Welsh Government

M4 Corridor around Newport

Environmental Statement Supplement
Volume 3: Appendix S16.2 Flood Consequences Assessment

M4CaN-DJV-HDG-ZG_GEN-RP-CD-0010

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References

- Arup, 2014. M4 Corridor Around Newport, Flooding Assessment. 14/9235 Issue 1.
- Environment Agency, 2010. Flood and Coastal Erosion Risk Management Appraisal Guidance.
- Environment Agency, 2011. Adapting to Climate Change: Advice for Flood and Coastal Erosion Risk Management Authorities.
- Environment Agency, 2011. Coastal flood boundary conditions for UK mainland and islands.
- Environment Agency, 2014. Severn Estuary Flood Risk Management Strategy, Strategy Appraisal Report. Draft 10.
- Natural Resources Wales, 2016. Stephenson Street Embankment, Outline Business Case. Draft version 4.
- Welsh Assembly Government, 2007. Flood and Coastal Defence Appraisal Guidance, FCDPAG3 Economic Appraisal, Supplementary Note to Operating Authorities – Climate Change Impacts.
- Welsh Government, 2015. Coastal Risk Management Programme – Guidance Notes for Local Authorities.

1 Report Supplements

1.1 Purpose of this Report

1.1.1 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:

a) 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.

b) 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.

1.1.2 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 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.

1.1.3 The Key Stage 3 Flood Consequence Assessment Report provides details of how the new section of motorway could impact on flood consequences for the locality.

1.1.4 This supplementary report provides detail of changes to the flood consequences resulting from the above design amendments. This report also provides supplementary information on tidal flood risk.

1.2 Report Layout

1.2.1 This report presents supplementary information to the Flood Consequence Assessment Report using the same paragraph numbering as the original report.

4 Assessment Approach

4.7 Scheme Drainage

Carriageway Drainage

4.7.4 The preliminary drainage designs have been amended to reflect the changes to the proposed new section of motorway. A revised set of drawings are provided in Appendix A1.

6 Summary

6.1 Tidal Flood Risk

Existing situation as regards tidal defences

6.1.10 As noted in the Flood Consequence Assessment (FCA), the tidal flood defences along the Wentlooge and Caldicot Levels have a generally good Standard of Protection (SoP) of approximately 0.1% Annual Exceedance Probability (AEP). This is confirmed in the Severn Estuary Flood Risk Management Strategy (SEFRMS) (Environment Agency, 2014). At the time of the SEFRMS work, there were three localised sections of lower SoP tidal flood defences, that the SEFRMS recommended to be improved as Priority Schemes (Tabbs Gout, Stephenson Street and Portland Grounds). NRW have stated that Tabbs Gout priority scheme is now completed, and that the Portland Grounds priority scheme was completed in summer 2016.

6.1.11 Since the publication of the FCA, further information on the Stephenson Street Scheme was received from Natural Resources Wales, in August 2016 (NRW, in

draft, 2016). This confirmed that the scheme is currently at the project appraisal stage. Further items that were confirmed consist of:

- The existing SoP was confirmed as less than 3.3%AEP (noting that tidal flooding over the embankment occurred in January 2014, deemed to be approximately a 10%AEP event), with an NRW embankment inspection in 2015 classing the embankment as failing, were it to have been an asset within their responsibility.
- Concerns included evidence of subsidence, structural failure and an undulating and narrow crest. The SEFRMS estimated that the existing SoP was approximately 20%AEP, noting that more detailed topographic survey was required to confirm the detailed SoP of this section of tidal flood defence. Overall, the more detailed and up to date analysis in the Stephenson Street Scheme appraisal stage confirms that the existing SoP is approximately between 10%AEP and 3.3%AEP.
- The economic justification for the scheme was also confirmed to remain robust, with further analysis within the appraisal stage estimating that the Benefit Cost Ratio (BCR) was 24.8. The SEFRMS estimated the BCR as 66. The differences between the BCRs used in the two studies can be mostly attributed to the more detailed scheme level analysis, and the scheme level choice of the improvements being a combination of sheet-piled wall, reinforced concrete wall and embankment, which are more costly than the assumptions in the SEFRMS.
- The planned design crest level of the scheme was confirmed at the appraisal stage as 9.03mAOD. This ensures provision of a 0.5%AEP SoP, accounting for sea level rise through to 2064. For clarity, it is noted that whilst the appraisal stage report states that the SEFRMS recommends a 0.5%AEP SoP, this refers to the simplified, non-technical documentation. The more detailed, technical information in the Strategy Appraisal Report (StAR) and its appendices (Environment Agency, 2014; the StAR sets out the business case for the SEFRMS, and the more detailed engineering, economic and environmental recommendations) states that a 0.1%AEP SoP is recommended. Regardless of this, a 0.5%AEP SoP through to 2064 is closely equivalent to a 0.1%AEP SoP through to 2030; and also NRW confirmed in their letter of 4th May 2016 that if the Stephenson Street Scheme were to be constructed, then a 0.1%AEP SoP through to 2030 would be provided.

Summary of previous studies and datasets

6.1.12 The tidal flood risk that would occur into the future, and particularly the year 2122 and for the 0.1%AEP event, is approximated by a number of previous studies. These include the SESMP2, SEFRMS, KS2 (Arup, 2014) and Stephenson Street Scheme appraisal stage report (in draft, NRW, 2016).

6.1.13 The SESMP2 and SEFRMS studies assessed the tidal flood risks based on the existing tidal flood defences as at 2010. These specifically did not include any improvement works at Tabbs Gout, Portland Grounds and Stephenson Street. However, there is still useful information on the wider SoP of the overall tidal flood defence system along the Wentlooge and Caldicot Levels, and how the SoP would reduce over time due to predicted climate change, if no improvements were undertaken.

6.1.14 The draft Stephenson Street Scheme appraisal stage assessed the tidal flood risks caused by the locally lower SoP tidal defence. This therefore provides more detail on the localised flood risks that would occur with or without the scheme.

6.1.15 These documents provide a useful indication of the baseline flood risk management position on the Wentlooge and Caldicot levels.

6.1.16 The KS2 study assessed the tidal flood risks based on the Tabbs Gout and Portland Grounds schemes having been completed, but with the Stephenson Street scheme not having occurred now or into the future. This provides useful information on the overall SoP and tidal inundation processes that would occur now and into the future including an allowance for climate change, assuming the tidal flood defences stay as they are currently, when works on the M4CaN commence.

