Welsh Government

M4 Corridor around Newport

Environmental Statement Volume 3: Appendix 2.3

Reen Mitigation Strategy

M4CaN-DJV-HDG_GEN-FN-CD-0002

At Issue | March 2016

CVJV/AAR
3rd Floor
Longross Court,
47 Newport Road,
Cardiff
CF24 0AD

File Note

Project title	M4 Corridor around Newport
cc	File reference: M4CaN-DJV-HDG_GEN-FN-CD-0002
Prepared by	Date: March 2016
Subject	Reen Mitigation Strategy

1. Introduction

The purpose of this note is to outline the reen mitigation strategy for the section of the proposed M4.

The Scheme is a new section of 3-lane motorway to the south of Newport following a protected (TR111) route. Part of this route crosses the Gwent Levels. These Levels contain a large number of Natural Resources Wales (NRW) maintained watercourses. These watercourses will be referred to as “reens” for the remainder of this report. Between these reens there are also a significant amount of smaller drainage ditches around or within fields which do not necessarily take water all year round, and have a base level above that of the surrounding reens. These will be referred to as “field ditches”. These are maintained by the landowners/tenants.

As the proposed new section of motorway crosses the Levels, it bisects a number of reens and field ditches. This note covers the proposals for mitigation measures to minimise watercourse and environmental impacts for the removal of these reens and field ditches.

Consultation has been undertaken with NRW with regards to the proposals, but approval of the proposals is still required.

2. The Existing Reen Network

The current reen system on the Gwent Levels is a network of interconnecting watercourses (reens and field ditches) which feed into the Severn Estuary. As the area is below high tide the reens serve as a storage facility when outfalls are tide locked. The water levels in the reens are controlled by a series of sluice structures. NRW have the responsibility for the reen management and maintenance for the watercourses classified as Main Rivers (generally running north to south) and also all other major reens within the Caldicot and Wentlooge Levels Internal Drainage District. 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 to provide a water source for agricultural purposes. During extreme storm events it is possible for water levels to rise above these levels.

NRW review the WPL and SPL on a five year cycle taking into account landowner considerations. A review of these penning levels has confirmed that the WPL and SPL will not change in the vicinity of the proposed scheme.

Reens typically have 1 in 1 side slopes, and vary in depth and width, typically 3m width at the top and 1m at the base. As the water levels are controlled by sluices there is typically very little flow, and most of the reens have no recognisable catchment within the Flood Estimation Handbook (FEH) software.

Field ditches are smaller than these reens and are frequently dry. They commonly run along existing hedgerows on the edge of fields and connect to the reens.

The reens and ditches support a wide range of aquatic plants, including many rare or scarce species that in turn support a wide variety of other wildlife. There is a diverse community of insects (for example water beetles) and other invertebrates inhabiting the reens and ditches. The assemblage of water beetles found across the Levels is unique in Wales and includes the great silver water beetle which is found nowhere else in Wales and is restricted to only a few other sites in southern England. This is the reason that the Levels have been designated a Site of Special Scientific Interest (SSSI).

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 reens and ditches also provide habitat for protected species including otter, water vole, grass snake and amphibians.

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 2,570m. The estimated length of field ditch crossings that would be infilled as part of the Scheme is approximately 9,150m.

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

Chainage	Reen Name	Length infilled	Reason infilled
5+100-5+300	Nant-y-moor Reen	194m	Existing reen runs parallel and underneath mainline footprint
5+500-5+750	Percoed Reen and SDR reen	274m	Existing reen runs underneath mainline footprint, with junction with SDR reen
6+820-6+900	Morfa Gronw Reen	116m	Existing reen runs perpendicular to mainline footprint
7+750	Old Dairy Reen	79m	Existing reen runs perpendicular to mainline footprint
7+980	Pont-y-Cwcw	74m	Existing reen runs perpendicular to mainline footprint
8+400	Sea Wall Reen	267m	Existing reen diverted away from Sea Wall to allow construction of bridge abutment over River Ebbw
12+350	Lakes Reen	53m	Existing reen runs perpendicular to mainline footprint
12+400	Julians Reen	89m	Existing reen runs parallel to existing side road
13+000	Julians Reen	55m	Existing reen runs perpendicular to mainline footprint

File Note

March 2016

Chainage	Reen Name	Length infilled	Reason infilled
14+280 – 14+360	Ellen Reen	210m	Existing reen runs perpendicular to mainline and slip road footprint
14+650-14+750	Middle Reen	163m	Existing reen runs perpendicular to mainline and slip road footprint
14+880	Black Wall Reen	112m	Existing reen runs perpendicular to mainline and slip road footprint
14+900	Monks Ditch	103m	Existing reen runs perpendicular to mainline and slip road footprint
16+600	Elver Pill Reen	65m	Existing reen runs perpendicular to mainline footprint
17+750	Middle Road Reen Diversion	41m	Existing reen runs underneath North Row side road at skew
17+900	Middle Road Reen Diversion	63m	Existing reen runs perpendicular to mainline footprint
18+480	Cock Street Reen	60m	Existing reen runs perpendicular to mainline footprint
19+150 – 19+410	Petty Reen	198m	Existing reen runs perpendicular to mainline footprint
19+650 – 19+750	Stutwall Reen	142m	Existing reen runs perpendicular to mainline footprint
19+850 – 20+050	Bareland Street Reen	210m	Existing reen runs perpendicular to mainline footprint
Total	2568m		

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

Chainage	Length infilled	Reason infilled
5+630 – 5+950	376m	Existing field ditch under mainline footprint and Percoed NMU bridge approach embankment
5+950 – 6+050	109m	Existing field ditch under footprint of WTA 4a
6+050 – 6+100	383m	Two existing field ditches under footprint of WTA 4a and mainline
6+120 – 6+280	170m	Existing field ditch under mainline footprint
6+250 – 6+350	150m	Existing field ditch under mainline footprint
6+400 – 6+550	419m	Existing field ditch under mainline and structural embankment footprint
6+550 – 6+650	101m	Existing field ditch under mainline footprint
6+900	66m	Existing field ditch under mainline footprint connecting to Morfa Gronw Reen
6+930 – 7+400	718m	Existing field ditches parallel to mainline footprint and WTA 5.
7+380	106m	Existing field ditch parallel to Lighthouse Road Side Road
7+410	61m	Existing field ditch under mainline footprint
7+500	99m	Existing field ditches under mainline footprint
7+520 – 7+670	184m	Existing field ditch parallel to mainline footprint

