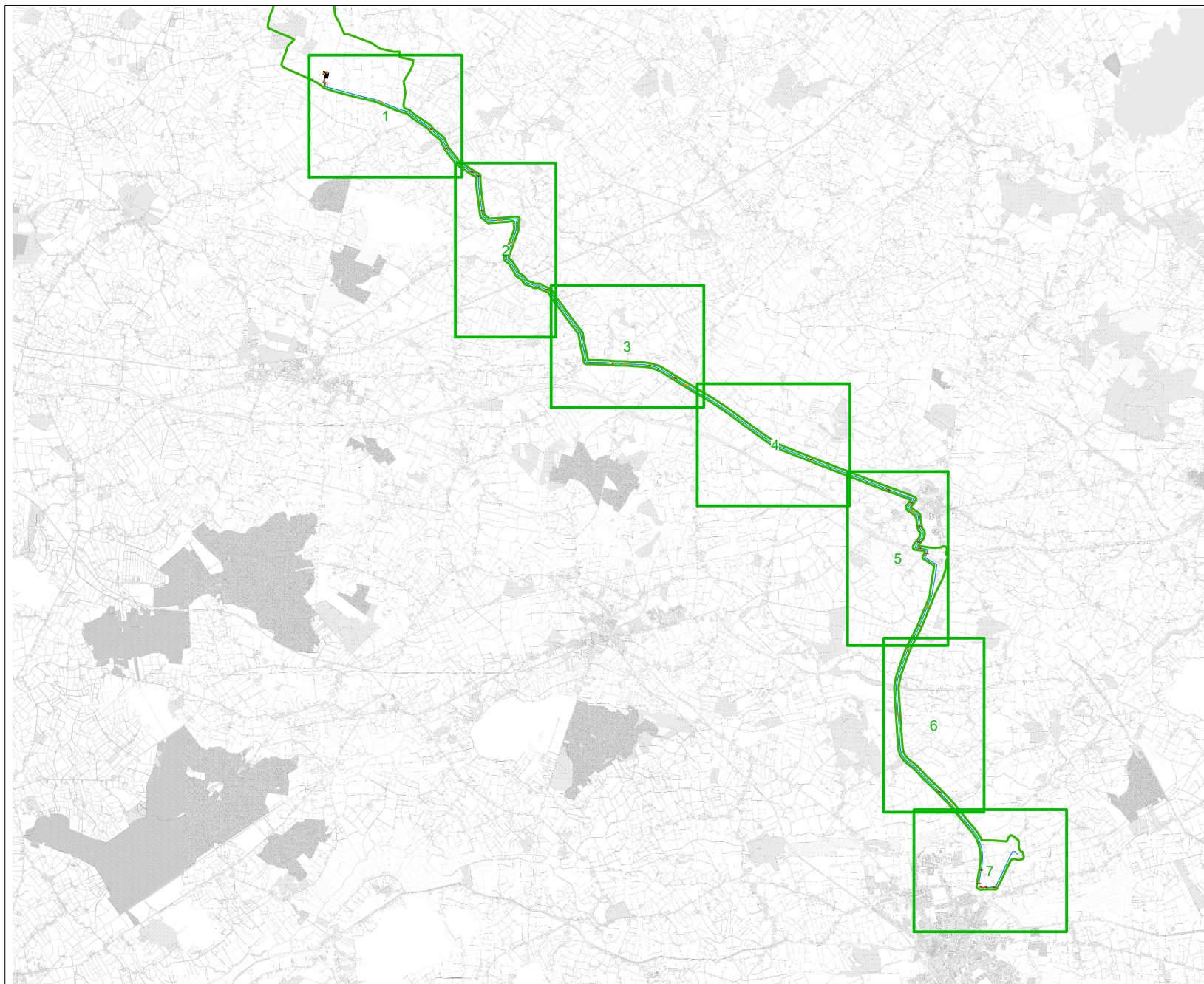




APPENDIX 4-5

GRID CONNECTION INFRASTRUCTURE



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 7. The location of cable/joint bay in the road cartilage to be subject to TSB specifications and agreement with Westmeath County Council.

Drawing Legend

- EIAR Site Boundary
-  Underground Electrical Cabling Route
-  Joint Bay
-  Culvert Crossing
-  Watercourse Crossing



DRAWING TITLE:
**Site Layout Map Key
Plan (1:5,000)**

PROJECT TITLE: Umma More Renewable Energy Development, Co. Westmeath

DRAWING BY: Joseph O'Brien	CHECKED BY: Meabhann Crowe
PROJECT No: 201050	DRAWING No: 201050 - 01
SCALE: 1:40,000 @ A1	DATE: 02.03.2023



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7. Exact location of cable/joint bay in the road cuttings to be subject to ESB specifications and agreement with Westmeath County Council.

- Drawing Legend**
- EIAR Site Boundary
 - Underground Electrical Cabling Route
 - Cabling Construction Track
 - Joint Bay
 - Culvert Crossing
 - Watercourse Crossing



DRAWING TITLE
Site Layout Map
Sheet 1 of 7

PROJECT TITLE
Umma More Renewable Energy Development, Co. Westmeath

DRAWING BY Joseph O'Brien	CHECKED BY Meabhann Crowe
PROJECT NO. 201050	DESIGN NO. 201050 - 02
SCALE 1:5,000 @ A1	DATE 02.03.2023

OS SHEET NO.
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Drawing Legend

- EIAR Site Boundary
-  Underground Electrical Cabling Route
-  Joint Bay
-  Culvert Crossing
-  Watercourse Crossing



1. *Journal of the American Medical Association*, 2000; 283: 2686-2692.

DRAWING TITLE:

Site Layout Map
Sheet 3 of 7

PROJECT TITLE: Umma More Renewable Energy Development, Co. Westmeath

DRAWING BY: Joseph O'Brien	CHECKED BY: Meabhann Crowe
PROJECT No.: 201050	DRAWING No.: 201050 - 04
SCALE: 1:5,000 @ A1	DATE: 02.03.2023
OS SHEET No.: 0000, 0001, 0002, 0003, 0004, 0005, 0006, 0007, 0008, 0009, 0010, 0011, 0012, 0013, 0014, 0015, 0016, 0017, 0018, 0019, 0020, 0021, 0022, 0023, 0024, 0025, 0026, 0027, 0028, 0029, 0030, 0031, 0032, 0033, 0034, 0035, 0036, 0037, 0038, 0039, 0040, 0041, 0042, 0043, 0044, 0045, 0046, 0047, 0048, 0049, 0050, 0051, 0052, 0053, 0054, 0055, 0056, 0057, 0058, 0059, 0060, 0061, 0062, 0063, 0064, 0065, 0066, 0067, 0068, 0069, 0070, 0071, 0072, 0073, 0074, 0075, 0076, 0077, 0078, 0079, 0080, 0081, 0082, 0083, 0084, 0085, 0086, 0087, 0088, 0089, 0090, 0091, 0092, 0093, 0094, 0095, 0096, 0097, 0098, 0099, 0100, 0101, 0102, 0103, 0104, 0105, 0106, 0107, 0108, 0109, 0110, 0111, 0112, 0113, 0114, 0115, 0116, 0117, 0118, 0119, 0120, 0121, 0122, 0123, 0124, 0125, 0126, 0127, 0128, 0129, 0130, 0131, 0132, 0133, 0134, 0135, 0136, 0137, 0138, 0139, 0140, 0141, 0142, 0143, 0144, 0145, 0146, 0147, 0148, 0149, 0150, 0151, 0152, 0153, 0154, 0155, 0156, 0157, 0158, 0159, 0160, 0161, 0162, 0163, 0164, 0165, 0166, 0167, 0168, 0169, 0170, 0171, 0172, 0173, 0174, 0175, 0176, 0177, 0178, 0179, 0180, 0181, 0182, 0183, 0184, 0185, 0186, 0187, 0188, 0189, 0190, 0191, 0192, 0193, 0194, 0195, 0196, 0197, 0198, 0199, 0200, 0201, 0202, 0203, 0204, 0205, 0206, 0207, 0208, 0209, 0210, 0211, 0212, 0213, 0214, 0215, 0216, 0217, 0218, 0219, 0220, 0221, 0222, 0223, 0224, 0225, 0226, 0227, 0228, 0229, 0230, 0231, 0232, 0233, 0234, 0235, 0236, 0237, 0238, 0239, 0240, 0241, 0242, 0243, 0244, 0245, 0246, 0247, 0248, 0249, 0250, 0251, 0252, 0253, 0254, 0255, 0256, 0257, 0258, 0259, 0260, 0261, 0262, 0263, 0264, 0265, 0266, 0267, 0268, 0269, 0270, 0271, 0272, 0273, 0274, 0275, 0276, 0277, 0278, 0279, 0280, 0281, 0282, 0283, 0284, 0285, 0286, 0287, 0288, 0289, 0290, 0291, 0292, 0293, 0294, 0295, 0296, 0297, 0298, 0299, 0300, 0301, 0302, 0303, 0304, 0305, 0306, 0307, 0308, 0309, 0310, 0311, 0312, 0313, 0314, 0315, 0316, 0317, 0318, 0319, 0320, 0321, 0322, 0323, 0324, 0325, 0326, 0327, 0328, 0329, 0330, 0331, 0332, 0333, 0334, 0335, 0336, 0337, 0338, 0339, 0340, 0341, 0342, 0343, 0344, 0345, 0346, 0347, 0348, 0349, 0350, 0351, 0352, 0353, 0354, 0355, 0356, 0357, 0358, 0359, 0360, 0361, 0362, 0363, 0364, 0365, 0366, 0367, 0368, 0369, 0370, 0371, 0372, 0373, 0374, 0375, 0376, 0377, 0378, 0379, 0380, 0381, 0382, 0383, 0384, 0385, 0386, 0387, 0388, 0389, 0390, 0391, 0392, 0393, 0394, 0395, 0396, 0397, 0398, 0399, 0400, 0401, 0402, 0403, 0404, 0405, 0406, 0407, 0408, 0409, 0410, 0411, 0412, 0413, 0414, 0415, 0416, 0417, 0418, 0419, 0420, 0421, 0422, 0423, 0424, 0425, 0426, 0427, 0428, 0429, 0430, 0431, 0432, 0433, 0434, 0435, 0436, 0437, 0438, 0439, 0440, 0441, 0442, 0443, 0444, 0445, 0446, 0447, 0448, 0449, 0450, 0451, 0452, 0453, 0454, 0455, 0456, 0457, 0458, 0459, 0460, 0461, 0462, 0463, 0464, 0465, 0466, 0467, 0468, 0469, 0470, 0471, 0472, 0473, 0474, 0475, 0476, 0477, 0478, 0479, 0480, 0481, 0482, 0483, 0484, 0485, 0486, 0487, 0488, 0489, 0490, 0491, 0492, 0493, 0494, 0495, 0496, 0497, 0498, 0499, 0500, 0501, 0502, 0503, 0504, 0505, 0506, 0507, 0508, 0509, 0510, 0511, 0512, 0513, 0514, 0515, 0516, 0517, 0518, 0519, 0520, 0521, 0522, 0523, 0524, 0525, 0526, 0527, 0528, 0529, 0530, 0531, 0532, 0533, 0534, 0535, 0536, 0537, 0538, 0539, 0540, 0541, 0542, 0543, 0544, 0545, 0546, 0547, 0548, 0549, 0550, 0551, 0552, 0553, 0554, 0555, 0556, 0557, 0558, 0559, 0560, 0561, 0562, 0563, 0564, 0565, 0566, 0567, 0568, 0569, 0570, 0571, 0572, 0573, 0574, 0575, 0576, 0577, 0578, 0579, 0580, 0581, 0582, 0583, 0584, 0585, 0586, 0587, 0588, 0589, 0590, 0591, 0592, 0593, 0594, 0595, 0596, 0597, 0598, 0599, 0600, 0601, 0602, 0603, 0604, 0605, 0606, 0607, 0608, 0609, 0610, 0611, 0612, 0613, 0614, 0615, 0616, 0617, 0618, 0619, 0620, 0621, 0622, 0623, 0624, 0625, 0626, 0627, 0628, 0629, 0630, 0631, 0632, 0633, 0634, 0635, 0636, 0637, 0638, 0639, 0640, 0641, 0642, 0643, 0644, 0645, 0646, 0647, 0648, 0649, 0650, 0651, 0652	



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Drawing Legend

-  EIAR Site Boundary
-  Underground Electrical Cabling Route
-  Joint Bay
-  Culvert Crossing



1000

DRAWING TITLE: **Site Layout Map**
Sheet 4 of 7

PROJECT TITLE: Umma More Renewable Energy Development, Co. Westmeath

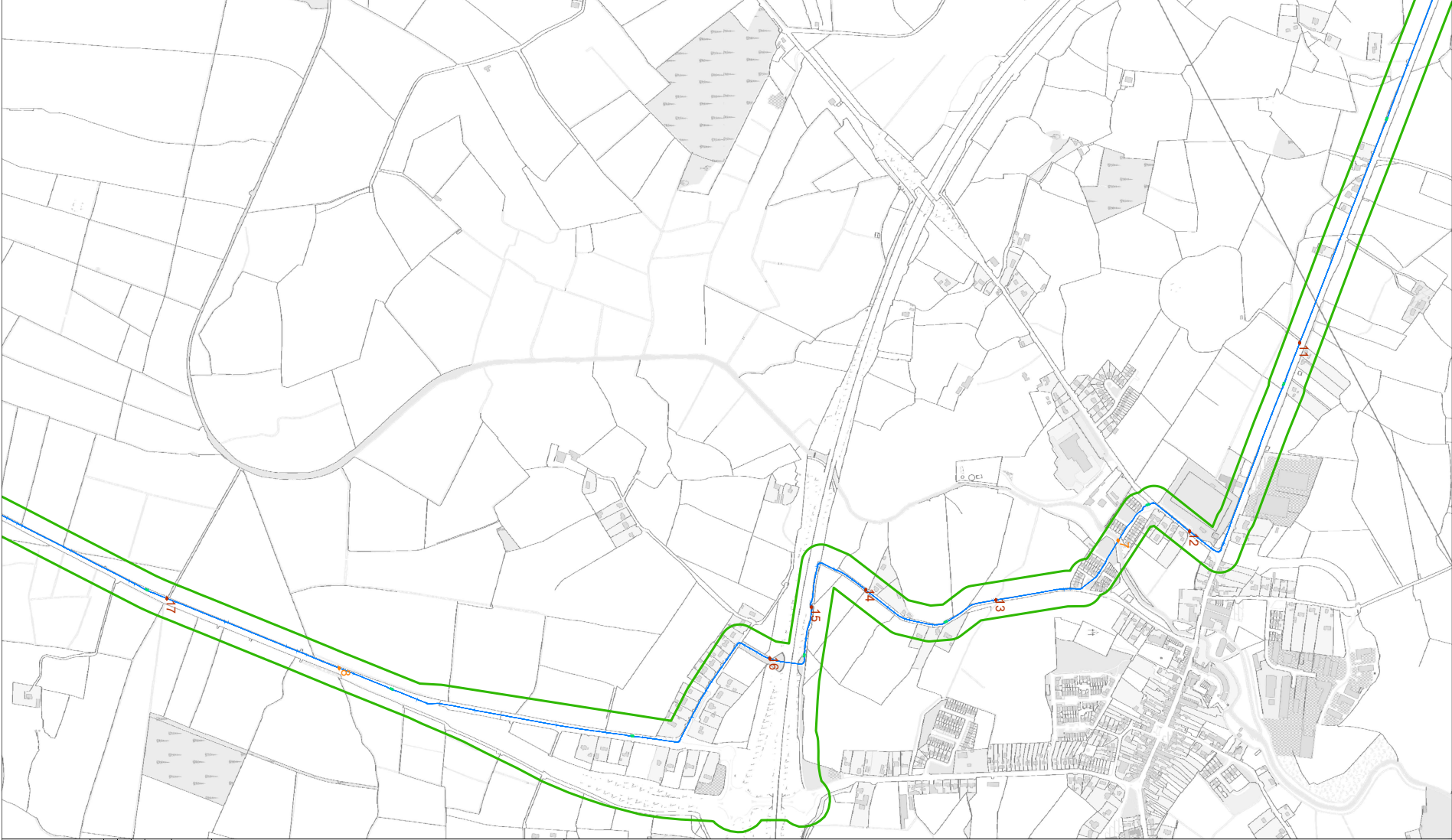
DRAWING BY: Joseph O'Brien	CHECKED BY: Meabhann Crowe
PROJECT No: 201050	DRAWING No.: 201050 - 05
SCALE: 1:500 @ A4	DATE: 02.02.2023



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Team Road, Galway
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Project Design Drawing Notes

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10. Do not scale of the drawing. Figured metric dimensions only should be used for all dimensions.



