

# Dolgellau Water Main Renewal

## Archaeological Watching Brief



Ymddiriedolaeth Archaeolegol Gwynedd  
Gwynedd Archaeological Trust

# Dolgellau Water Main Renewal

## Archaeological Watching Brief

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Adroddiad Rhif / Report No.1398

Prepared for: Morrison Utility Services

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## CONTENTS

<i>Crynodeb Annhechnegol</i> .....	2
NON-TECHNICAL SUMMARY .....	2
1 INTRODUCTION .....	3
2 Archaeological and historical background .....	4
3 METHODOLOGY .....	6
4 RESULTS .....	7
4.1 Launch Pit 1 (Plates 03-04) .....	7
4.2 Launch Pit 2 (Plates 05-06) .....	7
5 CONCLUSION .....	8
6 SOURCES CONSULTED .....	9
Appendix I .....	8
Gwynedd Archaeological Trust project design, July 2017 .....	8
Appendix II .....	9
Gwynedd Archaeological Trust photographic metadata .....	9
Appendix III .....	10
Context Register .....	10

## Figures

Figure 01: Reproduction of Capital Delivery Alliance drawing CAF411-5200-CD15110-N-D-C01.

Figure 02: Reproduction of Capital Delivery Alliance drawing CAF411-5201-CD15110-N-D-C01; with Gwynedd Archaeological Trust amendments denoting launch pit locations.

Figure 03: Location Map denoting scheme route along with route sub-divisions A to M. Based on Ordnance Survey 1:10000 Series County Series Map Sheet SH71NW. Scale: 1 to 7500@A4.

## Plates

Plate 01: General view looking south along pipeline easement route (archive image: G2528\_010).

Plate 02: General view looking north along pipeline easement route (archive image: G2528\_011).

Plate 03: launch pit 1 - view from northwest with topsoil removed in early stages of excavation (archive image: G2528\_002).

Plate 04: launch pit 1 - view from northwest post excavation (scale: 1.0m; archive image: G2528\_003).

Plate 05: launch pit 2 - general location as viewed from the east (scale: 1.0m; archive image: G2528\_005).

Plate 06: launch pit 2 - view from north post-excavation (scale: 1.0m; archive image: G2528\_009).

## **CRYNODEB ANNHECHNEGOL**

*Commisynnwyd Ymddiriedolaeth Archeolegol Gwynedd gan Morrison Utility Services i gynnal briff gwylio archeolegol yn ystod gwaith daear ar gyfer adnewyddu prif pibell dŵr yn Dolgellau, Gwynedd. Gwylwyd dau bwell yn cael ei cloddio i ddarparu safle ar gyfer uned drilio cyfeiriadol i osod y prif pibell dŵr. Ni welwyd archaeoleg yn y ddau bwell, ond nodwyd dyddodion trwchus oedd yn arwydd o'r gwlyptir a hefyd manau lle a gwellwyd y tir yn yr ardal.*

## **NON-TECHNICAL SUMMARY**

*Gwynedd Archaeological Trust was commissioned by Morrison Utility Services to undertake an archaeological watching brief during groundworks for a water main renewal scheme at Dolgellau, Gwynedd. The watching brief monitored the excavation of two pits designed to accommodate a directional drilling unit for the water main. The two pits did not include any archaeological activity and were limited to thick deposits indicative of the wetland and semi-improved conditions that characterised the area. The peat deposits identified were considered to be of recent date.*

# 1 INTRODUCTION

Gwynedd Archaeological Trust (GAT) was commissioned by *Morrison Utility Services* to undertake an archaeological watching brief during groundworks for a water main renewal scheme at Dolgellau, Gwynedd (NGR SH71171830). A desk-based assessment for the entire scheme was completed by GAT in 2016, which sub-divided the scheme into eight sections (GAT Report 1293; cf. Figure 03). The watching brief monitored the works in Section A – B, which ran 223m across an open field west of the existing Dolgellau Sewage Works, between NGR SH7120318405 and NGR SH7116618186, as detailed in Capital Delivery Alliance drawings CAF411-5200-CD15110-N-D-C01 (Figure 01) and CAF411-5201-CD15110-N-D-C01 (Figure 02). The groundworks comprised 2 No drilling pits, each measuring 3.0 m long and 1.3m deep that were designed to accommodate a directional drilling rig (Figure 02). The works were undertaken from the 26<sup>th</sup> to 27<sup>th</sup> July 2017, following approval of the Project Design (Appendix I).

The watching brief was completed in accordance with the following guidance:

- Standard and Guidance for Archaeological Watching Brief (Chartered Institute for Archaeologists, 2014);
- Historic England, 2004 Historic England. Human Bones from Archaeological Sites. Guidelines for producing assessment documents and analytical reports;
- Management of Archaeological Projects (English Heritage, 1991);
- Management of Research Projects in the Historic Environment: The MoRPHE Project Managers' Guide (Historic England, 2015); and
- Guidelines for digital archives Royal Commission on Ancient and Historic Monuments of Wales 2015.

The watching brief was monitored by the Gwynedd Archaeological Planning Service (GAPS); the content of this report must be approved by GAPS prior to final issue.

Gwynedd Archaeological Trust is certified to ISO 9001:2008 and ISO 14001:2004 (Cert. No. 74180/A/0001/UK/En) and is a Registered Organisation with the Chartered Institute for Archaeologists and a member of the Federation of Archaeological Managers and Employers (FAME).

## **2 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND**

GAT undertook an archaeological watching brief as part of the 2010 site investigation programme for the Dolgellau Flood Risk Management Scheme (GAT report 876), to the east of the current mitigation area. A total of 9 test pits were monitored within the Dolgellau floodplain that were characterised by shallow topsoil (maximum depth 0.15m), followed by alluvial deposits of river gravels and coarse and fine sand. No archaeological activity was identified within the confines of any example and no organic material was recorded.

Additional test pits for the Dolgellau Flood Risk Management Scheme were excavated in December 2013 (GAT Report G1157); Pit TP1 was located east of Afon Aran, within the floodplain, while Test Pit TP2 was positioned close to the mouth of the Afon Aran, at it flows into the Afon Wnion. Test Pit TP 1 was quite shallow with gravels and groundwater reached at a depth of 1.20m, below 2 layers of natural clayey sand deposits as well as the topsoil. No archaeological features or artefactual material was found in this test pit. Test Pit TP 2 achieved a depth of 3.30m with the upper deposits below the grassed surface area mainly composed of late 19<sup>th</sup> and early 20<sup>th</sup> century deposits containing quite a large amount of broken glass bottles and pottery throughout. The upper levels of this deposit also contained more modern waste material that had been mixed into the final levelling of the topsoil for the playing areas. Beneath the modern deposit layer, at a depth of 1.80m below ground level, two layers of sandy clay were encountered before reaching gravel and water levels at at 3.30m. Apart from the modern material no other archaeological deposits were found.

GAT completed an archaeological assessment for the proposed water main renewal scheme, in 2016 (GAT Report 1293). The scheme design measured 5.6km in length and was located within and around the Marian Mawr floodplain. The scheme route was divided into eight sections of varied length and methodology; for the purposes of the assessment, the sections were designated as A – B, through L – M. The scheme design included open cut sections, sliplining and pipe bursting. The assessment identified 19 existing sites within a 50m buffer zone surrounding the scheme route; a further seven additional sites were subsequently identified along the route during the walkover survey and desk based research. The existing sites were all buildings, and included houses, a school, a barn, a stable and a folly. These were all of post-medieval date and reflect the growth of the town in the 19<sup>th</sup> century to the north and west of the town's historic core. All the additional sites, consisting of a cottage, two boundary walls, two areas of drainage ditch, a boundary, and back gardens are also all of post-medieval or modern date. The assessment recommended that an



intensive watching brief be carried out during all significant intrusive groundworks associated with the 'sliplining' and 'pipe-bursting', and during the open cut lengths of new trenching, particularly in the low lying open field stretches on section A-B at the western end of the scheme. This was an area of low lying boggy wetland to the west of the sewage treatment works, where peat deposits were thought likely to be present, and there was the possibility of preserved archaeology (Evans 2016, 5).

### 3 METHODOLOGY

An archaeological watching brief is defined by the Chartered Institute for Archaeologists as a formal programme of observation and investigation conducted during any operation carried out for non-archaeological reasons where there is a possibility that archaeological deposits may be disturbed or destroyed. The programme will result in the preparation of a report and ordered archive (CiFA, 2014).

An archaeological watching brief can be divided into four categories:

- comprehensive (present during all ground disturbance)
- intensive (present during sensitive ground disturbance)
- intermittent (viewing the trenches after machining)
- partial (as and when seems appropriate).

GAT monitored 2 No drilling launch pits, each measuring 3.0 m long and 1.3m deep that were designed to accommodate a directional drilling rig (Figure 02). The works were undertaken by *Morrison Utility Services* from the 26<sup>th</sup> to 27<sup>th</sup> July. An 8 tonne tracked excavator was used to complete the excavations.

The archaeological watching brief was completed on an intensive basis and was monitored to the limit of excavation. All attendances and identified features will be recorded using GAT watching brief pro-formas. Photographic images were taken using a digital SLR (Nikon D40) camera set to maximum resolution (3008 × 2000 6.1 effective megapixels) in RAW format and were converted to TIFF for archiving using Adobe Photoshop. The photographic record was maintained on site using GAT pro-formas and digitised in *Microsoft Access* as part of the fieldwork archive and dissemination process (photographic archive nos. G2528\_001 to G2528\_011). Photographic images were also taken for each test hole location prior to excavation along with general shots of the area.

## 4 RESULTS

The pits were located within low-lying wetland/semi-improved land within a *juncus* (grass-like rushes and sedges) rich field; the field was also characterised by surface level drainage channels (Plates 01 and 02). The field was bounded by an old railway embankment to the north, a sewage works to the east and mature trees to the west and south. For the purposes of the watching brief, the two drilling pits were designated as Launch Pit 1 and Launch Pit 2, respectively; a third launch pit was proposed, but was not undertaken. The numbers in rounded brackets represent the unique numbers given to each identified deposit, a list of which is given in Appendix III.

### 4.1 Launch Pit 1 (Plates 03-04)

Size (l x w x d): 3m x 1m x 1.3m

Description:

The launch pit, located near to the old railway embankment to the north, was orientated north-south along the proposed new water main route (Figure 02). The launch pit comprised a 0.2m thick deposit of *juncus* and topsoil, which sealed a 0.6m deposit of grey-brown clay-silt soil (101); this in turn sealed a mid to dark orangey brown peat-rich deposit that contained fragments of wood and branches, which continued to the limit of excavation, at a depth of 1.5m (102). It had a dense and spongey consistency and was heavily waterlogged, but broke up upon excavation creating a loose deposit. No evidence for archaeological activity was identified within the confines of the launch pit, and the peat appears to be of recent rather than historic date. The peat observed was consistent for a depth of 0.7m below the grey-brown silt, and the presence of any underlying peats at a greater depth is unknown.

### 4.2 Launch Pit 2 (Plates 05-06)

Size (l x w x d): 3m x 1m x 1.3m

Description:

The launch pit was located 100m to the south of Launch Pit 1 and was orientated north-south along the proposed new water main route (Figure 02). The launch pit comprised a 0.2m thick deposit of *juncus* and topsoil, which sealed a deposit of grey-brown clay-silt soil that continued to the limit of excavation. No evidence for peat deposits or archaeological activity were identified within the confines of the launch pit. The lack of peat in this pit may suggest it was localised or the peat horizon slopes to the south from the location of Launch Pit 1.