File Note

March 2016

Chainage	Length infilled	Reason infilled
7+670	18m	Existing field ditch under mainline footprint
7+730	68m	Existing field ditch perpendicular to mainline footprint
7+880	74m	Existing field ditch perpendicular to mainline footprint
8+000 – 8+350	421m	Existing field ditches under embankment approach to River Ebbw Crossing
11+550	67m	Existing field ditches under embankment from main bridge crossing
11+640 – 11+760	165m	Existing field ditch parallel to mainline footprint
11+800 – 12+000	313m	Existing field ditches under mainline footprint
12+070	84m	Existing field ditch perpendicular to mainline footprint
12+150 – 12+350	191m	Existing field ditch through WTA 6
12+460 – 12+620	245m	Existing field ditches under mainline footprint
12+700	80m	Existing field ditch under mainline footprint
12+850 – 12+970	271m	Existing field ditches under mainline footprint
13+000	60m	Existing field ditch perpendicular to mainline footprint
13+000 – 13+100	216m	Existing field ditches perpendicular to mainline footprint
13+130 – 13+210	142m	Existing field ditches perpendicular to mainline footprint
13+240 – 13+330	150m	Existing field ditches perpendicular to mainline footprint
13+500 – 13+730	361m	Existing field ditch parallel to mainline footprint
13+900	59m	Existing field ditch perpendicular to mainline footprint
14+120 – 14+160	80m	Existing field ditch perpendicular to mainline footprint
14+280 – 14+360	64m	Existing field ditches perpendicular to mainline and Garn Llyn Slip lanes
14+400 – 14+550	296m	Existing field ditches perpendicular to mainline and Garn Llyn Slip lanes
16+390	53m	Steelworks dedicated reen perpendicular to mainline footprint
16+400 – 16+460	74m	Existing field ditch skewed to mainline footprint
16+850 – 17+100	814m	Existing field ditches skewed to mainline footprint
17+150	60m	Existing field ditch perpendicular to mainline footprint
17+200	59m	Existing field ditch perpendicular to mainline footprint
17+500	59m	Existing field ditch perpendicular to mainline footprint
17+520 – 17+880	799m	Existing field ditches under mainline and WTA 9
17+900	134m	Existing field ditches perpendicular to mainline footprint
18+000	69m	Existing field ditch perpendicular to mainline footprint
18+150	67m	Existing field ditch perpendicular to mainline footprint
18+980	63m	Existing field ditch perpendicular to mainline footprint
19+080	67m	Existing field ditch perpendicular to mainline footprint
19+130	66m	Existing field ditch perpendicular to mainline footprint
19+230 – 19+280	54m	Existing field ditch parallel to mainline footprint

Chainage	Length infilled	Reason infilled
19+400	70m	Existing field ditch perpendicular to mainline footprint
19+600	82m	Existing field ditch perpendicular to mainline footprint
19+700 – 19+850	179m	Existing field ditch parallel to mainline
Total	9136m	

Infilling would have a negative impact the water management and biodiversity of the levels. Therefore mitigation of this impact is proposed and outlined below.

4. Mitigation Proposals for Reens and Field Ditches

In order to mitigate for the loss in length of reen and field ditch, it is proposed that new reens are provided in areas in which existing reens are being infilled. Continuing advice would be sought from NRW on their specification for reen design, however in general the proposals are that the reens will be excavated to a depth of 2.0m with 1 in 1 side slopes, a 0.7m berm and will be approximately 5.7m wide at the surface. These engineered reens will connect reens that have been cut off by the highway, with tilting sluices to allow manipulation of the water levels in the reen. A 7m width Section 250 easement for maintenance will be provided. The reen will be placed 3m outside of the highway fenceline. Responsibility for maintenance is to be agreed with NRW.

Where existing field ditches have been cut off by the works, replacement field ditches will be provided. Continuing advice would be sought from NRW on their specification for field ditches however in general the proposals are that these will be 2.5m wide at the surface with 1 in 1 slopes and 1m deep. These will connect to the nearest main reens to provide connectivity and compensate losses.

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. Culverts with a catchment are currently proposed to be 1800mm height, with the widths to be determined from the hydrological analysis. Culvert heights may be amended to allow mammals (including bats) and other wildlife to cross.

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.

Chainage	North or south of carriageway	Length provided	Reason of provision
5+100 – 5+520	North	426m	Connect Nant-y-Moor reen to SDR reen to improve water management
5+100 – 5+300	South	194m	Diversion of Nant-y-Moor reen
5+520 – 5+760	South	246m	Diversion of Percoed reen and connection of SDR reen to Percoed reen

Chainage	North or south of carriageway	Length provided	Reason of provision
6+000 – 6+700	North	775m	Connection of Percoed reen to Morfa Gronw reen to improve water management
6+820 – 6+900	North	91m	Diversion of Morfa Gronw reen
7+750 – 7-980	North	259m	Connect Old Dairy Reen to Pont-y-Cwcw
8+050 – 8+400	North	365m	Connect Pont-y-Cwcw reen to Sea Wall reen.
8+400	North	58m	Divert Sea Wall Reen
19+120 – 19+300	North	145m	Water flows diverted to Cock Street Reen
19+120	South	98m	Existing ditch widened to outfall to Rush Wall Reen
Total		2657m	

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

Chainage	North or south of carriageway	Length provided	Reason of provision
4+320 – 4+520	North	209m	Intercept ditches and transfer flow to culverts
4+420 – 5+100	South	658m	Interception and diversion of flows to connect to Nant-y-Moor Reen, including flowing through Church Lane overbridge
5+510 – 5+760	North	219m	Intercept ditches and transfer flows to Percoed Reen
5+760 – 6+130	South	472m	Field ditch diversion around Water Treatment Area 4b
6+120 – 6+330	South	201m	Ditch to intercept flows from drain
6+530 – 6+680	South	122m	Intercept highway embankment runoff and direct to existing drains
6+680 –6+880	South	209m	Intercept highway embankment runoff and direct to existing drains
6+880 – 7+110	South	247m	Intercept highway embankment runoff and direct to existing drains
7+400 – 7+750	North	302m	Intercept flows from existing ditches and redirect towards culverts
7+400 7+500	South	90m	Intercept highway embankment runoff and direct to existing drains
7+500 – 7+750	South	233m	Intercept highway embankment runoff and direct to existing drains
7+760 – 8+380	South	627m	Intercept highway embankment runoff and direct to existing drains
11+550 – 11+820	North	254m	Intercept flows from existing ditches and redirect towards culverts
11+640 – 11+960	South	323m	Intercept highway embankment runoff and direct to existing drains
11+810 – 12+350	North	591m	Intercept flows from existing ditches and redirect towards Lakes Reen around Water Treatment Area 6

Chainage	North or south of carriageway	Length provided	Reason of provision
11+960 – 12+090	South	122m	Intercept highway embankment runoff and direct to existing drains
12+350 – 12+470	North	97m	Intercept flows from existing ditches and redirect towards Lakes Reen
12+670 – 12+910	North	327m	Intercept flows from existing ditches and redirect towards Lakes Reen
12+850 – 13+000	South	158m	Intercept highway embankment runoff and direct to existing drains
13+000 – 13+310	North	12m	Connect existing ditch to Julians Reen
13+000 – 13+050	South	43m	Connect existing ditch to Julians Reen
13+000 – 13+900	North	865m	Intercept flows from existing ditches and redirect towards culverts
13+900 – 13+960	South	161m	Widen existing ditch to allow flows under new section of motorway
16+600 – 17+230	South	633m	Intercept highway embankment runoff and direct to existing drains
17+880 – 17+900	South	33m	Intercept highway embankment runoff and direct to existing drains
17+880 – 19+130	North	1217m	Intercept flows from existing ditches and redirect towards culverts
18+010 – 18+480	South	462m	Intercept highway embankment runoff and direct to existing drains
18+980 – 19+130	South	150m	Intercept highway embankment runoff and direct to existing drains
19+300 19+800	South	620m	Intercept highway embankment runoff and direct to existing drains
19+830 – 19+950	South	114m	Intercept highway embankment runoff and direct to existing drains
Total		9771m	

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

Type	Length infilled (m)	New length provided (m)
Reens	2568	2657
Field ditches	9136	9771

The embankment of the proposed new section of motorway will also potentially truncate overland flow paths during low probability flood events. The proposed engineered reens will seek to capture overland flow paths and route flows to culverts below the proposed road embankment. The effectiveness of the proposals has been tested as part of the Flood Consequences Assessment (Reference number M4CaN-DJV-HDG-ZG_GEN-RP-CD-0007) for the scheme.