- Drawing Legend**
- 10kV line boundary
 - Underground Electricity Cabling Route
 - Cable Laying
 - Cable Crossing
 - Watercourse Crossing



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Site Layout Map

Sheet 5 of 7

PROJECT: Uthma Mice Renewable Energy Development, Co. Westmeath

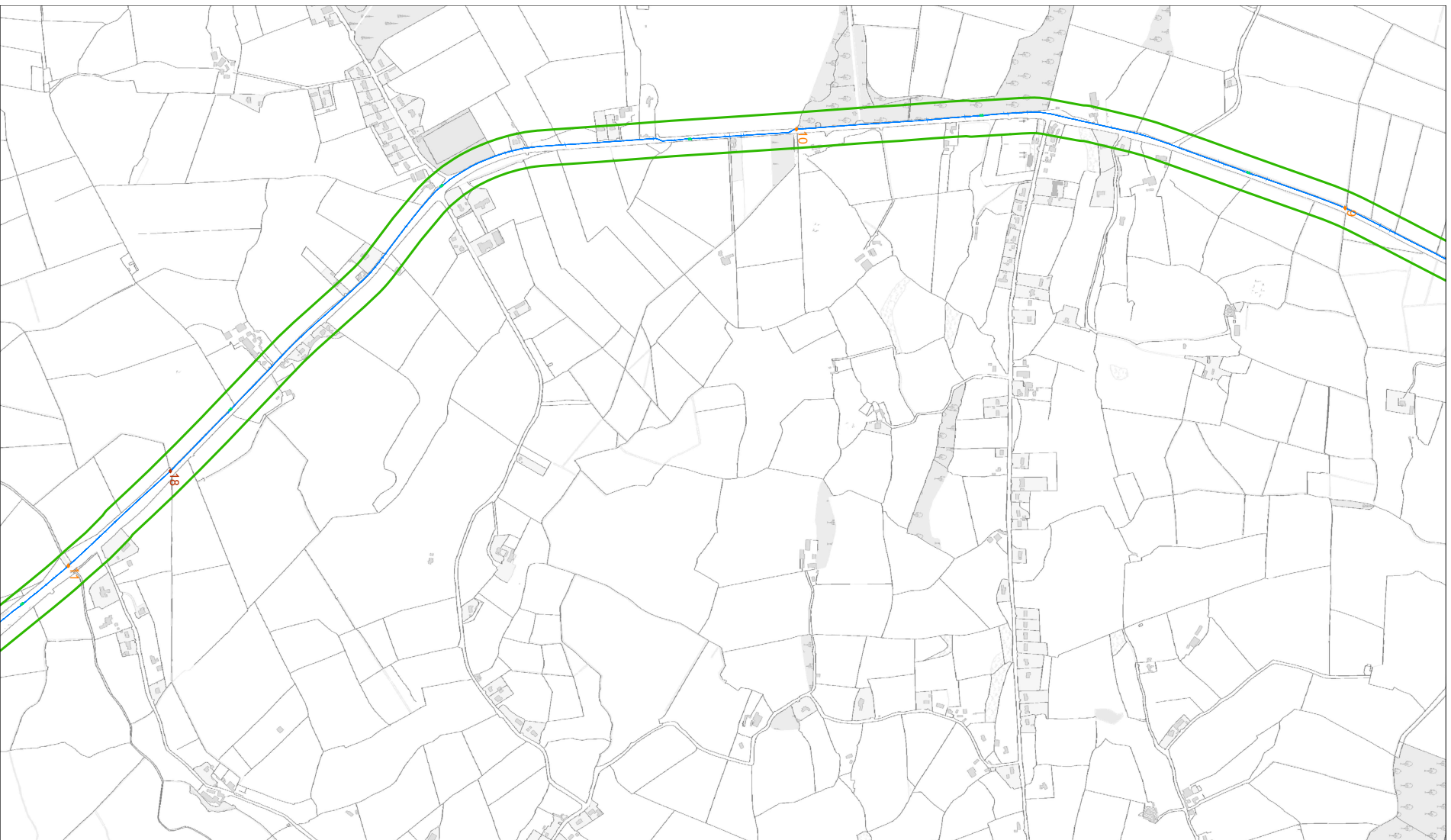
DRAWN BY: Joseph O'Brien

CHECKED BY: Michael Crowe

DATE: 20/09/2023

SCALE: 1:500 @ A1

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Project Design Drawing Notes

- [illegible]

Drawing Legend

- EAAR Sea Boundary
- Underground Electrical Cabling Route
- Joint Bay
- Culvert Crossing
- Watercourse Crossing



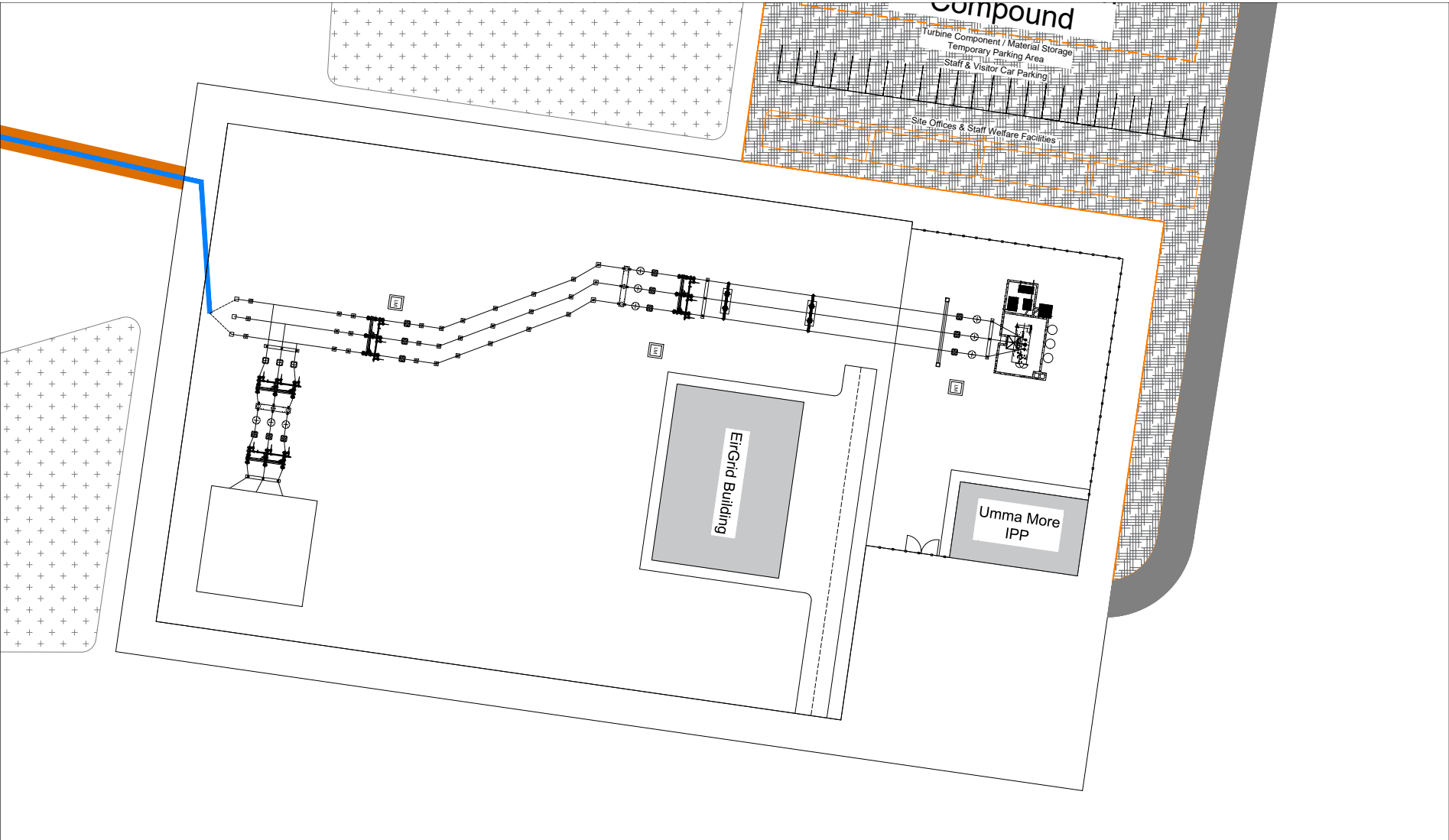
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Site Layout Map
Sheet 6 of 7

PROJECT NO.	Umma More Renewable Energy Development, Co. Westmeath		
DRAWN BY	Meehan Crowe		
PROJECT NO.	201050	DRAWN DATE	201050 - 07
SCALE	1:5,000 @ A1	DATE	02.03.2023



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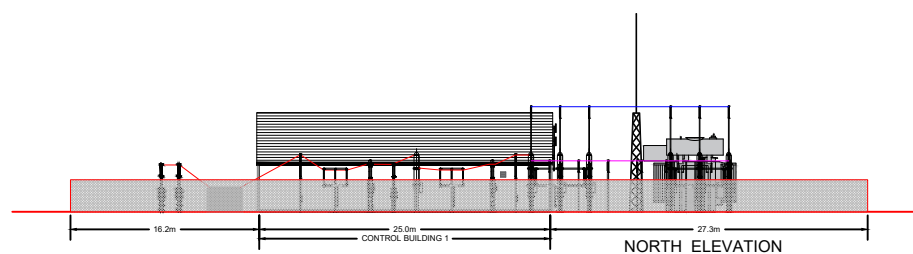
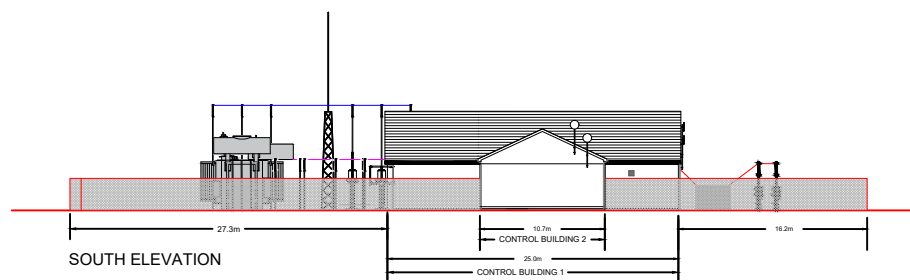
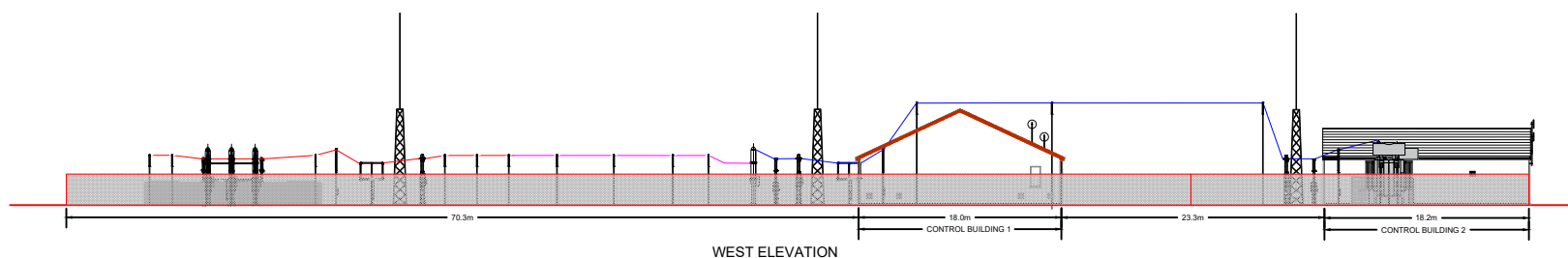
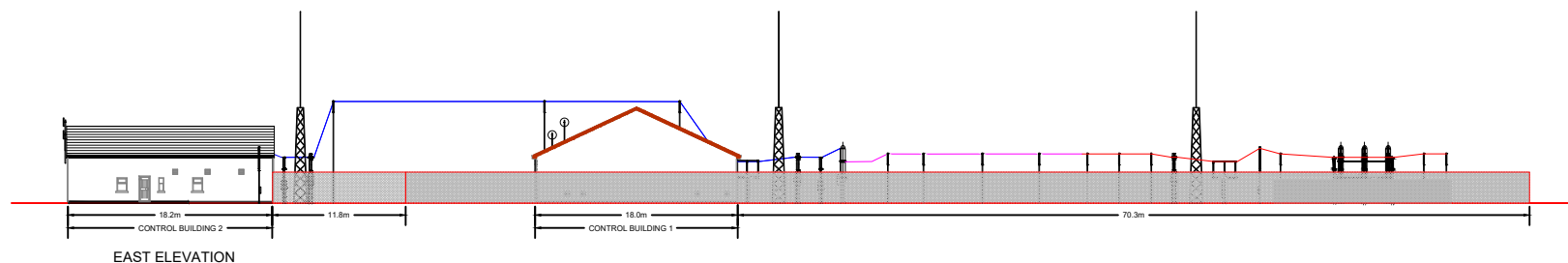
Ordnance Survey Ireland Licence No. CYAL502675176 Ordnance Survey Ireland/Government of Ireland

**Onsite 110kV Substation
Drawing Layout**

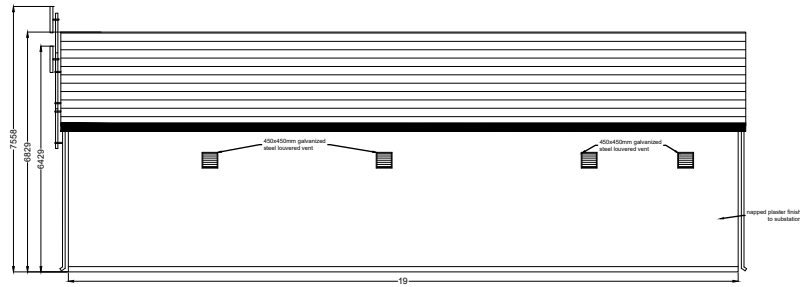
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DESIGNED BY Joseph O'Brien	DRAWN BY Masham Crowe
PROJECT NO. 201090	REVISION 201090 - 10
SCALE 1:500 @ A3	DATE 06.03.2023



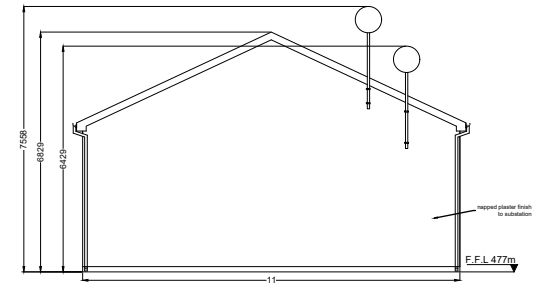
MKO
Planning and
Construction
Services Ltd
Units 10-11, The
Mills, 100-102
Mills Road, Carrigrohane,
Co. Cork, Ireland
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W: www.miko.ie



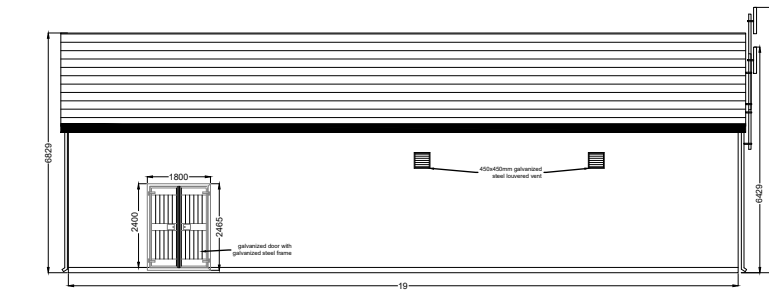
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Onsite 110kV Substation Drawing Elevations	
PROJECT TITLE	
Uimma More Renewable Energy Development, Co. Westmeath	
DRAWING BY	CHECKED BY
Joseph O'Brien	Meabhann Crowe
PROJECT NO.	DRAWING NO.
201050	201050 - 11
SCALE	DATE
1:200 @ A1	02.03.2023
 MKO Planning and Environmental Consultants Team Road, Galway Ireland, H91 V954 +353 (0) 91 735611 email: info@www.mkoland.ie Website: www.mkoland.ie	



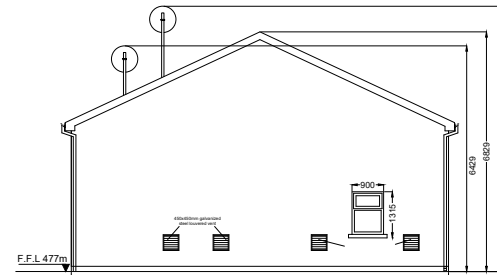
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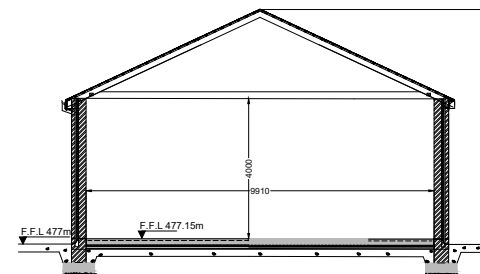
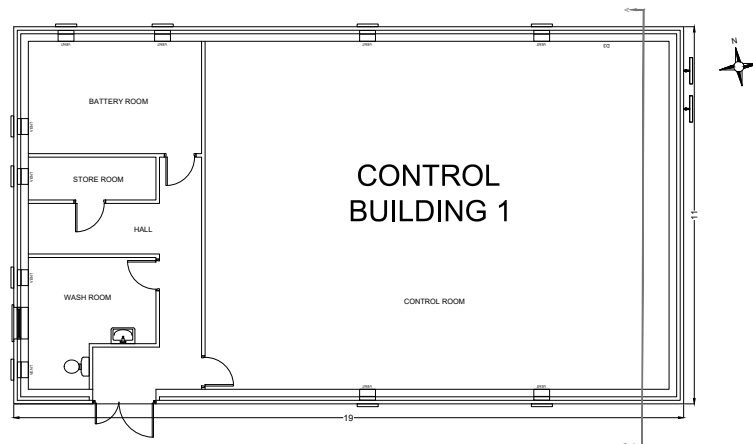
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South Elevation

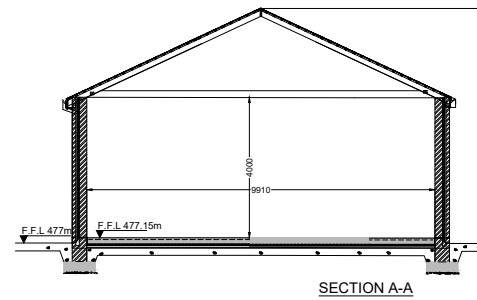
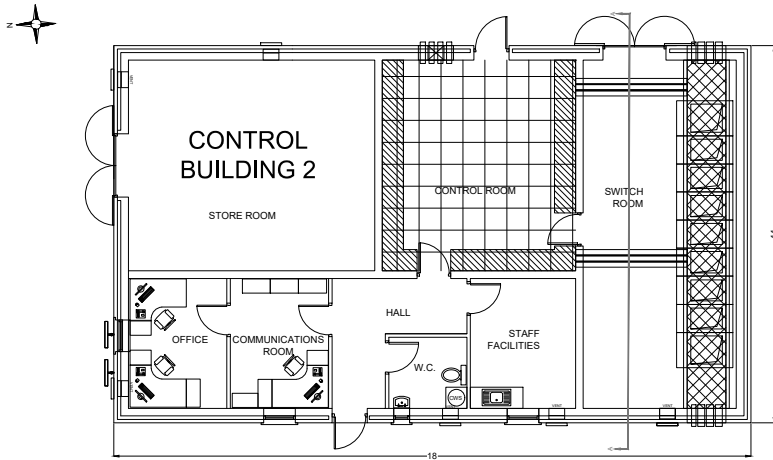
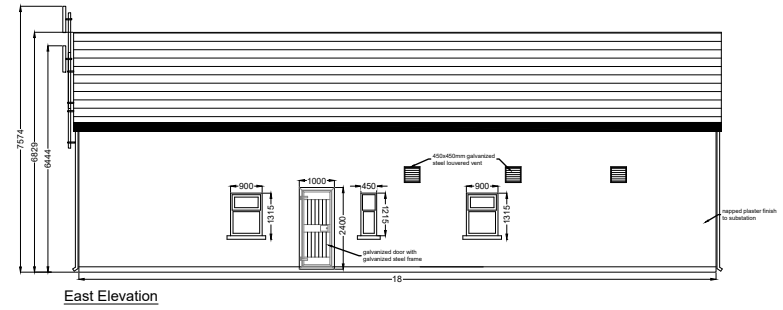
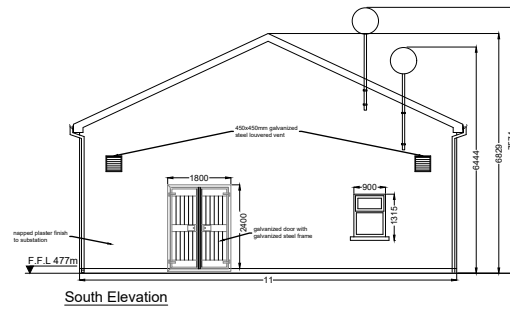
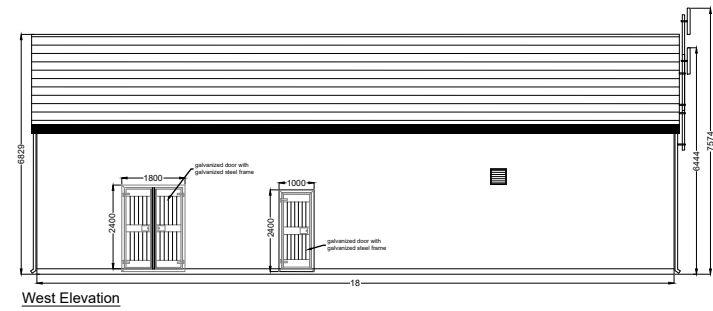
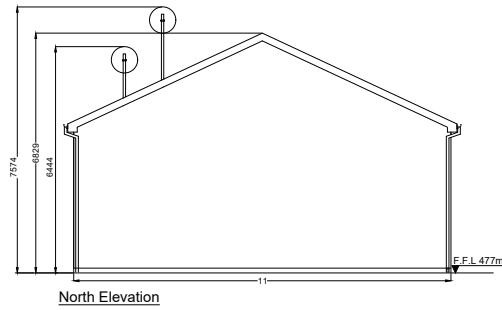


