATION**

**SHEET 8 OF 16**

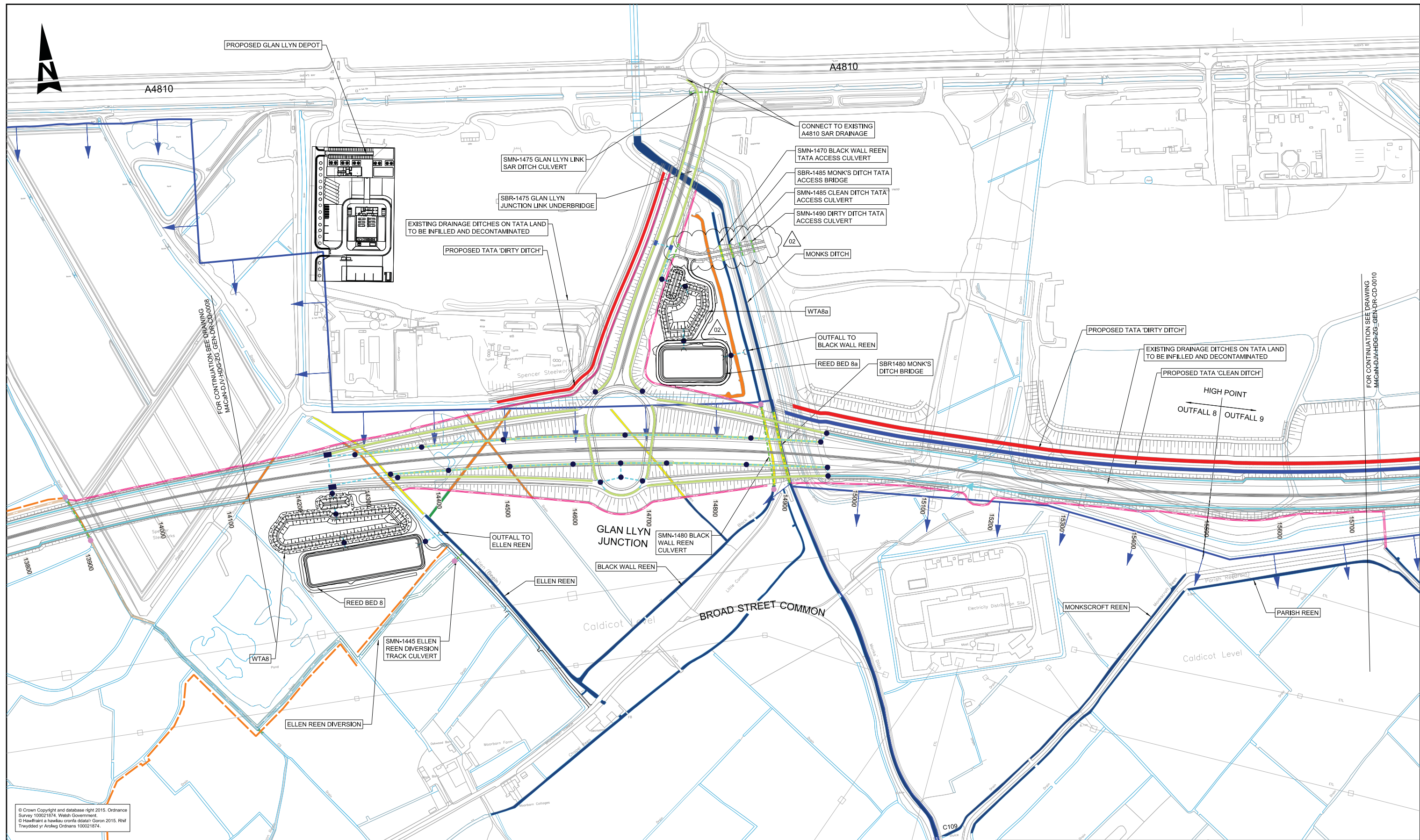
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Drawing Number	Project	Originator	Volume	Revision
		M4CaN - DJV - HDG - ZG_GEN - DR - CD - 0008		ISSUE 2
Location	Type	Role	Number	



DO NOT SCALE

Millimetres

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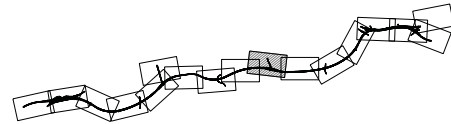


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GENERAL NOTES:  
1. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.  
2. ONLY WRITTEN DIMENSIONS SHALL BE USED. DO NOT SCALE.  
3. FIN DRAINS NOT SHOWN FOR CLARITY. TO BE HCD F18 TYPE 7.

