Appendix to Chapter 15: Material Assets (Roads)

Appendix 15.4: Stage 1 Road Safety Audit and Review

The data and descriptions in this appendix have informed the cumulative evaluations in the EIA Main Report.

Malachy Walsh and Partners
Engineering and Environmental Consultants
Cork | Tralee | Limerick | London

ECOPOWER Developments Ltd.

Proposed Upperchurch Windfarm Grid Connection (UWF Grid Connection), County Tipperary

Stage 1 Road Safety Audit and Review

Project No.: 20815
Document No.: 6001/Rev.B
Date: October 2019

ECOPOWER Development Ltd.

Proposed Upperchurch Windfarm Grid Connection (UWF Grid Connection), County Tipperary

Stage 1 Road Safety Audit and Review

Project No.	Doc. No.	Rev.	Date	Prepared By	Checked By	Approved By	Status
20815	6001	A	02.09.2019	S. Quigley	S Doyle	S Quigley	Draft
20815	6001	B	02.10.2019	S. Quigley	S Doyle	S Quigley	Draft
20815	6001	B	14.10.2019	S. Quigley	S Doyle	S Quigley	Final

Malachy Walsh and Partners, Engineering and Environmental Consultants

Address: Park House, Mahon Technology Park, Bessboro Road, Blackrock, Cork

Malachy Walsh and Partners
Engineering and Environmental Consultants

CONTENTS

1.0 INTRODUCTION

1.1 This report details the findings of a Stage 1 Road Safety Audit and Review of the proposed Upperchurch Windfarm Grid Connection (UWF Grid Connection), County Tipperary. This Road Safety Audit and Review was commissioned by Ecopower Developments Ltd.

1.2 The scope of this Audit and Review includes a Stage 1 Road Safety Audit of the proposed public road works design and the proposed temporary construction public road traffic management design during the construction works; and a Road Safety Review of the existing Local Roads and R503 Regional Road along the proposed UWF Grid Connection public road route.

1.3 Malachy Walsh and Partners' Road Safety Auditors carried out the Audit and Review, as follows:-

Sean Doyle, BE CEng MIEI	Malachy Walsh and Partners
Seamus Quigley, BE CEng MIEI MCIHT	Malachy Walsh and Partners

1.4 Sean Doyle and Seamus Quigley inspected the site on the 28th August 2019, between 10.00 a.m. and 1.30 p.m., in daylight, by foot and in a car, during dry weather conditions. Record photographs were taken.

1.5 The proposed UWF Grid Connection extends from the proposed Mountphilips Substation in Mountphilips townland, north of Newport, to the permitted Upperchurch Windfarm at Knockcurraghabola Commons townland, on the west side of Upperchurch, County Tipperary. The UWF Grid Connection extends approximately 30.5 kms from the proposed Mountphilips Substation, via the L2166-10, L6013-0, L2156-0, L2157-0, L6009-0, R503, L2264-50 and L6188-0, to the consented Upperchurch Windfarm.

1.6 The proposed UWF Grid Connection public road works include a new access junction at an existing farm gate on the west side of the L2166-10 Local Road for the proposed Mountphilips Substation; and works to an existing watercourse bridge on the L2156-0 over the Newport River (at watercourse crossing W7, Bridge No.2) and two watercourse bridges on the R503 over the Claire River (at watercourse crossing W36, Bridge No.11) and the Bilboa River (at watercourse crossing W53, Bridge

No.15). These watercourse crossings and bridge references are as per the UWF Grid Connection EIAR. All the proposed public road works are located within the existing 80 km/hour rural speed limit zone.

1.7 Adjacent to the proposed Mountphilips Substation access, the L2166-10 Local Road has a typical road carriageway width of 5.2 metres, with variable width grass verges and hedgerow boundaries. The existing horizontal alignment is relatively straight and the vertical alignment is on a slight inclining gradient northbound. There is an existing farm gate at the location of the proposed access to Mountphilips Substation. The proposed Mountphilips Substation access junction on the west side of the L2166 includes junction sight visibility splays of 160 metres along the L2166, from a setback distance of 2.4 metres. A new gate is proposed at a setback distance of 4.5 metres from the L2166 road carriageway. The existing site boundary hedgerow and trees would be removed, cut back and replanted, accordingly.

1.8 The L6013-0 has a crossroads junction with the L2166-10 south of the proposed Mountphilips Substation access. The L6013-0 has a typical road carriageway width of 4.2 metres, with a narrowed section of circa 3.6 metres, locally.