West Elevation

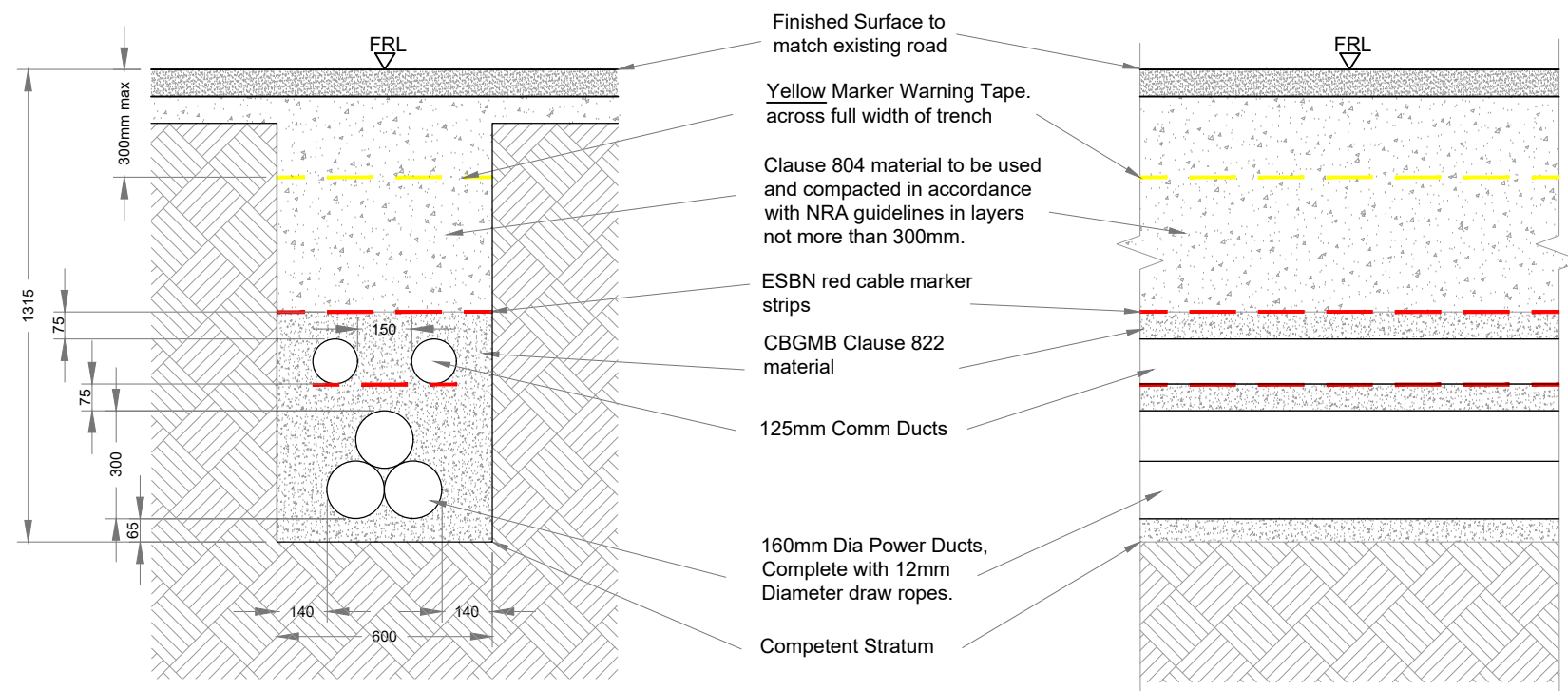


SECTION A-A

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Control Building 1 Elevations & Section			
PROJECT TITLE Umma More Renewable Energy Development, Co. Westmeath			
DRAWING BY Joseph O'Brien	CHECKED BY Meabhann Crowe		
PROJECT NO. 201050	DRAWING NO. Fig 4-15		
SCALE 1:100 @ A2	DATE 08.03.2023		
		MKO Planning and Environmental Consultants Tuam Road, Galway Ireland, V91 YW84 +353 (0) 91 756613 email: info@www.mkofireland.ie Website: www.mkofireland.ie	



DRAWING TITLE: Control Building 2 Elevations & Section	
PROJECT TITLE: Umma More Renewable Energy Development, Co. Westmeath	
DRAWING BY: Joseph O'Brien	DRAWING NO: Meabhann Crowe
PROJECT NO: 201050	Fig 4-16
SCALE: 1:100 @ A2	DATE: 08.03.2023
 MKO Planning and Environmental Consultants Tuam Road, Galway Ireland, V91 YW84 +353 (0) 91 75663 email: info@www.mkoireland.ie Website: www.mkoireland.ie	



Standard 110kV Trench Detail
SCALE 1:20

Note:
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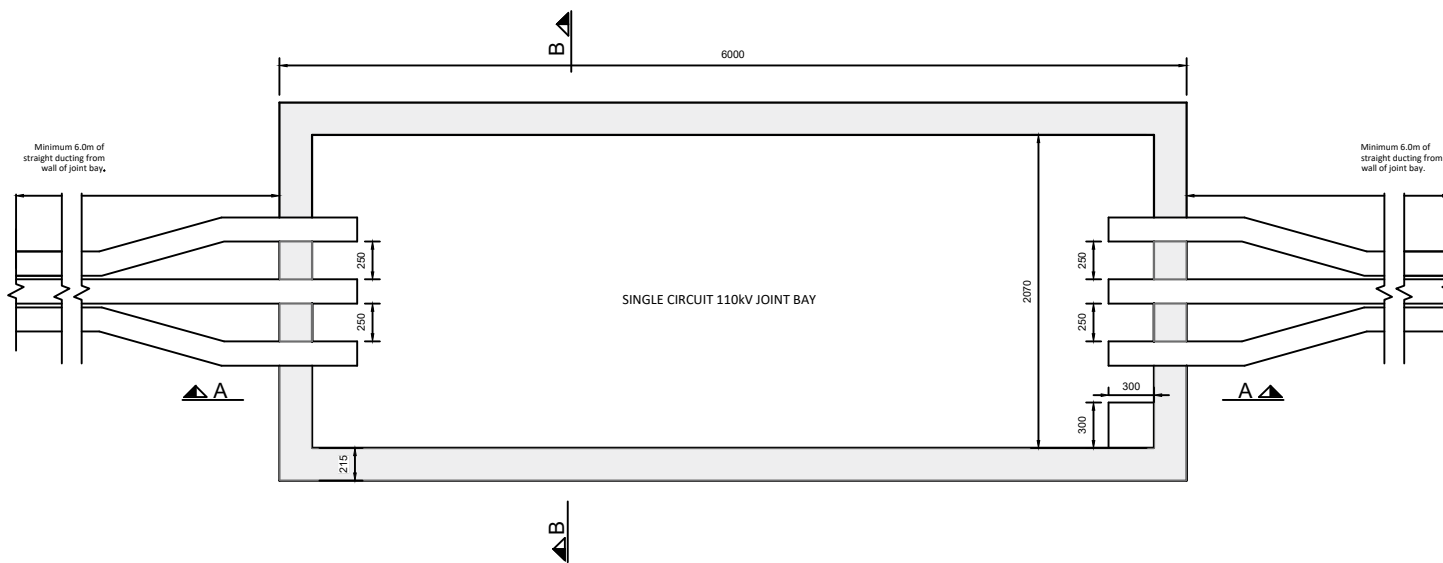
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Umma More

Drawing:

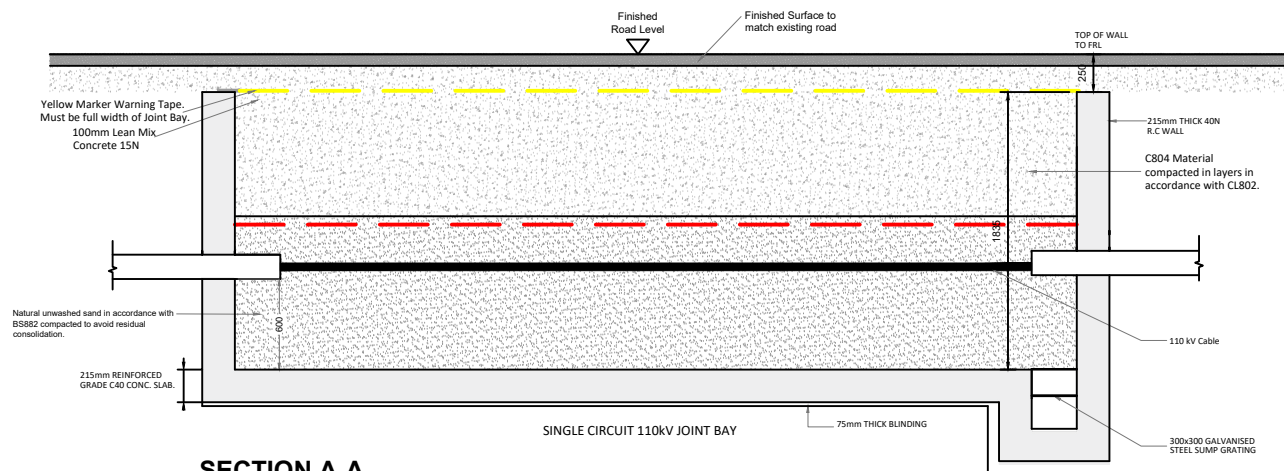
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Drawn By:	Checked By:	Drawing No.
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Scale:	As Shown @ A3	



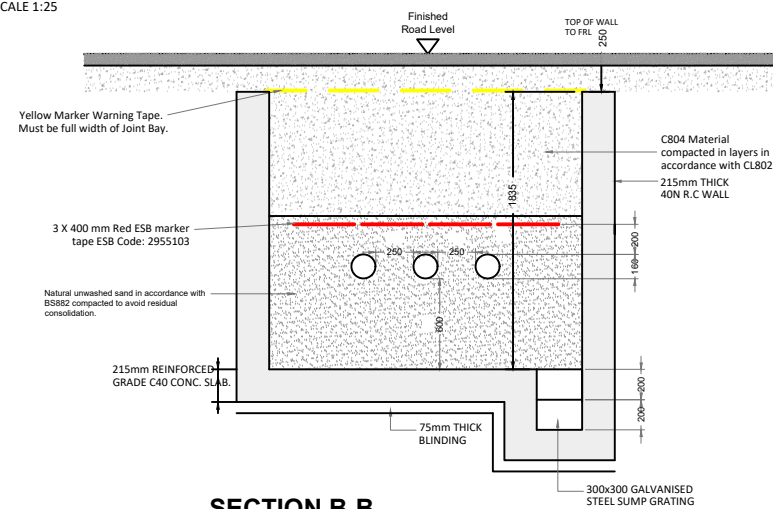
110kV JOINT BAY DETAIL

SCALE 1:25



SECTION A-A

SCALE 1:25



SECTION B-B

SCALE 1:25

Note:
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Project:

Umma More

Drawing:

110kV Joint Bay Detail

Drawn By:

MJM

Checked By:

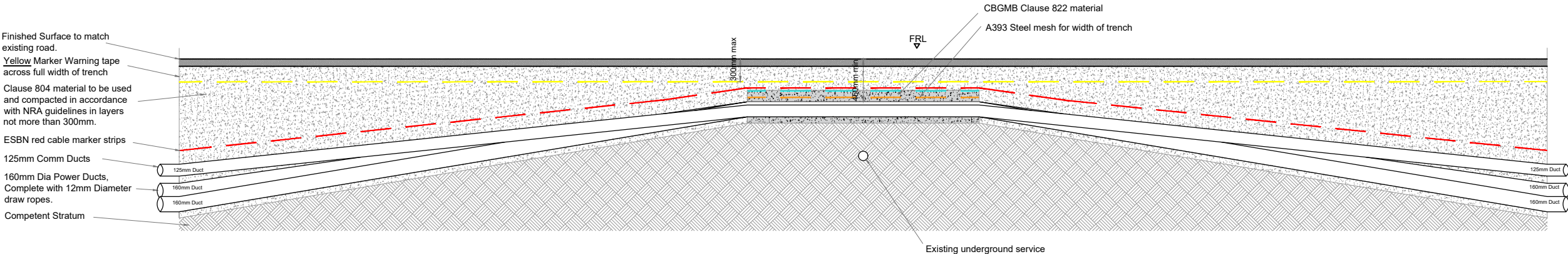
T.Sca

Drawing No.

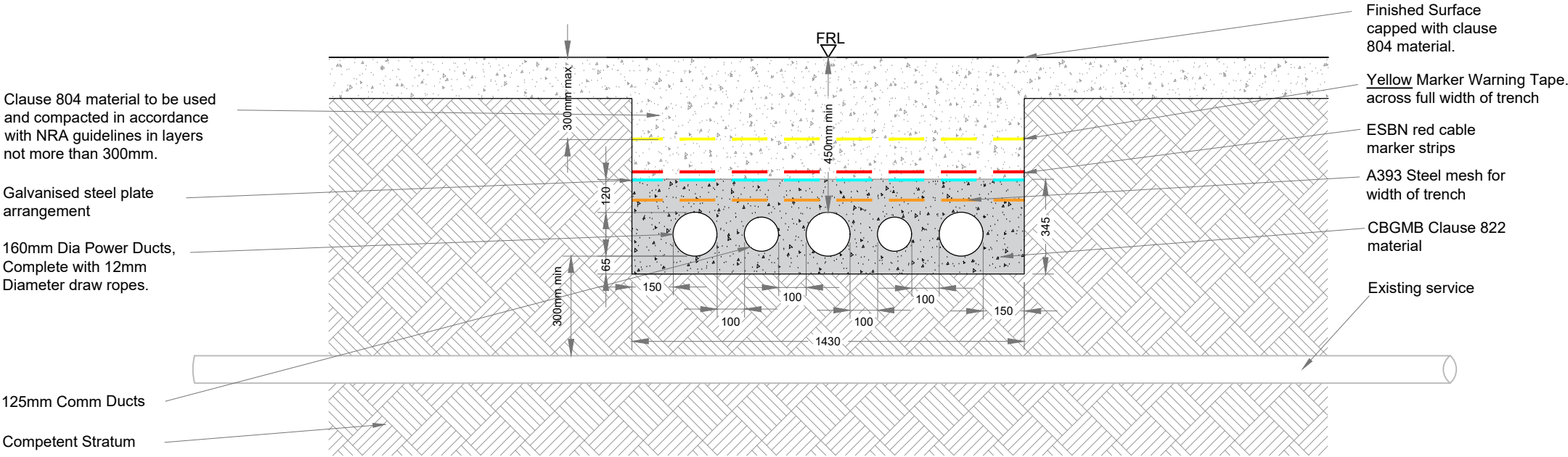
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Scale:

As Shown @ A3



Option C - Flat bed over existing service - 110kV
SCALE 1:50



Option C - Flat bed over existing service - 110kV
SCALE 1:20

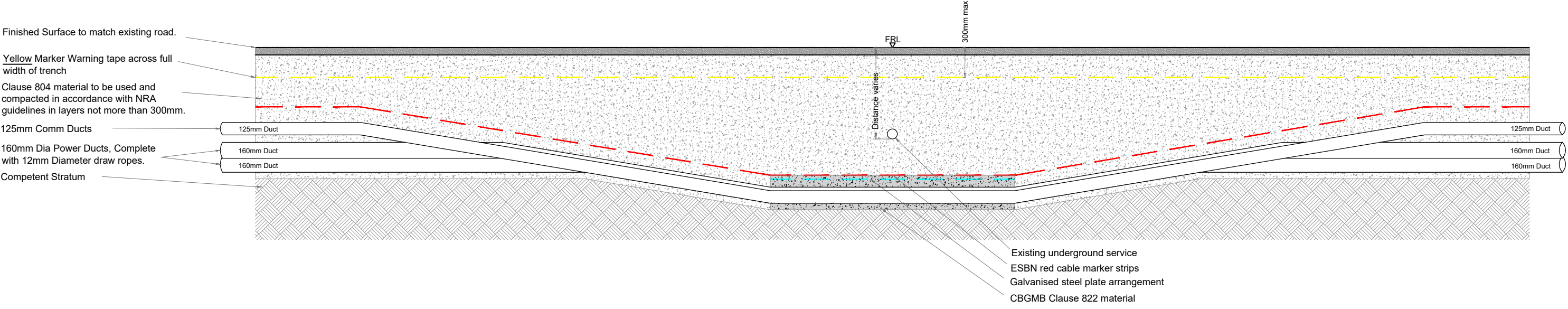
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ALL DIMENSIONS TO BE CHECKED ON SITE AND ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER. FIGURED DIMENSIONS ONLY TO BE USED. DRAWINGS NOT TO BE SCALED.