In order to encourage establishment of vegetation characteristic of the existing reen and ditch network, material would be introduced into the new features from both existing reens and ditches being removed (subject to timing) and also using material removed from the reen network arising from NRW's annual maintenance, again subject to NRW's agreement.

As well as introducing appropriate plant species, this would also assist in establishing populations of aquatic invertebrates.

Mammals, reptiles and amphibians would colonise the new watercourses as the vegetation develops.

All of the replacement reens have the potential to impact on archaeological remains within the Levels. Although it is intended to be able to identify areas of higher archaeological potential in KS3, it would be prudent to include the excavation of the replacement reens as an early activity in KS6. If archaeological sites are picked up during this work, they may well extend beneath the carriageway embankment, so the excavation of the replacement reens could be used as an additional form of archaeological evaluation which could alert us to areas where further archaeological investigation may be required.

NRW have advised that any replacement lengths of reens and ditches are excavated, connected and functioning prior to the infilling of the sections to be lost in order to minimise disruption.

5. Conclusion

This note outlines the mitigation for the reens and field ditches for the Scheme. Reen connectivity will be retained with the implementation of culverts, and a significant amount of additional reen length will be added to the levels which will have a significant positive impact both on the biodiversity and the water management along the levels.

Field ditches will also be reinstated 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.

Appendix A

DO NOT SCALE

Millimetres 100 10 0

SMN-0190 PARK FARM CULVERT EXTENSION

SMN-0215 PWLL DIWAELOD CULVERT

NEW PARK FARM

FOR CONTINUATION SEE DRAWING M4CaN-DJV-HDG-ZG_GEN-DR-CD-0002

OUTFALL 1

HIGH POINT

PANT-RHIW-GOCH FARM

SBR-0200 PARK FARM FOOTBRIDGE

EXISTING PARK FARM BRIDGE TO BE DEMOLISHED

SMN-0235 MAINTENANCE TRACK CULVERT

EXISTING SMN-0220 A48M 1000 C01 - CULVERT 2 CASTLETON

SBR-0245 CASTLETON INT OVERBRIDGE LINK

BRYN IVOR LODGE CARE HOME

SMN-0230 A48M CULVERT

WTA 1

REED BED 1

HOLLYWOOD FARM

DRUIDSTONE ROAD

COAL PIT LANE

RECLASSIFIED A48(M)

M4

A48M

CASTLETON

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
- GRASS LINED DITCH 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
- GRASS LINED CHANNEL
- COMBINED KERB DRAINAGE
- REPLACEMENT REEN
- REPLACEMENT FIELD DITCH
- HIGHWAY CUT OFF DITCH
- 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
- 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

Rev.	Date	Description	By	Chk'd	App'd
Issue	27/01/16	FINAL ISSUE TO WG	DJW	TJD	HR

Drawing Status: FOR COSTING

Suitability: D1

Project Team

Client: Llywodraeth Cymru Welsh Government

Project Title: M4 CORRIDOR AROUND NEWPORT

Drawing Title: HIGHWAY DRAINAGE AND REEN MITIGATION SHEET 1 OF 16

Scale	Designed / Drawn	Checked	Approved	Authorised
1:2500	DJW	TJD	HR	BCS
Original Size	**Date**	**Date**	**Date**	**Date**
A1	27/01/16	27/01/16	27/01/16	27/01/16

Drawing Number: M4CaN - DJV - HDG - ZG_GEN - DR - CD - 0001
(Project | Originator | Volume | Location | Type | Role | Number)

Revision: Issue

DO NOT SCALE

Millimetres 0 10 100

PENYLAN FARM

HIGH POINT

OUTFALL 1

OUTFALL 2

SMN-0315 M4S 29-29 C10 PENYLAN (NANT-SELSIG) CULVERT

SMN-0255 CASTLETON INTERCHANGE CULVERT

FOR CONTINUATION SEE DRAWING M4CaN-DJV-HDG-ZG_GEN-DR-CD-0001

PROPOSED CASCADE

POUND HILL

CASTLETON INTERCHANGE

SBR-0365 CASTLETON INTERCHANGE GAS MAIN CULVERT

SBR-0355 CASTLETON INTERCHANGE OVERBRIDGE LINK C

SBR-0375 A48 UNDERBRIDGE EASTBOUND

EXISTING M4

A48

SMN-0395A BERRYHILL CULVERT

SMN-0395B LITTLE ORCHARD CULVERT

FOR CONTINUATION SEE DRAWING M4CaN-DJV-HDG-ZG_GEN-DR-CD-0003

SMN-0310 M4 28-29 C85 THE GLEN (NANT-SELSIG) CULVERT

SBR-0360 CASTLETON INTERCHANGE OVERBRIDGE LINK B

SMN-0370 LONGHOUSE CULVERT

SBR-0370 A48 UNDERBRIDGE WESTBOUND

SBR-0245 CASTLETON INTERCHANGE OVERBRIDGE LINK A

EXISTING CASTLETON 1C OVERBRIDGE TO BE DEMOLISHED

SMN-0305 OLD RECTORY CULVERT

TOE DRAINAGE BETWEEN THESE POINTS TO CONSIST OF FILTER DRAIN TO ACCOUNT FOR UNDULATING EXISTING GROUND LEVELS

EXISTING SMN-0250 M4S 29-29 C20 CASTLETON GARDEN CENTRE CULVERT

EXISTING SMN-0250 M4S 29-29 C20 CASTLETON GARDEN CENTRE CULVERT

SMN-0390 THE CONIFERS CULVERT

WTA 1

WTA 1

OUTFALL TO TYN-Y-BRWYN REEN

WTA 2

WTA 2

OUTFALL TO PWLL BARGOED REEN

REED BED 1

REED BED 2

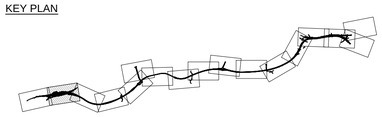
GENERAL NOTES:

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
- GRASS LINED DITCH 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
- GRASS LINED CHANNEL
- COMBINED KERB DRAINAGE
- REPLACEMENT REEN
- REPLACEMENT FIELD DITCH
- HIGHWAY CUT OFF DITCH
- 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
- 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