6.1.17 The draft Stephenson Street Scheme appraisal stage assessed the tidal flood risks caused by the locally lower SoP tidal defence. This therefore provides more detail on the localised flood risks that would occur with or without the scheme.

6.1.18 This document provides an assessment of the likely extent of the flood impacts of the scheme, in the event that the Stephenson Street scheme does not go ahead.

6.1.19 Combined consideration of the above studies, and interpretation of their findings, can be used to estimate the overall SoP of the tidal flood defence system as it would be if all three of the Tabbs Gout, Portland Grounds and Stephenson Street schemes were present along the Wentlooge and Caldicot Levels, and how the overall SoP would reduce over time if the subsequent SEFRMS recommended programme of improvement through 2030-2110 did not occur. It is noted that this interpretation is necessarily semi-qualitative.

6.1.20 Of particular note is that various sets of extreme water level (EWLs) and climate change scenarios have been applied across the above studies, due to their specific purpose and timing of when they were undertaken. Table 6.1 and 6.2 provides a summary of the EWLs and climate change scenarios applied for the different studies (with and without confidence intervals). It is further noted that the SEFRMS undertook an analysis of extreme wave heights and their joint probability analysis with EWLs. Our understanding is that these two analyses remain the only study on extreme wave heights, and the Joint Probability Analysis between extreme wave heights and EWLs.

6.1.21 Furthermore, it is noted that the SEFRMS undertook its analyses for the medium 95%ile emissions scenario, and it also undertook sensitivity analyses for the low 50%ile, upper end (similar to Defra 2006/WAG 2007) and upper end plus surge emissions scenarios; and also for the SEFRMS EWLs and also the EA (2011) EWLs. Under all these scenarios the SEFRMS recommendations remained robust for provision of a 0.1%AEP SoP now and through to 2110.

6.1.22 The following sections describe the tidal flood risk that would occur with or without the recommended programme of improvements from the SESMP2 and SEFRMS. As the various studies have used different EWLs and climate change scenarios, the following sections interpret all the studies to a common basis of the EA (2011) EWLs and WAG (2007) climate change guidance, so as to form an assessment in accordance with TAN15 requirements. This primarily requires reference to future years to be amended, and the actual amount of sea level rise (SLR) to one decimal place is added in brackets to provide a clear reference.

Table 6.1. Application of EWLs in Previous Studies.

Location and reference			0.1%AEP EWL dataset in 2010		
Approximate location	EA (2011) chainage reference	SEFRMS reference	SEFRMS	EA (2011) without CI	EA (2011) with CI (0.6m)
River Rhymney	408	JPA2	9.0	8.5	9.1
Peterstone Gout	402	JPA3	8.9	8.6	9.2
River Usk	396	JPA4	9.0	8.8	9.4
Goldcliff	392	JPA5	9.1	8.9	9.5
Magor Pill	384	JPA6	9.5	9.2	9.8
Studies using EWL datasets			SEFRMS	SEFRMS, Arup (2014), NRW (2016)	

Table 6.2. Application of Climate Change Guidance in Previous Studies.

Year	Sea level rise from base date of 2010				
	WAG (2007)	Scenarios from EA (2011)			
		Low 50%ile from UKCP09	Medium 95%ile from UKCP09	Upper end	Upper end plus surge
2030	0.09	0.06	0.11	0.10	0.30
2060	0.35	0.17	0.31	0.35	0.70
2110	1.00	0.39	0.72	1.02	1.72
Studies using climate change guidance	SEFRMS, Arup (2014)	SEFRMS	SEFRMS, NRW (2016)	SEFRMS	SEFRMS

Note: values are given to 2 decimal places solely to clarify differences between guidance and scenarios.

Tidal Flood Risk without the SESMP2 and SEFRMS Recommended Programme of Improvements (2030 to 2110)

6.1.23 NRW (2016) indicates that in 2016 without the Stephenson Street Scheme present, tidal flooding to the immediate east of the River Usk (Caldicot Levels) would begin to occur in the 10%AEP event (from actual observed flooding in January 2014); this was confirmed by the modelling in Arup (2014).

6.1.24 NRW (2016) indicates that currently without the Stephenson Street Scheme present, tidal flooding to the immediate east of the River Usk (Caldicot Levels) would begin to occur in the 10%AEP event (from actual observed flooding in January 2014); this was confirmed by the modelling in Arup (2014). NRW (2016) notes that in the event of a breach in the 0.5%AEP event in 2014, to the immediate east of the River Usk some 192 residential and 620 non-residential properties are predicted to be inundated, as well as regionally-significant industrial areas, leisure amenities and key infrastructure such as the A48, Newport International Sports Village, Newport Stadium and Dragon Park. By 2030 (0.1m SLR) in the 0.1%AEP event this increases to 1,117 residential and 1,016 non-residential properties.

6.1.25 The Arup (2014) flood extent for the 0.1%AEP event in 2013 (with no breaches due to excessive wave or tidal overtopping) broadly corroborates the NRW (2016) modelling work in that the flood extent without a breach is less extensive but still exists.

6.1.26 The Arup (2014) work states that there would be up to 260 properties at risk of flooding. Inspection of the flood extent from NRW (2016) (which includes a 50m breach) indicates that flooding could extend further east of the River Usk, which would indicate that, with the M4CaN in place, there could be some further betterment and detriment to properties (likely not negligible) in and around the flood extent of the NRW (2016) work.

6.1.27 Overall, the above discussion identifies that without the Stephenson Street scheme in place there would be significant flooding of over 2,000 properties and regionally significant infrastructure, to the immediate east of the River Usk by 2030 in the 0.1%AEP event. This would occur with or without the M4CaN in place. The NRW (2016) work confirms that there is a compelling case for the Stephenson Street scheme to occur. Furthermore, Arup (2014) confirms that there would be no tidal flooding of the Wentlooge Levels in 2013 in the 0.1%AEP event.