- LEGEND:
- CATCHPIT - HCD F11 / MANHOLE - HCD F4, F5, F6 & F7
  - INTAKE CHAMBER - HCD F22 & F24
  - PETROL INTERCEPTOR
  - CONCRETE HEADWALL
  - GRASSED CHANNEL IN BOX CULVERT
  - CARRIER PIPE - HCD F1
  - CONCRETE CHANNEL - HCD F21 & B3 & B7 & B12
  - CONCRETE CHANNEL - HCD F21 & B3 & B7 & B12 WITH CARRIER PIPE - HCD F1 BELOW
  - GRASSED CHANNEL
  - COMBINED KERB DRAINAGE
  - REPLACEMENT REEN
  - REPLACEMENT FIELD DITCH
  - HIGHWAY CUT OFF DITCH
  - FILTER DRAIN - HCD F2
  - EXISTING REEN
  - EXISTING REEN TO BE FILLED
  - EXISTING FIELD DITCH TO BE FILLED
  - EXISTING CULVERT TO BE RETAINED
  - PROPOSED CULVERT
  - COMBINED KERB DRAINAGE WITH CARRIER PIPE - HCD F1 BELOW

KEY PLAN



- EXISTING NRW SLUICE
- PROPOSED NRW TILTING WEIR/PENSTOCK
- POTENTIAL NRW ACCESS (IN ABEYANCE)
- INDIRECT LOSS FIELD DITCHES
- SITE OF SPECIAL SCIENTIFIC INTEREST BOUNDARY

#### SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).


Construction  
Contaminated land

Maintenance / Cleaning  
Culverts partially submerged

Use  
No exceptional risks

Decommissioning / Demolition  
No exceptional risks

Rev.	Date	Description	By	Chk'd	App'd
ISSUE 1	27/01/16	FINAL ISSUE TO WG	AC	DOL	HR
ISSUE 2	26/08/16	SUPPLEMENTARY ISSUE	AC	DOL	HR

Drawing Status		Suitability	Project Title					
			M4 CORRIDOR AROUND NEWPORT					
Project Team			Drawing Title					
			HIGHWAY DRAINAGE AND REEN MITIGATION SHEET 9 OF 16					
			Scale	Designed / Drawn	Checked	Approved	Authorised	
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 Llywodraeth Cymru Welsh Government			Drawing Number				Revision	
			Project				Originator	Volume
			M4CaN - DJV - HDG - ZG_GEN - DR - CD - 0009					ISSUE 2
			Location	Type	Role	Number		





DO NOT SCALE

Millimetres

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A4810

A4810

FOR CONTINUATION SEE DRAWING  
M4CaN-DJV-HDG-ZG\_GEN-DR-CD-0009

Slag Heap

PROPOSED TATA 'DIRTY DITCH' TO TIE INTO  
EXISTING DITCH

PROPOSED TATA 'CLEAN DITCH' TO TIE INTO  
EXISTING STEEL  
WORKS DEDICATED CULVERT

STEEL WORKS DEDICATED REEN

SMN-1655 ELVER PILL REEN CULVERT

SMN-1720 NEW CUT REEN

NEW CUT REEN

SBR-1640 STEEL  
WORKS  
DEDICATED REEN  
BRIDGE

ELVER PILL REEN

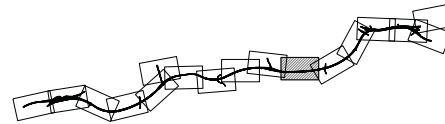
EXISTING DRAINAGE DITCHES ON TATA LAND  
TO BE INFILLED AND DECONTAMINATED

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C29

C30

KEY PLAN



### SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work  
detailed on this drawing, note the following significant residual risks  
(Reference shall also be made to the design hazard log).

Construction  
Contaminated land

Maintenance / Cleaning  
Culverts partially submerged

Use  
No exceptional risks

Decommissioning / Demolition  
No exceptional risks

- GENERAL NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
  2. ONLY WRITTEN DIMENSIONS SHALL BE USED. DO NOT SCALE.
  3. FIN DRAINS NOT SHOWN FOR CLARITY. TO BE HCD F16 TYPE 7.

#### LEGEND:

- CATCHPIT - HCD F11 / MANHOLE - HCD F4, F5, F6 & F7
- INTAKE CHAMBER - HCD F22 & F24
- PETROL INTERCEPTOR
- CONCRETE HEADWALL
- GRASSED CHANNEL IN BOX CULVERT
- CARRIER PIPE - HCD F1
- CONCRETE CHANNEL - HCD F21 & B3 & B7 & B12
- CONCRETE CHANNEL - HCD F21 & B3 & B7 & B12  
WITH CARRIER PIPE - HCD F1 BELOW
- GRASSED CHANNEL
- COMBINED KERB DRAINAGE
- REPLACEMENT REEN
- REPLACEMENT FIELD DITCH
- HIGHWAY CUT OFF DITCH
- FILTER DRAIN - HCD F2
- EXISTING REEN
- EXISTING REEN TO BE FILLED
- EXISTING FIELD DITCH TO BE FILLED
- EXISTING CULVERT TO BE RETAINED
- PROPOSED CULVERT
- COMBINED KERB DRAINAGE WITH  
CARRIER PIPE - HCD F1 BELOW
- EXISTING NRW SLUICE
- PROPOSED NRW TILTING WEIR/PENSTOCK
- POTENTIAL NRW ACCESS (IN ABEYANCE)
- INDIRECT LOSS FIELD DITCHES
- PROPOSED CULVERT
- SITE OF SPECIAL SCIENTIFIC  
INTEREST BOUNDARY