## 5 CONCLUSION

Gwynedd Archaeological Trust monitored two launch pits excavated within a field to the immediate west of the sewage works in Dolgellau, Gwynedd. The works were undertaken as part of a larger water main renewal scheme in the area and the pits were designed to accommodate drilling units for the new main. Route A –B is bounded at either end by mature trees, to the north on the former railway line embankment; the ground rises slightly to the south of the A493 road, and is overlooked by Ysgbor Bryn Adda.

The location of the test pits, at the western end of the Water Main renewal scheme, were situated on low lying boggy ground to the west of the sewage works, with many shallow drainage channels noted crossing it on the surface, and *juncus* growth to a height of about 0.3m. The site would appear to have been marshy for some time, and is low lying.

The overlying silty clay, observed to a depth of about 1.3m appears devoid of environmental material, and appears to be created as a result of deposits left by the Afon Wnion when in flood.

The characterisation of *juncus*-rich foliage indicative of wetland/semi-improved land, was confirmed by the two pits which were characterised by thick uniform deposits of clay-rich soil; in the case of launch pit 2, this deposit continued to the limit of excavation at 1.3m, whilst in launch pit 1, the clay-rich soil overlay a peat-rich deposit. In both cases no archaeological activity was identified and the results were indicative of a location subject to limited activity. There is moderate value in the peat deposits, although those observed are thought to be relatively recent in origin, underlying peat deposits may be present. The fact that peat was only observed in one localised point (LP1) means that its distribution and extent, and therefore its significance, is not well understood. A programme of core sampling would be required to resolve this. If further, large-scale excavation is required in the area, the potential is there to recover waterlogged and/or peat-rich deposits.

## 6 SOURCES CONSULTED

Brunning, R and Watson, J 2010 *Waterlogged Wood: Guidelines on the Recording, Sampling, Conservation and Curation of Waterlogged Wood* (3<sup>rd</sup> ed). Swindon: English Heritage

English Heritage, 1991, *Management of Archaeological Projects*

English Heritage 1995 *Guidelines for the Care of Waterlogged Archaeological Leather . Scientific and Technical Guidelines 4*. London: English Heritage

Evans, R, 2016, *Marian Mawr: Dolgellau: Archaeological Assessment*, GAT Report 1293

Historic England, 2004. *Human Bones from Archaeological Sites Guidelines for producing assessment documents and analytical reports*

Historic England, 2011, *Environmental Archaeology: a guide to the theory and practice of methods, from sampling and recovery to post-excavation*

Historic England, 2015, *Management of Research Projects in the Historic Environment (MoRPHE)*

Ordnance Survey 1-inch to 25-mile County Series Map Sheets XVI.04, XVI.08, XVII.05 and XVII.01 First Edition (1889 & 1890)

Ordnance Survey 1-inch to 25-mile County Series Map Sheets XVI.04, XVI.08, XVII.05 and XVII.01 Second Edition (1900)

Ordnance Survey 1-inch to 25-mile County Series Map Sheets XVI.04, XVI.08, XVII.05 and XVII.01 Third Edition (1914)

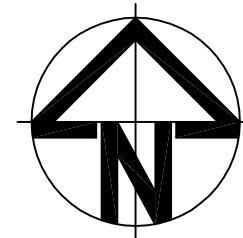
Royal Commission on Ancient and Historic Monuments of Wales 2015 *Guidelines for digital archives*

*Standard and Guidance for an archaeological watching brief* (Chartered Institute for Archaeologists, 2014).

**FIGURE 01**

**Reproduction of Capital Delivery Alliance drawing CAF411-5200-  
CD15110-N-D-C01**





STAGE 2  
NORTH OF THE RIVER  
63mm RIDER REQUIRED  
PIPEWORK PRESSURE 5-10BAR

5201

5204

5202

5203

STAGE 1  
SOUTH OF THE RIVER  
63mm RIDER REQUIRED  
PIPEWORK PRESSURE 9-10BAR

- NOTES:
1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE FOLLOWING DCWW SPECIFICATIONS:  
a. THE CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY REVISION 6 (CESWI 7)  
2. ALL FLANGES TO BE NP16 RATED  
3. ALL PROFUSE PIPE AND FITTING TO BE SDR 11 - 16 BAR RATED  
4. ALL MDPE PIPES AND FITTINGS TO BE 12.5 BAR RATED.  
5. REFER TO DRAWING TD101 FOR THE FOLLOWING DETAILS:  
FIRE HYDRANT, AIR VALVE, SLUICE VALVE AND PRV CHAMBER DETAILS  
TIMBER POST STOCK PROOF FENCE DETAIL  
INDICATOR AND MARKER POST DETAIL  
TYPICAL THRUST BLOCK DETAILS  
6. TRENCH DETAILS / REINSTATEMENT TO BE AS DRAWING TD102 FOR WORK IN GRASSLAND, UNMADE TRACK, ROAD VERGE AND HIGHWAY  
7. NO HEDGEROWS ARE TO BE REMOVED ON THIS PROJECT. IF HEDGEROW REMOVAL IS FOUND TO BE UNAVOIDABLE, THE CONTRACTOR IS TO CONTACT THE DESIGNER IN ADVANCE FOR FURTHER GUIDANCE. ALSO, DISTURBANCE TO HEDGEROWS IS TO BE AVOIDED DURING THE BIRD NESTING SEASON OF MARCH TO JULY  
8. THE DEPTH AND LINE OF THE NEW MAIN IS TO BE SUPPLIED BY THE CONTRACTOR AT 50M INTERVALS FOR ALL DIRECTIONAL DRILLING WORK. ALL NEW DIRECTIONAL DRILL MAINS TO BE INSTALLED A MINIMUM DISTANCE OF METRES FROM THE EXISTING WATER MAINS  
9. SERVICE TRANSFERS: THE CONTRACTOR IS TO ALLOW FOR THE TRANSFER OF ALL SERVICE CONNECTIONS FROM THE EXISTING MAINS TO THE PROPOSED MAIN. NEW PIPES TO BE mm MDPE. TO BE INSTALLED BY OPEN CUT, MOLING OR SLIP LINING AS APPROPRIATE. ESTIMATED NUMBER OF RESIDENTIAL TRANSFERS - 82 (PLUS FIELD CONNECTIONS) LOCATION OF CONNECTIONS TO BE DETERMINED BY THE CONTRACTOR ON SITE  
10. CAUTION - CABLES: OVERHEAD CABLES ARE PRESENT WITHIN THE WORKING AREA. CONTRACTOR TO REFER TO HSE GUIDANCE NOTE GS6 " AVOIDANCE OF DANGER FROM OVERHEAD LINES". UNDERGROUND CABLES ARE ALSO PRESENT ON SITE. CONTRACTOR TO CONSULT UTILITY DRAWINGS AND IDENTIFY ALL UNDERGROUND SERVICES PRIOR TO COMMENCEMENT OF WORK  
11. WORKING PRESSURE ON THIS PROJECT IS 10 BAR. TEST PRESSURE IS 15 BAR AT THE LOWEST POINT  
12. CAUTION! - NO CHLORINATED / CONTAMINATED WATER OR DRILLING FLUIDS ARE ALLOWED TO ENTER ANY WATER COURSE OR STORM DRAIN. CONTRACTOR TO REFER TO GUIDELINES ON POLLUTION PREVENTION AND INSTRUCTIONS IN CASE OF EMERGENCY  
13. THIS DRAWING NEEDS TO BE READ IN CONJUNCTION WITH THE UTILITY INFORMATION PROVIDED SEPARATELY BY THE INDIVIDUAL UNDERTAKERS  
14. TRIAL HOLES MAY BE REQUIRED TO ESTABLISH EXACT LOCATION OF UTILITIES  
15. DETAILS ARE GUIDES ONLY. ALL PIPES, FITTINGS AND ASSOCIATED MATERIALS TO COMPLETE THE JOB ARE TO BE PROVIDED BY CONTRACTOR  
16. CONTRACTOR TO BE AWARE THAT WATER MAINS MATERIALS MAY NOT BE MARKED OR MARKED INCORRECTLY TO WHAT IS INDICATED. IT IS THEREFORE ADVISABLE THAT THE POSSIBLE PRESENCE OF ASBESTOS (AC) OR PITCH FIBRE (PF) BE ANTICIPATED AND INCLUDED IN RAMS.

- EXISTING WATER MAIN
- ABANDONED WATER MAIN
- WATER MAIN TO BE ABANDONED
- PROPOSED WATER MAIN - OPENCUT
- PROPOSED WATER MAIN - DIRECTIONAL DRILL
- PROPOSED WATER MAIN - PIPEBURST
- PROPOSED WATER MAIN - SLIPLINE
- PROPOSED COMMUNICATION PIPE
- TRIAL HOLE POSITION
- SSSI, SCHEDULED ANCIENT MONUMENT
- CONTAMINATED LAND
- GREAT CRESTED NEWT RESTRICTIONS
- ARCHAEOLOGICAL RESTRICTIONS
- BADGER SETTS
- MINE SHAFTS

POST CODE LL40 2SP

C01	23.01.17	JP	Construction Issue	ET	MK	LH	23.01.17
T01	27.05.16	JP	Tender Issue	ET	MK	LH	27.05.16
Rev.	Date.	Dm.	Description	Rvd.	Chkd.	Appd.	Date.

 Capital Delivery Alliance  
Cynghair Cyflawni Cyfalaf  
Ty Awen, Spooner Close, Coed Kernew, Newport, NP108FZ