6.1.28 The SEFRMS (EA, 2014) sets out how the wider SoP of the Wentlooge and Caldicot Levels would reduce over time in response to climate change beyond 2030, assuming that the existing tidal flood defence system is maintained as it is. This identifies that:

- By 2060 (0.3m SLR), the majority of the Wentlooge and Caldicot Levels tidal defences would still provide a SoP against breach (due to excessive wave or tidal overtopping) at or greater than 0.1%AEP; however, there are localised sections that would provide a SoP against breach of between 10-0.5%AEP. These sections would be where extensive flooding would initiate for events greater than 10%AEP.
- By 2110 (1.0m), the majority of the Wentlooge and Caldicot Levels tidal defences would not provide a SoP against breach of 0.1%AEP. The SoP against breach across the tidal flood defence system would vary between 100-1%AEP. There would be sections where extensive flooding would initiate for events greater than 100%AEP (i.e. annual flooding). Arup (2014) estimates that by 2113 (assuming the Stephenson Street scheme is not constructed, and no breaches occur due to excessive tidal overtopping), that extensive flooding of the Wentlooge and Caldicot Levels would result in up to 4,575 (Wentlooge Levels) and 22,926 (Caldicot Levels) properties, and nationally significant infrastructure, being at flood risk in the 0.1%AEP event.

6.1.29 The above regular and extensive flooding of the vast majority of the Wentlooge and Caldicot Levels, and the properties and infrastructure present in the floodplain, would occur with or without the M4CaN in place.

6.1.30 With the M4CaN in place, Arup (2014) indicates that in the 0.1%AEP event in 2113 (assuming no breaches due to excessive wave and tidal overtopping), up to 4,638 (Wentlooge Levels, an increase of 63) and 22,977 (Caldicot Levels, an increase of 49) properties would be at flood risk. This translates to:

- In the Wentlooge Levels, betterment for 2,045 (0-0.2m reduced flood depth) properties; and detriment for 551 (0-0.2m increased flood depth), 60 (0.2-0.4m increased flood depth), and 2 (0.4-0.6m increased flood depth) properties.
- In the Caldicot Levels, betterment for 38 (0.2-0.4m reduced flood depth) and 4,560 (0-0.2m reduced flood depth) properties; and detriment for 755 (0-0.2m increased flood depth), 266 (0.2-0.4m increased flood depth), and 6 (0.4-0.6m increased flood depth) properties.
- However, Arup (2014) states that without the M4CaN the flood depths would be up to 1.2m (Wentlooge Levels) and exceed 3m on average (Caldicot Levels), rendering the above impacts (betterments and detriments) relatively small in context.

- The above property numbers would be expected to reduce if quantitative modelling was undertaken with the Stephenson Street scheme in place, since the SoP would be improved. A qualitative assessment of the situation with the Stephenson Street scheme in place is set out below, given the reasonable likelihood that the scheme progresses. However, the Arup (2014) work can be considered to be a precautionary worst case assessment.

6.1.31 Whilst inspection of the WAG (2007) climate change guidance indicates that between 2110 and 2122 a further approximately 0.2m of sea level rise would occur, the above discussion would still provide a reasonable description of the baseline flood risks, assuming the Stephenson Street scheme were not to proceed.

Tidal Flood Risk with the SESMP2 and SEFRMS Recommended Programme of Improvements (2030 to 2110)

6.1.32 With the recommended SESMP2 and SEFRMS programme of improvements, the tidal flood defence system would provide a 0.1%AEP SoP against breach through to 2110. The recommended programme of improvements are independent of the M4CaN and would be recommended whether the M4CaN was present or not.

6.1.33 Implementation of the improvements programme would result in only localised and temporary flooding occurring due to wave overtopping, and limited tidal overtopping that would not cause breach. Under these conditions the M4CaN would not be expected to cause any betterment or detriment to properties within the Wentlooge and Caldicot Levels.

6.1.34 Whilst inspection of the WAG (2007) climate change guidance indicates that between 2110 and 2122 a further approximately 0.2m of sea level rise would occur, interpretation of the SESMP2 and SEFRMS recommendations indicates that the above discussion would still provide a reasonable description of the expected programme of improvement works.

6.1.35 The reasonable likelihood is that the Stephenson Street scheme will proceed, and the above description of flood risks is reasonable. However, on a precautionary basis the flood risks without the Stephenson Street scheme are set out above, notwithstanding that that is not the likely scenario.

6.3 Fluvial Flooding (St Brides Brook/Mill Reen)

6.3.6 The impact of the changes to the vertical alignment at St Brides Road Bridge has slightly reduced the footprint of the proposed embankment on the flood plain of the St Brides Brook.

6.3.7 This will slightly reduce the adverse impacts associated with the loss of flood plain storage to the north of the new section of motorway.

6.3.8 The preferred solution to accept that there will be a slight increase in flood risk to the north and enter into a ‘right to flood’ agreement with the landowner or alternatively exercising CPO rights still holds.

6.4 Fluvial Flood Risk (River Usk and River Ebbw Crossings)

6.4.4 NRW's Newport hydraulic model (ESTRY TUFLOW) was used to investigate whether the bridge supports for the River Usk and River Ebbw crossings will impact on the flood risk within the lower reaches of the Rivers Usk and Ebbw.

6.4.5 NRW supplied surge tide data and the median flood (50% (1 in 2) AEP) for this purpose. Model simulations were tested for 50% (1 in 2) AEP flood routed against the 0.1% (1 in 1000) AEP tide, (9.56mAOD). Climate change (100 years) was added to both the fluvial and tidal boundary conditions.

6.4.6 Although NRW are currently looking at schemes to improve tidal flood risk within the lower reaches of the River Usk, (SEFRM priority scheme: Stephenson St), the model previously included the current level of the defences, (i.e. no scheme in place).

6.4.7 In order to assess whether the bridge supports would impact on flood risk following completion of the tidal flood defence scheme, a second test was made whereby levels were raised along the east bank of the river to protect against the 0.1% (1 in 1000) AEP tide.