Rev.	Date	Description	By	Chk'd	App'd
Issue	27/01/16	FINAL ISSUE TO WG	DJW	TJD	HR

Drawing Status: FOR COSTING

Suitability: D1

Project Title: M4 CORRIDOR AROUND NEWPORT

Project Team

Drawing Title: HIGHWAY DRAINAGE AND REEN MITIGATION SHEET 2 OF 16

Client: Llywodraeth Cymru Welsh Government

Scale	Designed / Drawn	Checked	Approved	Authorised
1:2500	DJW	TJD	HR	BCS
Original Size	**Date**	**Date**	**Date**	**Date**
A1	27/01/16	27/01/16	27/01/16	27/01/16

Drawing Number: Project | Originator | Volume | Location | Type | Role | Number

M4CaN - DJV - HDG - ZG_GEN - DR - CD - 0002

Revision: Issue

DO NOT SCALE

Millimetres 0 10 100

COEDKERNEW

DUFFRYN LINK

DUFFRYN LANE

CHURCH LANE

A48

HIGH POINT

OUTFALL 2

OUTFALL 4

FOR CONTINUATION SEE DRAWING M4CaN-DJV-HDG-ZG_GEN-DR-CD-0002

SMN-0430 ATHENSWAY CULVERT

SMN-0450 ELM CULVERT

SMN-0460 CHURCH LANE CULVERT

SBR-0460 CHURCH LANE OVERBRIDGE

SMN-0510 NANT-Y-MOOR REEN CULVERT

SMN-0550 SDR REEN CULVERT

SMN-0580 PONT-ESTYLL CULVERT

SBR-0580 PERCOED NMU BRIDGE

SBR-0570 PERCOED REEN BRIDGE

SMN-0590 PERCOED LANE CULVERT

FOR CONTINUATION SEE DRAWING M4CaN-DJV-HDG-ZG_GEN-DR-CD-0004

ELECTRICITY SUB-STATION

WTA 2

WTA 4b

WTA 4a

REED BED 2

REED BED 4b

REED BED 4a

OUTFALL TO TYN-Y-BRWYN REEN

OUTFALL TO DIVERTED WATERCOURSE

PERCOED REEN

PERCOED LANE

GWENT LEVELS - St. BRIDES SSSI

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
- GRASS LINED DITCH 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
- GRASS LINED CHANNEL
- COMBINED KERB DRAINAGE
- REPLACEMENT REEN
- REPLACEMENT FIELD DITCH
- HIGHWAY CUT OFF DITCH
- 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
- 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

Rev.	Date	Description	By	Chk'd	App'd
Issue	27/01/16	FINAL ISSUE TO WG	DJW	TJD	HR

Drawing Status: FOR COSTING

Suitability: D1

Project Team

Client: Llywodraeth Cymru Welsh Government

Project Title: M4 CORRIDOR AROUND NEWPORT

Drawing Title: HIGHWAY DRAINAGE AND REEN MITIGATION SHEET 3 OF 16

Scale	Designed / Drawn	Checked	Approved	Authorised
1:2500	DJW	TJD	HR	BCS
Original Size	**Date**	**Date**	**Date**	**Date**
A1	26/01/16	26/01/16	26/01/16	27/01/16

Drawing Number: M4CaN - DJV - HDG - ZG_GEN - DR - CD - 0003
(Project | Originator | Volume | Location | Type | Role | Number)

Revision: Issue

Millimetres 0 10 100

DO NOT SCALE

N

W73

W69a x

W69x

MORFA-GRONW REEN

PERCOED REEN

FOR CONTINUATION SEE DRAWING M4CaN-DJV-HDG-ZG GEN-DR-CD-0003

FOR CONTINUATION SEE DRAWING M4CaN-DJV-HDG-ZG GEN-DR-CD-0005

WTA5

REED BED 5

OUTFALL TO MORFA GRONW REEN

SMN-0630 COMPENSATORY REEN ACCESS

HIGH POINT

OUTFALL 4 | OUTFALL 5

SMN-0680 MORFA GRONW REEN CULVERT

SMN-0730 RAILWAY COTTAGE CULVERT

SMN-0685 TY-HIR CULVERT

TRANSITION TO GRASSED CHANNEL

5800 5900 6000 6100 6200 6300 6400 6500 6600 6700 6800 6900 7000 7100 7200 7300 7400 7500 7600 7700

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
- 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
- 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
Culverts partially submerged

Use
No exceptional risks

Decommissioning / Demolition
No exceptional risks

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

Drawing Status: FOR COSTING

Suitability: D1

Project Team

Client: Llywodraeth Cymru Welsh Government

Project Title: M4 CORRIDOR AROUND NEWPORT

Drawing Title: HIGHWAY DRAINAGE AND REEN MITIGATION SHEET 4 OF 16

Scale	Designed / Drawn	Checked	Approved	Authorised
1:2500	AC	DOL	HR	BCS
Original Size: A1	Date 26/01/16	Date 26/01/16	Date 26/01/16	Date 27/01/16

Drawing Number: Project | Originator | Volume | Location | Type | Role | Number
M4CaN - DJV - HDG - ZG_GEN - DR - CD - 0004

Revision: Issue

DO NOT SCALE

Millimetres 0 10 100

PONT Y CWCW REEN

OLD DAIRY REEN

SEA WALL REEN

SBR-0835 SEA WALL REEN BRIDGE

SMN-0805 PONT Y CWCW COMPENSATORY REEN CULVERT

SMN-0775 OLD DAIRY REEN CULVERT

SMN-0800 PONT Y CWCW REEN CULVERT

SMN-0810 NEW DAIRY FARM CULVERT

SMN-0770 OLD DAIRY REEN FIELD ACCESS CULVERT

EAST OUTFALL TO RIVER EBBW

WEST OUTFALL TO RIVER EBBW

OUTFALL FROM USK CROSSING DRAINAGE

FOR CONTINUATION SEE DRAWING M4CaN-DJV-HDG-ZG-GEN-DR-CD-0004

FOR CONTINUATION SEE DRAWING M4CaN-DJV-HDG-ZG-GEN-DR-CD-0016

FOR CONTINUATION SEE DRAWING M4CaN-DJV-HDG-ZG-GEN-DR-CD-0006

W77 W81 W81a W77a

7600 7700 7800 7900 8000 8100 8200 8300 8400 8500 8600 8700 8800 8900 9000 9100 9200 9300 9400 9500

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
- 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
No exceptional risks

Maintenance / Cleaning
Culverts partially submerged
Main bridge drainage to outfalls at bridge abutment

Use
No exceptional risks

Decommissioning / Demolition
No exceptional risks

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

Drawing Status: FOR COSTING
Suitability: D1

Project Team

Client: Llywodraeth Cymru Welsh Government

Project Title: M4 CORRIDOR AROUND NEWPORT

Drawing Title: HIGHWAY DRAINAGE AND REEN MITIGATION SHEET 5 OF 16

Scale	Designed / Drawn	Checked	Approved	Authorised
1:2500	AC	DOL	HR	BCS
Original Size	Date	Date	Date	Date
A1	26/01/16	26/01/16	26/01/16	27/01/16