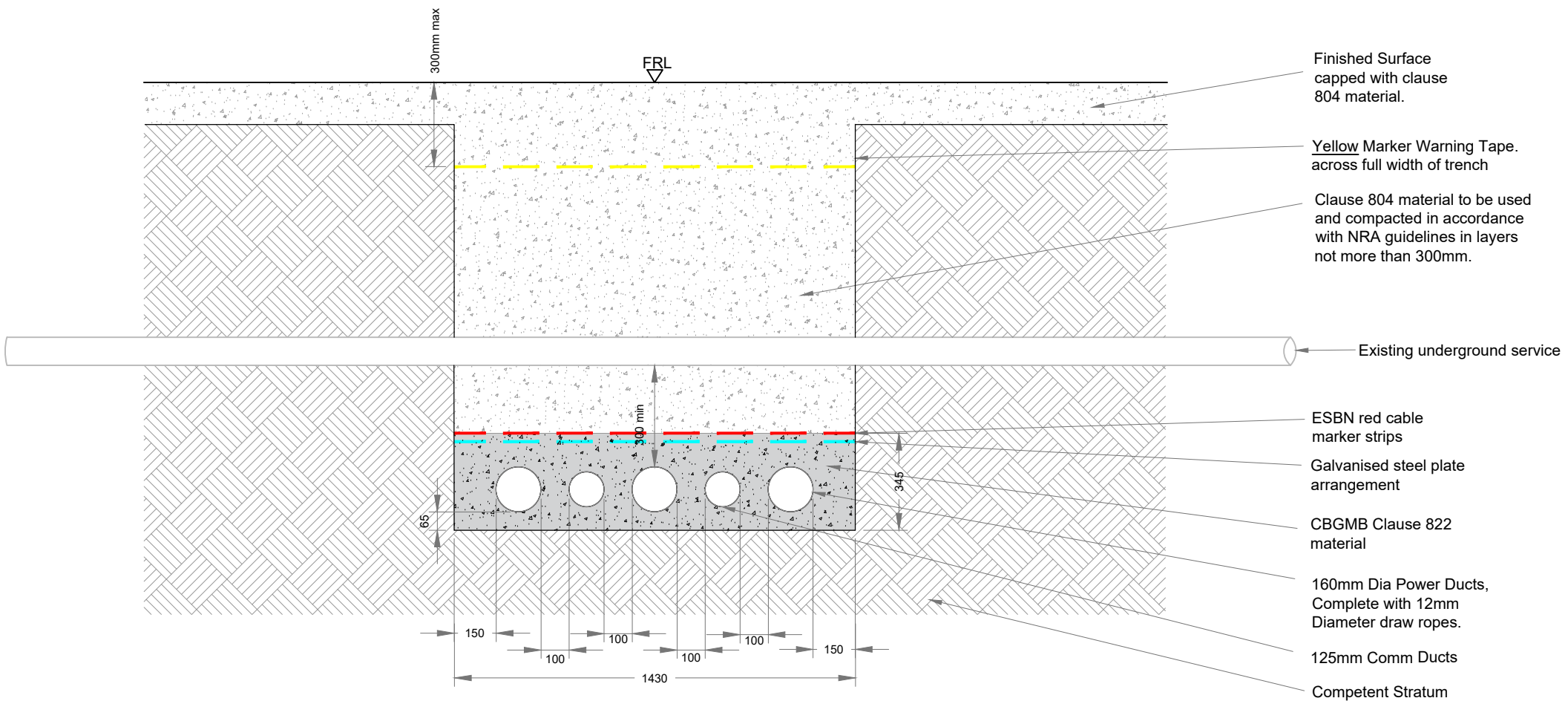
Project:
Umma More

Drawing:
Flat Bed Over - Existing Service

Drawn By: MJM	Checked By: T.Sca	Drawing No. 0099 - 01 - E - 002 - R001
Scale: As Shown @ A3		



Option B - Flat bed under existing service - 110kV
SCALE 1:40



Option B - Flat bed under existing service - 110kV
SCALE 1:20

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Project:
Umma More

Drawing:
Flat Bed Under - Existing Service

Drawn By: MJM	Checked By: T.Sca	Drawing No. 0099 - 01 - E - 001 - R001
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1.

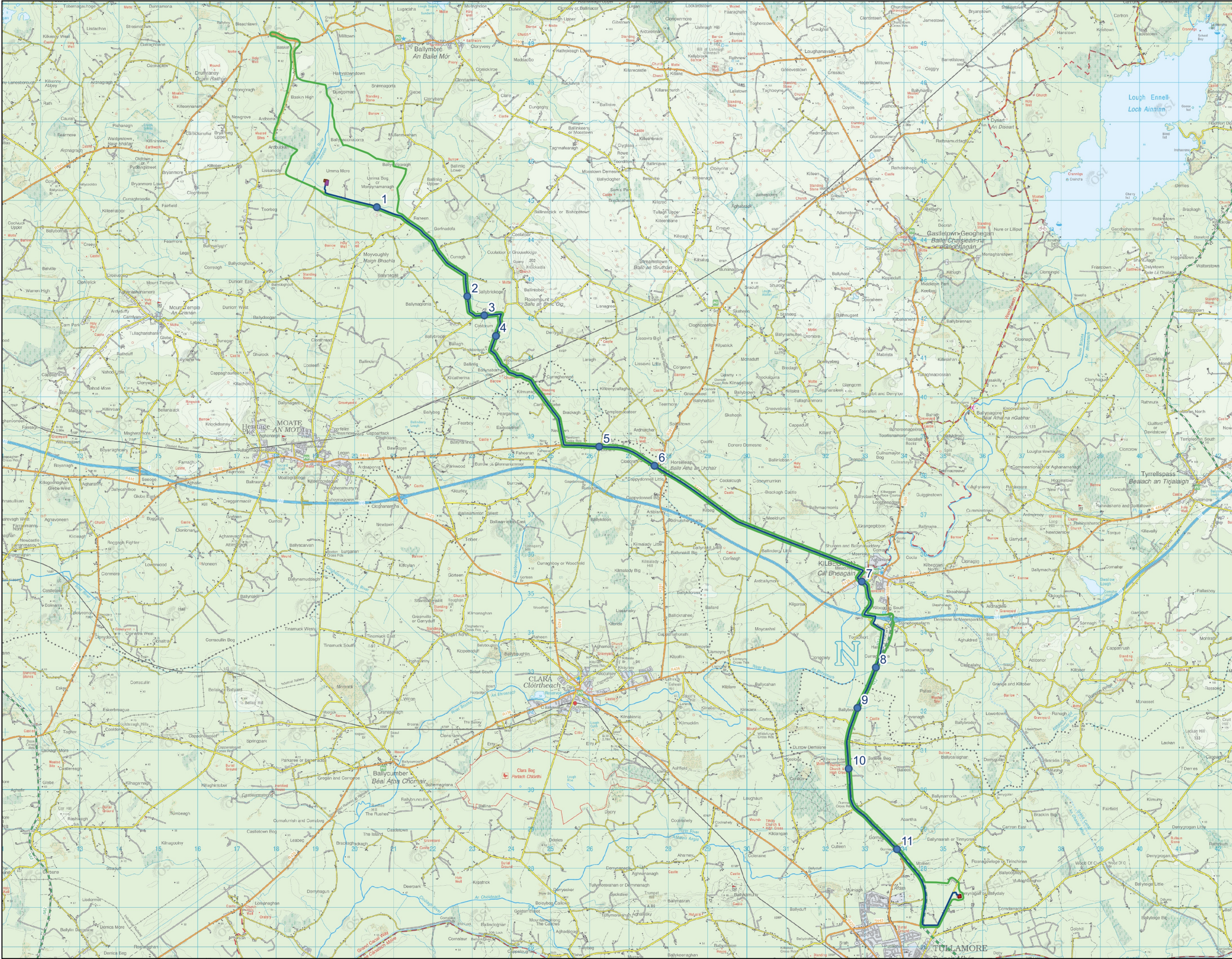
WATERCOURSE CROSSINGS METHODOLOGY

Watercourse Crossing Reference No.	Watercourse Type	Width of Channel (m)	Cover from Road Level to Top of Culvert (m)	Crossing Option Description	Watercourse Crossing Option	Extent of In-Channel Works	Site Layout Drawing Reference (included as Appendix 4-5)
1	Stone Culvert	-	0.6	Where cable ducts are to be installed over an existing culvert and sufficient cover cannot be achieved, the ducts will be laid in a much shallower trench, the depth of which will be determined by the cover available at the culvert crossing location. The ducts within the shallow formation trench will be encased in 6mm thick steel galvanized plates and backfilled with 35N concrete.	Option C	None. No in-stream works required.	Appendix 4-5: Figure 1
2	Concrete Bridge	-	0.4	Where sufficient depth is not available over or under the crossing for a trench arrangement, the laying of cable ducts to be completed using directional drilling. This crossing methodology will ensure that no contact will be made with the watercourse during the works.	Option D	None. No in-stream works required.	Appendix 4-5: Figure 2
3	Stone Arch Bridge	-	0.4	Where sufficient depth is not available over or under the crossing for a trench arrangement, the laying of cable ducts to be completed using directional drilling. This crossing methodology will ensure that	Option D	None. No in-stream works required.	Appendix 4-5: Figure 3

Watercourse Crossing Reference No.	Watercourse Type	Width of Channel (m)	Cover from Road Level to Top of Culvert (m)	Crossing Option Description	Watercourse Crossing Option	Extent of In-Channel Works	Site Layout Drawing Reference (included as Appendix 4-5)
				no contact will be made with the watercourse during the works.			
4	Stone Arch Bridge	-	0.4	Where sufficient depth is not available over or under the crossing for a trench arrangement, the laying of cable ducts to be completed using directional drilling. This crossing methodology will ensure that no contact will be made with the watercourse during the works.	Option D	None. No in-stream works required.	Appendix 4-5: Figure 4
5	Concrete Bridge	-	0.4	Where sufficient depth is not available over or under the crossing for a trench arrangement, the laying of cable ducts to be completed using directional drilling. This crossing methodology will ensure that no contact will be made with the watercourse during the works.	Option D	None. No in-stream works required.	Appendix 4-5: Figure 5
6	Stone Arch Bridge	-	1.2	Where cable ducts are to be installed over an existing culvert and sufficient cover cannot be achieved, the ducts will be laid in a much shallower trench, the depth of which will be determined by the cover available at the culvert crossing location. The ducts within the shallow formation trench will be encased in 6mm thick steel galvanized plates and backfilled with 35N concrete.	Option C	None. No in-stream works required.	Appendix 4-5: Figure 6
7	Open channel	3.9	-	Where sufficient depth is not available over or under the crossing for a trench arrangement, the laying of cable ducts to be completed using directional drilling. This crossing methodology will ensure that	Option D	None. No in-stream works required.	Appendix 4-5: Figure 7

Watercourse Crossing Reference No.	Watercourse Type	Width of Channel (m)	Cover from Road Level to Top of Culvert (m)	Crossing Option Description	Watercourse Crossing Option	Extent of In-Channel Works	Site Layout Drawing Reference (included as Appendix 4-5)
				no contact will be made with the watercourse during the works.			
8	1500 mm Concrete Pipe	-	0.9	Where cable ducts are to be installed over an existing culvert and sufficient cover cannot be achieved, the ducts will be laid in a much shallower trench, the depth of which will be determined by the cover available at the culvert crossing location. The ducts within the shallow formation trench will be encased in 6mm thick steel galvanized plates and backfilled with 35N concrete.	Option C	None. No in-stream works required.	Appendix 4-5: Figure 8
9	600mm Concrete Pipe	-	0.9	Where cable ducts are to be installed over an existing culvert and sufficient cover cannot be achieved, the ducts will be laid in a much shallower trench, the depth of which will be determined by the cover available at the culvert crossing location. The ducts within the shallow formation trench will be encased in 6mm thick steel galvanized plates and backfilled with 35N concrete.	Option C	None. No in-stream works required.	Appendix 4-5: Figure 9
10	1200mm Concrete Pipe	-	1.6	Where adequate cover exists above a culvert, the standard aforementioned trench arrangement will be used where the cable ducts pass over a culvert without any contact with the existing culvert or watercourse.	Option A	None. No in-stream works required.	Appendix 4-5: Figure 10
11	Box Culvert Bridge	-	1	Where sufficient depth is not available over or under the crossing for a trench arrangement, the laying of cable ducts to	Option D	None. No in-stream works required.	Appendix 4-5: Figure 11

Watercourse Crossing Reference No.	Watercourse Type	Width of Channel (m)	Cover from Road Level to Top of Culvert (m)	Crossing Option Description	Watercourse Crossing Option	Extent of In-Channel Works	Site Layout Drawing Reference (included as Appendix 4-5)
				be completed using directional drilling. This crossing methodology will ensure that no contact will be made with the watercourse during the works.			



Map Legend

- EIAR Site Boundary
- Watercourse Crossings

Proposed Grid Development

- Grid Connection
- Onsite Substation
- Temporary Construction Compound
- Thornsberry 110kV Substation



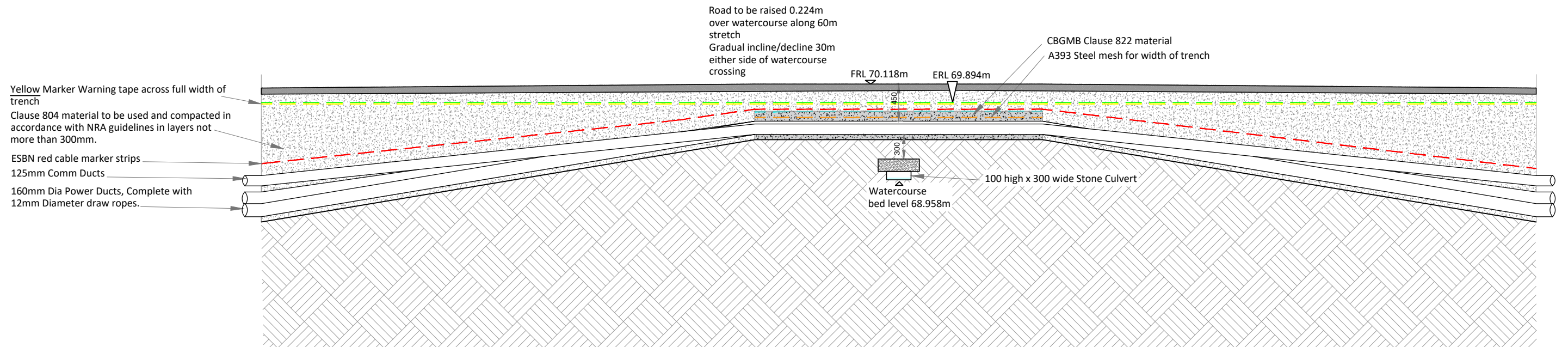
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Project Title
Umma More Renewable Energy Development

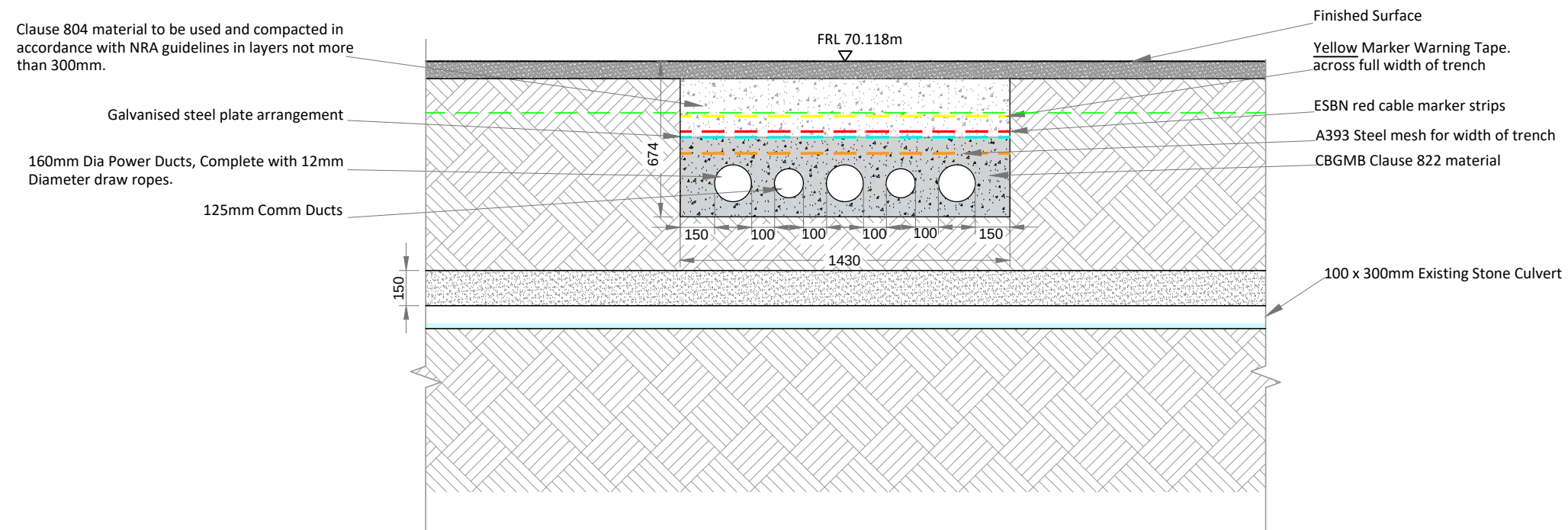
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Project No. 201050	Drawing No. Figure 4-29
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Section A-A
SCALE 1:50



Section B-B
SCALE 1:25

Note:
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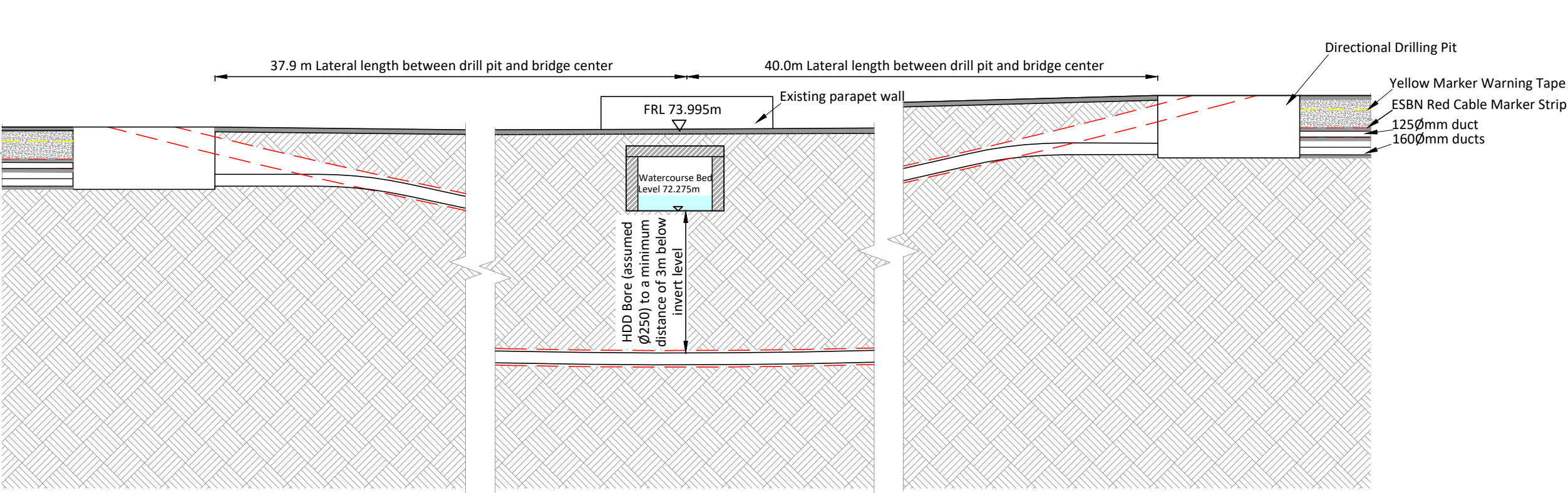
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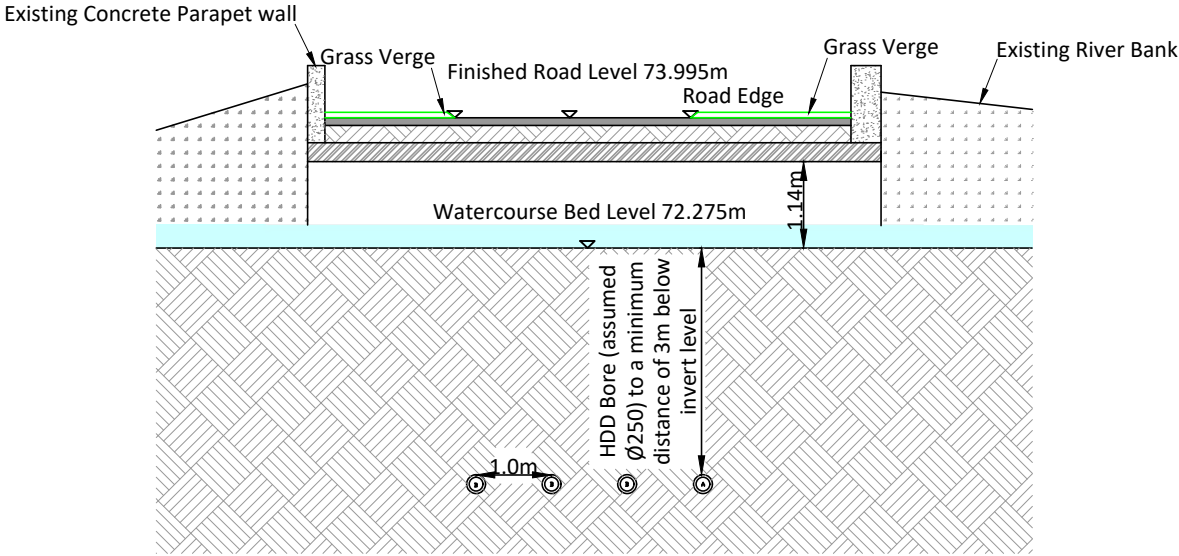
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Figure 1: WC Crossing 1 - Flat Bed Over & Raise Road