1.9 The L2156-0 forms a Stop T-junction on the west side of the L6013-0, immediately north of the L2156-0's watercourse bridge with the Newport River (watercourse crossing W7, Bridge No.2). There are white on red Slow road marking warnings on the L2156-0 on its approaches to its Newport River bridge. The vertical alignment on both L2156-0 bridge approaches are on declining gradients, while the horizontal alignment is on an S-curve at the bridge location.

1.10 The L2156-0 has a 4.9 metres wide road carriageway, between the bridge no.2 parapet walls. The existing bridge parapet walls are 1.3 metres in height, and are splayed on both sides of the bridge. Open ditch drainage channels are provided along the L2156-0 on both sides of the bridge location. At the bridge, the vertical alignment of the L2156-0 is on a slight decline from north to south, and has a slight cross fall from east to west.

1.11 The road works to bridge no.2 (W7) includes the reinstatement and build up of the road pavement to a level of up to approximately 140 mm above existing, with 2.5% camber to each side from the road centreline. The extent of proposed road pavement build up is at the bridge between its straight parapet walls' section. The works also include a handrail to the west side parapet wall.

1.12 South of its Newport River Bridge (W7, bridge no.2), the L2156-0 has a typical road carriageway width of 5.1 metres and extends south to the Local Road L5337-1, which is within the Newport Town 50 km/hour urban area.

1.13 The L2157-0 forms a T-junction with the L2156-0 on the east side of the L2157-0 at Rockvale cemetery. The L2157-0 Local Road has a typical road carriageway width of 4.2 metres, with set-back property boundaries and a south side footway along its western section. The eastern section of the L2156-0 has a typical road carriageway width of 6 metres. The L2156-0 has a relatively straight horizontal alignment and slight declining vertical gradient eastbound.

1.14 The L6009-0 has a crossroads junction with the L2157-0 on the west side of the L2157-0 at Ahane. The L6009-0 Local Road has a typical road carriageway width of 3.0 metres, with intermittent set-back property boundaries. The L6009-0 horizontal alignment includes a series of relatively straight sections with connecting 90 degrees horizontal bends, and a relatively level vertical alignment.

1.15 East of Newport, the R503 has a typical road carriageway width of 5.0 metres within its 80 km/hour speed limit zone.

1.16 The R503 crosses the Claire River (W36, bridge no.11) over the Tooreenbrien Bridge, west of Rear Cross. This watercourse bridge has Tipperary County Council bridge reference TN-R503-005. The R503 has a road carriageway width, between the bridge parapet walls of 6.4 metres. The existing parapet walls are 0.4 metres in height. In the vicinity of the bridge, the horizontal alignment of the R503 is relatively straight, while the vertical alignment is relatively level. There are property accesses immediately on both sides of the bridge onto the eastbound carriageway; and a farm gate access on the west side of the bridge onto the westbound carriageway. At the bridge, the vertical levels decline slightly to both ends from the approximate bridge centre.

1.17 The road works to bridge no.11 (W36) includes the reinstatement and build up of the road pavement to a level of up to 140 mm above existing, with 2.5% camber to each side from the road centreline. The extent of proposed road pavement build up is at the bridge between its parapet walls. The works also include the build up of the parapet walls.

1.18 The R503 has a typical road carriageway width of 5.8 metres in the vicinity of the bridge, with centreline and road edge markings. Centreline road studs and cats eyes are provided, including along the bridge.

1.19 East of the bridge, the R503 has a 50 km/hour urban speed limit at Rear Cross. East of Rear Cross, the R503 has a typical road carriageway width of 5.0 metres.

1.20 East of Rear Cross, the R503 has a restricted horizontal alignment curve radius at Tipperary County Council bridge reference TN-503-006 and watercourse crossing reference W49 and bridge no.14 in the UWF Grid Connection EIAR. There are warning signs on the R503 approaches including Dangerous Bridge Ahead.

1.21 Further east, the R503 crosses the River Bilboa (watercourse crossing W53, bridge no.15) at Anglesey Bridge, at Kilcommon. The R503 has a road carriageway width of 4.9 metres, and a clear width between bridge parapets of 6.6 metres. The existing north and south bridge parapet walls are 0.7 metres and 0.8 metres in height, respectively. In the vicinity of the bridge, the horizontal alignment of the R503 is relatively straight with a horizontal curve on its south side, including at its north side L6086 junction. The vertical alignment is on a slight crest curve at the bridge, with a slight sag curve on the west side of the bridge.