Drawing Number: M4CaN - DJV - HDG - ZG_GEN - DR - CD - 0005
(Project | Originator | Volume | Location | Type | Role | Number)

Revision: Issue

DO NOT SCALE

Millimetres 0 10 100

HIGH POINT

OUTFALL 5 OUTFALL 6

MAXIMUM PIPE DIAMETER 600mm

COMBINED KERB DRAINAGE TO OUTFALL TO PIPE UNDER CENTRAL RESERVATION AT 100m INTERVALS

DRAINAGE TO DROP DOWN PIER TO GROUND LEVEL

POLLUTION CONTROL LAGOON

OUTFALL TO MARSH AREA

FOR CONTINUATION SEE DRAWING M4CaN-DJV-HDG-ZG_GEN-DR-CD-0007

FOR CONTINUATION SEE DRAWING M4CaN-DJV-HDG-ZG_GEN-DR-CD-0005

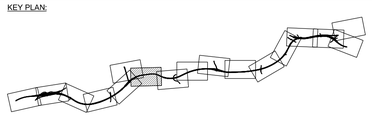
GENERAL NOTES:

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
- 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
- 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
- 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
Large diameter pipe underneath bridge deck

Maintenance / Cleaning
Large diameter pipe underneath bridge deck

Use
No exceptional risks

Decommissioning / Demolition
No exceptional risks

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

Drawing Status: FOR COSTING

Suitability: D1

Project Team

Client: Llywodraeth Cymru Welsh Government

Project Title: M4 CORRIDOR AROUND NEWPORT

Drawing Title: HIGHWAY DRAINAGE AND REEN MITIGATION SHEET 6 OF 16

Scale	Designed / Drawn	Checked	Approved	Authorised
1:2500	AC	DOL	HR	BCS
Original Size: A1	Date: 26/01/16	Date: 26/01/16	Date: 26/01/16	Date: 27/01/16

Drawing Number: Project | Originator | Volume | Location | Type | Role | Number
M4CaN - DJV - HDG - ZG_GEN - DR - CD - 0006

Revision: Issue

DO NOT SCALE

Millimetres 100 0 10

FOR CONTINUATION SEE DRAWING M4CaN-DJV-HDG-ZG_GEN-DR-CD-0008

SOLUTIA PCB CELL

DRAINAGE TO OUTFALL INTO ABUTMENT FROM USK CROSSING

POLLUTION CONTROL LAGOON

SMN-1235 LAKE'S REEN NORTH ACCESS CULVERT

LAKES REEN

SMN-1225 LAKE'S REEN SOUTH ACCESS CULVERT

OUTFALL TO LAKES REEN

REED BED 6

WTA6

PIPE TO FALL BACK TO WTA6

FOR CONTINUATION SEE DRAWING M4CaN-DJV-HDG-ZG_GEN-DR-CD-0008

TRANSITION FROM COMBINED KERB DRAINAGE TO GRASSED CHANNEL

SMN-1230 LAKE'S REEN CULVERT

SMN-1245 PYE CORNER CULVERT

SMN-1250 JULIANS REEN FARM ACCESS CULVERT

SMN-1180 PICKED LANE CULVERT

SMN-1240 JULIAN'S REEN SIDE ROAD CULVERT

C1

C2

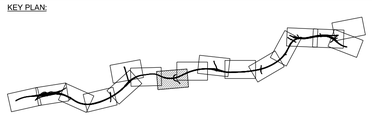
GENERAL NOTES:

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
- 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
- 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
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

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

Drawing Status: FOR COSTING
Suitability: D1

Project Team

Client: Llywodraeth Cymru Welsh Government

Project Title: M4 CORRIDOR AROUND NEWPORT

Drawing Title: HIGHWAY DRAINAGE AND REEN MITIGATION SHEET 7 OF 16

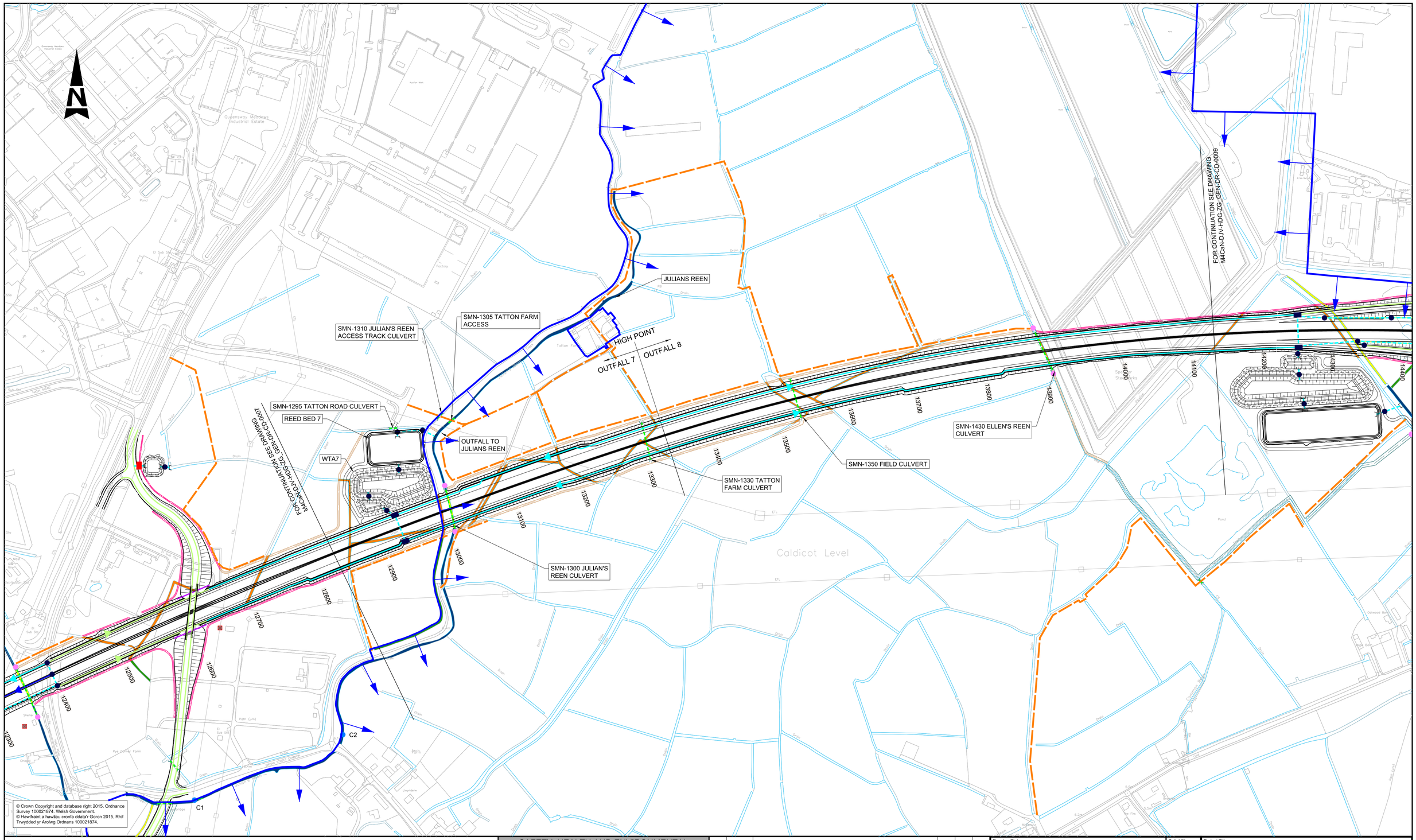
Scale	Designed / Drawn	Checked	Approved	Authorised
1:2500	AC	DOL	HR	BCS
Original Size	Date	Date	Date	Date
A1	26/01/16	26/01/16	26/01/16	27/01/16