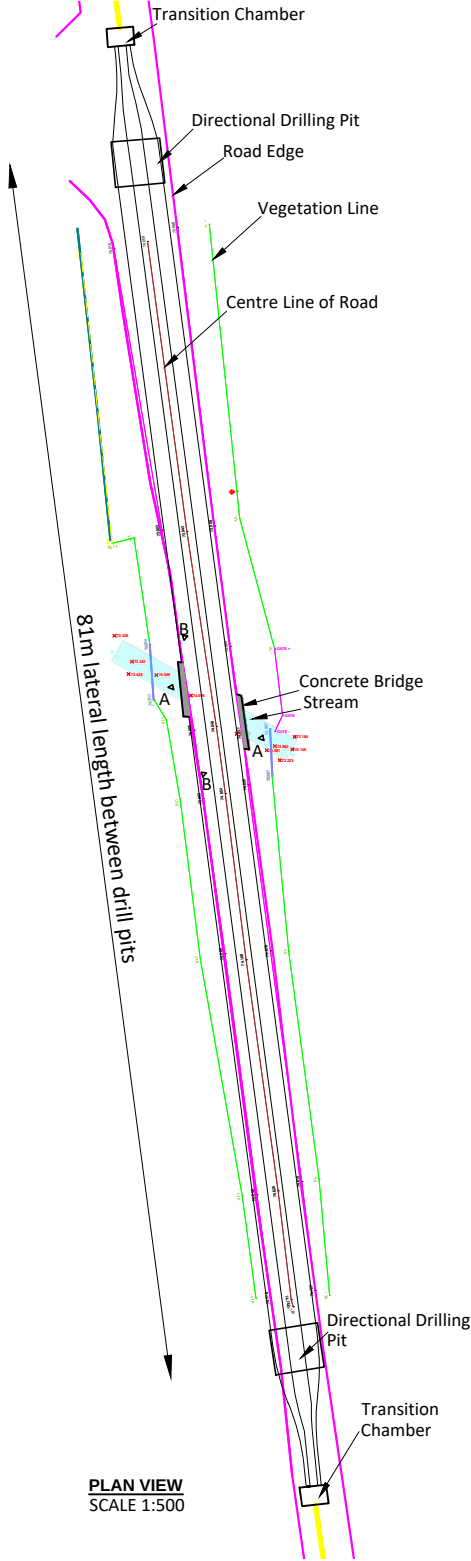
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Section B-B
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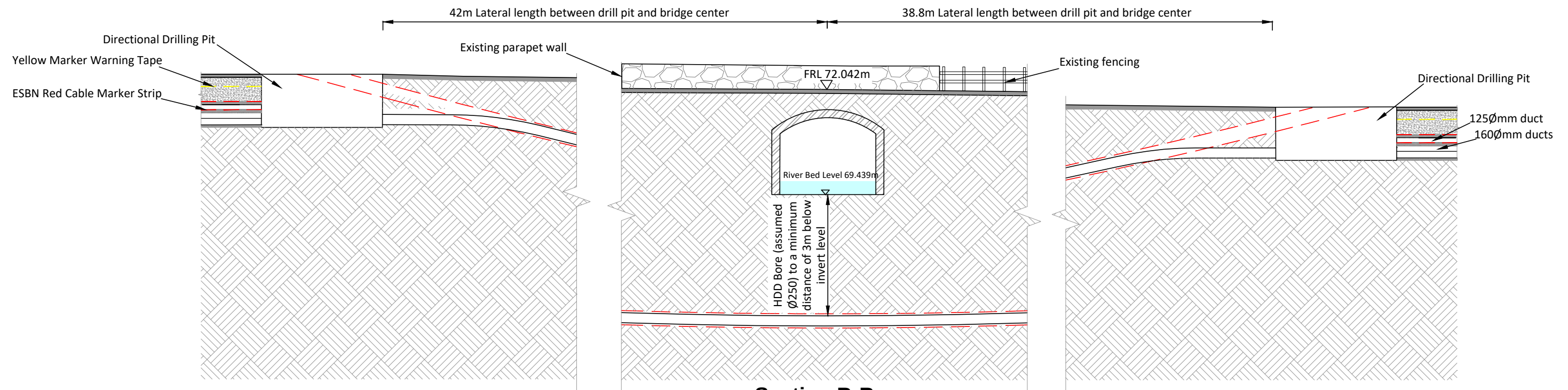
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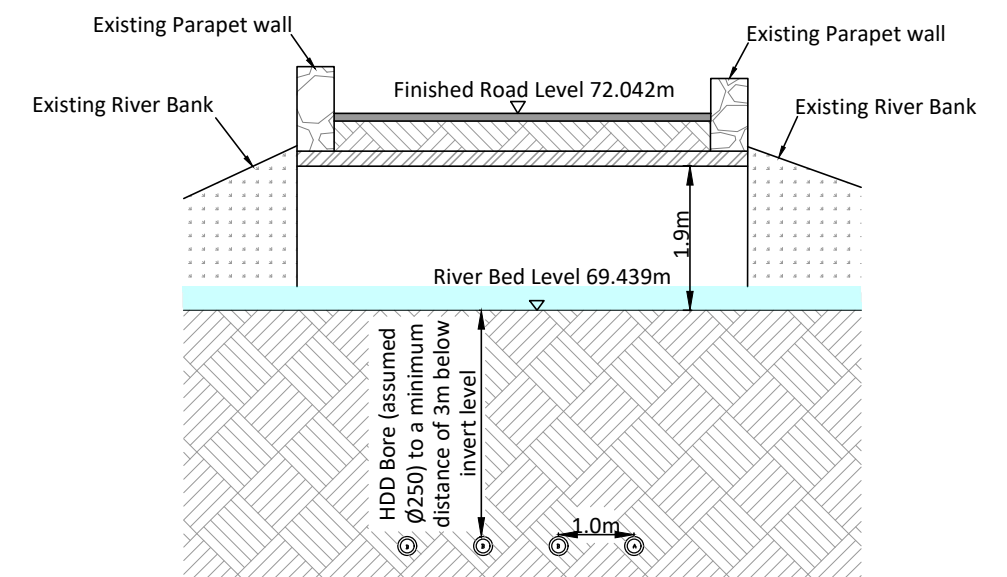
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Drawing: Figure 2: WC Crossing 2 - HDD - 81m		
Drawn By: MJM	Checked By: T.Sca	Drawing No. 0099 - 03 - I - 002A - R001
Scale: As Shown @ A3		



Section B-B
SCALE 1:100



Section A-A
SCALE 1:100

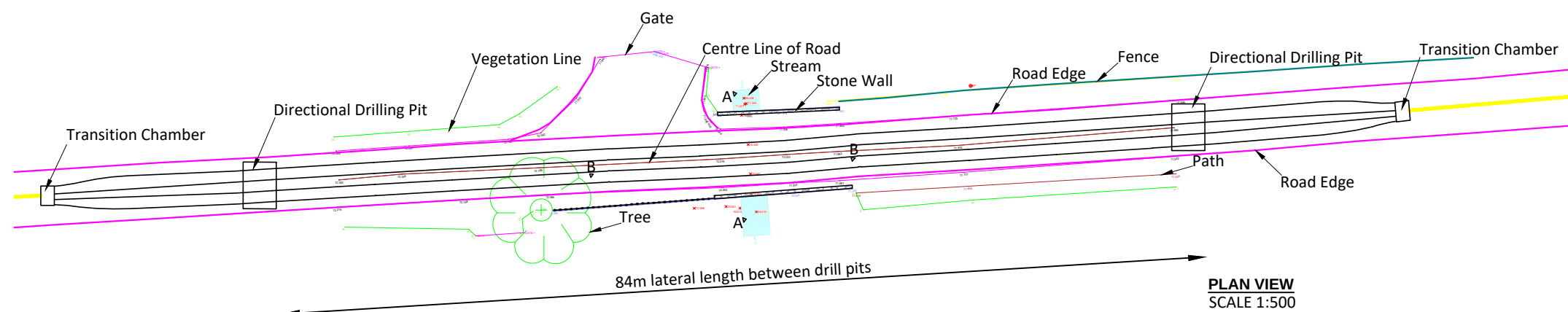
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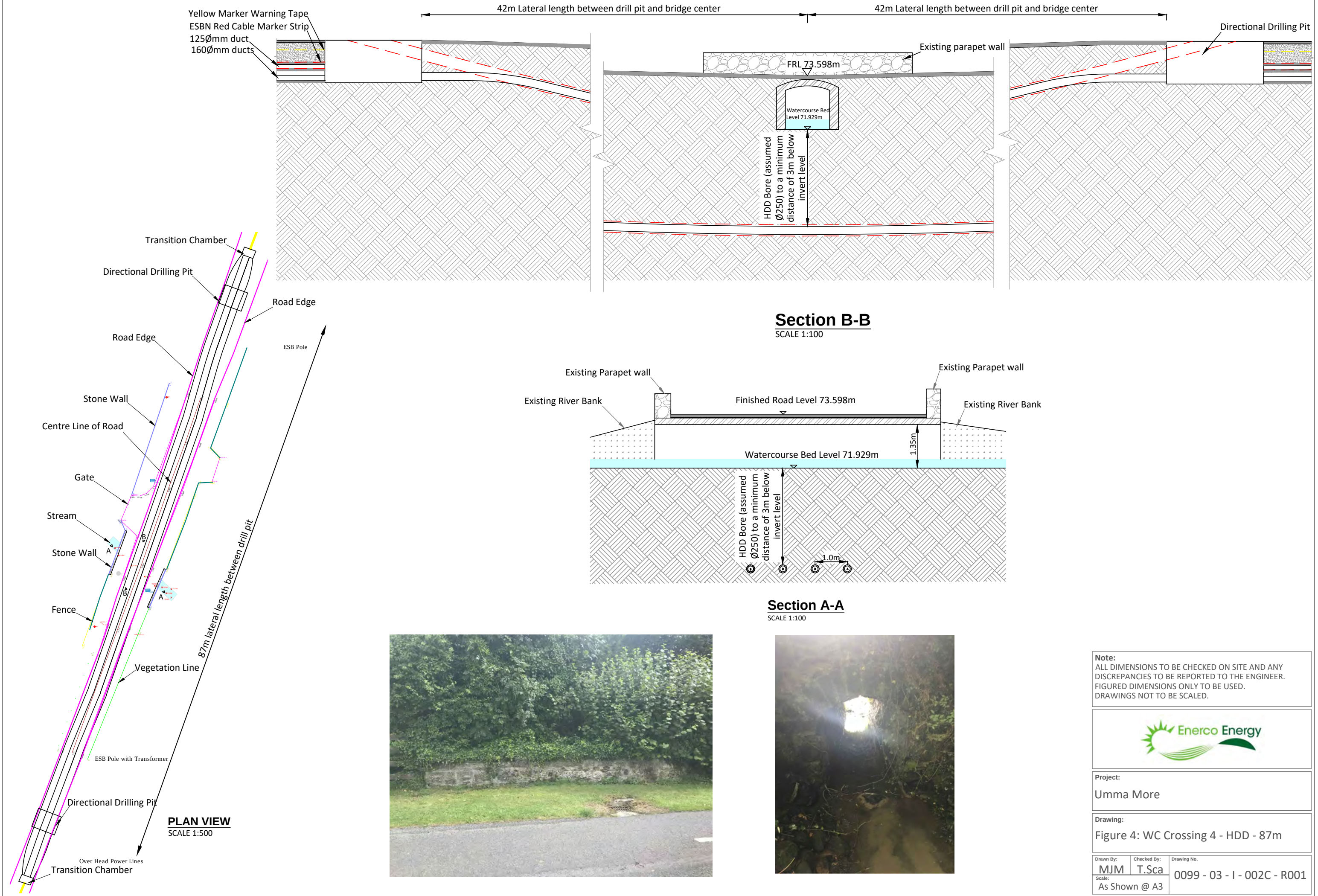
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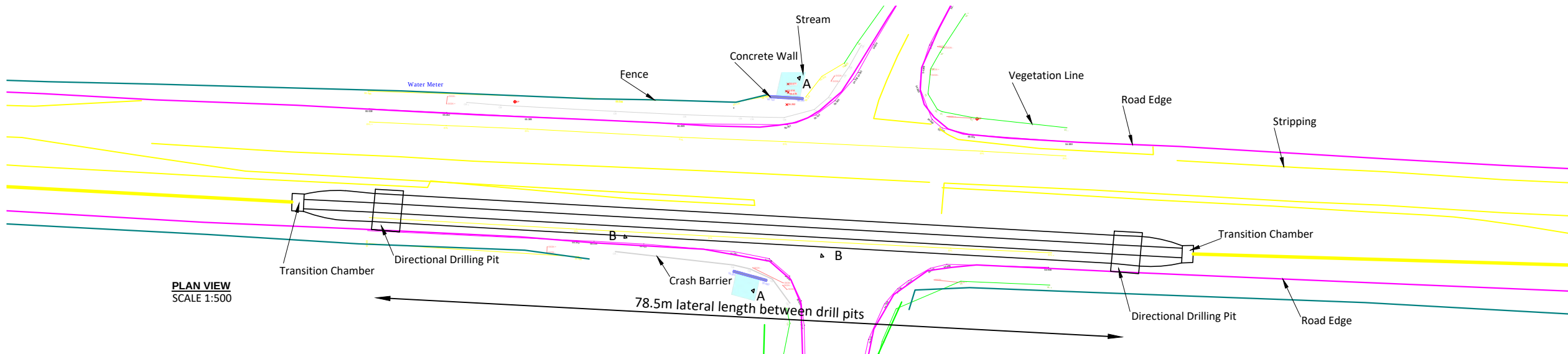
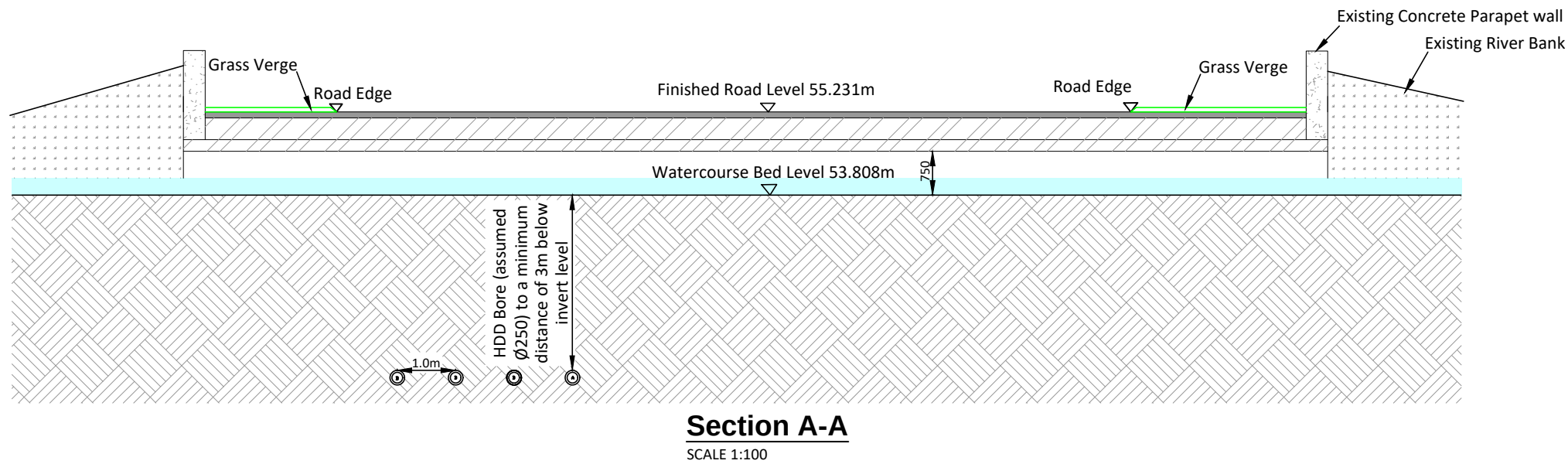
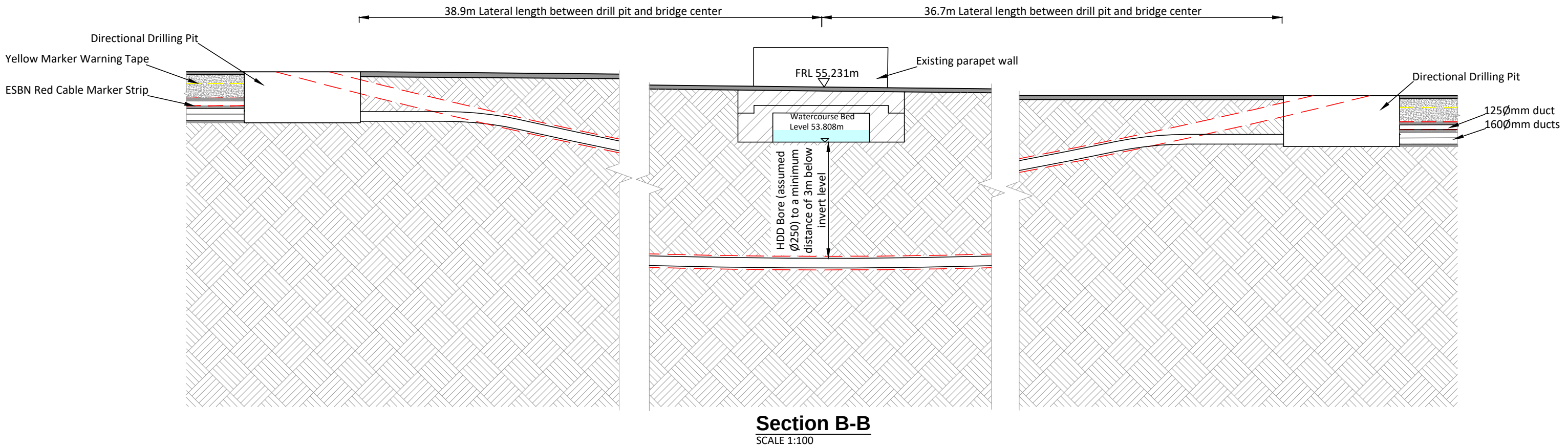
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Figure 3: WC Crossing 3 - HDD - 84m