1.22 The road works to bridge no.15 (W53) includes the reinstatement and build up of the road pavement to a level of up to 348 mm above existing, with 2.5% camber to each side from the road centreline. The extent of proposed road pavement build up is at the bridge between its parapet walls. The works also include the build up of the parapet walls and the installation of handrails to the parapet walls.

1.23 The L2264-50 has a Stop junction on the north side of the R503, immediately east of the R503/R497 T-junction. There are warning signs and road markings on the R503 approaches, including Slow Dangerous Junction Ahead. The L2264-50 is on a declining gradient to its R503 junction. The L2264-50 has a typical road carriageway width of 4.0 metres.

1.24 The L6188-0 forms a Stop junction on the east side of the L2264-50, with a road carriageway width of 4.0 metres, locally, at the junction. The L2264-50 has a horizontal curve west of its L6188-0 junction. East of the junction, the L6188-0 has a typical road carriageway width of 3.5 metres.

1.25 The proposed temporary construction traffic management on public roads for the UWF Grid Connection includes short period road closures on the L6013-0, L6009-0 and L6188-0; and one traffic lane closures, with alternating traffic, on the R503, L2166-10, L2156-0, L2157-0 and L2264-50.

1.26 The drawings and other documents provided to carry out the Road Safety Audit and Review are listed in Appendix A.

1.27 This Audit and Review have been carried out in accordance with the procedures provided in the relevant sections of the TII Road Safety Audit GE-STY-01024 December 2017 and TII Road Safety Audit Guidelines GE-STY-01027 December 2017; and with reference to the DoTTS Design Manual for Urban Roads and Streets. The Auditors have examined and reported only on those features of the design considered to have road safety implications and have not examined or verified the compliance of the scheme to any other criteria.

1.28 Section 2 of this report presents the findings of the Stage 1 Road Safety Audit and Review of the proposed UWF Grid Connection.

Designer's Feedback in Response to the Audit and Review

1.29 The Designer's Feedback is provided in Appendix B and includes revised drawings in response to the audit.

1.30 The Designer has accepted all of the problems and recommended measures identified in the findings of the Stage 1 Road Safety Audit and Review. The revised drawings provided in response to the Audit and Review incorporate the audit recommended measures.

1.31 The Designer's Feedback Form is signed by the Designer, Employer and Audit Team Leader.

2.0 FINDINGS OF THE STAGE 1 ROAD SAFETY AUDIT AND REVIEW

MOUNTPHILIPS SUBSTATION ACCESS JUNCTION

2.1 Comment – Potential Landscaping Growth within Junction Sight Visibility Splays

The partial removal/pruning of hedges and trees; and replanting hedge and trees behind sight lines are proposed at the junction. It is recommended that landscaping located adjacent to the junction sight visibility splays is cut back and maintained, as required, to ensure that junction sight visibility splays are maintained clear of landscaping obstruction.

L2156-0 NEWPORT RIVER BRIDGE ROAD WORKS (WATERCOURSE CROSSING W7, BRIDGE NO.2)

2.2 Problem – No Details of Proposed Vertical Levels at Tie-Ins

There are no details of the vertical levels proposed at the tie-ins, with the existing L2156-0 road pavement surface, at either end of the proposed road pavement reinstatement and build up. The risks are that tie-ins without appropriate transition could result in sharp ramped edges, and consequent possible damage to vehicles and to the road pavement; and result in inadequate drainage, with ponding and ice during cold weather, and consequent potential skidding, collisions and injuries.

Recommendation:
Provide appropriate vertical tie-ins and transitions, maintaining the existing drainage from north to south along the L2156-0 across the bridge.

2.3 Comment – Bridge Parapet Walls' Warning Markings Obscured by Vegetation

During the site inspection, the black and yellow warning markings on the bridge parapet and splay walls were obscured by vegetation. This reduces awareness for drivers and increases the risk of collisions and consequent injuries. It is recommended that the vegetation should be cut back and maintained and the markings renewed and maintained, as appropriate, by Tipperary County Council.

Photograph: View Southbound on L2156-0 Approach to Newport River Bridge

R503 CLAIRE RIVER BRIDGE ROAD WORKS (WATERCOURSE CROSSING W36, BRIDGE NO.11)

2.4 Problem – No Details of Proposed Vertical Levels at Tie-Ins

There are no details of the vertical levels proposed at the tie-ins with the existing R503 road pavement surface at either end of the proposed road pavement reinstatement and build up. The risks are that tie-ins without appropriate transition could result in sharp ramped edges, and consequent possible damage to vehicles and to the road pavement; and result in inadequate drainage, with ponding and ice during cold weather, and consequent potential skidding, collisions and injuries.