Project Name: MARIAN MAWR PLAYING FIELDS (INCLUDING DOLGELLAU COLLEGE AND TALARAON PH2)  
DCWW.3279.W.202

Drawing Title: OVERVIEW

Drawing Status: CONSTRUCTION ISSUE

Checked: M KENNEDY	Approved: L HOLLOWAY	Date: MAY '16
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Scale: NTS	Designer: J. PROUT	Rev: C01
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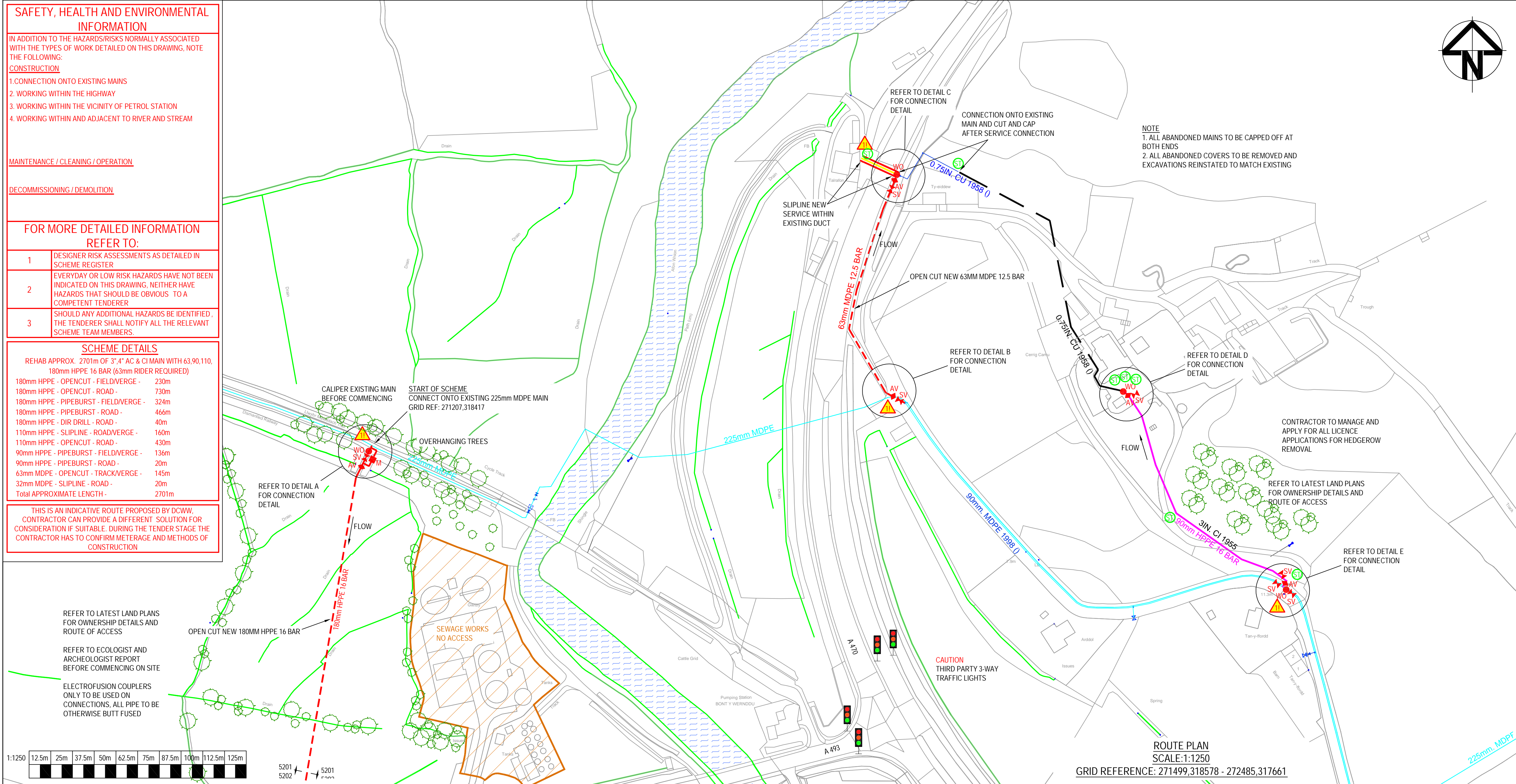
Drawing Number: CAF411-5200-CD15110-N-D



## **FIGURE 02**

**Reproduction of Capital Delivery Alliance drawing CAF411-5201-  
CD15110-N-D-C01**





NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE FOLLOWING DCWW SPECIFICATIONS:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE FOLLOWING DCWW SPECIFICATIONS:

a. THE CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY REVISION 6 (CESW 7)

2. ALL FLANGES TO BE NP16 RATED

3. ALL PROFUSE PIPE AND FITTING TO BE SDR 11 - 16 BAR RATED

4. ALL MDPE PIPES AND FITTINGS TO BE 12.5 BAR RATED.

5. REFER TO DRAWING TD101 FOR THE FOLLOWING DETAILS: FIRE HYDRANT, AIR VALVE, SLUICE VALVE AND PRV CHAMBER DETAILS

6. TRENCH DETAILS / REINSTATEMENT TO BE AS DRAWING TD102 FOR WORK IN GRASSLAND, UNMADE TRACK, ROAD VERGE AND HIGHWAY

7. NO HEDGEROWS ARE TO BE REMOVED ON THIS PROJECT. IF HEDGEROW REMOVAL IS FOUND TO BE UNAVOIDABLE, THE CONTRACTOR IS TO CONTACT THE DESIGNER IN ADVANCE FOR FURTHER GUIDANCE. ALSO, DISTURBANCE TO HEDGEROWS IS TO BE AVOIDED DURING THE BIRD NESTING SEASON OF MARCH TO JULY

8. THE DEPTH AND LINE OF THE NEW MAIN IS TO BE SUPPLIED BY THE CONTRACTOR AT 50m INTERVALS FOR ALL DIRECTIONAL DRILLING WORK. ALL NEW DIRECTIONAL DRILL MAINS TO BE INSTALLED A MINIMUM DISTANCE OF 5METRES FROM THE EXISTING WATER MAINS

9. SERVICE TRANSFERS: THE CONTRACTOR IS TO ALLOW FOR THE TRANSFER OF ALL SERVICE CONNECTIONS FROM THE EXISTING MAINS TO THE PROPOSED MAIN. NEW PIPES TO BE 25mm MDPE, TO BE INSTALLED BY OPEN CUT, MOLING OR SLIP LINING AS APPROPRIATE. ESTIMATED NUMBER OF RESIDENTIAL TRANSFERS - 82 (PLUS FIELD CONNECTIONS) LOCATION OF CONNECTIONS TO BE DETERMINED BY THE CONTRACTOR ON SITE

10. CAUTION - CABLES: OVERHEAD CABLES ARE PRESENT WITHIN THE WORKING AREA. CONTRACTOR TO REFER TO HSE GUIDANCE NOTE GS6 "AVOIDANCE OF DANGER FROM OVERHEAD LINES". UNDERGROUND CABLES ARE ALSO PRESENT ON SITE. CONTRACTOR TO CONSULT UTILITY DRAWINGS AND IDENTIFY ALL UNDERGROUND SERVICES PRIOR TO COMMENCEMENT OF WORK

11. WORKING PRESSURE ON THIS PROJECT IS 10 BAR. TEST PRESSURE IS 15BAR AT THE LOWEST POINT

12. CAUTION! - NO CHLORINATED / CONTAMINATED WATER OR DRILLING FLUIDS ARE ALLOWED TO ENTER ANY WATER COURSE OR STORM DRAIN. CONTRACTOR TO REFER TO GUIDELINES ON POLLUTION PREVENTION AND INSTRUCTIONS IN CASE OF EMERGENCY

13. THIS DRAWING NEEDS TO BE READ IN CONJUNCTION WITH THE UTILITY INFORMATION PROVIDED SEPARATELY BY THE INDIVIDUAL UNDERTAKERS

14. TRIAL HOLES MAY BE REQUIRED TO ESTABLISH EXACT LOCATION OF UTILITIES

15. DETAILS ARE GUIDES ONLY. ALL PIPES, FITTINGS AND ASSOCIATED MATERIALS TO COMPLETE THE JOB ARE TO BE PROVIDED BY CONTRACTOR

16. CONTRACTOR TO BE AWARE THAT WATER MAINS MATERIALS MAY NOT BE MARKED OR MARKED INCORRECTLY TO WHAT IS INDICATED. IT IS THEREFORE ADVISABLE THAT THE POSSIBLE PRESENCE OF ASBESTOS (AC) OR PITCH FIBRE (PF) BE ANTICIPATED AND INCLUDED IN RAMS.

EXISTING WATER MAIN

ABANDONED WATER MAIN

WATER MAIN TO BE ABANDONED

PROPOSED WATER MAIN - OPENCUT

PROPOSED WATER MAIN - DIRECTIONAL DRILL

PROPOSED WATER MAIN - PIPEBURST

PROPOSED WATER MAIN - SLIPLINE

PROPOSED COMMUNICATION PIPE

TRIAL HOLE POSITION

SSSI, SCHEDULED ANCIENT MONUMENT

CONTAMINATED LAND

GREAT CRESTED NEWT RESTRICTIONS

ARCHAEOLOGICAL RESTRICTIONS

BADGER SETTS

MINE SHAFTS

POST CODE LL40 2SP

DETAIL A

DETAIL B

DETAIL C

DETAIL D

DETAIL E

1. UNDER PRESSURE TEE FOR 225mm UPVC WITH 180mm BRANCH

2. 80mm OFF 150mm DIA A.F. TEE

3. 150mm DIA AF DISTANCE PIECE 250mm LONG

4. 80mm OFF 150mm DIA A.F. TEE

5. 80mm n.b. SLUICE VALVE C-CLOSING

6. 80mm WASH OUT HYDRANT

7. 150mm DIA SLUICE VALVE C.C.

8. 25mm GA AIR VALVE WITH A 80mm FLANGE

9. 180mm o.d. PUPPED FLANGE

10. 180mm o.d. ELECTRO FUSION COUPLING

11. 180mm o.d. 16 BAR HPPE PIPE

12. 80mm DIA DISTANCE PIECE 200mm LONG

13. 80mm DIA ALL FLANGE 90° BEND

14. 80mm DIA DISTANCE PIECE 500mm LONG

15. 90mm od PUPPED FLANGE

16. 80mm DIA AQUAGRIP

17. 80mm METER

18. 80mm DIA DISTANCE PIECE 300mm LONG

1. EXISTING 90mm MDPE PIPE

2. 90mm AQUAGRIP

3. 80mm DIA A.F. TEE

4. 80mm DIA SLUICE VALVE C.C.