Drawing Status

Suitability

Project Title

M4 CORRIDOR AROUND NEWPORT

Drawing Title

HIGHWAY DRAINAGE AND REEN MITIGATION  
SHEET 10 OF 16

Scale

1:2500

Designed / Drawn

AC

Checked

DOL

Approved

HR

Authorised

KEN

Original Size

A1

Date

25/08/16

Date

25/08/16

Date

26/08/16

Drawing Number

Project

Originator

M4CaN - DJV - HDG -

ZG\_GEN - DR - CD - 0010

Volume

Issue

ISSUE 2

Location

Type

Role

Number

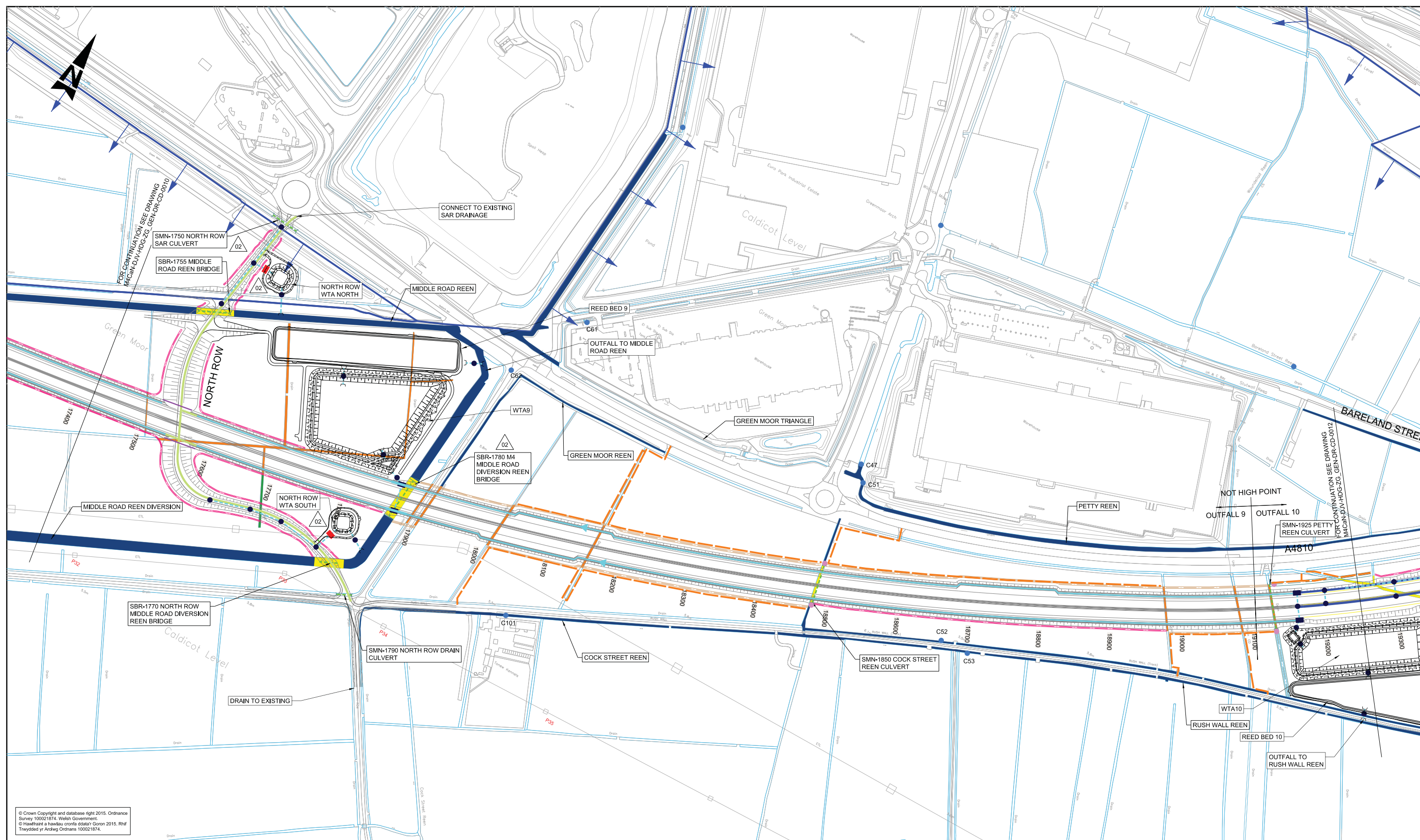




DO NOT SCALE

0 10 100

Millimetres



**GENERAL NOTES:**

- ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
- ONLY WRITTEN DIMENSIONS SHALL BE USED. DO NOT SCALE.
- FIN DRAINS NOT SHOWN FOR CLARITY - TO BE HCD F18 TYPE 7.