Drawing Number: Project | Originator | Volume
M4CaN - DJV - HDG - ZG_GEN - DR - CD - 0007
Location | Type | Role | Number

Revision: Issue

DO NOT SCALE

Millimetres 0 10 100



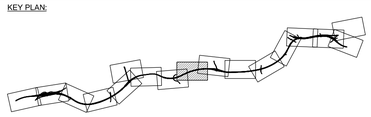
GENERAL NOTES:

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
- 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
- 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
Culverts partially submerged

Use
No exceptional risks

Decommissioning / Demolition
No exceptional risks

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

Drawing Status: FOR COSTING
Suitability: D1

Project Team

Client: Llywodraeth Cymru Welsh Government

Project Title: M4 CORRIDOR AROUND NEWPORT

Drawing Title: HIGHWAY DRAINAGE AND REEN MITIGATION SHEET 8 OF 16

Scale	Designed / Drawn	Checked	Approved	Authorised
1:2500	AC	DOL	HR	BCS
Original Size	**Date**	**Date**	**Date**	**Date**
A1	26/01/16	26/01/16	26/01/16	27/01/16

Drawing Number: Project | Originator | Volume
M4CaN - DJV - HDG - ZG_GEN - DR - CD - 0008
Location | Type | Role | Number

Revision: Issue

DO NOT SCALE

Millimetres 0 10 100

CONNECT TO EXISTING SAR DRAINAGE

SBR-1475 GLAN LLYN JUNCTION LINK UNDERBRIDGE

SMN-1475 GLAN LLYN LINK SAR DITCH CULVERT

SBR-1475 GLAN LLYN JUNCTION LINK UNDERBRIDGE

EXISTING DRAINAGE DITCHES ON TATA LAND TO BE INFILLED AND DECONTAMINATED

MONKS DITCH

WTA8a

OUTFALL TO BLACK WALL REEN

REED BED 8a

SBR1480 MONK'S DITCH BRIDGE

PROPOSED TATA 'DIRTY DITCH'

EXISTING DRAINAGE DITCHES ON TATA LAND TO BE INFILLED AND DECONTAMINATED

PROPOSED TATA 'CLEAN DITCH'

HIGH POINT

OUTFALL 8 | OUTFALL 9

FOR CONTINUATION SEE DRAWING M4CaN-DJV-HDG-ZG_GEN-DR-CD-0008

FOR CONTINUATION SEE DRAWING M4CaN-DJV-HDG-ZG_GEN-DR-CD-0010

OUTFALL TO ELLEN REEN

SMN-1480 BLACK WALL REEN CULVERT

BLACK WALL REEN

ELLEN REEN

REED BED 8

WTA8

SMN-1445 ELLEN REEN DIVERSION TRACK CULVERT

ELLEN REEN DIVERSION

MONKSCROFT REEN

PARISH REEN

C109

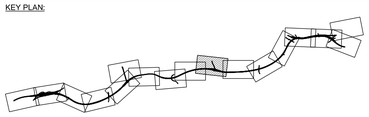
GENERAL NOTES:

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
- 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
- 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
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	27/01/16	FINAL ISSUE TO WG	AC	DOL	HR

Drawing Status: FOR COSTING

Suitability: D1

Project Team

Client: Llywodraeth Cymru Welsh Government

Project Title: M4 CORRIDOR AROUND NEWPORT

Drawing Title: HIGHWAY DRAINAGE AND REEN MITIGATION SHEET 9 OF 16

Scale	Designed / Drawn	Checked	Approved	Authorised
1:2500	AC	DOL	HR	BCS
Original Size	**Date**	**Date**	**Date**	**Date**
A1	26/01/16	26/01/16	26/01/16	27/01/16

Drawing Number: Project | Originator | Volume | Location | Type | Role | Number
M4CaN - DJV - HDG - ZG_GEN - DR - CD - 0009

Revision: Issue

DO NOT SCALE

Millimetres 0 10 100

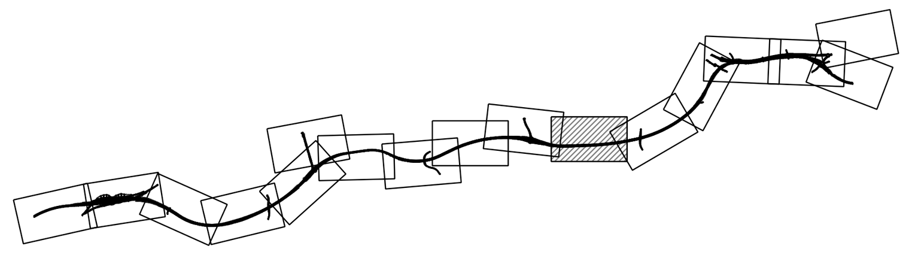
GENERAL NOTES:

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
- 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
- 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
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	27/01/16	FINAL ISSUE TO WG	AC	DOL	HR

Drawing Status: FOR COSTING

Suitability: D1

Project Team

Client: Llywodraeth Cymru Welsh Government

Project Title: M4 CORRIDOR AROUND NEWPORT

Drawing Title: HIGHWAY DRAINAGE AND REEN MITIGATION SHEET 10 OF 16

Scale	Designed / Drawn	Checked	Approved	Authorised
1:2500	AC	DOL	HR	BCS
Original Size: A1	Date: 26/01/16	Date: 26/01/16	Date: 26/01/16	Date: 27/01/16

Drawing Number (Project | Originator | Volume | Location | Type | Role | Number): M4CaN - DJV - HDG - ZG_GEN - DR - CD - 0010

Revision: Issue

DO NOT SCALE

Millimetres 0 10 100

CONNECT TO EXISTING SAR DRAINAGE

SMN-1750 NORTH ROW SAR CULVERT

FOR CONTINUATION SEE DRAWING M4CaN-DJV-HDG-ZG_GEN-DR-CD-0010

SBR-1755 MIDDLE ROW REEN BRIDGE

WTA9A

MIDDLE ROAD REEN

REED BED 9 AREA = 10332m²

C61

OUTFALL TO MIDDLE ROAD REEN

C62

WTA9

GREEN MOOR TRIANGLE

GREEN MOOR REEN

SBR-1780 MIDDLE ROAD REEN DIVERSION M4 BRIDGE

C47

C51

MIDDLE ROAD REEN DIVERSION

WTA9B

PETTY REEN

NOT HIGH POINT

OUTFALL 9

OUTFALL 10

SMN-1925 PETTY REEN CULVERT

FOR CONTINUATION SEE DRAWING M4CaN-DJV-HDG-ZG_GEN-DR-CD-0012

SBR-1770 NORTH ROW MIDDLE ROAD DIVERSION REEN BRIDGE

C101

SMN-1790 NORTH ROW DRAIN CULVERT

COCK STREET REEN

SMN-1850 COCK STREET REEN CULVERT

C52

C53

DRAIN TO EXISTING

WTA10

RUSH WALL REEN

REED BED 10

OUTFALL TO RUSH WALL REEN

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
- 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
- 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
Culverts partially submerged