5. 80mm DIA AF DISTANCE PIECE 250mm LONG

6. 80mm DIA A.F. TEE

7. 63mm PUSHFIT SOCKET WITH 63mm 12.5 BAR MDPE PIPE

8. 80mm n.b. SLUICE VALVE C-CLOSING

9. 25mm GA AIR VALVE WITH A 80mm FLANGE

1. 63mm 12.5 BAR MDPE PIPE

2. 80mm FLANGE TO 63mm PUSHFIT SOCKET

3. 80mm DIA SLUICE VALVE C-CLOSING

4. 80mm DIA AF DISTANCE PIECE 250mm LONG

5. 80mm DIA ALL FLANGE TEE

6. 80mm DIA ALL FLANGE TEE

7. 80mm DIA AF DISTANCE PIECE 150mm LONG

8. 25mm GA AIR VALVE WITH A 80mm FLANGE

9. 80mm WASH OUT HYDRANT

1. 90mm o.d. 16 BAR HPPE PIPE

2. 90mm o.d. ELECTRO FUSION COUPLING

3. 90mm o.d. PUPPED FLANGE

4. 80mm DIA SLUICE VALVE C-CLOSING

5. 80mm DIA AF DISTANCE PIECE 250mm LONG

6. 80mm DIA ALL FLANGE TEE

7. 80mm DIA DUCKFOOT BEND

8. 80mm DIA AF DISTANCE PIECE 150mm LONG

9. 25mm GA AIR VALVE WITH A 80mm FLANGE

10. 80mm WASH OUT HYDRANT

1. 90mm o.d. 16 BAR HPPE PIPE

2. 90mm o.d. ELECTRO FUSION COUPLING

3. 90mm o.d. PUPPED FLANGE

4. 80mm DIA SLUICE VALVE C-CLOSING

5. 80mm DIA AF DISTANCE PIECE 250mm LONG

6. 80mm DIA ALL FLANGE TEE

7. 80mm AQUAGRIP

8. 80mm n.b. SLUICE VALVE C-CLOSING

9. 80mm WASH OUT HYDRANT

10. 25mm GA AIR VALVE WITH A 80mm FLANGE

11. EXISTING 90mm HPPE MAIN



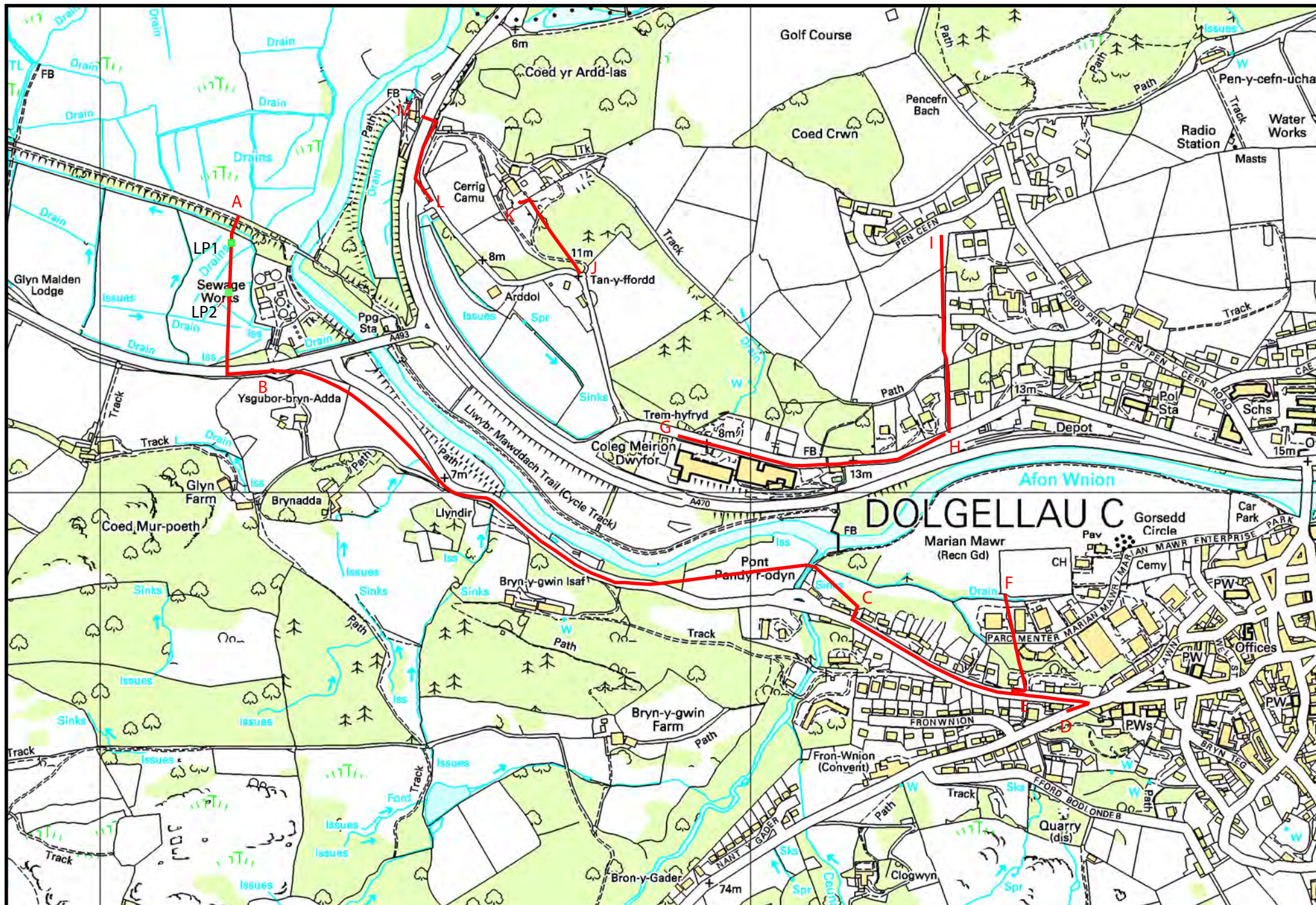


Figure 03 - Location Map denoting scheme route along with route sub-divisions A to M. Based on Ordnance Survey 1:10000 Series County Series Map Sheet SH71NW. Scale: 1 to 7500@A4. Crown Copyright. All Rights Reserved. License number AL100020895.





Plate 01: General view looking south along pipeline easement route (archive image: G2528\_010).



Plate 02: General view looking north along pipeline easement route (archive image: G2528\_011).





Plate 03: launch pit 1 - view from northwest with topsoil removed in early stages of excavation (archive image: G2528\_002).



Plate 04: launch pit 1 - view from northwest post excavation (scale: 1.0m; archive image: G2528\_003).





Plate 05: launch pit 2 - general location as viewed from the east (scale: 1.0m; archive image: G2528\_005).

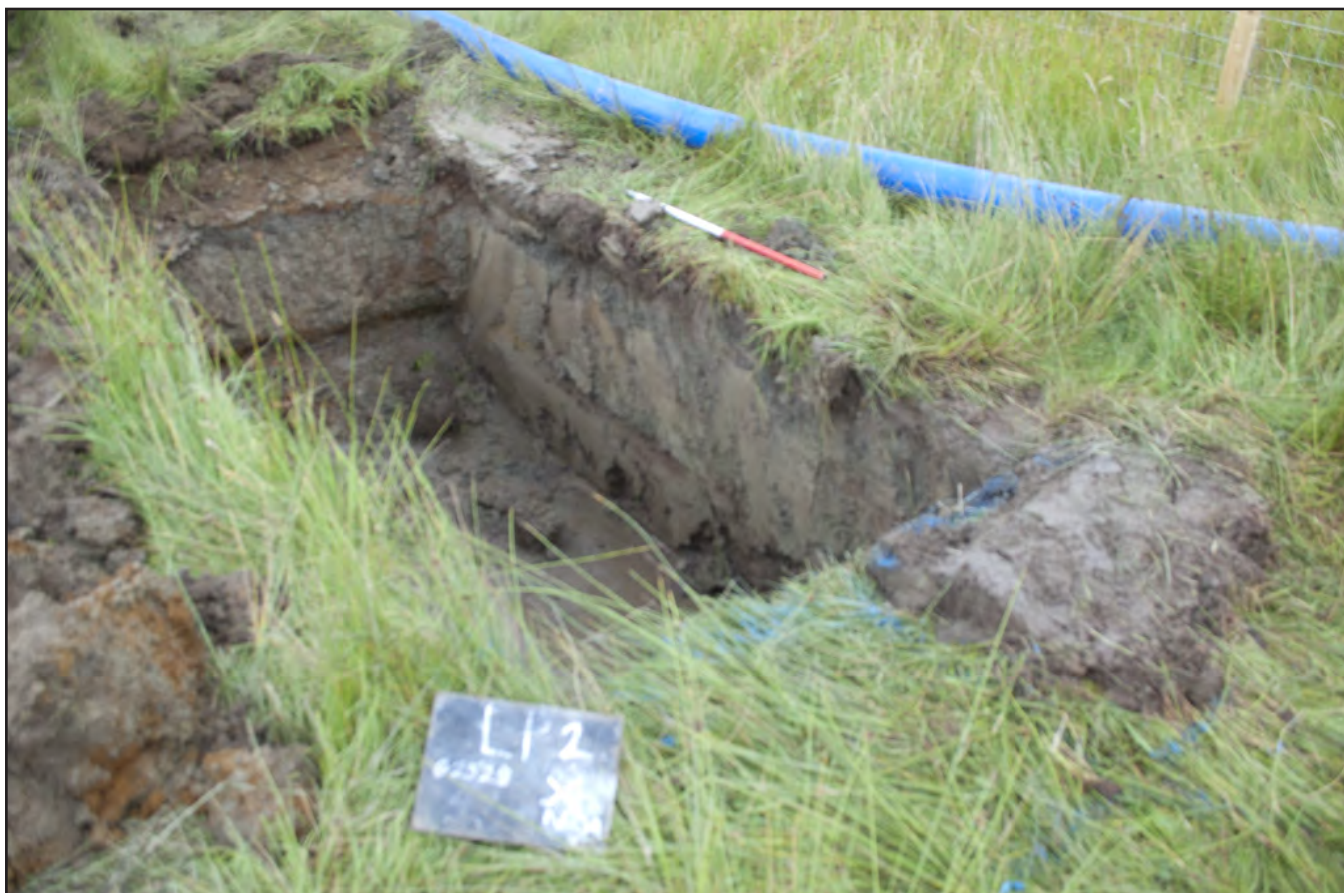


Plate 06: launch pit 2 - view from north post-excavation (scale: 1.0m; archive image: G2528\_009).

## **APPENDIX I**

**Gwynedd Archaeological Trust project design, July 2017**

MARIAN MAWR, DOLGELLAU  
(G2528)

PROJECT DESIGN FOR ARCHAEOLOGICAL  
WATCHING BRIEF

*Prepared for*

*Morrison Utility Services*

***July 2017***

Ymddiriedolaeth Archaeolegol Gwynedd  
Gwynedd Archaeological Trust

All GAT staff should sign their copy to confirm the project specification is read and understood and retain a copy of the specification for the duration of their involvement with the project. On completion, the specification should be retained with the project archive:

Name

Signature

Date



# MARIAN MAWR, DOLGELLAU, GWYNEDD

## PROJECT DESIGN FOR ARCHAEOLOGICAL WATCHING BRIEF

Prepared for *Morrison Utility Services*, May 2017

### CONTENTS

1. INTRODUCTION .....	5
2. Archaeological and historical background .....	7
3. METHODOLOGY .....	9
3.1 Watching Brief .....	9
3.2 Fieldwork Methodology .....	10
3.3 Human Remains .....	12
3.4 Ecofacts .....	13
3.5 Artefacts .....	14
3.6 Fieldwork Archiving .....	16
3.7 Historic Environment Record .....	17
4. PROCESSING DATA, ILLUSTRATION, REPORT AND ARCHIVING .....	18
5. DISSEMINATION AND ARCHIVING .....	19
6. PERSONNEL .....	20
7. HEALTH AND SAFETY .....	21
8. INSURANCE .....	22
9. SOURCES CONSULTED .....	23
FIGURE 01 .....	1
Reproduction of Capital Delivery Alliance drawing CAF411-5200-CD15110-N-D-C01 .....	1
FIGURE 02 .....	2
Reproduction of Capital Delivery Alliance drawing CAF411-5201-CD15110-N-D-C01 .....	2
FIGURE 03 .....	3
Location Map denoting scheme route along with route sub-divisions A to M. Based on Ordnance Survey 1:10000 Series County Series Map Sheet SH71NW. Scale: 1 to 7500@A4 .....	3
Appendix I .....	4
Gwynedd Archaeological Trust photographic metadata pro-forma .....	4
Appendix II .....	5
Gwynedd Archaeological Trust watching brief pro-forma .....	5

# 1. INTRODUCTION

Gwynedd Archaeological Trust (GAT) has been commissioned by *Morrison Utility Services* to prepare a project design for an archaeological watching brief during ground works for a water main renewal scheme at Dolgellau, Gwynedd (NGR SH72001794). A desk-based assessment for the entire scheme was completed by GAT in 2016, which sub-divided the scheme into eight sections (GAT Report 1293; cf. Figure 03); the current archaeological mitigation will monitor the works in Section A – B, which runs 223m across an open field west of the existing Dolgellau Sewage Works, between NGR SH7120318405 and NGR SH7116618186, as detailed in Capital Delivery Alliance drawings CAF411-5200-CD15110-N-D-C01 (Figure 01) and CAF411-5201-CD15110-N-D-C01 (Figure 02). The current groundworks will comprise 3No drilling pits, each measuring 3.0 m long and 1.3m deep, which are designed to accommodate a directional drilling rig; the exact location of each pit along Section A – B has not been confirmed. The works are scheduled from 26/07/17 for two days.

The watching brief will be completed in accordance with the following guidance:

- Standard and Guidance for Archaeological Watching Brief (Chartered Institute for Archaeologists, 2014);
- Historic England, 2004 Historic England. Human Bones from Archaeological Sites. Guidelines for producing assessment documents and analytical reports;
- Management of Archaeological Projects (English Heritage, 1991);
- Management of Research Projects in the Historic Environment: The MoRPHE Project Managers' Guide (Historic England, 2015); and
- Guidelines for digital archives Royal Commission on Ancient and Historic Monuments of Wales 2015.