**LEGEND:**


CATCHPIT - HCD F11 / MANHOLE - HCD F4, F5, F6 & F7	REPLACEMENT REEN
INTAKE CHAMBER - HCD F22 & F24	REPLACEMENT FIELD DITCH
PETROL INTERCEPTOR	HIGHWAY CUT OFF DITCH
CONCRETE HEADWALL	FILTER DRAIN - HCD F2
GRASSED CHANNEL IN BOX CULVERT	EXISTING REEN
CARRIER PIPE - HCD F1	EXISTING REEN TO BE FILLED
CONCRETE CHANNEL - HCD F21 & B3 & B7 & B12	EXISTING FIELD DITCH TO BE FILLED
CONCRETE CHANNEL - HCD F21 & B3 & B7 & B12 WITH CARRIER PIPE - HCD F1 BELOW	EXISTING CULVERT TO BE RETAINED
GRASSED CHANNEL	PROPOSED CULVERT
COMBINED KERB DRAINAGE	COMBINED KERB DRAINAGE WITH CARRIER PIPE - HCD F1 BELOW

**KEY PLAN:**

EXISTING NRW SLUICE	PROPOSED NRW TILTING WEIR/PENSTOCK
POTENTIAL NRW ACCESS (IN ABEYANCE)	INDIRECT LOSS FIELD DITCHES
SITE OF SPECIAL SCIENTIFIC INTEREST BOUNDARY	

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).
Construction No exceptional risks
Maintenance / Cleaning Culverts partially submerged
Use No exceptional risks
Decommissioning / Demolition No exceptional risks

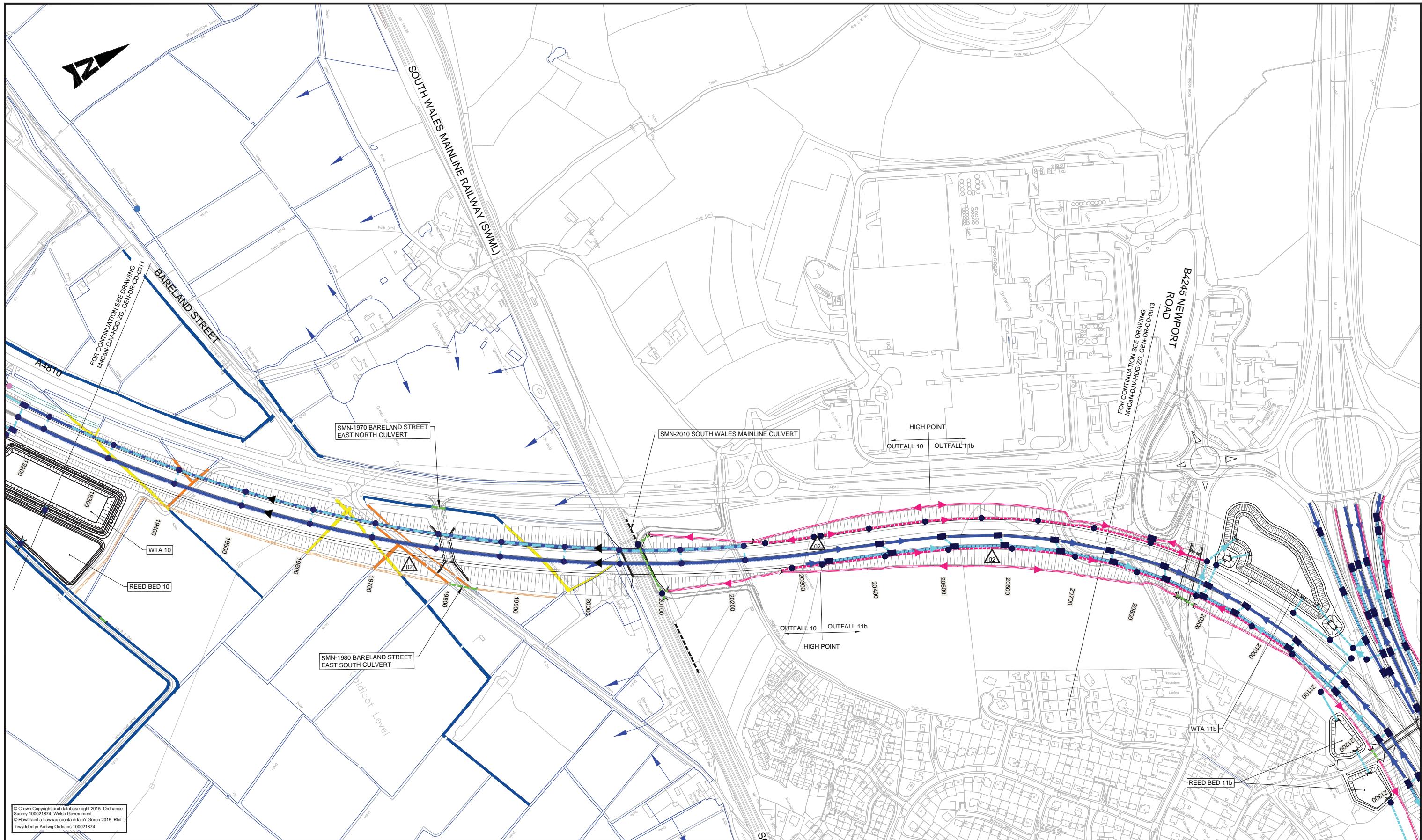
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Drawing Status		Sustainability		Project Title				
				M4 CORRIDOR AROUND NEWPORT				
Project Team				Drawing Title				
				HIGHWAY DRAINAGE AND REEN MITIGATION SHEET 11 OF 16				
<div><p>Llywodraeth Cymru Welsh Government</p></div>				Scale	Designed / Drawn	Checked	Approved	Authorised
				1:2500	AC	DOL	HR	KEN
				Original Size	Date	Date	Date	Date
A1	25/08/16	25/08/16	26/08/16	26/08/16				
Drawing Number		Originator		Volume		Revision		
Project		M4CaN - DJV - HDG -				ISSUE 2		
ZG_GEN - DR - CD - 0011								
Location	Type	Role	Number					