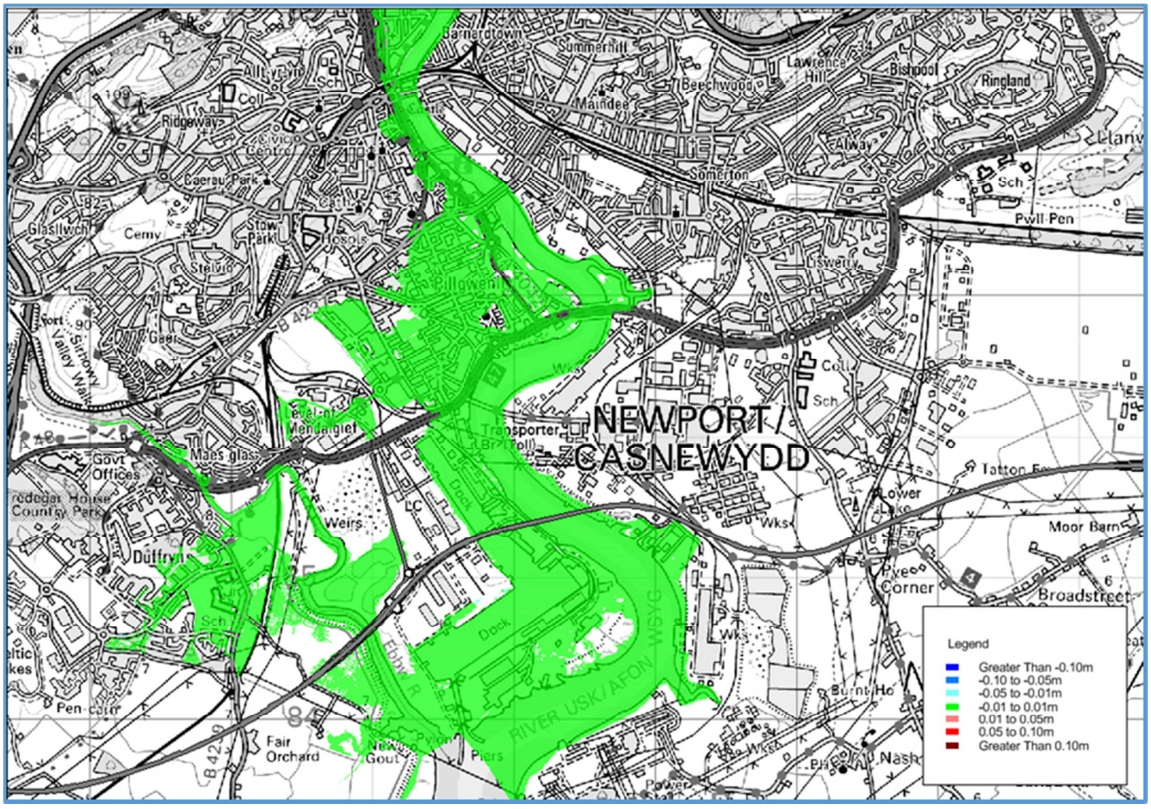
6.4.8 Simulations were run with and without the supports for the new bridge.

6.4.9 Figure 6.1 shows the level difference grid derived from the pre and post project simulations.

6.4.10 The results indicate that following completion of the Stephenson Street Scheme the supports for the new bridge will not impact on flood risk in the lower reaches of the Rivers Usk and Ebbw.

6.4.11

Figure 6.1 Difference Grid for Pre and Post Project Simulations for the 50% (1 in 2 year) +cc AEP flood routed against the 0.1% (1 in 1000 year) AEP tide (9.56mAOD) and raised tidal defences.



6.6 Scheme Drainage

6.6.6 The design changes undertaken within KS4 have not resulted in any changes to the impermeable surfaces for the proposed section of new motorway. The design of the Water Treatment Areas developed during KS3 is unchanged.

6.6.7 The surface water drainage infrastructure for the proposed new section of motorway will ensure satisfactory consequences with respect to highway drainage.

6.7 Conclusion

6.7.2 It is concluded that the Scheme can still be developed with satisfactory consequences with respect to flood risk.

7 Appendices

A1 Preliminary Drainage Drawings

DO NOT SCALE

Millimetres 100 0 10

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

M4

DRUIDSTONE ROAD

HOLLYWOOD FARM

COAL PIT LANE

RECLASSIFIED A48(M)

A48M

SMN-0235 MAINTENANCE TRACK CULVERT

EXISTING SMN-0220 A48M 1000 C01 - CULVERT 2 CASTLETON

SMN-0230 A48M CULVERT

BRYN IVOR LODGE CARE HOME

WTA 1

REED BED 1

CASTLETON

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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
- 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
- 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
- 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
ISSUE 2	26/08/16	SUPPLEMENTARY ISSUE	DJW	WBO	HR

Drawing Status | Suitability

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	WBO	HR	KEN
Original Size	**Date**	**Date**	**Date**	**Date**
A1	25/08/16	25/08/16	25/08/16	26/08/16

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

Revision: ISSUE 2

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

SBR-0365 CASTLETON INTERCHANGE GAS MAIN CULVERT

CASTLETON INTERCHANGE

EXISTING M4

A48

PROPOSED CASCADE

SMN-0395A BERRYHILL CULVERT

SMN-0396 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

SMN-0305 OLD RECTORY CULVERT

SMN-0370 LONGHOUSE CULVERT

EXISTING M4S 29-29 C20 CASTLETON GARDEN CENTRE CULVERT

EXISTING M4S 29-29 C20 CASTLETON GARDEN CENTRE CULVERT

SMN-0390 THE CONIFERS CULVERT

WTA 1

OUTFALL TO TYN-Y-BRWYN REEN

WTA 2

OUTFALL TO PWLL BARGOED REEN

REED BED 2

REED BED 1

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- 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
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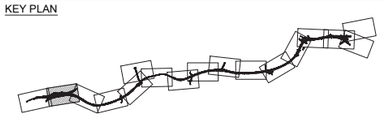
- SITE OF SPECIAL SCIENTIFIC INTEREST BOUNDARY

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
ISSUE 2	26/08/16	SUPPLEMENTARY ISSUE	DJW	WBO	HR

Drawing Status: Suitability:

Project Team:

Client: Llywodraeth Cymru Welsh Government

Project Title: M4 CORRIDOR AROUND NEWPORT

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

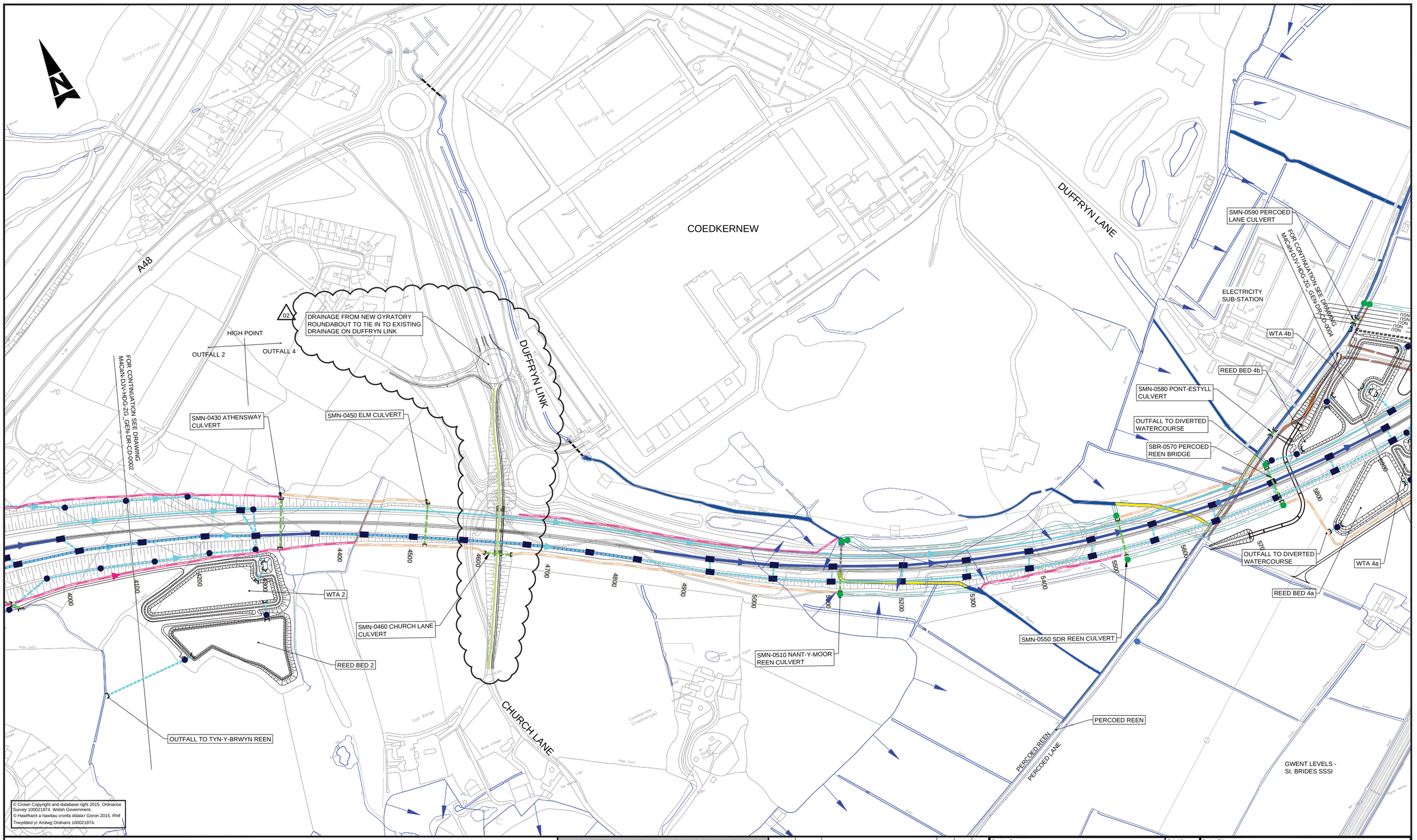
Scale	Designed / Drawn	Checked	Approved	Authorised
1:2500	DJW	WBO	HR	KEN
Original Size	**Date**	**Date**	**Date**	**Date**
A1	25/08/16	25/08/16	25/08/16	26/08/16

Drawing Number: Project | Originator | Volume | Location | Type | Role | Number
M4CaN - DJV - HDG - ZG_GEN - DR - CD - 0002

Revision: ISSUE 2

DO NOT SCALE

Millimetres 0 10 100



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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
- 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
- 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
- SITE OF SPECIAL SCIENTIFIC INTEREST BOUNDARY

KEY PLAN

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

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Construction
No exceptional risks

Maintenance / Cleaning
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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
ISSUE 2	26/08/16	SUPPLEMENTARY ISSUE	DJW	WBO	HR

Drawing Status | Suitability

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	WBO	HR	KEN
Original Size	**Date**	**Date**	**Date**	**Date**
A1	25/08/16	25/08/16	25/08/16	26/08/16

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

Revision: ISSUE 2

DO NOT SCALE

Millimetres 100 0 10

DUFFRYN LANE

ELECTRICITY SUB-STATION

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

SMN-0590 PERCOED LANE CULVERT

PERCOED REEN

MORFA-GRONW REEN

W69a x

W73

PYLON DIVERSION

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

WTA5

REED BED 5

OUTFALL TO MORFA GRONW REEN

02

SMN-0630 REPLACEMENT REEN ACCESS CULVERT

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

W69x

SOUTH WALES MAINLINE RAILWAY (SWML)

GREEN LANE

B4239 LIGHTHOUSE ROAD

Wentlooge Level

Morfa-Gronw Reen

Maerdy Farm

Four Trees Cottage

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

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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
- 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
ISSUE 2	26/08/16	SUPPLEMENTARY ISSUE	AC	DOL	HR

Drawing Status

Suitability

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

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

Revision
ISSUE 2

DO NOT SCALE

Millimetres 100 0 10

PONT Y CWCW REEN

OLD DAIRY REEN

SEA WALL REEN

SBR-0835 SEA WALL REEN BRIDGE

RIVER EBBW

SMN-0805 PONT Y CWCW REPLACEMENT 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

WEST OUTFALL TO RIVER EBBW

EAST OUTFALL TO RIVER EBBW

OUTFALL FROM USK CROSSING DRAINAGE

DOCKS WAY JUNCTION

SOUTH DOCK

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 W94 W81 W77a

02

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

ISSUE 04/02/16 FINAL ISSUE TO WG
ISSUE 2 26/08/16 SUPPLEMENTARY ISSUE

Drawing Status: Suitability

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

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

Revision: ISSUE 2

DO NOT SCALE

Millimetres 0 10 100

N

NORTH DOCK

SOUTH DOCK

ALEXANDRA DOCKS

DOCKS RAILWAY

EAST WAY ROAD

RIVER USK

USKMOUTH RAILWAY LINE

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

PYLON DIVERSION

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

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

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LEGEND:

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- INTAKE CHAMBER - HCD F22 & F24
- PETROL INTERCEPTOR
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- GRASSED CHANNEL IN BOX CULVERT
- CARRIER PIPE - HCD F1
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- 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
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- PROPOSED NRW TILTING WEIR/PENSTOCK
- POTENTIAL NRW ACCESS (IN ABEYANCE)
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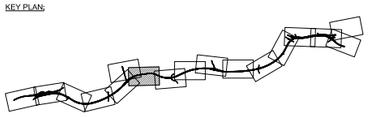
KEY PLAN:



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	Descriptiion	By	Chk'd	App'd
ISSUE	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: Llywodraeth Cymru Welsh Government

Project Title: M4 CORRIDOR AROUND NEWPORT

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

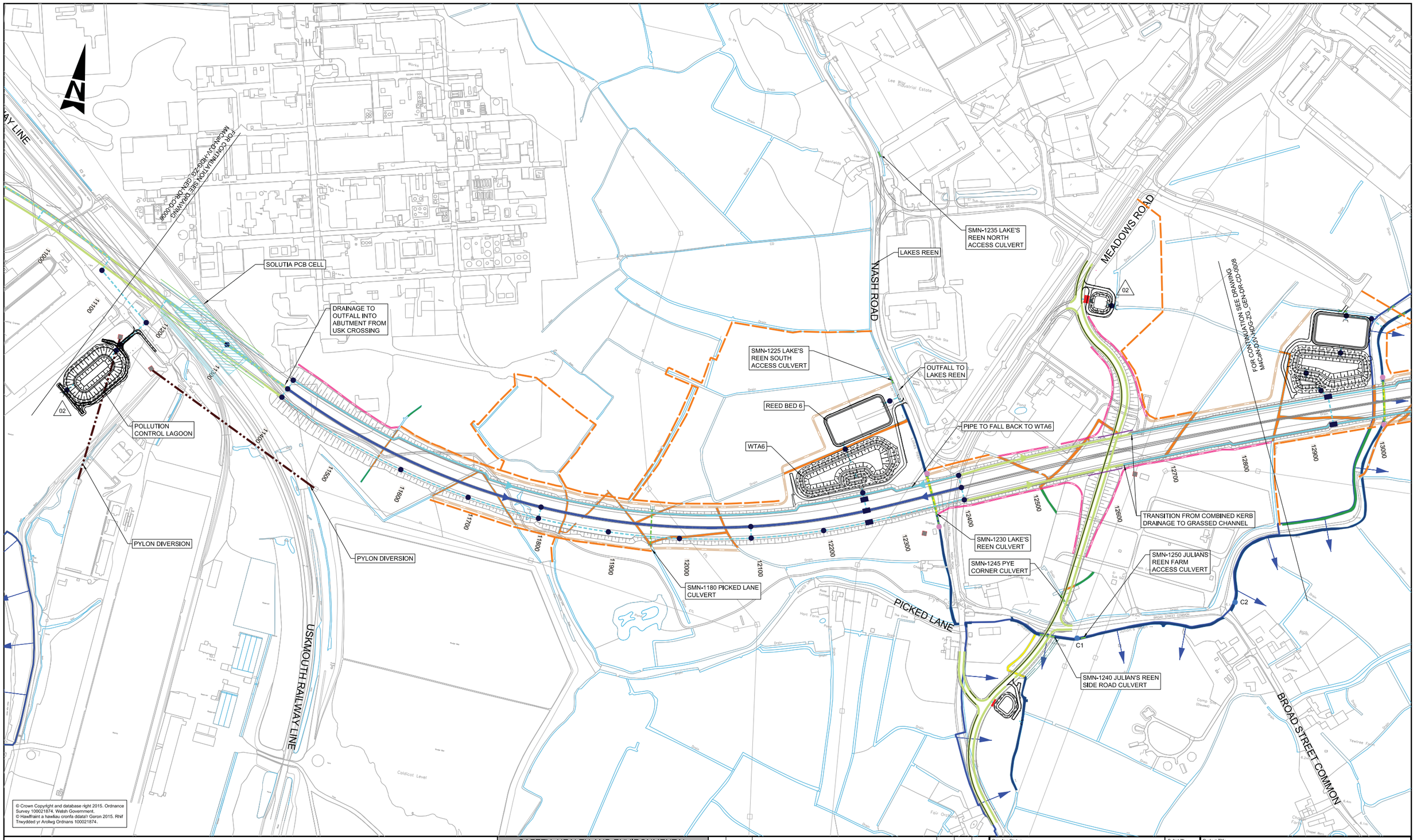
Scale	Designed / Drawn	Checked	Approved	Authorised
1:2500	AC	DOL	HR	KEN
Original Size: A1	Date: 25/08/16	Date: 25/08/16	Date: 26/08/16	Date: 26/08/16

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

Revision: ISSUE 2

DO NOT SCALE

Millimetres 0 10 100



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- INTAKE CHAMBER - HCD F22 & F24
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- 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
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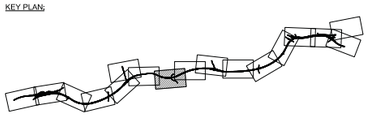
- PROPOSED NRW TILTING WEIR/PENSTOCK
- POTENTIAL NRW ACCESS (IN ABEYANCE)
- INDIRECT LOSS FIELD DITCHES
- SITE OF SPECIAL SCIENTIFIC INTEREST BOUNDARY

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

Drawing Status: Suitability

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	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
M4CaN - DJV - HDG - ZG_GEN - DR - CD - 0007
Location | Type | Role | Number

Revision: ISSUE 2

DO NOT SCALE

Millimetres 0 10 100

N

MEADOWS ROAD

SMN-1295 TATTON ROAD CULVERT

REED BED 7

WTA7

SMN-1310 JULIAN'S REEN ACCESS TRACK CULVERT

SMN-1305 TATTON FARM ACCESS

JULIANS REEN

HIGH POINT

OUTFALL 7

OUTFALL 8

OUTFALL TO JULIANS REEN

ELLENS REEN

RECONFIGURED TATA REED BEDS

SMN-1430 ELLEN'S REEN CULVERT

SMN-1350 FIELD CULVERT

SMN-1330 TATTON FARM CULVERT

SMN-1300 JULIAN'S REEN CULVERT

FOR CONTINUATION SEE DRAWING M4CaN-DJV-HDG-ZG_GEN-DR-CD-0009

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

Caldicot Level

BROADSTREET COMMON

C1

C2

12300 12400 12500 12600 12700 12800 12900 13000 13100 13200 13300 13400 13500 13600 13700 13800 13900 14000 14100 14200 14300 14400