The watching brief will be monitored by the Gwynedd Archaeological Planning Services (GAPS); the content of this design and all subsequent reporting by GAT must be approved by GAPS prior to final issue.

Gwynedd Archaeological Trust is certified to ISO 9001:2008 and ISO 14001:2004 (Cert. No. 74180/A/0001/UK/En) and is a Registered Organisation with the Chartered Institute for

Archaeologists and a member of the Federation of Archaeological Managers and Employers (FAME).

## **2. ARCHAEOLOGICAL AND HISTORICAL BACKGROUND**

GAT undertook an archaeological watching brief as part of the 2010 site investigation programme for the Dolgellau Flood Risk Management Scheme (GAT report 876), to the east of the current mitigation area. A total of 9 test pits were monitored within the Dolgellau floodplain that were characterised by shallow topsoil (maximum depth 0.15m), followed by alluvial deposits of river gravels and coarse and fine sand. No archaeological activity was identified within the confines of any example and no organic material was recorded.

Additional test pits for the Dolgellau Flood Risk Management Scheme were excavated in December 2013 (GAT Report G1157); Pit TP1 was located east of Afon Aran, within the floodplain, while Test Pit TP2 was positioned close to the mouth of the Afon Aran, at it flows into the Afon Wnion. Test Pit TP 1 was quite shallow with gravels and groundwater reached at a depth of 1.20m, below 2 layers of natural clayey sand deposits as well as the topsoil. No archaeological features or artefactual material was found in this test pit. Test Pit TP 2 achieved a depth of 3.30m with the upper deposits below the grassed surface area mainly composed of late 19<sup>th</sup> and early 20<sup>th</sup> century deposits containing quite a large amount of broken glass bottles and pottery throughout. The upper levels of this deposit also contained more modern waste material that had been mixed into the final levelling of the topsoil for the playing areas. Beneath the modern deposit layer, at a depth of 1.80m below ground level, two layers of sandy clay were encountered before reaching gravel and water levels at at 3.30m. Apart from the modern material no other archaeological deposits were found.

GAT completed an archaeological assessment for the proposed water main renewal scheme, in 2016 (GAT Report 1293). The scheme design measured 5.6km in length and was located within and around the Marian Mawr floodplain. The scheme route was divided into eight sections of varied length and methodology; for the purposes of the assessment, the sections were designated as A – B, through L – M. The scheme design included open cut sections, sliplining and pipe bursting. The assessment identified 19 existing sites within a 50m buffer zone surrounding the scheme route; a further seven additional sites were subsequently identified along the route during the walkover survey and desk based research. The existing sites were all buildings, and included houses, a school, a barn, a stable and a folly. These were all of post-medieval date and reflect the growth of the town in the 19<sup>th</sup> century to the north and west of the town's historic core. All the additional sites, consisting of a cottage, two boundary walls, two areas of drainage ditch, a boundary, and back gardens are also all of post-medieval or modern date. The assessment recommended that an intensive watching brief be carried out during all significant intrusive groundworks associated

with the 'sliplining' and 'pipe-bursting', and during the open cut lengths of new trenching, particularly in the low lying open field stretches on section A-B at the western end of the scheme.

### 3. METHODOLOGY

#### 3.1 Watching Brief

An archaeological watching brief is defined by the Chartered Institute for Archaeologists as a formal programme of observation and investigation conducted during any operation carried out for non-archaeological reasons where there is a possibility that archaeological deposits may be disturbed or destroyed. The programme will result in the preparation of a report and ordered archive (CiFA, 2014).

An archaeological watching brief can be divided into four categories:

- comprehensive (present during all ground disturbance)
- intensive (present during sensitive ground disturbance)
- intermittent (viewing the trenches after machining)
- partial (as and when seems appropriate).

GAT will monitor the following works scheduled to be undertaken by Morrison Utility Services during July 2017:

- The cutting of a 223m long open-cut trench for the laying of an 180mm water main pipe on land to the west of Dolgellau Sewage Works (NGR SH7120318405 - NGR SH7116618186; route section A – B; Figure 01; Figure 02); and
- The cutting of a 132m long open-cut trench for the laying of a new 63mm water main pipe along the eastern side of the A470 to the west of Cerrig Camu (NGR SH7151018445 - SH7150818564; route section L – M; Figure 01).

The archaeological watching brief will be completed on an **intensive** basis during the cutting of the pipe trenches. The excavations of pipe trenches will be monitored to the glacial horizon. It is currently expected that 1 project archaeologist will be in attendance.

GAPS will be informed of any changes to excavation methodology to those listed above.

GAT fieldwork methodology is discussed in para. 3.2.

### 3.2 Fieldwork Methodology

- During the watching brief, all attendances and identified features will be recorded using GAT watching brief pro-formas ([Appendix II](#));
- Photographic images will be taken using a digital SLR (Nikon D40) camera set to maximum resolution (3008 × 2000 6.1 effective megapixels) in RAW format and will be converted to TIFF and JPEG format for archiving using Adobe Photoshop; a photographic record will be maintained on site using GAT pro-formas ([Appendix I](#)) and digitised in *Microsoft Access* as part of the fieldwork archive and dissemination process. Photographic images will be archived in TIFF format; the archive numbering system will start from **G2528\_001**. A photographic ID board will be used during the watching brief to record site code, test hole number, date, image orientation and any relevant context numbers. Photographic images will also be taken for each test hole location prior to excavation along with general shots of the area.
- Any subsurface remains will be recorded photographically, with detailed notations and a measured survey;
- Any archaeological features/deposits/structures encountered will be manually cleaned and examined to determine extent, function, date and relationship to adjacent features. If encountered, the following minimum strategy will initially apply: 50% sample of each sub-circular feature, 10% sample of each linear feature. *In the event of the identification of extensive/complex remains (e.g. burials or structures), additional time, resourcing and costs may be required for GAT to complete an appropriate programme of works; this may also incur a delay to the water main replacement works programme;*
- Any required sections and detailed elevations to be drawn at a minimum 1:10 scale using GAT A4 or A2 pro-forma permatrace;
- Any required plans to be at a minimum 1:20 scale. Plans will be drawn on GAT A4 or A2 pro-forma permatrace;
- Should dateable artefacts, human remains and/or ecofacts be recovered, an **interim report** will be submitted summarising the results, along with an assessment of potential for analysis post-excavation project design (in line with the MAP2 process).

*To undertake a post-excavation programme of works, additional time, resourcing and costs will be required.*



### 3.3 Human Remains

If any human remains identified are to be excavated, and cannot be preserved in situ this will take place under appropriate regulations and with due regard for health and safety issues. In order to excavate human remains, a Ministry of Justice licence is required under Section 25 of the Burials Act 1857 for the removal of any body or remains of any body from any place of burial. In accordance with the Ministry of Justice licence, recovered remains will be reburied once the investigation and/or assessment/analysis are complete; the remains should be reburied inside the church as close as practical to their original location.

Non-fragmented skeletal remains will be excavated using wooden tools and collected and stored in polyethylene bags (with appropriate references for context, grave number, et al) and placed in a lidded cardboard archive box (note: separate boxes for each grave) and stored in a suitable manner within GAT premises. If significant quantities of human remains are encountered, a human osteologist should be contacted and appointed to advise the team during the fieldwork. The osteologist will be an external appointment (Lucy Whittingham | Project Manager (post-excavation) | AOC Archaeology | tel: 0208 843 7380 | email: [lucy.whittingham@aocarchaeology.com](mailto:lucy.whittingham@aocarchaeology.com)), who will assist in devising the excavation, recording and sampling strategy for features containing human remains. The osteologist should also help to ensure that adequate post-excavation processing of human remains is carried out so that the material is in a fit state for assessment during the post-excavation stage. For inhumations, this will involve washing, drying, marking and packing.

If human remains are recovered that are deemed suitable for further assessment/analysis, this will be completed in accordance with the osteologist's requirements and with *Human Bones from Archaeological Sites Guidelines for producing assessment documents and analytical reports* (Historic England, 2004).

### 3.4 Ecofacts

Due to the the presence of boggy areas in the ground to the west of the Sewage Works (route section A-B), it is likely that waterlogged/organic deposits will be encountered, including peat deposits. Bulk samples will not be taken by GAT from any waterlogged/organic deposits/peat deposits, but the GAT archaeologist will monitor and record the depth and context of the deposit or deposits. Based on initial results and potential, e.g., an extensive depth of peat, recourse may be made to a specialist (via Lucy Whittingham | Project Manager (post-excavation) | AOC Archaeology | tel: 0208 843 7380 | email: [lucy.whittingham@aocarchaeology.com](mailto:lucy.whittingham@aocarchaeology.com)) for advice on a palaeoenvironmental assessment and analysis strategy.

Should any archaeological features be identified that include sealed deposits deemed suitable for dating, samples will be taken of not less than 40 litres for bulk samples (or 100% if the feature is smaller). The sampling strategy will be undertaken in accordance with the principles set out in *Environmental Archaeology: a guide to the theory and practice of methods, from sampling and recovery to post-excavation* (Historic England, 2011).

Any ecofact samples taken from human burials will be completed in accordance with an appointed osteologist's guidance.

### 3.5 Artefacts

Diagnostic artefacts will be retained for further examination and identification. Pottery sherds of 19<sup>th</sup> and 20<sup>th</sup> century date will be examined on site and the context from which they were retrieved noted but the sherds will not be retained. The artefacts will be treated according to guidelines issued by the UK Institute of Conservation (Watkinson and Neal 2001) in particular the advice provided within *First Aid for Finds* (Rescue 1999) and Historic England.

Any waterlogged artefacts (e.g. wood or leather) that are to be recovered for post-excavation assessment and analysis will be processed in accordance with *Environmental Archaeology: a guide to the theory and practice of methods, from sampling and recovery to post-excavation* (English Heritage, 2011) and specifically in accordance with Brunning and Watson (2010) for waterlogged wood and English Heritage (1995) for waterlogged leather. In such cases an external specialist will be contacted to agree an appropriate sampling and recovery strategy via Lucy Whittingham | Project Manager (post-excavation) | AOC Archaeology | tel: 0208 843 7380 | email: [lucy.whittingham@aocarchaeology.com](mailto:lucy.whittingham@aocarchaeology.com)).

All finds are the property of the landowner; however, it is Trust policy to recommend that all finds are donated to an appropriate museum, (in this case STORIEL, Ffordd Gwynedd, Bangor, Gwynedd LL57 1DT), where they can receive specialist treatment and study. Access to finds must be granted to the Trust for a reasonable period to allow for analysis and for study and publication as necessary. Trust staff will undertake initial identification, but any additional advice would be sought from a wide range of consultants used by the Trust, including National Museums and Galleries of Wales at Cardiff.

All finds of treasure must be reported to the coroner for the district within fourteen days of discovery or identification of the items. Items declared Treasure Trove become the property of the Crown, on whose behalf the National Museums and Galleries of Wales acts as advisor on technical matters, and may be the recipient body for the objects.

The National Museums and Galleries of Wales will decide whether they or any other museum may wish to acquire the object. If no museum wishes to acquire the object, then the Secretary of State will be able to disclaim it. When this happens, the coroner will notify the occupier and landowner that he intends to return the object to the finder after 28 days unless he receives no objection. If the coroner receives an objection, the find will be retained until the dispute has been settled.