DO NOT SCALE

100  
0 10  
Millimetres



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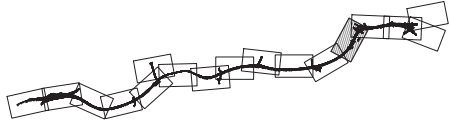
GENERAL NOTES:

1. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
2. ONLY WRITTEN DIMENSIONS SHALL BE USED. DO NOT SCALE.
3. FIN DRAINS NOT SHOWN FOR CLARITY. TO BE HCD F18 TYPE 7.
4. WTA 11a REMOVED.

LEGEND:

- |   |   |  |
|---|---|--|
| CATCHPIT - HCD F11 / MANHOLE - HCD F4, F5, F6 & F7                          | REPLACEMENT REEN                                  | EXISTING NRW SLUICE                          |
| INTAKE CHAMBER - HCD F22 & F24  | REPLACEMENT FIELD DITCH                           | PROPOSED NRW TILTING WEIR / PENSTOCK         |
| PETROL INTERCEPTOR  | HIGHWAY CUT OFF DITCH                             | POTENTIAL NRW ACCESS (IN ABEYANCE)           |
| CONCRETE HEADWALL   | FILTER DRAIN - HCD F2                             | EXISTING CULVERT TO BE RETAINED              |
| GRASS LINED DITCH IN BOX CULVERT  | EXISTING REEN                                     | PROPOSED CULVERT                             |
| CARRIER PIPE - HCD F1   | EXISTING REEN TO BE FILLED                        | INDIRECT LOSS FIELD DITCHES                  |
| CONCRETE CHANNEL - HCD F21 & B3 & B7 & B12                                  | EXISTING FIELD DITCH TO BE FILLED                 | SITE OF SPECIAL SCIENTIFIC INTEREST BOUNDARY |
| CONCRETE CHANNEL - HCD F21 & B3 & B7 & B12 WITH CARRIER PIPE - HCD F1 BELOW | COMBINED CULVERT                                  |  |
| GRASS LINED CHANNEL   | COMBINED CULVERT WITH CARRIER PIPE - HCD F1 BELOW |  |
| COMBINED KERB DRAINAGE  |   |  |

KEY PLAN



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).


Construction  
No exceptional risks

Maintenance / Cleaning  
No exceptional risks

Use  
No exceptional risks

Decommissioning / Demolition  
No exceptional risks

ISSUE	27/01/16	FINAL ISSUE TO WG	DJW	TJD	HR
ISSUE 2	26/08/16	SUPPLEMENTARY ISSUE	DJW	WBO	HR
Rev.	Date	Description	By	Chk'd	App'd