Drawn By: MJM	Checked By: T.Sca	Drawing No. 0099 - 03 - I - 002B - R001
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PLAN VIEW
SCALE 1:500

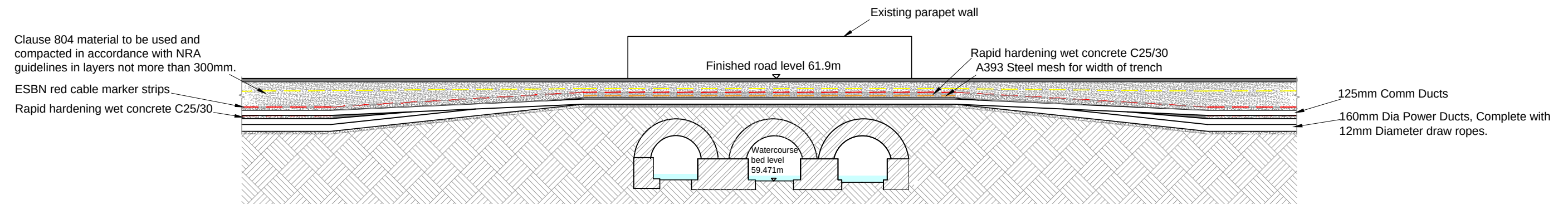




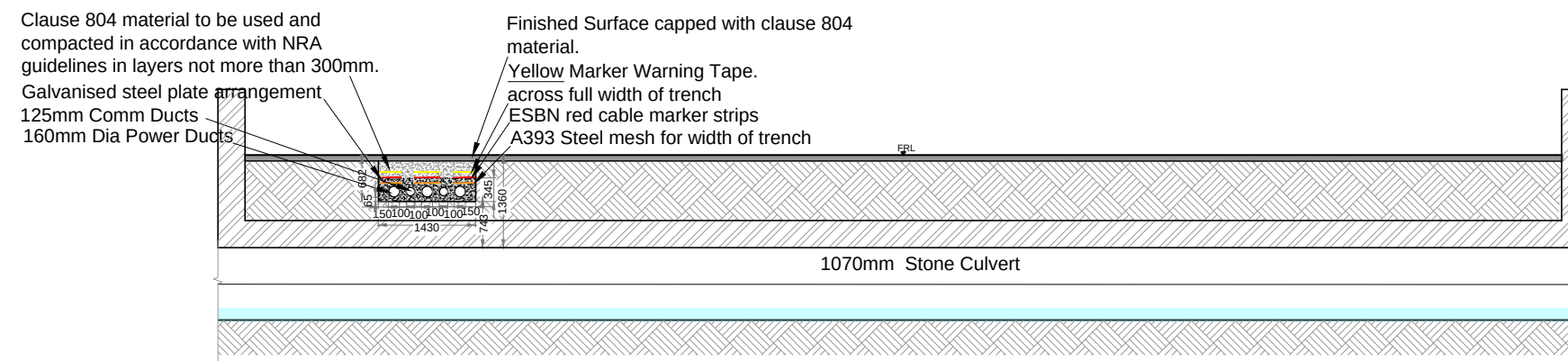
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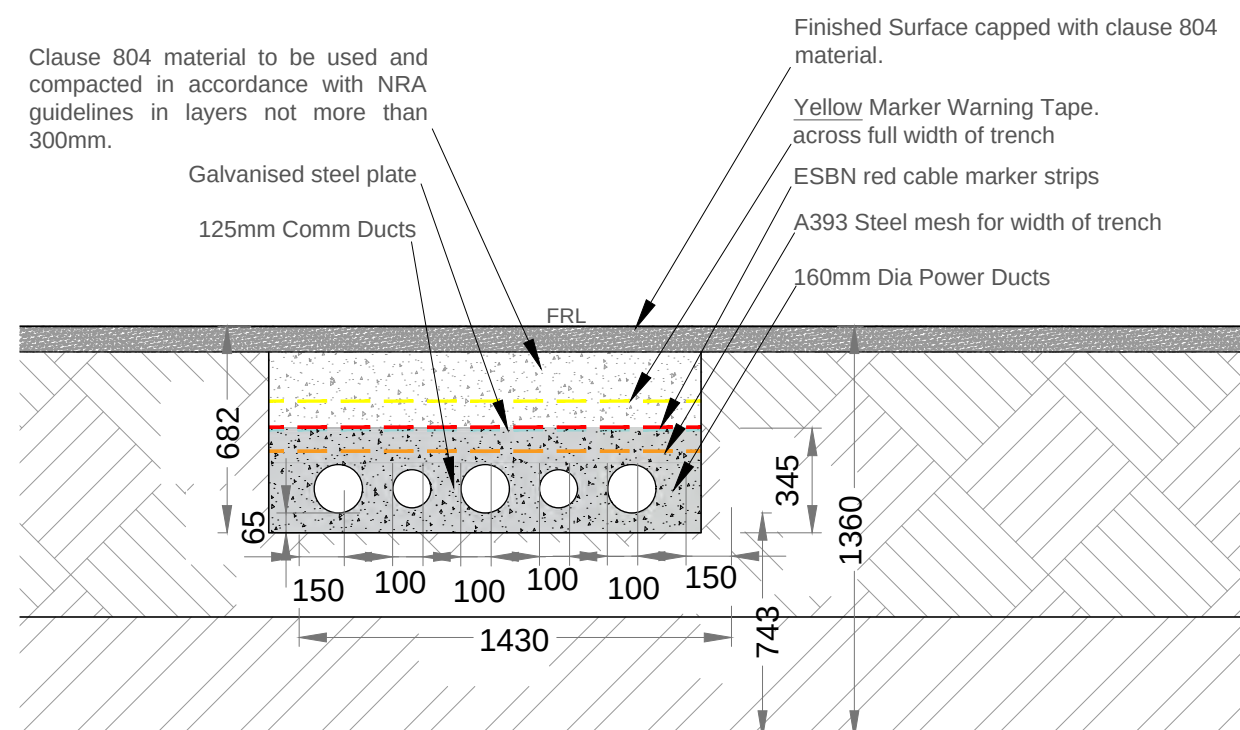
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Drawing: Figure 5: WC Crossing 5 - HDD - 78.5m		
Drawn By: MJM	Checked By: T.Sca	Drawing No. 0099 - 03 - I - 002D - R001
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Section A-A
SCALE 1:100



Section B-B
SCALE 1:100



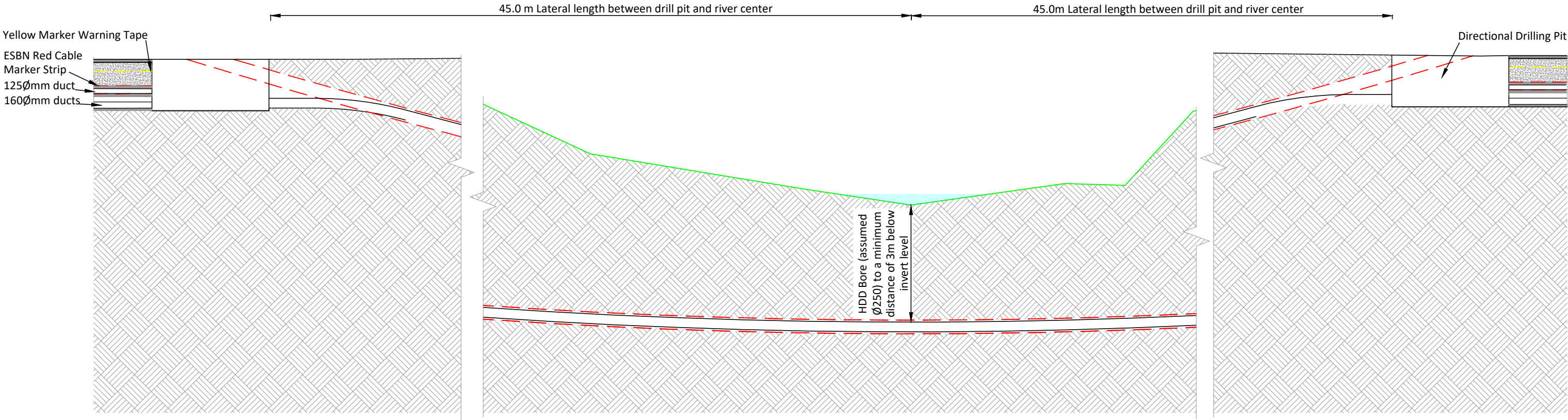
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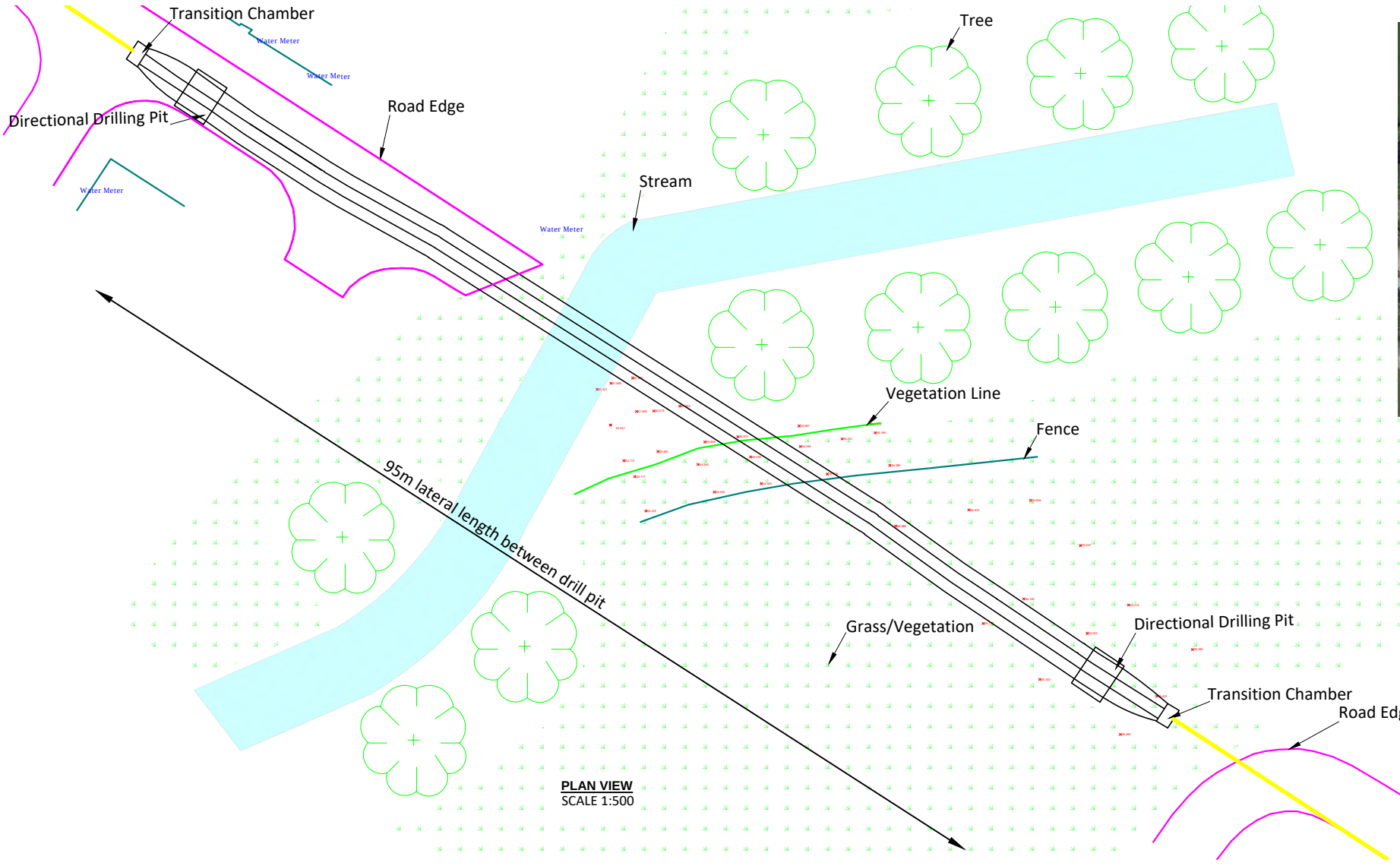
Project:
Umma More

Drawing:
Figure 6: WC Crossing 6 - Flat Bed Over

Drawn By: MJM	Checked By: T.Sca	Drawing No. 0099 - 03 - I - 002G - R001
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Section B-B
SCALE 1:100



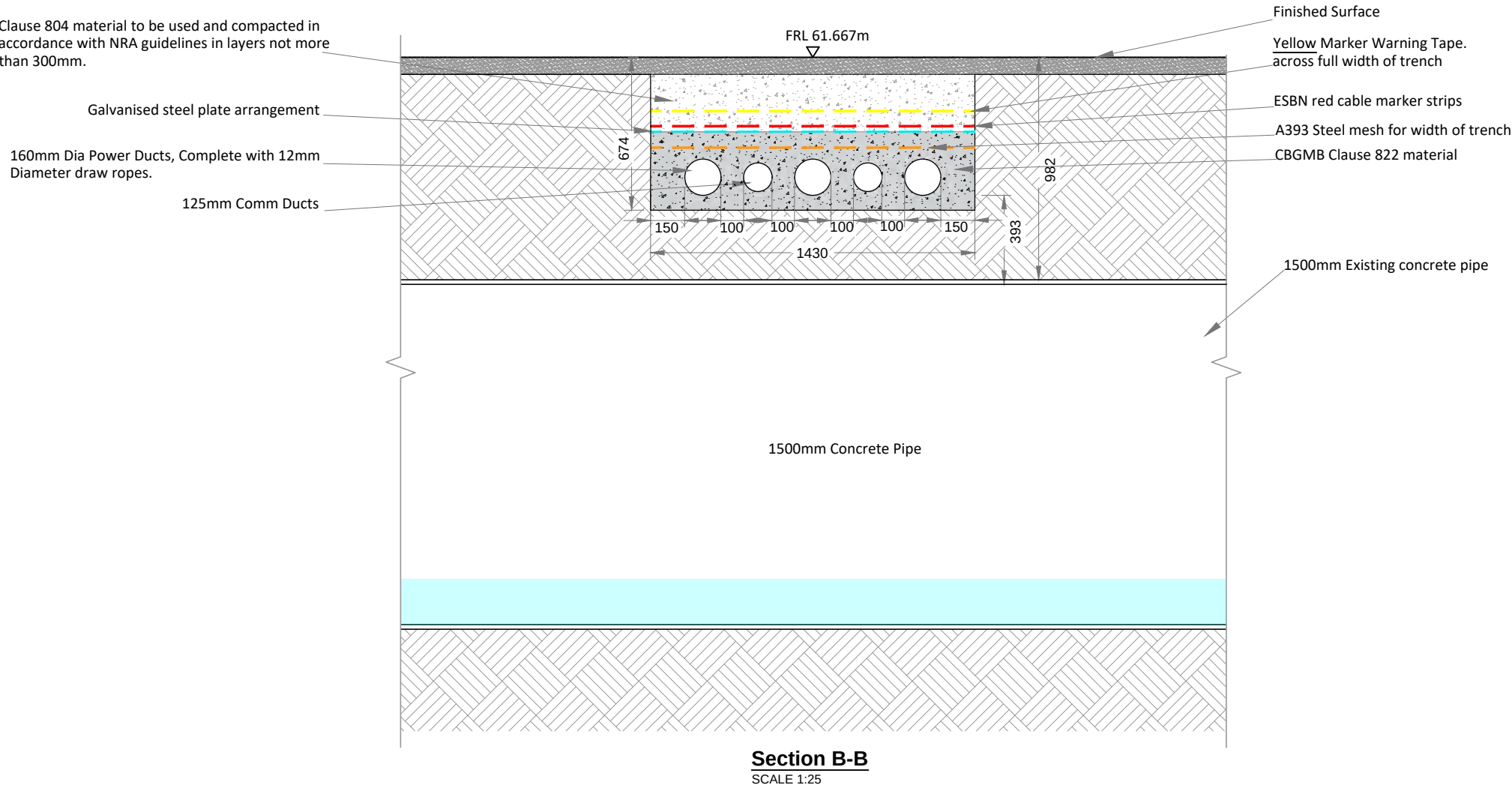
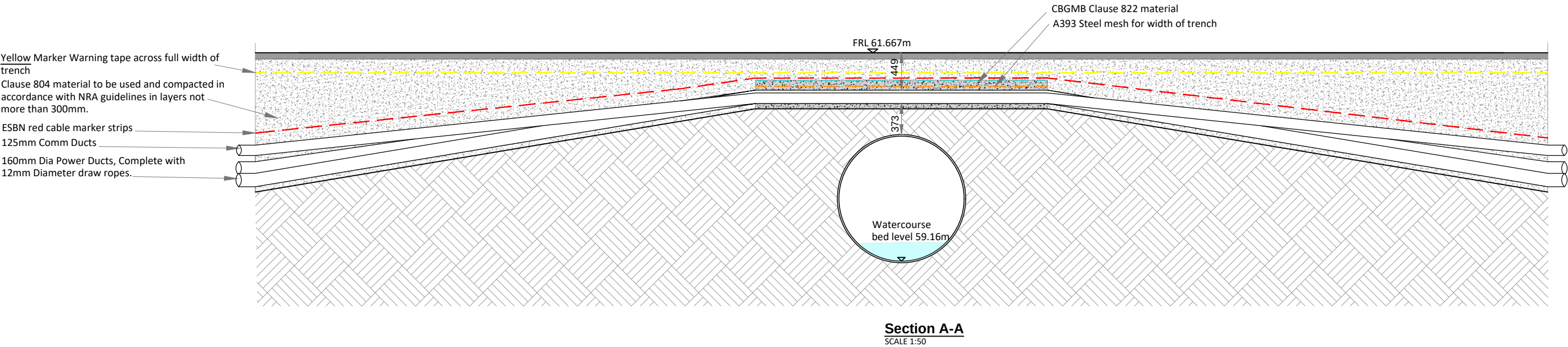
Note:
ALL DIMENSIONS TO BE CHECKED ON SITE AND ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER. FIGURED DIMENSIONS ONLY TO BE USED. DRAWINGS NOT TO BE SCALED.