GAT will contact the landowner (via Morrison Utility Services) for agreement regarding the transfer of artefacts, initially to GAT and subsequently to the relevant museum

(STORIEL, Ffordd Gwynedd, Bangor, Gwynedd LL57 1DT). A GAT produced pro-forma will be issued to the landowner where they are given the option to donate the finds or to record that they want them returning to them once analysis and assessment has been completed. If artefacts are transferred to STORIEL, this must be in accordance with their current guidelines.

### 3.6 Fieldwork Archiving

Following the completion of the fieldwork, a programme of field work archiving will be completed based on following task list;

1. Pro-formas: all cross referenced and complete;
2. Photographic Metadata: completed in *Microsoft Access* and cross-referenced with all pro-formas;
3. Sections: all cross referenced and complete with relevant site matrix completed;
4. Survey data: downloaded using a Computer Aided Design package;
5. Plans: all cross referenced and complete;
6. Artefacts (if relevant): quantified and identified; register completed;
7. Ecofacts (if relevant): quantified and register completed;
8. Context register (if relevant): quantified and register completed;
9. Site Matrix (if relevant); all cross referenced and complete.

All data will be processed, final illustrations will be compiled and a report will be produced which will detail and synthesise the results.

### **3.7 Historic Environment Record**

In line with the regional Historic Environment Record (HER) requirements, the HER must be contacted at the onset of the project to ensure that any data arising is formatted in a manner suitable for accession to the HER. At the onset, the HER Enquiry Form provided by the HER, will be completed and submitted.

#### **4. PROCESSING DATA, ILLUSTRATION, REPORT AND ARCHIVING**

Following completion of the stages outlined above, a report will be produced within one month incorporating the following:

1. Non-technical summary
2. Introduction
3. Background
4. Methods and techniques, including details and location of project archive
5. Watching Brief Results
6. Summary and conclusions (including any further recommendations – if relevant)
7. List of sources consulted.
8. Appendix I – approved GAT project specification

Illustrations will include plans of the location, site plans and elevations. Historical maps, when appropriate and if copyright permissions allow, will be included. A draft copy of the report will be sent to the client prior to production of the final report.

## 5. DISSEMINATION AND ARCHIVING

A full archive including plans, photographs, written material and any other material resulting from the project will be prepared. The archaeological mitigation outlined in this project specification will commence in July 2017. A draft report (or interim report) will be submitted within one month of fieldwork completion (August 2017); a final report will be submitted to the Historic Environment within six months of submitting the draft report (January 2018).

The following dissemination will apply:

- A paper report(s) plus digital report(s) will be provided to the client and GAPS (draft report then final report);
- A paper report plus a digital report will be provided to the regional Historic Environment Record, Gwynedd Archaeological Trust; this will be submitted within six months of report completion (final report only);
- A digital report and archive (including photographic and drawn) data will be provided to Royal Commission on Ancient and Historic Monuments, Wales (final report only);
- Submission of digital information to the Royal Commission on the Ancient and Historical Monuments of Wales shall be undertaken in accordance with the *RCAHMMW Guidelines for Digital Archives Version 1*. Digital information will include the photographic archive and associated metadata;
- Dependent on the results of the watching brief a summary note or a specific article will be included in the Council for British Archaeology Wales publication *Archaeology in Wales*. This shall be agreed with GAPS, and client in advance of publication along with all publication content. GAPS involvement in the project will be acknowledged therein.



## **6. PERSONNEL**

The project will be managed by John Roberts, Principal Archaeologist GAT Contracts Section with attendances on-site undertaken by at least one GAT project archaeologist. The project archaeologist will be responsible for the watching brief, including all field management duties, e.g., GAPS liaison, main contractor liaison, osteologist or palaeo-environmentalist liaison (if relevant). The project archaeologist will be responsible for completing the watching brief record sheets as well as all other on site pro-formas and the fieldwork archive itemised in para. 3.9. The project archaeologist will also be responsible for submitting a draft final report (or interim report) for project manager review and approval. The report will then be submitted as per the arrangements defined in para. 5.

## **7. HEALTH AND SAFETY**

The GAT Project Archaeologist(s) will be CSCS certified. Copies of the site specific risk assessment will be supplied to the client and site contractor prior to the start of fieldwork. Any risks and hazards will be indicated prior to the start of work via a submitted risk assessment. All staff will be issued with required personal safety equipment, including high visibility jacket, steel toe-capped boots and hard hat.

## **8. INSURANCE**

### **Public Liability**

Limit of Indemnity- £5,000,000 any one event in respect of Public Liability

INSURER Aviva Insurance Limited

POLICY TYPE Public Liability

POLICY NUMBER 24765101CHC/000405

EXPIRY DATE 21/06/2018

### **Employers Liability**

Limit of Indemnity- £10,000,000 any one occurrence.

The cover has been issued on the insurers standard policy form and is subject to their usual terms and conditions. A copy of the policy wording is available on request.

INSURER Aviva Insurance Limited

POLICY TYPE Employers Liability

POLICY NUMBER 24765101CHC/000405

EXPIRY DATE 21/06/2018

### **Professional Indemnity**

Limit of Indemnity- £5,000,000 in respect of each and every claim

INSURER Hiscox Insurance Company Limited

POLICY TYPE Professional Indemnity

POLICY NUMBER

HU PI 9129989/1208

EXPIRY DATE 22/07/2018

## 9. SOURCES CONSULTED

Brunning, R and Watson, J 2010 *Waterlogged Wood: Guidelines on the Recording, Sampling, Conservation and Curation of Waterlogged Wood* (3<sup>rd</sup> ed). Swindon: English Heritage

English Heritage, 1991, *Management of Archaeological Projects*

English Heritage 1995 *Guidelines for the Care of Waterlogged Archaeological Leather . Scientific and Technical Guidelines 4*. London: English Heritage

Evans, R, 2016, *Marian Mawr: Dolgellau: Archaeological Assessment*, GAT Report 1293

Historic England, 2004. *Human Bones from Archaeological Sites Guidelines for producing assessment documents and analytical reports*

Historic England, 2011, *Environmental Archaeology: a guide to the theory and practice of methods, from sampling and recovery to post-excavation*

Historic England, 2015, *Management of Research Projects in the Historic Environment (MoRPHE)*

Ordnance Survey 1-inch to 25-mile County Series Map Sheets XVI.04, XVI.08, XVII.05 and XVII.01 First Edition (1889 & 1890)

Ordnance Survey 1-inch to 25-mile County Series Map Sheets XVI.04, XVI.08, XVII.05 and XVII.01 Second Edition (1900)

Ordnance Survey 1-inch to 25-mile County Series Map Sheets XVI.04, XVI.08, XVII.05 and XVII.01 Third Edition (1914)

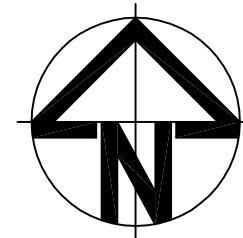
Royal Commission on Ancient and Historic Monuments of Wales 2015 *Guidelines for digital archives*

*Standard and Guidance for an archaeological watching brief* (Chartered Institute for Archaeologists, 2014).

## **FIGURE 01**

**Reproduction of Capital Delivery Alliance drawing CAF411-5200-  
CD15110-N-D-C01**





STAGE 2  
NORTH OF THE RIVER  
63mm RIDER REQUIRED  
PIPEWORK PRESSURE 5-10BAR

5201

5204

5202

5203

STAGE 1  
SOUTH OF THE RIVER  
63mm RIDER REQUIRED  
PIPEWORK PRESSURE 9-10BAR

- NOTES:
1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE FOLLOWING DCWW SPECIFICATIONS:  
a. THE CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY REVISION 6 (CESWI 7)  
2. ALL FLANGES TO BE NP16 RATED  
3. ALL PROFUSE PIPE AND FITTING TO BE SDR 11 - 16 BAR RATED  
4. ALL MDPE PIPES AND FITTINGS TO BE 12.5 BAR RATED.  
5. REFER TO DRAWING TD101 FOR THE FOLLOWING DETAILS:  
FIRE HYDRANT, AIR VALVE, SLUICE VALVE AND PRV CHAMBER DETAILS  
TIMBER POST STOCK PROOF FENCE DETAIL  
INDICATOR AND MARKER POST DETAIL  
TYPICAL THRUST BLOCK DETAILS  
6. TRENCH DETAILS / REINSTATEMENT TO BE AS DRAWING TD102 FOR WORK IN GRASSLAND, UNMADE TRACK, ROAD VERGE AND HIGHWAY  
7. NO HEDGEROWS ARE TO BE REMOVED ON THIS PROJECT. IF HEDGEROW REMOVAL IS FOUND TO BE UNAVOIDABLE, THE CONTRACTOR IS TO CONTACT THE DESIGNER IN ADVANCE FOR FURTHER GUIDANCE. ALSO, DISTURBANCE TO HEDGEROWS IS TO BE AVOIDED DURING THE BIRD NESTING SEASON OF MARCH TO JULY  
8. THE DEPTH AND LINE OF THE NEW MAIN IS TO BE SUPPLIED BY THE CONTRACTOR AT 50M INTERVALS FOR ALL DIRECTIONAL DRILLING WORK. ALL NEW DIRECTIONAL DRILL MAINS TO BE INSTALLED A MINIMUM DISTANCE OF METRES FROM THE EXISTING WATER MAINS  
9. SERVICE TRANSFERS: THE CONTRACTOR IS TO ALLOW FOR THE TRANSFER OF ALL SERVICE CONNECTIONS FROM THE EXISTING MAINS TO THE PROPOSED MAIN. NEW PIPES TO BE mm MDPE. TO BE INSTALLED BY OPEN CUT, MOLING OR SLIP LINING AS APPROPRIATE. ESTIMATED NUMBER OF RESIDENTIAL TRANSFERS - 82 (PLUS FIELD CONNECTIONS) LOCATION OF CONNECTIONS TO BE DETERMINED BY THE CONTRACTOR ON SITE  
10. CAUTION - CABLES: OVERHEAD CABLES ARE PRESENT WITHIN THE WORKING AREA. CONTRACTOR TO REFER TO HSE GUIDANCE NOTE GS6 " AVOIDANCE OF DANGER FROM OVERHEAD LINES". UNDERGROUND CABLES ARE ALSO PRESENT ON SITE. CONTRACTOR TO CONSULT UTILITY DRAWINGS AND IDENTIFY ALL UNDERGROUND SERVICES PRIOR TO COMMENCEMENT OF WORK  
11. WORKING PRESSURE ON THIS PROJECT IS 10 BAR. TEST PRESSURE IS 15 BAR AT THE LOWEST POINT  
12. CAUTION! - NO CHLORINATED / CONTAMINATED WATER OR DRILLING FLUIDS ARE ALLOWED TO ENTER ANY WATER COURSE OR STORM DRAIN. CONTRACTOR TO REFER TO GUIDELINES ON POLLUTION PREVENTION AND INSTRUCTIONS IN CASE OF EMERGENCY  
13. THIS DRAWING NEEDS TO BE READ IN CONJUNCTION WITH THE UTILITY INFORMATION PROVIDED SEPARATELY BY THE INDIVIDUAL UNDERTAKERS  
14. TRIAL HOLES MAY BE REQUIRED TO ESTABLISH EXACT LOCATION OF UTILITIES  
15. DETAILS ARE GUIDES ONLY. ALL PIPES, FITTINGS AND ASSOCIATED MATERIALS TO COMPLETE THE JOB ARE TO BE PROVIDED BY CONTRACTOR  
16. CONTRACTOR TO BE AWARE THAT WATER MAINS MATERIALS MAY NOT BE MARKED OR MARKED INCORRECTLY TO WHAT IS INDICATED. IT IS THEREFORE ADVISABLE THAT THE POSSIBLE PRESENCE OF ASBESTOS (AC) OR PITCH FIBRE (PF) BE ANTICIPATED AND INCLUDED IN RAMS.