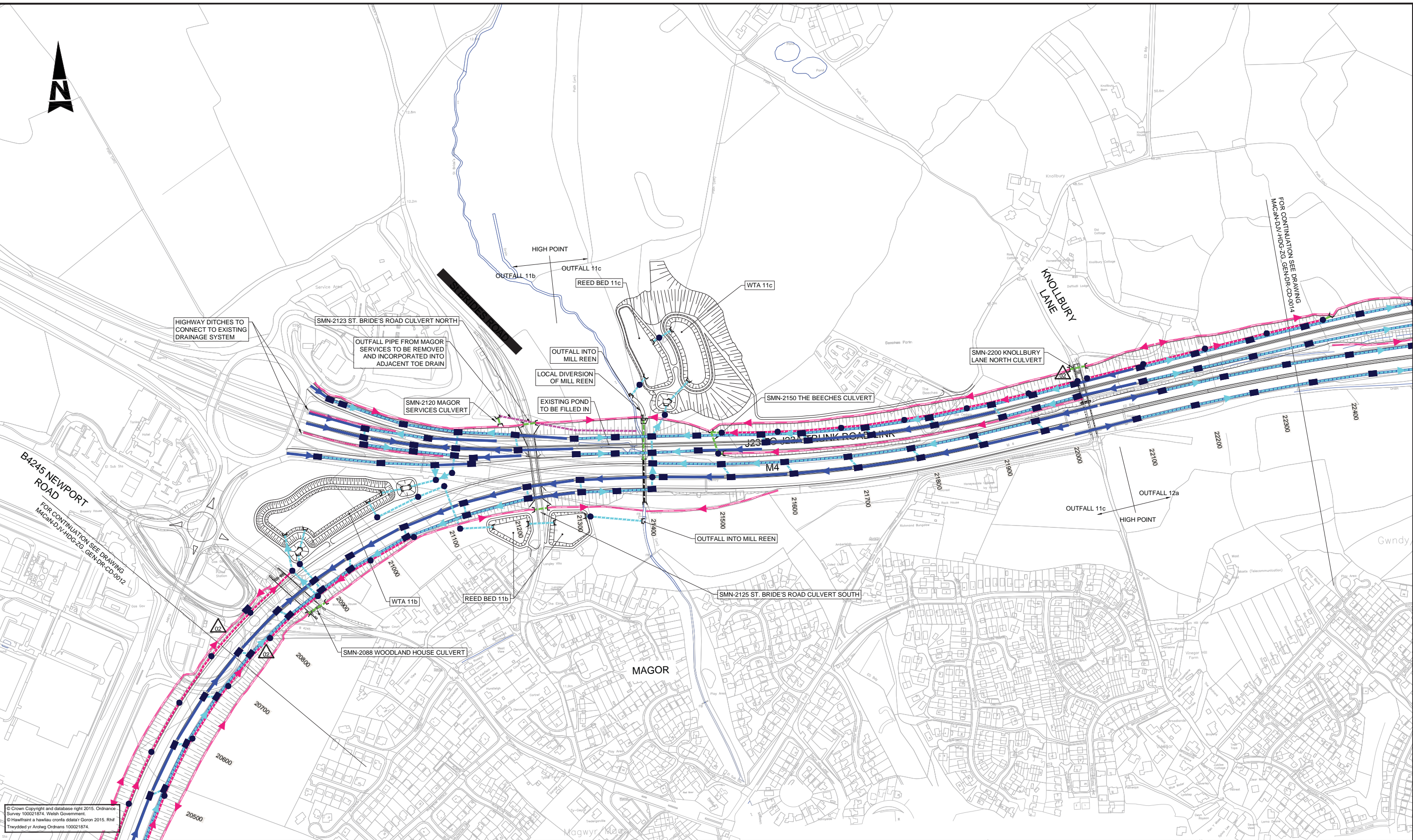
Drawing Status		Suitability		Project Title				
				M4 CORRIDOR AROUND NEWPORT				
Project Team				Drawing Title				
				HIGHWAY DRAINAGE AND REEN MITIGATION SHEET 12 OF 16				
Client				Scale	Designed / Drawn	Checked	Approved	Authorised
				1:2500	DJW	WBO	HR	KEN
				Original Size	Date	Date	Date	Date
				A1	25/08/16	25/08/16	25/08/16	26/08/16
 Llywodraeth Cymru Wylbwr Gwernpennu				Drawing Number		Revision		
				Project		Originator		Volume
				M4CaN - DJV - HDG - ZG_GEN - DR - CD - 0012		ISSUE 2		





DO NOT SCALE

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Millimetres

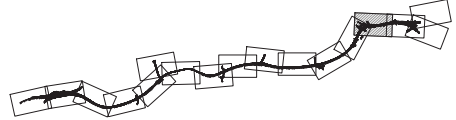


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- GENERAL NOTES:
- ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
  - ONLY WRITTEN DIMENSIONS SHALL BE USED. DO NOT SCALE.
  - FIN DRAINS NOT SHOWN FOR CLARITY. TO BE HCD F18 TYPE 7.

- LEGEND:
- |  |   |  |                                   |  |   |
|--|---|--|-----------------------------------|--|---|
|  | CATCHPIT - HCD F11 / MANHOLE - HCD F4, F5, F6 & F7                          |  | REPLACEMENT REEN                  |  | EXISTING NRW SLUICE                                     |
|  | INTAKE CHAMBER - HCD F22 & F24  |  | REPLACEMENT FIELD DITCH           |  | PROPOSED NRW TILTING WEIR / PENSTOCK                    |
|  | PETROL INTERCEPTOR  |  | HIGHWAY CUT OFF DITCH             |  | POTENTIAL NRW ACCESS (IN ABEYANCE)                      |
|  | CONCRETE HEADWALL   |  | FILTER DRAIN - HCD F2             |  | INDIRECT LOSS FIELD DITCHES                             |
|  | GRASS LINED DITCH IN BOX CULVERT  |  | EXISTING REEN                     |  | EXISTING CULVERT TO BE RETAINED                         |
|  | CARRIER PIPE - HCD F1   |  | EXISTING REEN TO BE FILLED        |  | PROPOSED CULVERT  |
|  | CONCRETE CHANNEL - HCD F21 & B3 & B7 & B12                                  |  | EXISTING FIELD DITCH TO BE FILLED |  | COMBINED KERB DRAINAGE WITH CARRIER PIPE - HCD F1 BELOW |
|  | CONCRETE CHANNEL - HCD F21 & B3 & B7 & B12 WITH CARRIER PIPE - HCD F1 BELOW |  | EXISTING CULVERT TO BE FILLED     |  | COMBINED KERB DRAINAGE                                  |
|  | GRASS LINED CHANNEL   |  | PROPOSED CULVERT                  |  |   |
|  | COMBINED KERB DRAINAGE  |  |                                   |  |   |