Recommendation:
Provide appropriate vertical tie-ins and transitions, maintaining the existing drainage along the R503 from the approximate centre of the bridge to both ends, with appropriate tie-ins with the existing adjacent accesses.

R503 RIVER BILBOA BRIDGE ROAD WORKS (WATERCOURSE CROSSING W53, BRIDGE NO.15)

2.5 Problem – No Details of Proposed Vertical Levels at Tie-Ins

There are no details of the vertical levels proposed at the tie-ins with the existing R503 road pavement surface at either end of the proposed road pavement reinstatement and build up. The risks are that tie-ins without appropriate transition could result in sharp ramped edges, and consequent possible damage to vehicles and to the road pavement; and result in inadequate drainage, with ponding and ice during cold weather, and consequent potential skidding, collisions and injuries.

Recommendation:
Provide appropriate vertical tie-ins and transitions, maintaining the existing drainage along the R503 from the approximate centre of the bridge to both ends.

2.6 Problem – Increased Vertical Crest Curve and Reduced Visibilities

The existing bridge is on a vertical crest curve on the R503, with vertical sag curves on either side of the bridge. The vertical sag curve on the west side of the bridge is more pronounced than on the east side. The proposed road level build up of up to 348 mm on the bridge would increase the abruptness of both the crest and sag curves and reduce forward visibilities for drivers, particularly westbound. This would increase the risk of vehicle collisions, including for vehicles turning at the L6086 junction on the west side of the bridge, with possible consequent injuries for vehicle occupants. The risk of collisions and injuries for cyclists and pedestrians would also be increased, by reduced visibilities.

Recommendation:

Provide an appropriate vertical alignment at the bridge, to maintain existing visibilities, by increasing the length of the vertical curves from east of the L6086 junction on the west side, to west of the properties and existing drainage gullies on the east side of the bridge. Refer also to item 2.5 above.

2.7 Problem – No Details of Parapet Containment Level

The existing bridge parapet walls are less than the 1.0 metres height for vehicle parapets identified by the TII publication The Design of Vehicle and Pedestrian Parapets, for structures carrying roads. It is proposed to install handrails on both parapets. It is unclear if the proposed parapets would meet the H2 parapet containment level identified by the TII requirements for structures carrying roads. Without appropriate containment, the proposed road level build up could increase the risk of an errant vehicle leaving the road carriageway at the bridge, with possible consequent injuries for vehicle occupants.

Recommendation:

Provide appropriate parapet containment level, with reference to the TII Standards, in consultation with Tipperary County Council.

TEMPORARY TRAFFIC MANAGEMENT

2.8 Comment – Road Works Traffic Lane Closures Sign Distances

The proposed temporary construction traffic management on public roads for the UWF Grid Connection includes one traffic lane closure, with alternating traffic, on the R503, L2166-10, L2156-0, L2157-0 and L2264-50. The drawing provided for audit indicates distances between advance signs of 25 metres. This is in accordance with the DoTTS Traffic Signs Manual Chapter 8 for 50 km/hour and 60 km/hour single carriageway roads. The Traffic Signs Manual identifies a longer distance for 80 km/hour roads. The drawing provided for audit does not include a sign visibility distance to the first road works sign. The Traffic Signs Manual identifies sign visibility distances to the first sign of up to 75 metres for 50/60 km/hour roads, and 120 metres for 80 km/hour roads. It is recommended that sign distances are in accordance with Chapter 8 of the Traffic Signs Manual, with provision for traffic queues, as appropriate.

L6013-0 STOP JUNCTION WITH THE L2166-10

2.9 Comment – Possible Inconspicuous Junction with See Through

The L6013-0 Stop junction with the L2166-10 is a see through crossroads junction on the westbound approach, and may not be conspicuous for all westbound drivers on the L6013 approach. There is no junction warning sign on the approach and there are no road markings visible at the junction from near distance on approach. The risk is that westbound drivers on the L6013-0 approach may not stop at the junction or brake late, putting them and other drivers on the L2166-10 at risk of serious collisions with consequent injuries for vehicle occupants. It is recommended that Tipperary County Council should provide appropriate junction warning and definition, to mitigate the see through at the crossroads junction and enhance its conspicuousness.