- EXISTING WATER MAIN
- ABANDONED WATER MAIN
- WATER MAIN TO BE ABANDONED
- PROPOSED WATER MAIN - OPENCUT
- PROPOSED WATER MAIN - DIRECTIONAL DRILL
- PROPOSED WATER MAIN - PIPEBURST
- PROPOSED WATER MAIN - SLIPLINE
- PROPOSED COMMUNICATION PIPE
- TRIAL HOLE POSITION
- SSSI, SCHEDULED ANCIENT MONUMENT
- CONTAMINATED LAND
- GREAT CRESTED NEWT RESTRICTIONS
- ARCHAEOLOGICAL RESTRICTIONS
- BADGER SETTS
- MINE SHAFTS

POST CODE LL40 2SP

C01	23.01.17	JP	Construction Issue	ET	MK	LH	23.01.17
T01	27.05.16	JP	Tender Issue	ET	MK	LH	27.05.16
Rev.	Date.	Dm.	Description	Rvd.	Chkd.	Appd.	Date.

 **Capital Delivery Alliance**  
**Cynghair Cyflawni Cyfalaf**  
Ty Awen, Spooner Close, Coed Kernew, Newport, NP108FZ

Project Name: MARIAN MAWR PLAYING FIELDS (INCLUDING DOLGELLAU COLLEGE AND TALARAON PH2) DCWW.3279.W.202

Drawing Title: OVERVIEW

Drawing Status: CONSTRUCTION ISSUE

Checked: M KENNEDY	Approved: L HOLLOWAY	Date: MAY '16
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Scale: NTS	Designer: J. PROUT	Rev: C01
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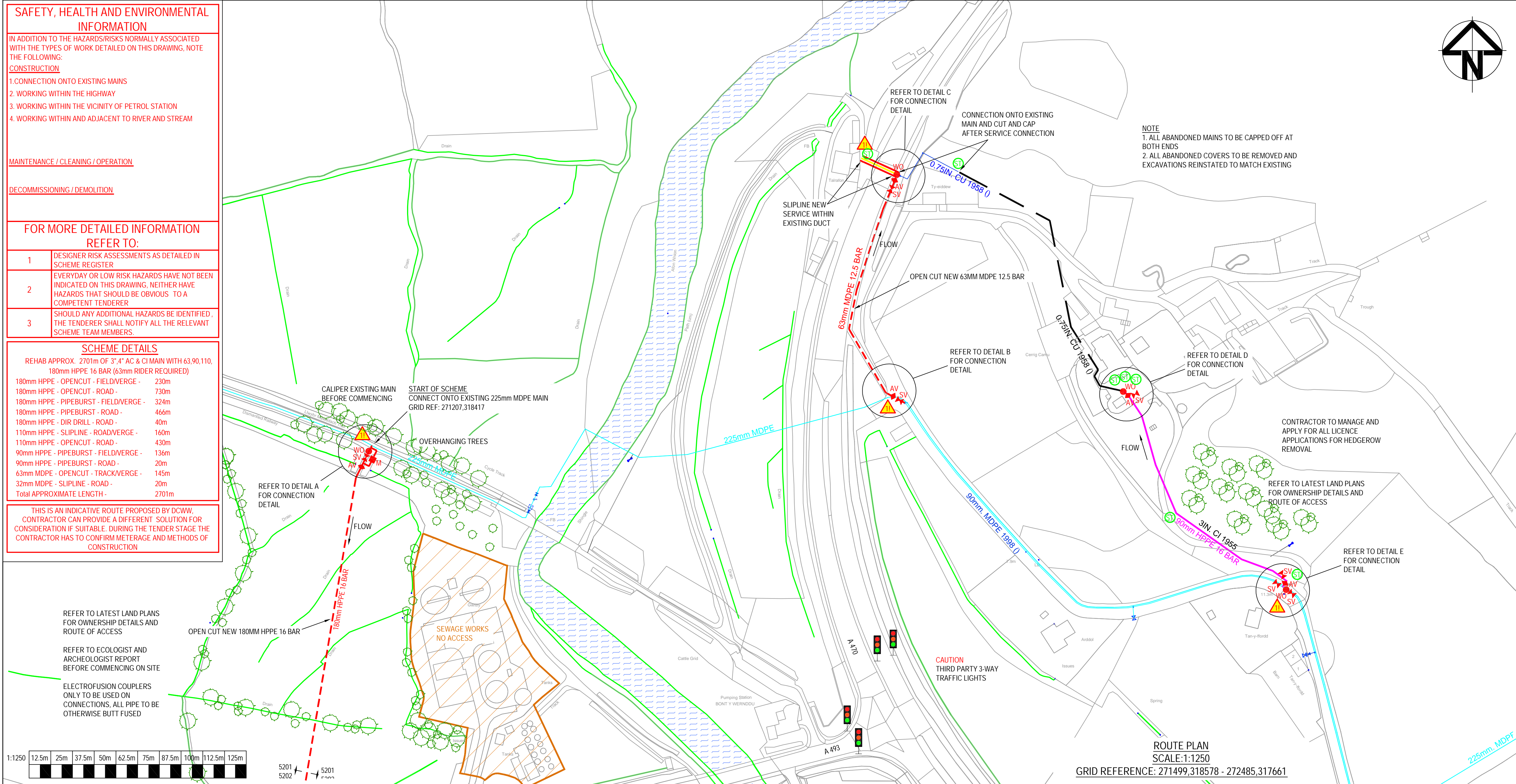
Drawing Number: CAF411-5200-CD15110-N-D



## **FIGURE 02**

**Reproduction of Capital Delivery Alliance drawing CAF411-5201-  
CD15110-N-D-C01**





NOTES:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE FOLLOWING DCWW SPECIFICATIONS:

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE FOLLOWING DCWW SPECIFICATIONS:

a. THE CIVIL ENGINEERING SPECIFICATION FOR THE WATER INDUSTRY REVISION 6 (CESW 7)

2. ALL FLANGES TO BE NP16 RATED

3. ALL PROFUSE PIPE AND FITTING TO BE SDR 11 - 16 BAR RATED

4. ALL MDPE PIPES AND FITTINGS TO BE 12.5 BAR RATED.

5. REFER TO DRAWING TD101 FOR THE FOLLOWING DETAILS: FIRE HYDRANT, AIR VALVE, SLUICE VALVE AND PRV CHAMBER DETAILS

6. TRENCH DETAILS / REINSTATEMENT TO BE AS DRAWING TD102 FOR WORK IN GRASSLAND, UNMADE TRACK, ROAD VERGE AND HIGHWAY

7. NO HEDGEROWS ARE TO BE REMOVED ON THIS PROJECT. IF HEDGEROW REMOVAL IS FOUND TO BE UNAVOIDABLE, THE CONTRACTOR IS TO CONTACT THE DESIGNER IN ADVANCE FOR FURTHER GUIDANCE. ALSO, DISTURBANCE TO HEDGEROWS IS TO BE AVOIDED DURING THE BIRD NESTING SEASON OF MARCH TO JULY

8. THE DEPTH AND LINE OF THE NEW MAIN IS TO BE SUPPLIED BY THE CONTRACTOR AT 50m INTERVALS FOR ALL DIRECTIONAL DRILLING WORK. ALL NEW DIRECTIONAL DRILL MAINS TO BE INSTALLED A MINIMUM DISTANCE OF 5METRES FROM THE EXISTING WATER MAINS

9. SERVICE TRANSFERS: THE CONTRACTOR IS TO ALLOW FOR THE TRANSFER OF ALL SERVICE CONNECTIONS FROM THE EXISTING MAINS TO THE PROPOSED MAIN. NEW PIPES TO BE 25mm MDPE, TO BE INSTALLED BY OPEN CUT, MOLING OR SLIP LINING AS APPROPRIATE. ESTIMATED NUMBER OF RESIDENTIAL TRANSFERS - 82 (PLUS FIELD CONNECTIONS) LOCATION OF CONNECTIONS TO BE DETERMINED BY THE CONTRACTOR ON SITE

10. CAUTION - CABLES: OVERHEAD CABLES ARE PRESENT WITHIN THE WORKING AREA. CONTRACTOR TO REFER TO HSE GUIDANCE NOTE GS6 "AVOIDANCE OF DANGER FROM OVERHEAD LINES". UNDERGROUND CABLES ARE ALSO PRESENT ON SITE. CONTRACTOR TO CONSULT UTILITY DRAWINGS AND IDENTIFY ALL UNDERGROUND SERVICES PRIOR TO COMMENCEMENT OF WORK

11. WORKING PRESSURE ON THIS PROJECT IS 10 BAR. TEST PRESSURE IS 15BAR AT THE LOWEST POINT

12. CAUTION! - NO CHLORINATED / CONTAMINATED WATER OR DRILLING FLUIDS ARE ALLOWED TO ENTER ANY WATER COURSE OR STORM DRAIN. CONTRACTOR TO REFER TO GUIDELINES ON POLLUTION PREVENTION AND INSTRUCTIONS IN CASE OF EMERGENCY

13. THIS DRAWING NEEDS TO BE READ IN CONJUNCTION WITH THE UTILITY INFORMATION PROVIDED SEPARATELY BY THE INDIVIDUAL UNDERTAKERS

14. TRIAL HOLES MAY BE REQUIRED TO ESTABLISH EXACT LOCATION OF UTILITIES

15. DETAILS ARE GUIDES ONLY. ALL PIPES, FITTINGS AND ASSOCIATED MATERIALS TO COMPLETE THE JOB ARE TO BE PROVIDED BY CONTRACTOR

16. CONTRACTOR TO BE AWARE THAT WATER MAINS MATERIALS MAY NOT BE MARKED OR MARKED INCORRECTLY TO WHAT IS INDICATED. IT IS THEREFORE ADVISABLE THAT THE POSSIBLE PRESENCE OF ASBESTOS (AC) OR PITCH FIBRE (PF) BE ANTICIPATED AND INCLUDED IN RAMS.

EXISTING WATER MAIN

ABANDONED WATER MAIN

WATER MAIN TO BE ABANDONED

PROPOSED WATER MAIN - OPENCUT

PROPOSED WATER MAIN - DIRECTIONAL DRILL

PROPOSED WATER MAIN - PIPEBURST

PROPOSED WATER MAIN - SLIPLINE

PROPOSED COMMUNICATION PIPE

TRIAL HOLE POSITION

SSSI, SCHEDULED ANCIENT MONUMENT

CONTAMINATED LAND

GREAT CRESTED NEWT RESTRICTIONS

ARCHAEOLOGICAL RESTRICTIONS

BADGER SETTS

MINE SHAFTS

POST CODE LL40 2SP

DETAIL A

DETAIL B

DETAIL C

DETAIL D

DETAIL E

1. UNDER PRESSURE TEE FOR 225mm UPVC WITH 180mm BRANCH

2. 80mm OFF 150mm DIA A.F. TEE

3. 150mm DIA AF DISTANCE PIECE 250mm LONG

4. 80mm OFF 150mm DIA A.F. TEE

5. 80mm n.b. SLUICE VALVE C-CLOSING

6. 80mm WASH OUT HYDRANT

7. 150mm DIA SLUICE VALVE C.C.