KEY PLAN





#### SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).

Construction	No exceptional risks
Maintenance / Cleaning	No exceptional risks
Use	No exceptional risks
Decommissioning / Demolition	No exceptional risks

Rev.	Date	Description	By	Chk'd	App'd
ISSUE 1	27/01/16	FINAL ISSUE TO WG	DJW	TJD	HR
ISSUE 2	26/08/16	SUPPLEMENTARY ISSUE	DJW	WBO	HR

Drawing Status		Suitability		Project Title									
				M4 CORRIDOR AROUND NEWPORT									
Project Team				Drawing Title									
				HIGHWAY DRAINAGE AND REEN MITIGATION SHEET 13 OF 16									
<div><p>Llywodraeth Cymru</p></div>				Scale		Designed / Drawn		Checked		Approved		Authorised	
				1:2500		DJW		WBO		HR		KEN	
				Original Size		Date		Date		Date		Date	
		A1		25/08/16		25/08/16		25/08/16		26/08/16			
<div><p>Llywodraeth Cymru</p></div>				Drawing Number		Project		Originator		Volume		Revision	
								M4CaN - DJV - HDG -				ISSUE 2	
								ZG GEN - DR - CD - 0013					





DO NOT SCALE

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Millimetres



FOR CONTINUATION SEE DRAWING  
M4CAn-DJV-HDG-ZG\_GEN-DR-CD-0013

SMN-2265 ROCKFIELD LANE  
NORTH CULVERT

SMN-2270 ROCKFIELD LANE  
SOUTH CULVERT

SMN-2280 THE ELMS CULVERT

THE ELMS

J23 TO J23A TRUNK ROAD LINK

SMN-2362 HILL BARN CULVERT

SMN-2360 LEYS BREAK CULVERT

SMN-2361 BENCROFT LANE CULVERT

SMN-2365 THICKET WOOD CULVERT

SMN-2340 STANDING STONE CULVERT

ANCIENT SCHEDULED  
MONUMENT (STANDING STONE)

HIGHWAY DITCHES TO  
CONNECT TO EXISTING  
DRAINAGE SYSTEM

HIGHWAY DITCHES DESIGNED  
AS INFILTRATION TRENCHES

REED BED 12b

SMN-2410 GREEN FARM CULVERT

SMN-2400 THE OLD COURT CULVERT

OUTFALL FROM WTA12b TO  
DISCHARGE INTO EXISTING DITCH

SMN-2369  
LLANFIHANGEL CULVERT

SMN-2370 RED BARN CULVERT

SMN-2371 COURT FARM CULVERT

SMN-2359 CALDICOT ROAD CULVERT

NEW ATTENUATION DITCH  
TO REPLACE EXISTING

SMN-2380 ATTENUATION  
DITCH CULVERT

FOR CONTINUATION SEE DRAWING  
M4CAn-DJV-HDG-ZG\_GEN-DR-CD-0015

EXISTING SMN-2359  
CALDICOT ROAD CULVERT  
TO BE EXTENDED

NEW BOREHOLE SOAKAWAY  
TO REPLACE EXISTING

SMN-2339 ALLOTMENT  
CULVERT

SMN-2346 RETAINING  
WALL CULVERT

WTA 12a

REED BED 12a

B4245

ANCIENT SCHEDULED  
MONUMENT (MOAT)

SOUTH WALES MAINLINE RAILWAY (SWML)

Caldicot Level  
Caldicot Moor

CALDICOT LEVEL

CALDICOT MOOR

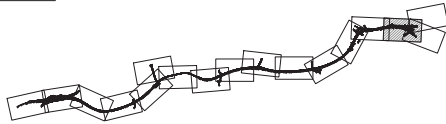
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2. ONLY WRITTEN DIMENSIONS SHALL BE USED. DO NOT SCALE.  
3. FIN DRAINS NOT SHOWN FOR CLARITY. TO BE HCD F18 TYPE 7.

LEGEND:

- |  |   |  |   |  |   |
|--|---|--|---|--|---|
|  | CATCHPIT - HCD F11 / MANHOLE - HCD F4, F5, F6 & F7                          |  | REPLACEMENT REEN  |  | EXISTING NRW SLUICE                                     |
|  | INTAKE CHAMBER - HCD F22 & F24  |  | REPLACEMENT FIELD DITCH                                 |  | PROPOSED NRW TILTING WEIR / PENSTOCK                    |
|  | PETROL INTERCEPTOR  |  | HIGHWAY CUT OFF DITCH                                   |  | POTENTIAL NRW ACCESS (IN ABYANCE)                       |
|  | CONCRETE HEADWALL   |  | FILTER DRAIN - HCD F2                                   |  | INDIRECT LOSS FIELD DITCHES                             |
|  | GRASS LINED DITCH IN BOX CULVERT  |  | EXISTING REEN   |  | PROPOSED CULVERT  |
|  | CARRIER PIPE - HCD F1   |  | EXISTING REEN TO BE FILLED                              |  | EXISTING CULVERT TO BE RETAINED                         |
|  | CONCRETE CHANNEL - HCD F21 & B3 & B7 & B12                                  |  | EXISTING FIELD DITCH TO BE FILLED                       |  | COMBINED KERB DRAINAGE WITH CARRIER PIPE - HCD F1 BELOW |
|  | CONCRETE CHANNEL - HCD F21 & B3 & B7 & B12 WITH CARRIER PIPE - HCD F1 BELOW |  | EXISTING FIELD DITCH TO BE FILLED                       |  | COMBINED KERB DRAINAGE WITH CARRIER PIPE - HCD F1 BELOW |
|  | GRASS LINED CHANNEL   |  | PROPOSED CULVERT  |  | COMBINED KERB DRAINAGE WITH CARRIER PIPE - HCD F1 BELOW |
|  | COMBINED KERB DRAINAGE  |  | COMBINED KERB DRAINAGE WITH CARRIER PIPE - HCD F1 BELOW |  | COMBINED KERB DRAINAGE WITH CARRIER PIPE - HCD F1 BELOW |

KEY PLAN



#### SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).

Construction

No exceptional risks

Maintenance / Cleaning

No exceptional risks


Use

No exceptional risks

Decommissioning / Demolition

No exceptional risks

Rev.	Date	Description	By	Chk'd	App'd
ISSUE 1	27/01/16	FINAL ISSUE TO WG	DJW	TJD	HR
ISSUE 2	26/08/16	SUPPLEMENTARY ISSUE	DJW	WBO	HR

Drawing Status		Suitability	Project Title M4 CORRIDOR AROUND NEWPORT					
Project Team			Drawing Title HIGHWAY DRAINAGE AND REEN MITIGATION SHEET 14 OF 16					
Client			Scale	Designed / Drawn	Checked	Approved	Authorised	
			1:2500	DJW	WBO	HR	KEN	
			Original Size	Date	Date	Date	Date	
			A1	25/08/16	25/08/16	25/08/16	26/08/16	
 Llywodraeth Cymru Welsh Government			Drawing Number	Project	Originator	Volume	Revision	
			M4CaN - DJV - HDG - ZG_GEN - DR - CD - 0014					ISSUE 2
			Location	Type	Role	Number		





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**GENERAL NOTES:**

1. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
2. ONLY WRITTEN DIMENSIONS SHALL BE USED. DO NOT SCALE.
3. FIN DRAINS NOT SHOWN FOR CLARITY. TO BE HCD F18 TYPE 7.

**LEGEND:**

● CATCHPIT - HCD F11 / MANHOLE - HCD F4, F5, F6 & F7	REPLACEMENT REEN
■ INTAKE CHAMBER - HCD F22 & F24	REPLACEMENT FIELD DITCH
— PETROL INTERCEPTOR	HIGHWAY CUT OFF DITCH
— CONCRETE HEADWALL	FILTER DRAIN - HCD F2
— GRASSED CHANNEL IN BOX CULVERT	EXISTING REEN
— CARRIER PIPE - HCD F1	EXISTING REEN TO BE FILLED
— CONCRETE CHANNEL - HCD F21 & B3 & B7 & B12	EXISTING FIELD DITCH TO BE FILLED
— CONCRETE CHANNEL - HCD F21 & B3 & B7 & B12 WITH CARRIER PIPE - HCD F1 BELOW	EXISTING CULVERT TO BE RETAINED
— GRASSED CHANNEL	PROPOSED CULVERT
— COMBINED KERB DRAINAGE	COMBINED KERB DRAINAGE WITH CARRIER PIPE - HCD F1 BELOW

**KEY PLAN:**

● EXISTING NRW SLUICE	● PROPOSED NRW TILTING WEIR/PENSTOCK
— POTENTIAL NRW ACCESS (IN ABEYANCE)	— INDIRECT LOSS FIELD DITCHES
— SITE OF SPECIAL SCIENTIFIC INTEREST BOUNDARY	

**SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION**

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).


Construction	No exceptional risks
Maintenance / Cleaning	Maes Glas Pill Culvert access
Use	No exceptional risks
Decommissioning / Demolition	No exceptional risks

Rev.	Date	Description	By	Chk'd	App'd	
ISSUE 1	27/01/16	FINAL ISSUE TO WG		AC	DOL	HR
ISSUE 2	26/08/16	SUPPLEMENTARY ISSUE		AC	DOL	HR

Drawing Status

Project Team

Client



Llywodraeth Cymru  
Welsh Government

Project Title

M4 CORRIDOR AROUND NEWPORT

Drawing Title

HIGHWAY DRAINAGE AND REEN MITIGATION  
SHEET 16 OF 16

Scale	Designed / Drawn	Checked	Approved	Authorised
1:2500	AC	DOL	HR	KEN

Original Size	Date	Date	Date	Date
A1	25/08/16	25/08/16	26/08/16	26/08/16

Drawing Number	Project	Originator	Volume	Revision
M4CaN - DJV - HDG - ZG_GEN - DR - CD - 0016				ISSUE 2