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LEGEND:

- CATCHPIT - HCD F11 / MANHOLE - HCD F4, F5, F6 & F7
- INTAKE CHAMBER - HCD F22 & F24
- PETROL INTERCEPTOR
- CONCRETE HEADWALL
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- 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
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- FILTER DRAIN - HCD F2
- EXISTING REEN
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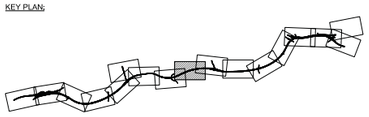
- PROPOSED CULVERT
- COMBINED KERB DRAINAGE WITH CARRIER PIPE - HCD F1 BELOW
- EXISTING NRW SLUICE
- PROPOSED NRW TILTING WEIR/PENSTOCK
- POTENTIAL NRW ACCESS (IN ABEYANCE)
- INDIRECT LOSS FIELD DITCHES
- SITE OF SPECIAL SCIENTIFIC INTEREST BOUNDARY

KEY PLAN:



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

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Construction
No exceptional risks

Maintenance / Cleaning
Culverts partially submerged

Use
No exceptional risks

Decommissioning / Demolition
No exceptional risks

Rev.	Date	Descrfptlon	By	Chk'd	App'd
ISSUE	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: 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	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 | Location | Type | Role | Number
M4CaN - DJV - HDG - ZG_GEN - DR - CD - 0008

Revision: ISSUE 2

DO NOT SCALE

Millimetres 0 10 100

PROPOSED GLAN LLYN DEPOT

A4810

CONNECT TO EXISTING A4810 SAR DRAINAGE

SMN-1475 GLAN LLYN LINK SAR DITCH CULVERT

SMN-1470 BLACK WALL REEN TATA ACCESS CULVERT

SBR-1485 MONK'S DITCH TATA ACCESS BRIDGE

SMN-1485 CLEAN DITCH TATA ACCESS CULVERT

SBR-1475 GLAN LLYN JUNCTION LINK UNDERBRIDGE

SMN-1490 DIRTY DITCH TATA ACCESS CULVERT

EXISTING DRAINAGE DITCHES ON TATA LAND TO BE INFILLED AND DECONTAMINATED

PROPOSED TATA 'DIRTY DITCH'

02

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

13900 14000 14100 14200 14300 14400 14500 14600 14700 14800 14900 15000 15100 15200 15300 15400 15500 15600 15700

OUTFALL TO ELLEN REEN

GLAN LLYN JUNCTION

SMN-1480 BLACK WALL REEN CULVERT

BLACK WALL REEN

ELLEN REEN

REED BED 8

BROAD STREET COMMON

Caldicot Level

MONKSCROFT REEN

PARISH REEN

WTA8

SMN-1445 ELLEN REEN DIVERSION TRACK CULVERT

ELLEN REEN DIVERSION

C109

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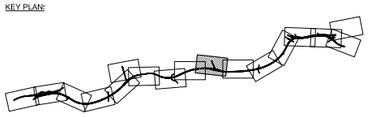
GENERAL NOTES:

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

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

Revision: ISSUE 2

DO NOT SCALE

Millimetres 0 10 100

A4810

A4810

STEEL WORKS DEDICATED REEN

PROPOSED TATA 'DIRTY DITCH' TO TIE INTO EXISTING DITCH

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

SMN-1720 NEW CUT REEN

SMN-1655 ELVER PILL REEN CULVERT

SBR-1640 STEEL WORKS DEDICATED REEN BRIDGE

NEW CUT REEN

ELVER PILL REEN

EXISTING DRAINAGE DITCHES ON TATA LAND TO BE INFILLED AND DECONTAMINATED

NORTH ROW

FOR CONTINUATION SEE DRAWING M4CaN-DJV-HDG-ZG_GEN-DR-CD-0009

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

Slag Heap

Spencer Steelworks

Green Moor

Caldicot Level

Pride's Bridge

Blackrock Reen

C29

C30

15600 15700 15800 15900 16000 16100 16200 16300 16400 16500 16600 16700 16800 16900 17000 17100 17200 17300 17400 17500

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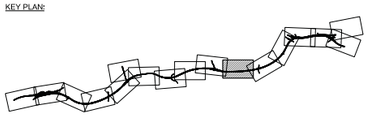
LEGEND:

- 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
- SITE OF SPECIAL SCIENTIFIC INTEREST BOUNDARY

KEY PLAN:



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

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

Rev.	Date	Descriptiion	By	Chk'd	App'd
ISSUE	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: 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	KEN
Original Size: A1	Date 25/08/16	Date 25/08/16	Date 26/08/16	Date 26/08/16

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

Revision: ISSUE 2

DO NOT SCALE

Millimetres 0 10 100

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

SMN-1750 NORTH ROW SAR CULVERT

CONNECT TO EXISTING SAR DRAINAGE

SBR-1755 MIDDLE ROAD REEN BRIDGE

NORTH ROW WTA NORTH

MIDDLE ROAD REEN

REED BED 9

C61

OUTFALL TO MIDDLE ROAD REEN

C62

NORTH ROW

WTA9

GREEN MOOR TRIANGLE

SBR-1780 M4 MIDDLE ROAD DIVERSION REEN BRIDGE

GREEN MOOR REEN

C47

C51

MIDDLE ROAD REEN DIVERSION

NORTH ROW WTA SOUTH

PETTY REEN

NOT HIGH POINT

OUTFALL 9

OUTFALL 10

SMN-1925 PETTY REEN CULVERT

A4810

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

BARELAND STREET

SBR-1770 NORTH ROW MIDDLE ROAD DIVERSION REEN BRIDGE

C101

C52

C53

SMN-1790 NORTH ROW DRAIN CULVERT

COCK STREET REEN

SMN-1850 COCK STREET REEN CULVERT

DRAIN TO EXISTING

WTA10

RUSH WALL REEN

REED BED 10

OUTFALL TO RUSH WALL REEN

Caldicot Level

Green Moor

Euro Park Industrial Estate

Greenmoor Arch

Woundwell Road

Shulwell Brook

Cock Street Reen

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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
- 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
ISSUE 2	26/08/16	SUPPLEMENTARY ISSUE	AC	DOL	HR