Project:
Umma More

Drawing:
Figure 7: WC Crossing 7 - HDD - 93m

Drawn By: MJM	Checked By: T.Sca	Drawing No. 0099 - 03 - I - 002E - R001
Scale: As Shown @ A3		



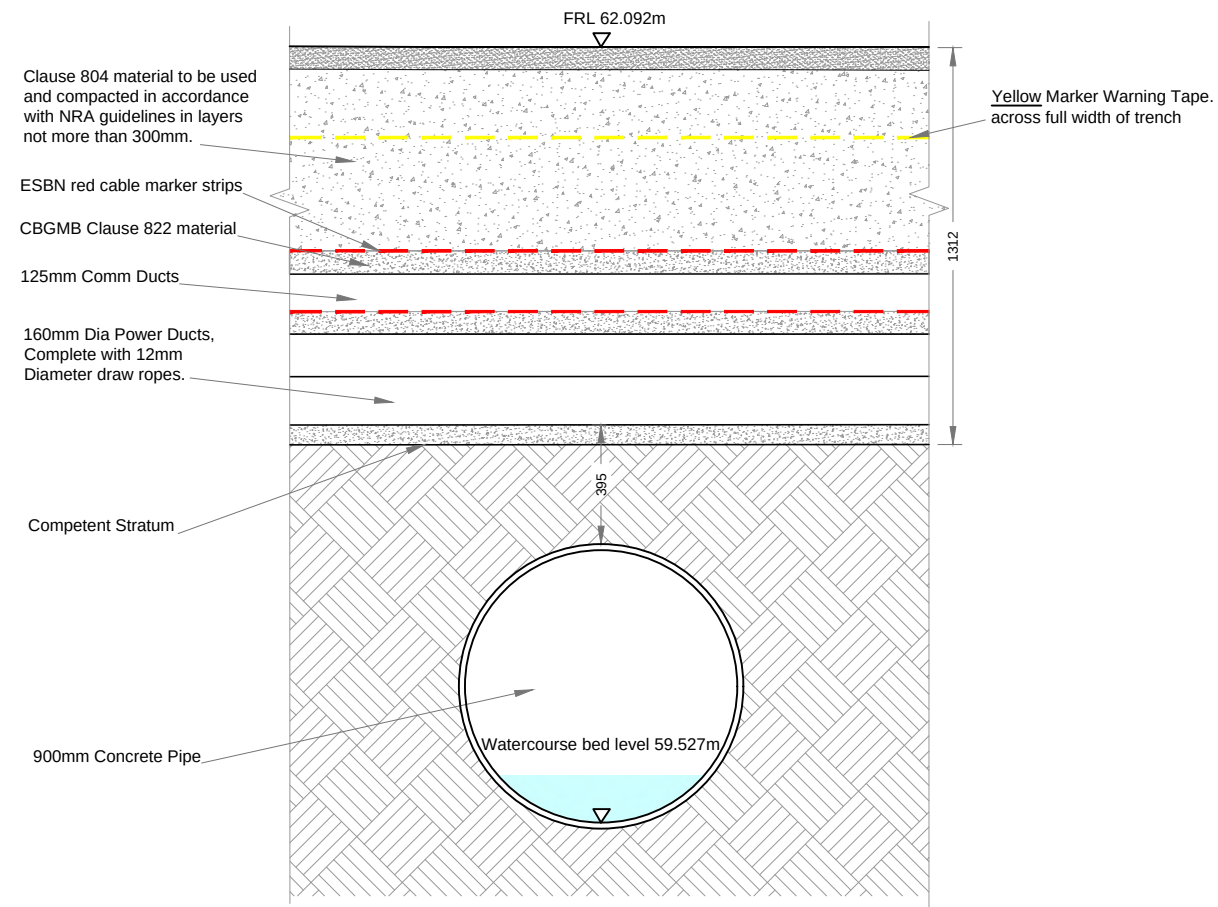
Note:
ALL DIMENSIONS TO BE CHECKED ON SITE AND ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER. FIGURED DIMENSIONS ONLY TO BE USED. DRAWINGS NOT TO BE SCALED.



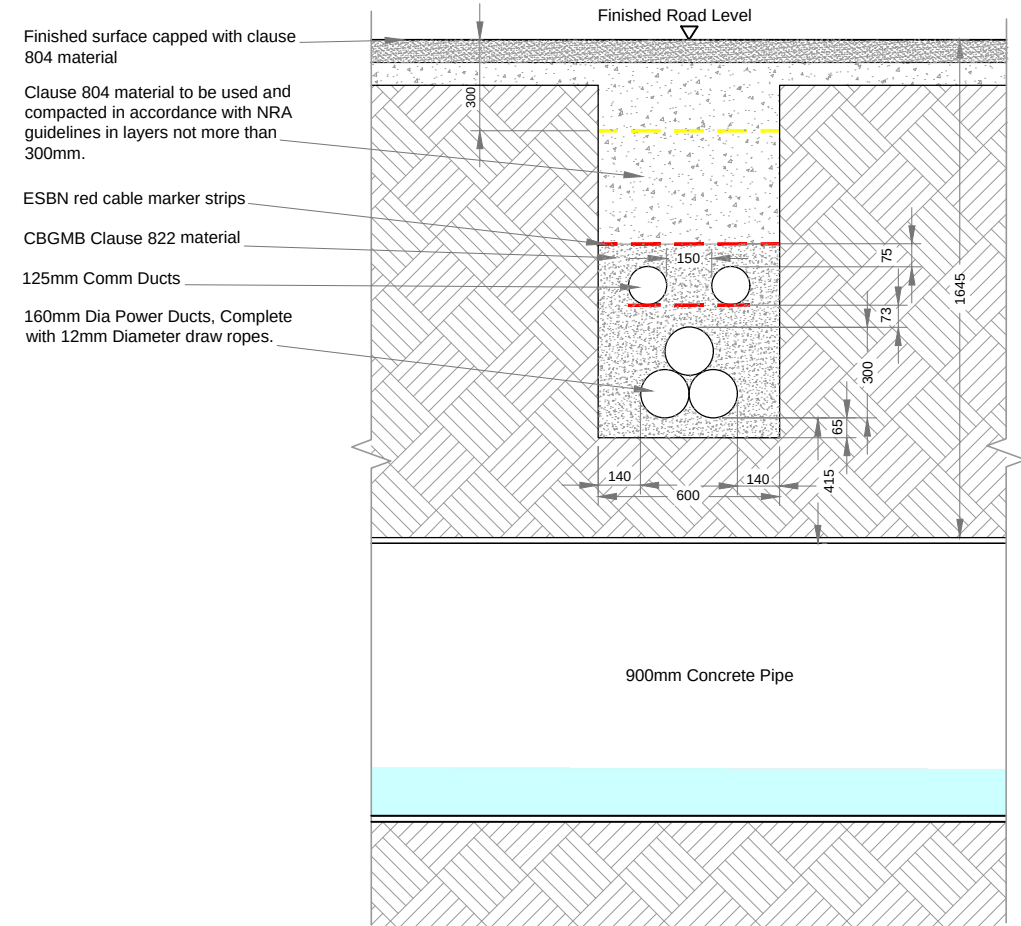
Project:
Umma More

Drawing:
Figure 8: WC Crossing 8 - Flat Bed Over

Drawn By: MJM	Checked By: T.Sca	Drawing No. 0099 - 03 - I - 002H - R001
Scale: As Shown @ A3		



Section A-A
SCALE 1:25



Section B-B
SCALE 1:25

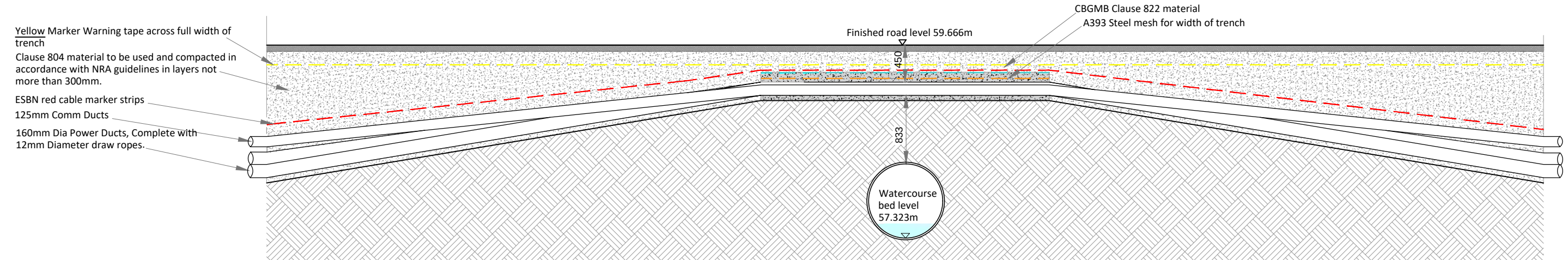
Note:
ALL DIMENSIONS TO BE CHECKED ON SITE AND ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER. FIGURED DIMENSIONS ONLY TO BE USED. DRAWINGS NOT TO BE SCALED.



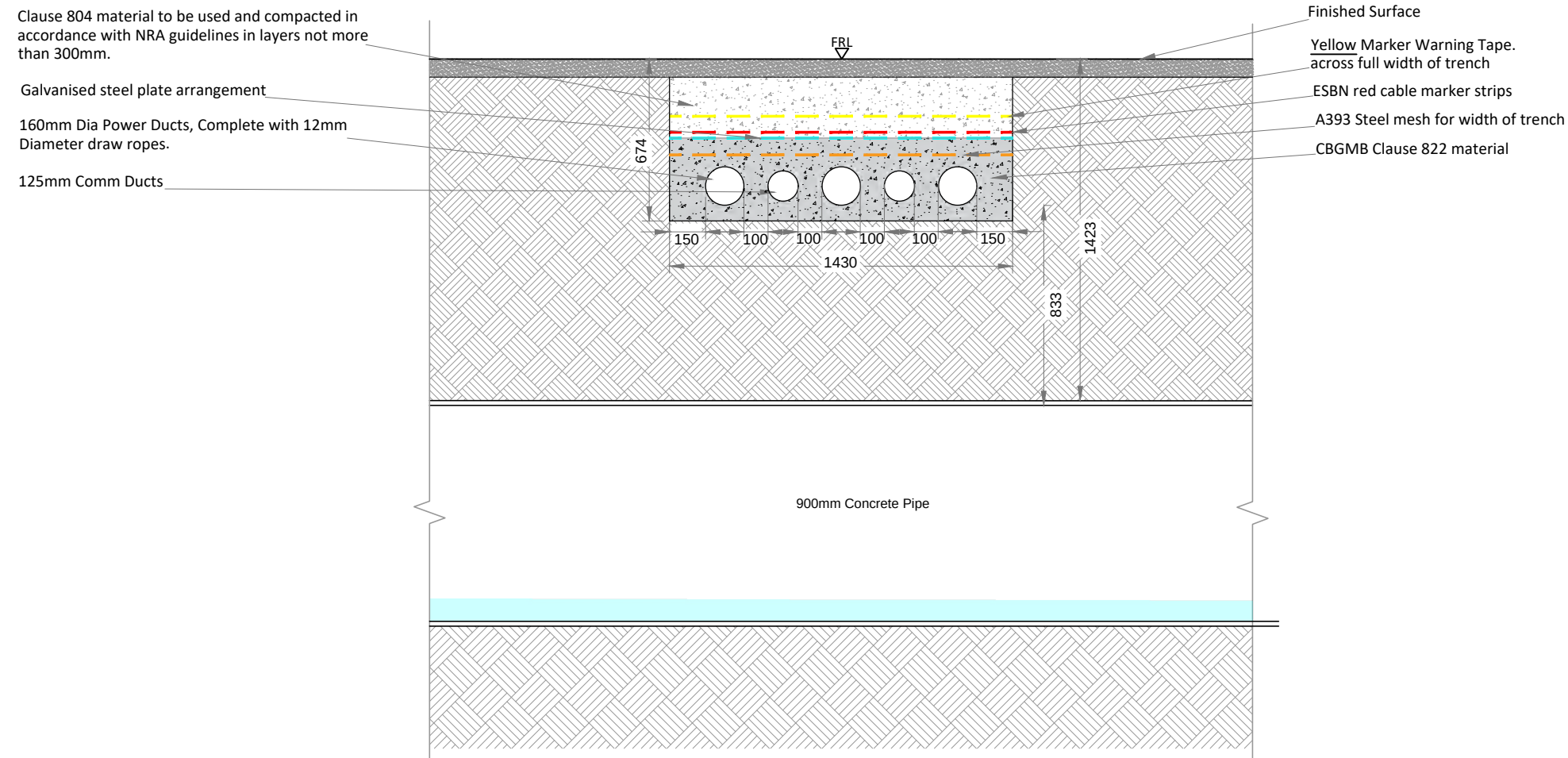
Project:
Umma More

Drawing:
Figure 9: WC Crossing 9 - Standard Trench Detail

Drawn By: MJM	Checked By: T.Sca	Drawing No. 0099 - 03 - I - 002I - R001
Scale: As Shown @ A3		



Section A-A
SCALE 1:50



Section B-B
SCALE 1:25

Note:
ALL DIMENSIONS TO BE CHECKED ON SITE AND ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER. FIGURED DIMENSIONS ONLY TO BE USED. DRAWINGS NOT TO BE SCALED.



Project:

Umma More

Drawing:

Figure 10: WC Crossing 10 - Flat Bed Over

Drawn By:

MJM

Checked By:

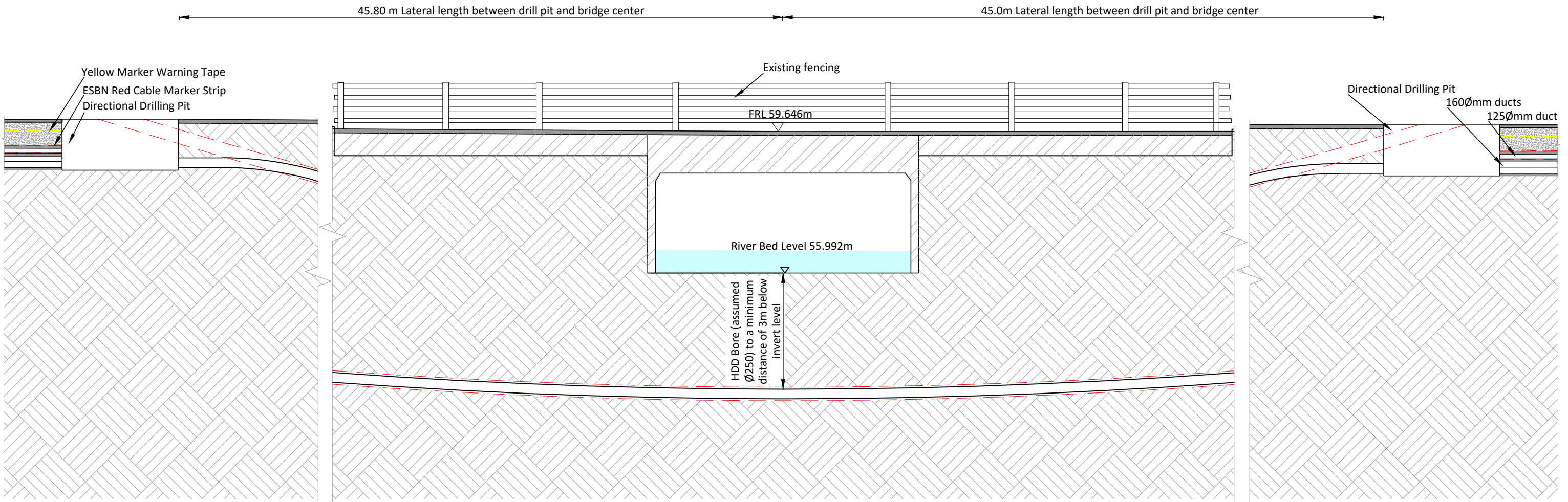
T.Sca

Drawing No.

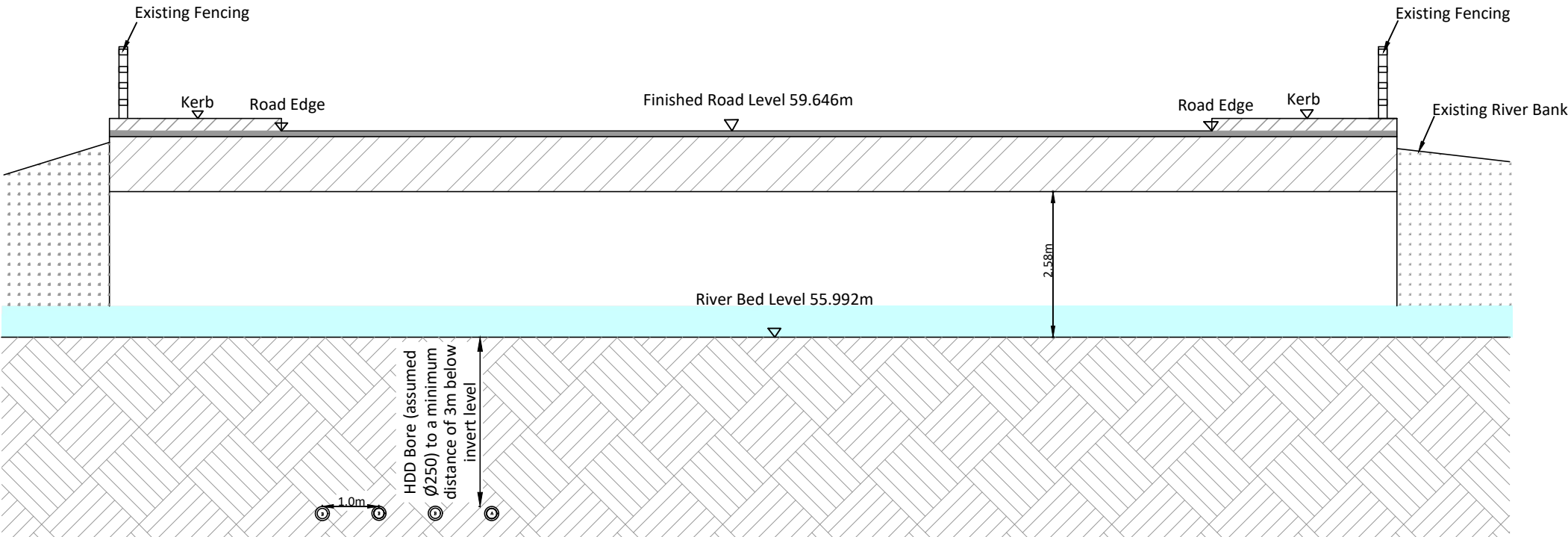
0099 - 03 - I - 002J - R001

Scale:

As Shown @ A3



Section B-B
SCALE 1:100



Section A-A
SCALE 1:100

Note:
ALL DIMENSIONS TO BE CHECKED ON SITE AND ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER. FIGURED DIMENSIONS ONLY TO BE USED. DRAWINGS NOT TO BE SCALED.