Use
No exceptional risks

Decommissioning / Demolition
No exceptional risks

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

Drawing Status: FOR COSTING
Suitability: D1

Project Team

Client: Llywodraeth Cymru Welsh Government

Project Title: M4 CORRIDOR AROUND NEWPORT

Drawing Title: HIGHWAY DRAINAGE AND REEN MITIGATION SHEET 11 OF 16

Scale	Designed / Drawn	Checked	Approved	Authorised
1:2500	AC	DOL	HR	BCS
Original Size: A1	Date: 26/01/16	Date: 26/01/16	Date: 26/01/16	Date: 27/01/16

Drawing Number: Project | Originator | Volume
M4CaN - DJV - HDG - ZG_GEN - DR - CD - 0011
Location | Type | Role | Number

Revision: Issue

DO NOT SCALE

Millimetres 0 10 100

SOUTH WALES MAINLINE RAILWAY (SWML)

BARELAND STREET

A4810

B4245 NEWPORT ROAD

FOR CONTINUATION SEE DRAWING M4CaN-DJV-HDG-ZG_GEN-DR-CD-0011

FOR CONTINUATION SEE DRAWING M4CaN-DJV-HDG-ZG_GEN-DR-CD-0013

SMN-1970 BARELAND STREET EAST NORTH CULVERT

SBR-1980 BARELAND STREET UNDERBRIDGE

SMN-2010 SOUTH WALES MAINLINE CULVERT

HIGH POINT

OUTFALL 10 OUTFALL 11b

SMN-2085 BREWERY HOUSE CULVERT

SMN-2090 NEWPORT ROAD CULVERT

SMN-2090 WOODLAND HOUSE CULVERT

SMN-1980 BARELAND STREET EAST SOUTH CULVERT

SBR-2000 LLANDEVENNY RAILWAY UNDERBRIDGE

WTA 10

WTA 11b

REED BED 11b

Caldicot Level

18200 18300 18400 18500 18600 18700 18800 18900 19000 19100 19200 19300 19400 19500 19600 19700 19800 19900 20000 20100 20200 20300 20400 20500 20600 20700 20800 20900 21000 21100 21200 21300

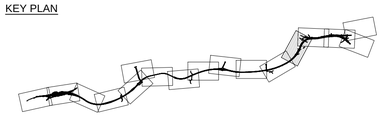
GENERAL NOTES:

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
- INTAKE CHAMBER - HCD F22 & F24
- PETROL INTERCEPTOR
- CONCRETE HEADWALL
- GRASS LINED DITCH 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
- GRASS LINED CHANNEL
- COMBINED KERB DRAINAGE
- REPLACEMENT REEN
- REPLACEMENT FIELD DITCH
- HIGHWAY CUT OFF DITCH
- 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
- 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

Rev.	Date	Description	By	Chk'd	App'd
Issue	27/01/16	FINAL ISSUE TO WG	DJW	TJD	HR

Drawing Status: FOR COSTING
Suitability: D1

Project Team

Client: Llywodraeth Cymru Welsh Government

Project Title: M4 CORRIDOR AROUND NEWPORT

Drawing Title: HIGHWAY DRAINAGE AND REEN MITIGATION SHEET 12 OF 16

Scale	Designed / Drawn	Checked	Approved	Authorised
1:2500	DJW	TJD	HR	BCS
Original Size: A1	Date: 26/01/16	Date: 26/01/16	Date: 26/01/16	Date: 27/01/16

Drawing Number: Project | Originator | Volume | Location | Type | Role | Number
M4CaN - DJV - HDG - ZG_GEN - DR - CD - 0012

Revision: Issue

DO NOT SCALE

Millimetres 0 10 100

HIGHWAY DITCHES TO CONNECT TO EXISTING DRAINAGE SYSTEM

SMN-2123 ST. BRIDE'S ROAD CULVERT NORTH

OUTFALL PIPE FROM MAGOR SERVICES TO BE REMOVED AND INCORPORATED INTO ADJACENT TOE DRAIN

SBR-2120A ST BRIDE'S ROAD UNDERBRIDGE

SMN-2120 MAGOR SERVICES CULVERT

HIGH POINT

OUTFALL 11b

OUTFALL 11c

REED BED 11c

WTA 11c

OUTFALL INTO MILL REEN

LOCAL DIVERSION OF MILL REEN

EXISTING POND TO BE FILLED IN

ST BRIDES ROAD

SMN-2150 THE BEECHES CULVERT

SBR-2205 KNOLLBURY LANE OVERBRIDGE 2

SMN-2200 KNOLLBURY LANE NORTH CULVERT

KNOLLBURY LANE

FOR CONTINUATION SEE DRAWING MACaN-DJV-HDG-ZG_GEN-DR-CD-0014

J23 TO J23A TRUNK ROAD LINK

M4

B4245 NEWPORT RC

FOR CONTINUATION SEE DRAWING MACaN-DJV-HDG-ZG_GEN-DR-CD-0012

WTA 11b

OUTFALL INTO MILL REEN

OUTFALL 12a

OUTFALL 11c

HIGH POINT

EXISTING KNOLLBURY - UNDY BRIDGE

SBR-2120 M4 23-23A 77 MAGOR PENHOW UNDERBRIDGE

SBR-2140 M4 23-23A 66 MILL REEN CULVERT

SMN-2125 ST. BRIDE'S ROAD CULVERT SOUTH

SMN-2085 BREWERY HOUSE CULVERT

SMN-2087 NEWPORT ROAD CULVERT

SMN-2088 WOODLAND HOUSE CULVERT

SBR-2080 NEWPORT ROAD OVERBRIDGE

WTA 11b

REED BED 11b

MAGOR

Magwyr / Magor

Gwndy

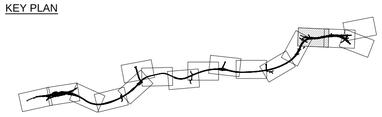
GENERAL NOTES:

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
- GRASS LINED DITCH 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
- GRASS LINED CHANNEL
- COMBINED KERB DRAINAGE
- REPLACEMENT REEN
- REPLACEMENT FIELD DITCH
- HIGHWAY CUT OFF DITCH
- 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
- 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