Photograph: View Westbound on L6013-0 Approach to L2166-10 Crossroads Junction

L2156-0 AT ROCKVALE CEMETERY

2.10 Comment – Faded Road Marking Warnings

The white on red road markings on the L2156-0 northbound, located adjacent to Rockvale Cemetery and south of the L2156-0 Newport River bridge, are faded. This could reduce awareness for drivers. It is recommended that Tipperary County Council should renew and maintain the faded road marking warnings.

Photograph: View Northbound on L2156-0 Approach to Newport River Bridge (W7, Bridge No.2)

R503 BRIDGE TN-503-006 (W49, BRIDGE NO.14)

2.11 Comment – Obscured Warning Markings and Incorrect Road Marking

During the site inspection, the black and yellow warning markings on the TN-503-006 bridge parapet walls (W49, bridge no.14) were obscured by vegetation. This reduces awareness for drivers and increases the risk of collisions and consequent injuries. It is recommended that the vegetation should be cut back and maintained; and the road markings renewed and maintained, as appropriate, by Tipperary County Council.

A 'Rumble Strips' worded road marking is provided on the westbound approach to the bridge, on the restricted horizontal bend. It is considered that this is incorrect and that actual rumble strip road markings were envisaged at this location to warn drivers. It is recommended that this should be corrected by Tipperary County Council.

Photograph: View Westbound on R503 Approach to TN-503-006 Bridge (W49, bridge no.14)

L2264-50 STOP JUNCTION WITH THE R503

2.12 Comment – No Advance Junction Warning Sign

There is no advance junction warning sign on the L2264-50 approach to its R503 junction. The L2264-50 approach is on a declining vertical gradient. There are two disused sign poles on the L2264-50 approach to the junction. Lack of appropriate warning for drivers increases the risk of vehicle late braking and overshooting out onto the R503 carriageway, putting them at risk of side impact collisions and consequent injuries for vehicle drivers. Eastbound drivers on the R503 could swerve across the centreline, around a protruding vehicle on the L2264-50, into the path of an opposing vehicle, with potential head on collisions and serious injuries for occupants. It is recommended that appropriate advance warning of the junction should be provided by Tipperary County Council, with reference to the DoTTS Traffic Signs Manual.

2.13 Comment – Stop Sign in Advance of Junction

There is a Stop sign on the L2264-50 in advance of its junction with the R503 and in advance of the horizontal bend on the L2264-50 immediately on approach to the junction. Incorrect or lack of appropriate information for drivers could result in early or late braking and potential collisions and injuries. It is recommended that the existing Stop sign should be relocated to the junction and replaced with a Stop Ahead warning sign by Tipperary County Council, with reference to the DoTTS Traffic Signs Manual.

L6188-0 STOP JUNCTION WITH THE L2264-50

2.14 Comment – Vegetation in Junction Visibility Splay

During the site inspection, vegetation was observed within the existing junction sight visibility splay on the north side of the L6188-0 at its Stop junction with the L2264-50. This restricts visibilities for drivers, increasing the risk of drivers pulling out into the path of southbound vehicles, with potential collisions and injuries. It is recommended that the vegetation should be cut back and maintained.

Photograph: View North from L6188-0 Stop Junction along L2264-50

3.0 AUDIT AND REVIEW TEAM STATEMENT

We certify that we have examined the drawings and other information listed in Appendix A of this report. The examination has been carried out for the sole purpose of identifying any features of the design that could be removed or modified in order to improve the safety of the scheme. The problems we have identified are noted in the report, together with suggestions for improvement, which we recommend should be studied for implementation.

Signed: _____ **Date:** 14/10/2019

Sean Doyle, BE CEng MIEI
Audit and Review Team Member
For and on behalf of Malachy Walsh and Partners
Engineering and Environmental Consultants
Reen Point
Blennerville
Tralee
Co. Kerry

Signed: _____ **Date:** 14/10/2019

Seamus Quigley, BE CEng MIEI MCIHT
Audit and Review Team Member
For and on behalf of Malachy Walsh and Partners
Engineering and Environmental Consultants
Park House
Mahon Technology Park
Blackrock
Cork

APPENDIX A – LIST OF DOCUMENTS PROVIDED FOR THIS AUDIT AND REVIEW

Drawings:-

Ecopower
Title: Figure GC 5.1
Location of the UWF Grid Connection on OSI Discovery Mapping
Date: 30-May-19

Ecopower
Title: Figure GC 5.2
Location of the Mountphilips Substation Site on Aerial Photography Mapping
Date: 30-May-19

Ecopower and TLI Group
Title: Figure GC 5.9
Cross Sections of Mountphilips – Upperchurch 110kV Underground Cables Trench
Date: 30-May-19