Drawing Status | Suitability

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

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

Revision
ISSUE 2

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

SMN-1980 BARELAND STREET EAST SOUTH CULVERT

SMN-2010 SOUTH WALES MAINLINE CULVERT

HIGH POINT

OUTFALL 10

OUTFALL 11b

WTA 10

REED BED 10

WTA 11b

REED BED 11b

Caldicot Level

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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.
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
- 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
- SITE OF SPECIAL SCIENTIFIC INTEREST BOUNDARY

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	27/01/16	FINAL ISSUE TO WG	DJW	TJD	HR
ISSUE 2	26/08/16	SUPPLEMENTARY ISSUE	DJW	WBO	HR

Drawing Status: Suitability

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	WBO	HR	KEN
Original Size	**Date**	**Date**	**Date**	**Date**
A1	25/08/16	25/08/16	25/08/16	26/08/16

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

Revision: ISSUE 2

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

HIGH POINT

OUTFALL 11b

OUTFALL 11c

REED BED 11c

WTA 11c

OUTFALL INTO MILL REEN

LOCAL DIVERSION OF MILL REEN

SMN-2120 MAGOR SERVICES CULVERT

EXISTING POND TO BE FILLED IN

SMN-2150 THE BEECHES CULVERT

SMN-2200 KNOLLBURY LANE NORTH CULVERT

KNOLLBURY LANE

FOR CONTINUATION SEE DRAWING M4CaN-DJV-HDG-ZG_GEN-DR-CD-0014

B4245 NEWPORT ROAD

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

J23 TO J23A M4 DUNK ROAD LINK

M4

OUTFALL INTO MILL REEN

OUTFALL 12a

OUTFALL 11c

HIGH POINT

WTA 11b

REED BED 11b

SMN-2125 ST. BRIDE'S ROAD CULVERT SOUTH

SMN-2088 WOODLAND HOUSE CULVERT

MAGOR

Gwndy

Magwyr

21100 21200 21300 21400 21500 21600 21700 21800 21900 22000 22100 22200 22300 22400 20900 20800 20700 20600 20500

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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
- 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
- SITE OF SPECIAL SCIENTIFIC INTEREST BOUNDARY

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	27/01/16	FINAL ISSUE TO WG	DJW	TJD	HR
ISSUE 2	26/08/16	SUPPLEMENTARY ISSUE	DJW	WBO	HR

Drawing Status: | Suitability:

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	WBO	HR	KEN
Original Size: A1	Date: 25/08/16	Date: 25/08/16	Date: 25/08/16	Date: 26/08/16

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

Revision: ISSUE 2

DO NOT SCALE

Millimetres 100 0 10

N

BENCROFT LANE

HIGH POINT

OUTFALL 12a

OUTFALL 12b

HIGHWAY DITCHES DESIGNED AS INFILTRATION TRENCHES

SMN-2362 HILL BARN CULVERT

HIGHWAY DITCHES TO CONNECT TO EXISTING DRAINAGE SYSTEM

SMN-2360 LEYS BREAK CULVERT

SMN-2280 THE ELMS CULVERT

SMN-2265 ROCKFIELD LANE NORTH CULVERT

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

BENCROFT LANE

M48

J23 TO J23A TRUNK ROAD LINK

SMN-2361 BENCROFT LANE CULVERT

REED BED 12b

SMN-2410 GREEN FARM CULVERT

SMN-2365 THICKET WOOD CULVERT

SMN-2400 THE OLD COURT CULVERT

SMN-2340 STANDING STONE CULVERT

ANCIENT SCHEDULED MONUMENT (STANDING STONE)

WTA 12b

SMN-2369 LLANFIHANGEL CULVERT

OUTFALL FROM WTA12b TO DISCHARGE INTO EXISTING DITCH

SMN-2270 ROCKFIELD LANE SOUTH 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

THE ELMS

EXISTING SMN-2359 CALDICOT ROAD CULVERT TO BE EXTENDED

WTA 12a

REED BED 12a

SMN-2346 RETAINING WALL CULVERT

NEW BOREHOLE SOAKAWAY TO REPLACE EXISTING

SMN-2339 ALLOTMENT CULVERT

B4245

ANCIENT SCHEDULED MONUMENT (MOAT)

SOUTH WALES MAINLINE RAILWAY (SWML)

M4

Gwndy/Undy

Llanfihangel near Ro

Caldicot Level

Caldicot Moor

CALDICOT LEVEL

CALDICOT MOOR

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LEGEND:

- CATCHPIT - HCD F11 / MANHOLE - HCD F4, F5, F6 & F7
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- 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
- 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
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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	27/01/16	FINAL ISSUE TO WG	DJW	TJD	HR
ISSUE 2	26/08/16	SUPPLEMENTARY ISSUE	DJW	WBO	HR

Drawing Status

Suitability

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	WBO	HR	KEN
Original Size	**Date**	**Date**	**Date**	**Date**
A1	25/08/16	25/08/16	25/08/16	26/08/16

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

Revision: ISSUE 2

DO NOT SCALE

Millimetres 0 10 100

SOUTHERN DISTRICTOR ROAD

0+000.000

SMN-0905A MAES-GLAS PILL CULVERT EXTENSION

02

0+100.000

0+200.000

0+300.000

0+400.000

0+500.000

0+600.000

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

0+700.000

0+800.000

0+300.000

0+400.000

0+500.000

0+554.377

0+000.000

RIVER USK

DOCKS RAILWAY

EAST WAY ROAD

NORTH DOCK

Newport Docks North Dock

Ventloage Level

Refuse Tip

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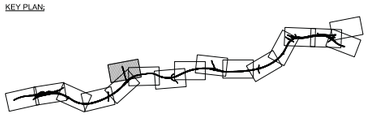
GENERAL NOTES:

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
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
ISSUE 2	26/08/16	SUPPLEMENTARY ISSUE	AC	DOL	HR

Drawing Status: Suitability

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: A1	Date: 25/08/16	Date: 25/08/16	Date: 26/08/16	Date: 26/08/16

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

Revision: ISSUE 2