Rev.	Date	Description	By	Chk'd	App'd
Issue	27/01/16	FINAL ISSUE TO WG	DJW	TJD	HR

Drawing Status: FOR COSTING

Suitability: D1

Project Team

Client: Llywodraeth Cymru Welsh Government

Project Title: M4 CORRIDOR AROUND NEWPORT

Drawing Title: HIGHWAY DRAINAGE AND REEN MITIGATION SHEET 13 OF 16

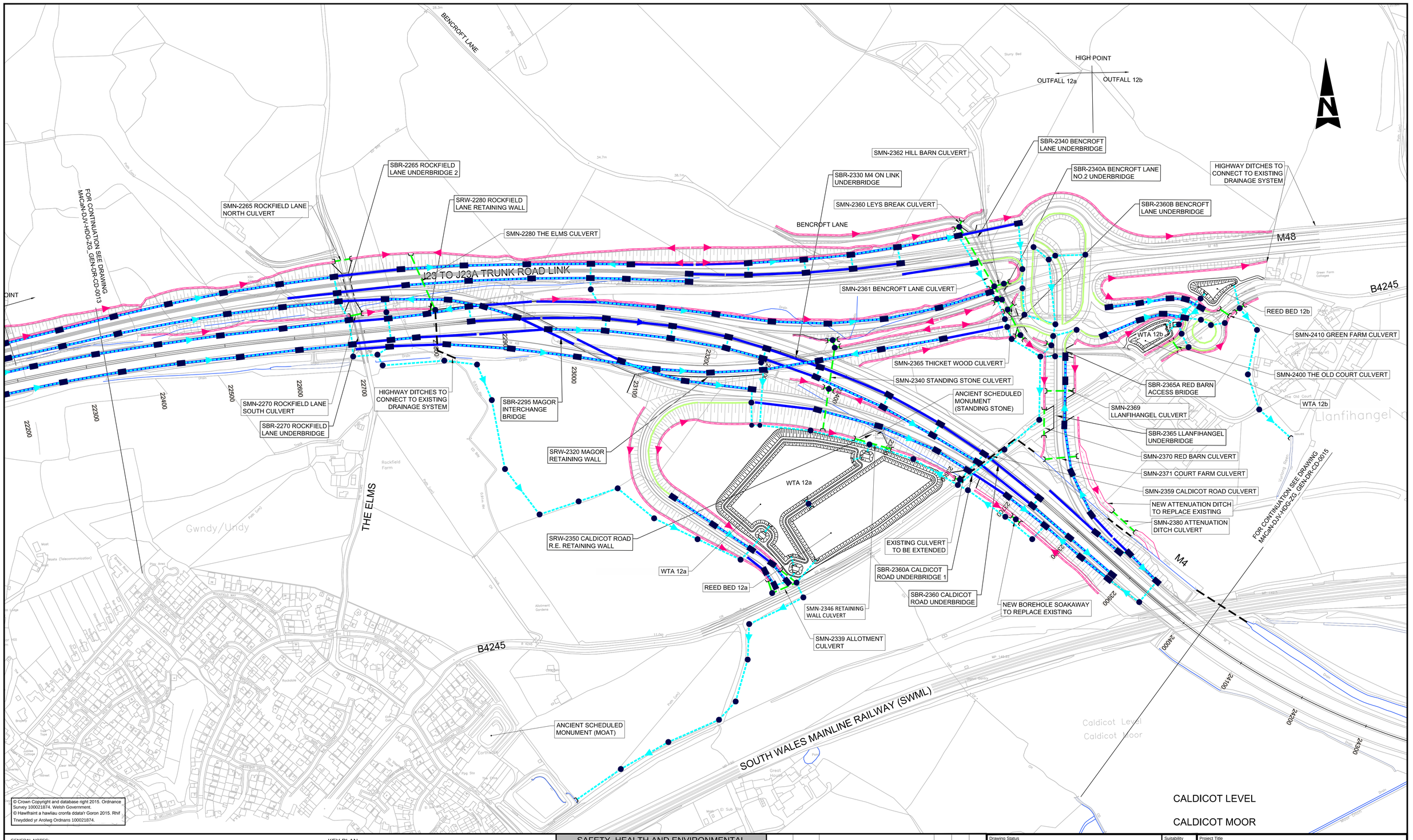
Scale	Designed / Drawn	Checked	Approved	Authorised
1:2500	DJW	TJD	HR	BCS
Original Size	**Date**	**Date**	**Date**	**Date**
A1	26/01/16	26/01/16	26/01/16	27/01/16

Drawing Number: M4CaN - DJV - HDG - ZG_GEN - DR - CD - 0013
(Project | Originator | Volume | Location | Type | Role | Number)

Revision: Issue

DO NOT SCALE

Millimetres 100 0 10



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, FS, F6 & F7
- INTAKE CHAMBER - HCD F22 & F24
- PETROL INTERCEPTOR
- CONCRETE HEADWALL
- GRASS LINED DITCH 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
- GRASS LINED CHANNEL
- COMBINED KERB DRAINAGE
- REPLACEMENT REEN
- REPLACEMENT FIELD DITCH
- HIGHWAY CUT OFF DITCH
- 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
- 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

Rev.	Date	Description	By	Chk'd	App'd
Issue	27/01/16	FINAL ISSUE TO WG	DJW	TJD	HR

Drawing Status: FOR COSTING
Suitability: D1

Project Team

Client: Llywodraeth Cymru Welsh Government

Project Title: M4 CORRIDOR AROUND NEWPORT

Drawing Title: HIGHWAY DRAINAGE AND REEN MITIGATION SHEET 14 OF 16

Scale	Designed / Drawn	Checked	Approved	Authorised
1:2500	DJW	TJD	HR	BCS
Original Size: A1	Date: 26/01/16	Date: 26/01/16	Date: 26/01/16	Date: 27/01/16

Drawing Number: M4CaN - DJV - HDG - ZG_GEN - DR - CD - 0014
(Project | Originator | Volume | Location | Type | Role | Number)

Revision: Issue

DO NOT SCALE

Millimetres 0 10 100

SMN-0905 MAES-GLAS
PILL CULVERT

FOR CONTINUATION SEE DRAWING
M4CaN-DJV-HDG-ZG-GEN-DR-CD-0005

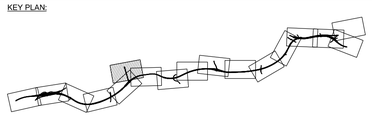
GENERAL NOTES:

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
- 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
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	27/01/16	FINAL ISSUE TO WG	AC	DOL	HR

Drawing Status: FOR COSTING
Suitability: D1

Project Title: M4 CORRIDOR AROUND NEWPORT

Project Team

Drawing Title: HIGHWAY DRAINAGE AND REEN MITIGATION SHEET 16 OF 16

Client: Llywodraeth Cymru Welsh Government

Scale	Designed / Drawn	Checked	Approved	Authorised
1:2500	AC	DOL	HR	BCS
Original Size: A1	Date: 26/01/16	Date: 26/01/16	Date: 26/01/16	Date: 27/01/16

Drawing Number: Project | Originator | Volume | Location | Type | Role | Number
M4CaN - DJV - HDG - ZG_GEN - DR - CD - 0016

Revision: Issue