Ecopower and TLI Group
Title: Figure GC 5.11
Cross Sections 110kV UGC in the Public Road
Date: 30-May-19

Ecopower
Title: Figure GC 5.14
Plan View of Permanent Site Entrance 1 at Coole (Mountphilips Substation & Temporary Compound)
Date: 30-May-19

Ecopower and NRB Consulting Engineers
Title: Figure GC 5.17
Advance Warning Signage for Road Works & Site Entrances
Date: 30-May-19

Ecopower
Title: Figure GC 15.1

Location of the UWF Grid Connection
Date: June 19

Ecopower
Title: Figure WP 15.2
Public Roads within the Whole Project Cumulative Evaluation Study Area
Date: June 19

Ecopower
Title: Figure WP 15.3
Road Users within the Whole Project Cumulative Evaluation Study Area
Date: June 19

Ecopower
Title: Figure GC 15.3
Road Users within the UWF Related Works Study Area
Date: June 19

TLI Group
Title: Bridge 11 (W36) Crossing Details
Road Users within the UWF Related Works Study Area
Drawing Number: 05652-525
Revision: 03
Date: 11.07.19

TLI Group
Title: Bridge 15 (W53) Crossing Details: Site Layout Plan & Duct Detail – Sheet 1 of 2
Drawing Number: 05652-536
Revision: 04
Date: 17.07.19

TLI Group
Title: Bridge 15 (W53) Crossing Details: Elevations – Sheet 2 of 2
Drawing Number: 05652-537
Revision: 03
Date: 17.07.19

TLI Group
Title: Bridge 2 (W7) Crossing Details
Drawing Number: 05652-545
Revision: 04
Date: 17.07.19

Other Documents:-

Ecopower
UWF Grid Connection Volume C2: EIAR Main Report
Chapter 5 Description of Development – UWF Grid Connection
Date: July 2019

Ecopower and TLI Group
UWF Grid Connection Volume C2: EIAR Main Report
Chapter 15: Material Assets – Roads
Date: July 2019

Ecopower and TLI Group
Appendix 15.1: Traffic and Transportation Assessment

Ecopower
Appendix 15.2 Pavement Condition Survey for UWT Grid Connection
PMS Pavement Management Services
Pavement Condition Survey for Upperchurch Windfarm Grid Connection, Co. Tipperary
Date: 15/07/2019

Ecopower
Email to Malachy Walsh and Partners
Date: 19/08/2019

APPENDIX B – DESIGNER'S FEEDBACK

Paragraph No. in Safety Audit: 2.1

Comment: Potential Landscaping Growth within Junction Sight Visibility Splays

Ecopower Developments Response: Yes, landscaping located adjacent to the junction sight visibility splays will be cut back and maintained, as required, to ensure that junction sight visibility splays are maintained clear of landscaping obstruction.

Paragraph No. in Safety Audit: 2.2

Problem: No Details of Proposed Vertical Levels at Tie-Ins at Bridge No.2

Ecopower Developments Response: Drawing "05652-545_Bridge 2 (W7)" attached showing vertical levels at Tie-Ins.

Paragraph No. in Safety Audit: 2.3

Comment: Bridge Parapet Walls' Warning Markings Obscured by Vegetation

Ecopower Developments Response: Ecopower Developments will engage with Tipperary Council regarding vegetation cut back and renewing road markings.

Paragraph No. in Safety Audit: 2.4

Problem: No Details of Proposed Vertical Levels at Tie-Ins at Bridge No.11

Ecopower Developments Response: Drawing "05652-525_Bridge 11 (W36)" attached showing vertical levels at Tie-Ins.

Paragraph No. in Safety Audit: 2.5

Problem: No Details of Proposed Vertical Levels at Tie-Ins at Bridge No.15

Ecopower Developments Response: Drawing "05652-536_Bridge 15 (W53) Sh 2 of 2" attached showing vertical levels at Tie-Ins.

Paragraph No. in Safety Audit: 2.6

Problem: Increased Vertical Crest Curve and Reduced Visibilities at Bridge No.15

Ecopower Developments Response: Drawing "05652-536_Bridge 15 (W53) Sh 2 of 2" attached showing increased vertical levels for visibility.

Paragraph No. in Safety Audit: 2.7

Problem: No Details of Parapet Containment Level at Bridge No.15

Ecopower Developments Response: Drawing "05652-536_Bridge 15 (W53) Sh 1 of 2" attached showing dimensions of appropriate containment wall.