8. 25mm GA AIR VALVE WITH A 80mm FLANGE

9. 180mm o.d. PUPPED FLANGE

10. 180mm o.d. ELECTRO FUSION COUPLING

11. 180mm o.d. 16 BAR HPPE PIPE

12. 80mm DIA DISTANCE PIECE 200mm LONG

13. 80mm DIA ALL FLANGE 90° BEND

14. 80mm DIA DISTANCE PIECE 500mm LONG

15. 90mm od PUPPED FLANGE

16. 80mm DIA AQUAGRIP

17. 80mm METER

18. 80mm DIA DISTANCE PIECE 300mm LONG

1. EXISTING 90mm MDPE PIPE

2. 90mm AQUAGRIP

3. 80mm DIA A.F. TEE

4. 80mm DIA SLUICE VALVE C.C.

5. 80mm DIA AF DISTANCE PIECE 250mm LONG

6. 80mm DIA A.F. TEE

7. 63mm PUSHFIT SOCKET WITH 63mm 12.5 BAR MDPE PIPE

8. 80mm n.b. SLUICE VALVE C-CLOSING

9. 25mm GA AIR VALVE WITH A 80mm FLANGE

1. 63mm 12.5 BAR MDPE PIPE

2. 80mm FLANGE TO 63mm PUSHFIT SOCKET

3. 80mm DIA SLUICE VALVE C-CLOSING

4. 80mm DIA AF DISTANCE PIECE 250mm LONG

5. 80mm DIA ALL FLANGE TEE

6. 80mm DIA ALL FLANGE TEE

7. 80mm DIA AF DISTANCE PIECE 150mm LONG

8. 25mm GA AIR VALVE WITH A 80mm FLANGE

9. 80mm WASH OUT HYDRANT

1. 90mm o.d. 16 BAR HPPE PIPE

2. 90mm o.d. ELECTRO FUSION COUPLING

3. 90mm o.d. PUPPED FLANGE

4. 80mm DIA SLUICE VALVE C-CLOSING

5. 80mm DIA AF DISTANCE PIECE 250mm LONG

6. 80mm DIA ALL FLANGE TEE

7. 80mm DIA DUCKFOOT BEND

8. 80mm DIA AF DISTANCE PIECE 150mm LONG

9. 25mm GA AIR VALVE WITH A 80mm FLANGE

10. 80mm WASH OUT HYDRANT

1. 90mm o.d. 16 BAR HPPE PIPE

2. 90mm o.d. ELECTRO FUSION COUPLING

3. 90mm o.d. PUPPED FLANGE

4. 80mm DIA SLUICE VALVE C-CLOSING

5. 80mm DIA AF DISTANCE PIECE 250mm LONG

6. 80mm DIA ALL FLANGE TEE

7. 80mm AQUAGRIP

8. 80mm n.b. SLUICE VALVE C-CLOSING

9. 80mm WASH OUT HYDRANT

10. 25mm GA AIR VALVE WITH A 80mm FLANGE

11. EXISTING 90mm HPPE MAIN



### **FIGURE 03**

**Location Map denoting scheme route along with route sub-divisions A to M. Based on Ordnance Survey 1:10000 Series County Series Map Sheet SH71NW. Scale: 1 to 7500@A4.**



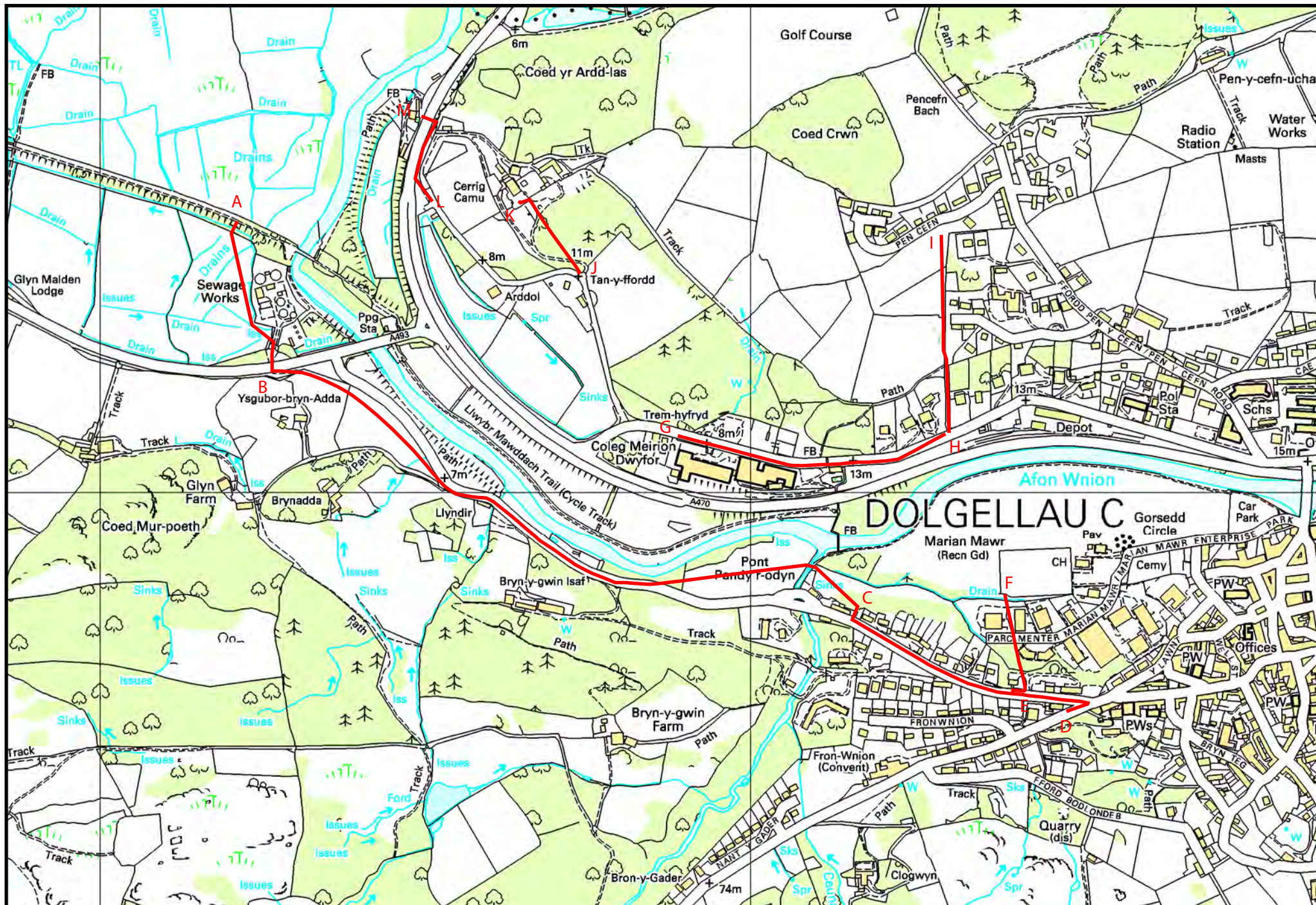


Figure 03 - Location Map denoting scheme route along with route sub-divisions A to M. Based on Ordnance Survey 1:10000 Series County Series Map Sheet SH71NW. Scale: 1 to 7500@A4. Crown Copyright. All Rights Reserved. License number AL100020895.



## **APPENDIX I**

### **Gwynedd Archaeological Trust photographic metadata pro-forma**



## Digital Photographic Record

Include main context numbers for each shot, drawing numbers for sections and any other relevant numbers for cross referencing.

Delete any unwanted photos **immediately** from the camera.

Regularly upload photographs to computer.

[illegible]

## **APPENDIX II**

### **Gwynedd Archaeological Trust watching brief pro-forma**

YMDDIRIEDOLAETH ARCHAEOLEGOL GWYNEDD ARCHAEOLOGICAL TRUST		
WATCHING BRIEF DAY RECORD		Date
Project name	Project number	Compiler
Location		
Description		
Times of travelling and on-site		
Drawn record details		
Photographic record details		

## **APPENDIX II**

### **Gwynedd Archaeological Trust photographic metadata**

PHOTO RECORD NUMBER*	PROJECT NAME	DESCRIPTION*	VIEW FROM	SCALE	CREATOR OF DIGITAL PHOTO*	DATE OF CREATION OF DIGITAL PHOTO*	ORIGINATING ORGANISATION	DIGITAL FILE TYPE*	RESOLU TION*	PLATE
G2528_001	DCWW Dolgellau	launch pit 1 general location	S	1m	Robert Evans	27/07/2017	Gwynedd Archaeological Trust	TIFF	3008*2 000	
G2528_002	DCWW Dolgellau	launch pit 1 with topsoil removed in early stages of excavation	NW		Robert Evans	28/07/2017	Gwynedd Archaeological Trust	TIFF	3008*2 001	
G2528_003	DCWW Dolgellau	launch pit 1 post excavation	NW	1m	Robert Evans	29/07/2017	Gwynedd Archaeological Trust	TIFF	3008*2 002	
G2528_004	DCWW Dolgellau	launch pit 1 post excavation	W	1m	Robert Evans	30/07/2017	Gwynedd Archaeological Trust	TIFF	3008*2 003	
G2528_005	DCWW Dolgellau	launch pit 2 general location	E	1m	Robert Evans	31/07/2017	Gwynedd Archaeological Trust	TIFF	3008*2 004	
G2528_006	DCWW Dolgellau	launch pit 2 general location	W	1m	Robert Evans	01/08/2017	Gwynedd Archaeological Trust	TIFF	3008*2 005	
G2528_007	DCWW Dolgellau	launch pit 2 general shot during excavation showing grey clay below juncus	NE		Robert Evans	02/08/2017	Gwynedd Archaeological Trust	TIFF	3008*2 006	



PHOTO RECORD NUMBER*	PROJECT NAME	DESCRIPTION*	VIEW FROM	SCALE	CREATOR OF DIGITAL PHOTO*	DATE OF CREATION OF DIGITAL PHOTO*	ORIGINATING ORGANISATION	DIGITAL FILE TYPE*	RESOLU TION*	PLATE
G2528_008	DCWW Dolgellau	launch pit 2 post-excavation showing grey clay fill	N	1m	Robert Evans	03/08/2017	Gwynedd Archaeological Trust	TIFF	3008*2 007	
G2528_009	DCWW Dolgellau	launch pit 2 angled view post-excavation	NE		Robert Evans	04/08/2017	Gwynedd Archaeological Trust	TIFF	3008*2 008	
G2528_010	DCWW Dolgellau	general view looking south along pipeline route	N		Robert Evans	05/08/2017	Gwynedd Archaeological Trust	TIFF	3008*2 009	
G2528_011	DCWW Dolgellau	general view looking north along pipeline route	S		Robert Evans	05/08/2017	Gwynedd Archaeological Trust	TIFF	3008*2 009	

## **APPENDIX III**

### **Context Register**

Context No.	Site Sub Division	Type	Description	Initials	Date
101	LP1 and LP2	Deposit	Mid/Light greyish Brown Waterlogged Clay	RE	27/07/2017
102	LP1	Deposit	Mid orangey brown peat with clay	RE	27/07/2017



Gwynedd Archaeological Trust  
Ymddiriedolaeth Archaeolegol Gwynedd

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