Project: Umma More		
Drawing: Figure 11: WC Crossing 11 - HDD - 93.8m		
Drawn By: MJM	Checked By: T.Sca	Drawing No. 0099 - 03 - I - 002F - R001
Scale: As Shown @ A3		



PLAN VIEW
SCALE 1:500

Note:
ALL DIMENSIONS TO BE CHECKED ON SITE AND ANY DISCREPANCIES TO BE REPORTED TO THE ENGINEER. FIGURED DIMENSIONS ONLY TO BE USED. DRAWINGS NOT TO BE SCALED.



Project:
Umma More

Drawing:
Figure 11: WC Crossing 11- Plan

Drawn By: MJM	Checked By: T.Sca	Drawing No. 0099-03-I-002F(1)-R001
Scale: NTS @ A3		



2.

CULVERT AND DRAIN CROSSINGS METHODOLOGY

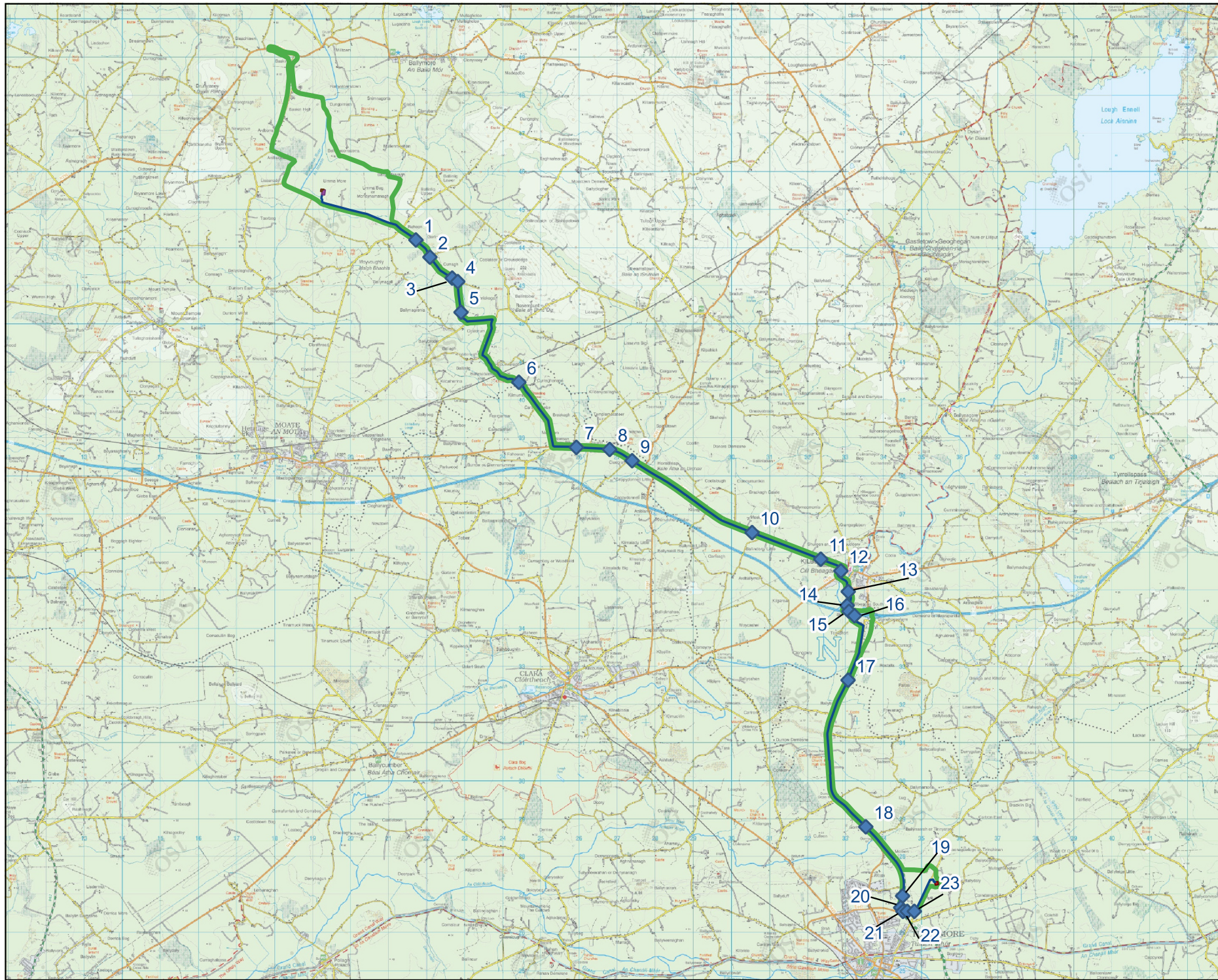
Culvert/Drain Crossing Reference No.	X (ITM)	Y (ITM)	Culvert/Drain Type	Width of Drain Channel (m)	Cover from Road Level to Top of Culvert (m)	Crossing Option Description	Watercourse Crossing Option	Extent of In-Channel Works
1	621671	744221	900mm Concrete Pipe	-	1.00 m	Where cable ducts are to be installed over an existing culvert and sufficient cover cannot be achieved, the ducts will be laid in a much shallower trench, the depth of which will be determined by the cover available at the culvert crossing location. The ducts within the shallow formation trench will be encased in 6mm thick steel galvanized plates and backfilled with 35N concrete.	Option C - Flat Bed Over	None. No in-stream works required.
2	622041	743768	600 mm Concrete Pipe	-	0.90 m	Where cable ducts are to be installed over an existing culvert and sufficient cover cannot be achieved, the ducts will be laid in a much shallower trench, the depth of which will be determined by the cover available at the culvert crossing location. The ducts within the shallow formation trench will be encased in 6mm thick steel galvanized plates and backfilled with 35N concrete.	Option C - Flat Bed Over	None. No in-stream works required.
3	622626	743218	450mm Concrete Pipe	-	0.90 m	Where cable ducts are to be installed over an existing culvert and sufficient cover cannot be achieved, the ducts will be laid in a much shallower trench, the depth of which will be determined by the cover available at the culvert crossing location. The ducts within the shallow formation trench will be encased in 6mm thick steel galvanized plates and backfilled with 35N concrete.	Option C - Flat Bed Over	None. No in-stream works required.
4	622773	743127	Blocked Concrete Pipe	-	-		Will be replaced with 450mm Pipe	None. No in-stream works required.

Culvert/Drain Crossing Reference No.	X (ITM)	Y (ITM)	Culvert/Drain Type	Width of Drain Channel (m)	Cover from Road Level to Top of Culvert (m)	Crossing Option Description	Watercourse Crossing Option	Extent of In-Channel Works
5	622858	742319	600 mm Concrete Pipe	-	1.10 m	Where cable ducts are to be installed over an existing culvert and sufficient cover cannot be achieved, the ducts will be laid in a much shallower trench, the depth of which will be determined by the cover available at the culvert crossing location. The ducts within the shallow formation trench will be encased in 6mm thick steel galvanized plates and backfilled with 35N concrete.	Option C - Flat Bed Over	None. No in-stream works required.
6	624378	740481	Blocked Stone Culvert	-	0.30 m		Will be repaced with 450mm Pipe	None. No in-stream works required.
7	625890	738770	900 mm Concrete Pipe	-	2.22 m	Where adequate cover exists above a culvert, the standard aforementioned trench arrangement will be used where the cable ducts pass over a culvert without any contact with the existing culvert or watercourse.	Option A - Standard Trench Detail	None. No in-stream works required.
8	626765	738714	600 Concrete Pipe	-	1.70 m	Where adequate cover exists above a culvert, the standard aforementioned trench arrangement will be used where the cable ducts pass over a culvert without any contact with the existing culvert or watercourse.	Option A - Standard Trench Detail	None. No in-stream works required.
9	627356	738418	Stone Culvert - 500mm x 800mm	-	1.70 m	Where adequate cover exists above a culvert, the standard aforementioned trench arrangement will be used where the cable ducts pass over a culvert without any contact with the existing culvert or watercourse.	Option A - Standard Trench Detail	None. No in-stream works required.
10	630508	736530	900 mm Concrete Pipe	-	1.45 m	Where adequate cover exists above a culvert, the standard aforementioned trench arrangement will be used where the cable ducts pass over a culvert without any contact with the existing culvert or watercourse.	Option A - Standard Trench Detail	None. No in-stream works required.

Culvert/Drain Crossing Reference No.	X (ITM)	Y (ITM)	Culvert/Drain Type	Width of Drain Channel (m)	Cover from Road Level to Top of Culvert (m)	Crossing Option Description	Watercourse Crossing Option	Extent of In-Channel Works
11	632314	735831	900 mm Concrete Pipe	-	1.22 m	Where cable ducts are to be installed over an existing culvert and sufficient cover cannot be achieved, the ducts will be laid in a much shallower trench, the depth of which will be determined by the cover available at the culvert crossing location. The ducts within the shallow formation trench will be encased in 6mm thick steel galvanized plates and backfilled with 35N concrete.	Option C - Flat Bed Over	None. No in-stream works required.
12	632844	735522	Box Culvert Bridge	-	0.40 m	Where sufficient depth is not available over or under the crossing for a trench arrangement, the laying of cable ducts to be completed using directional drilling. This crossing methodology will ensure that no contact will be made with the watercourse during the works.	Option D - HDD 46m	None. No in-stream works required.
13	633036	734978	900 mm Concrete Pipe	-	1.57 m	Where adequate cover exists above a culvert, the standard aforementioned trench arrangement will be used where the cable ducts pass over a culvert without any contact with the existing culvert or watercourse.	Option A - Standard Trench Detail	None. No in-stream works required.
14	633008	734613	300mm UPVC	-	0.70 m	Where the culvert consists of a socketed concrete or sealed plastic pipe and sufficient depth is not available over the crossing, a trench will be excavated beneath the culvert and cable ducts will be installed in the standard formation 300mm below the existing pipe.	Option B - Flat Bed Under	None. No in-stream works required.
15	633057	734460	1200 mm Concrete Pipe	-	0.35 m	Where the culvert consists of a socketed concrete or sealed plastic pipe and sufficient depth is not available over the crossing, a trench will be excavated beneath the culvert and cable ducts will be installed in the standard formation 300mm below the existing pipe.	Option B - Flat Bed Under	None. No in-stream works required.
16	633200	734344	900 mm Concrete Pipe	-	1.72 m	Where adequate cover exists above a culvert, the standard aforementioned trench arrangement will be used where the cable ducts pass over a culvert without any contact with the existing culvert or watercourse.	Option A - Standard Trench Detail	None. No in-stream works required.

Culvert/Drain Crossing Reference No.	X (ITM)	Y (ITM)	Culvert/Drain Type	Width of Drain Channel (m)	Cover from Road Level to Top of Culvert (m)	Crossing Option Description	Watercourse Crossing Option	Extent of In-Channel Works
17	633032	732652	Concrete Bridge 1200W	-	0.40 m	Where sufficient depth is not available over or under the crossing for a trench arrangement, the laying of cable ducts to be completed using directional drilling. This crossing methodology will ensure that no contact will be made with the watercourse during the works.	Option D - HDD 50m	None. No in-stream works required.
18	633498	728797	600 mm Concrete Pipe	-	1.67 m	Where adequate cover exists above a culvert, the standard aforementioned trench arrangement will be used where the cable ducts pass over a culvert without any contact with the existing culvert or watercourse.	Option A - Standard Trench Detail	None. No in-stream works required.
19	634465	726979	600 mm Concrete Pipe	-	0.30 m	Where the culvert consists of a socketed concrete or sealed plastic pipe and sufficient depth is not available over the crossing, a trench will be excavated beneath the culvert and cable ducts will be installed in the standard formation 300mm below the existing pipe.	Option B - Flat Bed Under	None. No in-stream works required.
20	634415	726673	600mm Concrete Pipe	-	0.97 m	Where cable ducts are to be installed over an existing culvert and sufficient cover cannot be achieved, the ducts will be laid in a much shallower trench, the depth of which will be determined by the cover available at the culvert crossing location. The ducts within the shallow formation trench will be encased in 6mm thick steel galvanized plates and backfilled with 35N concrete.	Option C - Flat Bed Over	None. No in-stream works required.
21	634474	726574	900 mm Concrete Pipe	-	2.10 m	Where adequate cover exists above a culvert, the standard aforementioned trench arrangement will be used where the cable ducts pass over a culvert without any contact with the existing culvert or watercourse.	Option A - Standard Trench Detail	None. No in-stream works required.
22	634588	726575	1200 mm Concrete Pipe	-	1.75 m	Where adequate cover exists above a culvert, the standard aforementioned trench arrangement will be used where the cable ducts pass over a culvert without any contact with the existing culvert or watercourse.	Option A - Standard Trench Detail	None. No in-stream works required.

Culvert/Drain Crossing Reference No.	X (ITM)	Y (ITM)	Culvert/Drain Type	Width of Drain Channel (m)	Cover from Road Level to Top of Culvert (m)	Crossing Option Description	Watercourse Crossing Option	Extent of In-Channel Works
23	634774	726575	900 mm Concrete Pipe	-	0.80 m	Where the culvert consists of a socketed concrete or sealed plastic pipe and sufficient depth is not available over the crossing, a trench will be excavated beneath the culvert and cable ducts will be installed in the standard formation 300mm below the existing pipe.	Option B - Flat Bed Under	None. No in-stream works required.



Map Legend

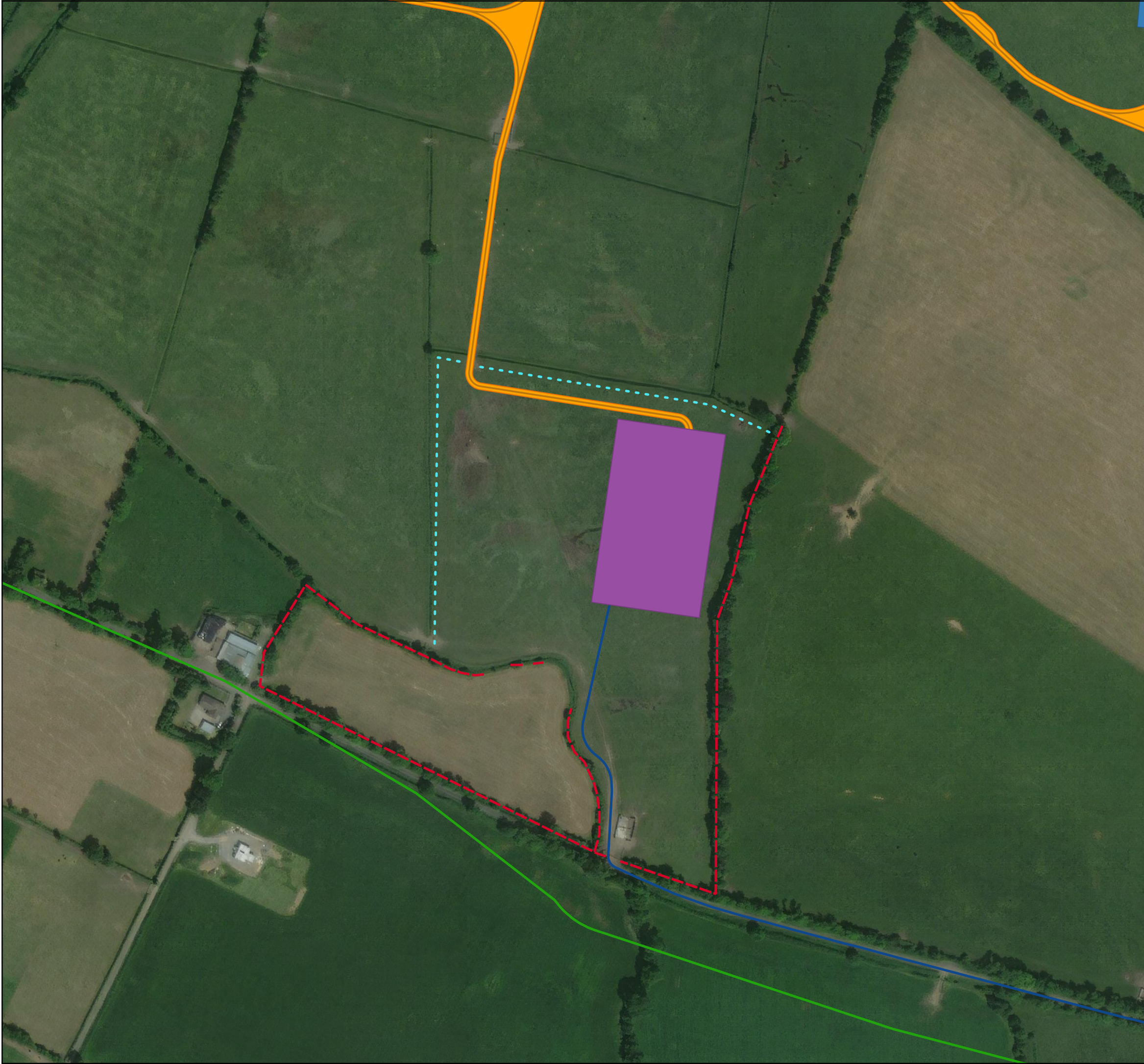
-  EIA Site Boundary
-  Culvert and Drain Crossings
-  Proposed 110 kV Onsite Substation
-  Existing Thornsberry 110kV Substation
-  Proposed Temporary Construction Route
-  Proposed Underground Electrical Cabling Route



Drawing Title	
Grid Connection Culvert and Drain Crossings	
Project Title	
Umma More Renewable Energy Development	
Drawn By	Checked By
NMCh	EC
Project No.	Drawing No.
201050	
Scale	Date
1:130,000	2023-02-01



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Website: www.mkofireland.ie



Map Legend

- EIAR Site Boundary
- Proposed New Roads
- Proposed Onsite Substation
- Proposed Grid Connection underground electrical cabling route
- Existing Treeline
- Proposed planting



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Drawing Title
Substation Enhancement Planting

Project Title
Umma More Renewable Energy Development

Drawn By	EC	Checked By	MW
Project No.	201050	Drawing No.	1
Scale	1:2750	Date	2023-03-08



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