Paragraph No. in Safety Audit: 2.8

Comment: Road Works Traffic Lane Closures Sign Distances Drawing

Ecopower Developments Response: Drawings "NRB Road Signage Layout Drawing 50kmhr" and "NRB Road Signage Layout Drawing 80kmhr" attached showing appropriate distances between advance signage and advance visibility.

Paragraph No. in Safety Audit: 2.9

Comment: Possible Inconspicuous Junction with See Through at L6013-0 / L2166-0 Junction

Ecopower Developments Response: Ecopower Developments will engage with Tipperary Council regarding road markings and signage.

Paragraph No. in Safety Audit: 2.10

Comment: Faded Road Marking Warnings along L2156-0

Ecopower Developments Response: Ecopower Developments will engage with Tipperary Council regarding road markings.

Paragraph No. in Safety Audit: 2.11

Comment: Obscured Warning Markings and Incorrect Road Marking at Bridge No.14

Ecopower Developments Response: Ecopower Developments will engage with Tipperary Council regarding road markings.

Paragraph No. in Safety Audit: 2.12

Comment: No Advance Junction Warning Sign at the L2264-50 / R503 Junction

Ecopower Developments Response: Ecopower Developments will engage with Tipperary Council regarding signage.

Paragraph No. in Safety Audit: 2.13

Comment: Stop Sign in Advance of Junction at the L2264-50 / R503 Junction

Ecopower Developments Response: Ecopower Developments will engage with Tipperary Council regarding signage

Paragraph No. in Safety Audit: 2.14

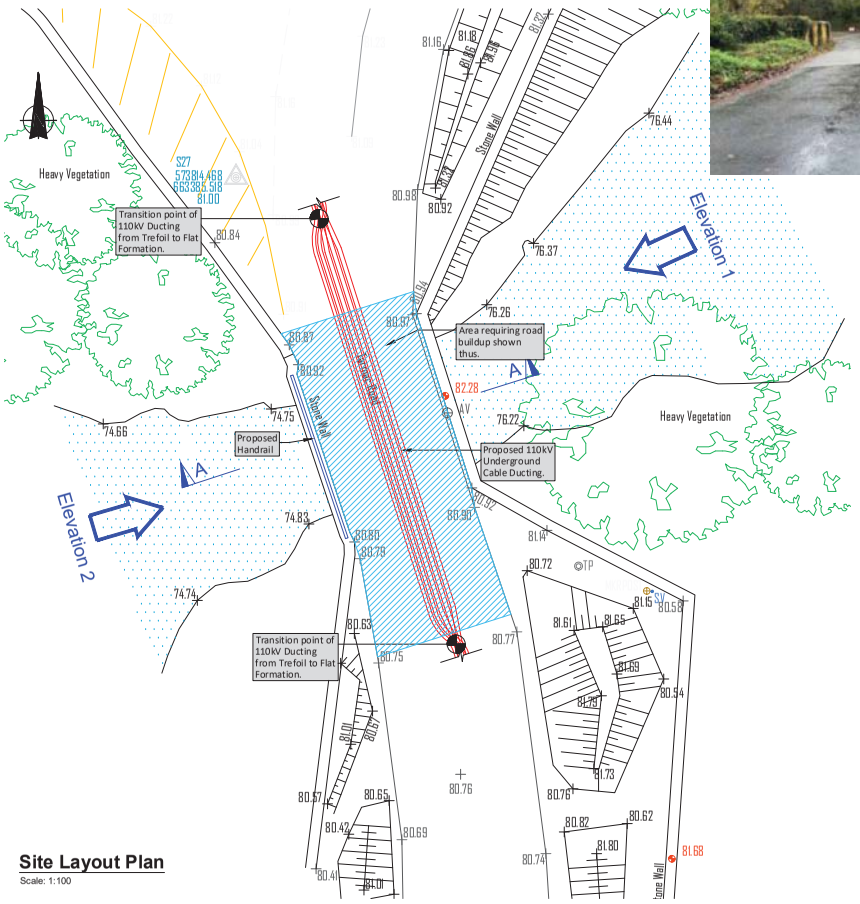
Comment: Vegetation in Junction Visibility Splay at L2264-50 / L6188-0 Junction

Ecopower Developments Response: Ecopower Developments will engage with Tipperary Council regarding vegetation cut back.

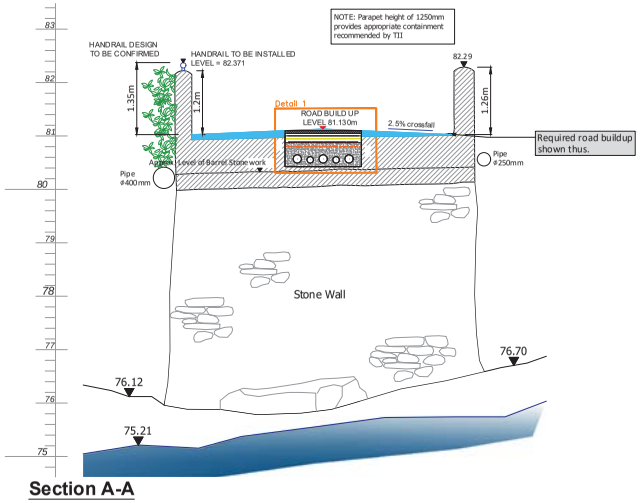
ISO A1 594mm x 841mm

TLI Group Bridge Ref: Bridge 2
Watercrossing Ref: W7.

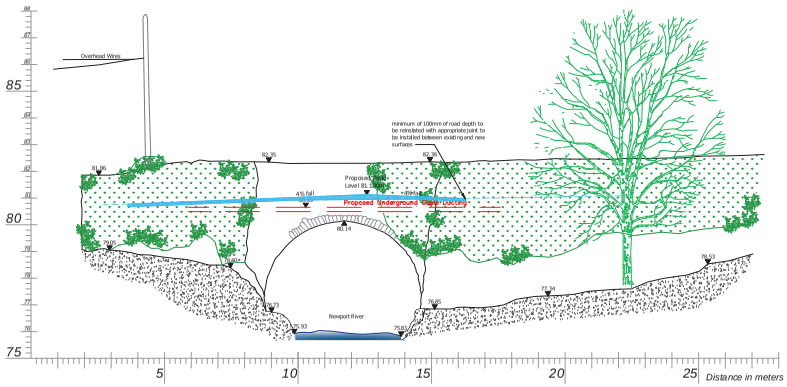
Notes:
1. This drawing is to be used only for the purpose of the planning application and is subject to detailed design.
2. This drawing is to be read in conjunction with all other relevant information.
3. Do not scale from this drawing, use only printed dimensions.
4. All dimensions are in millimetres. All chainages, levels and coordinates are in metres unless defined otherwise.
5. The existing utility service information shown on this plan is a general guide and the accuracy thereof cannot be guaranteed. no liability is accepted for any discrepancy, omission or deviation and the actual position of individual services must be verified and established on site before commencing the works.
6. No excavation shall commence until the contractor has consulted up to date services drawings and carried out an electromagnetic locator (emi) scan.
7. Hand dig only within 500mm of existing services.
8. All co-ordinates are referenced to ITM.
9. Drawings are in compliance with ESBN specification requirements for shallow formation, bridge crossings, etc.



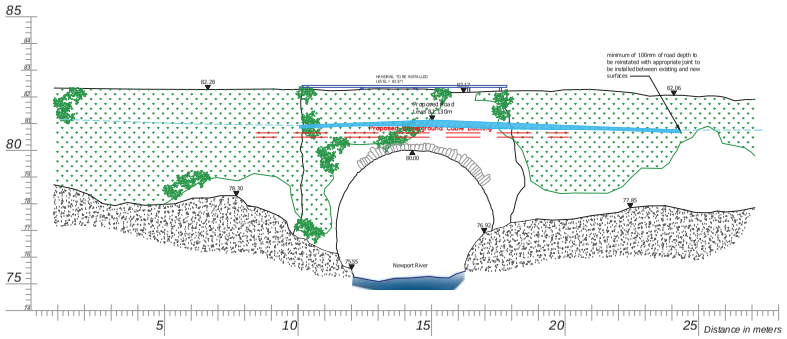
Site Layout Plan
Scale: 1:100



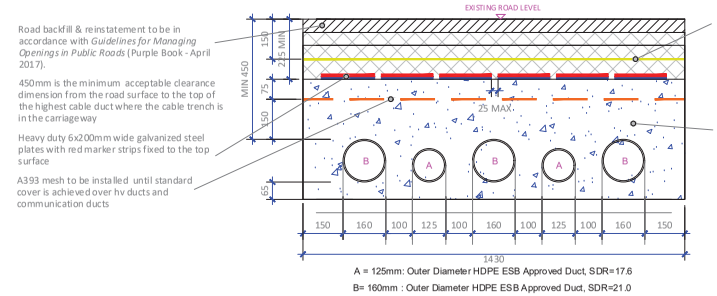
Section A-A
Scale: 1:50



Bridge Elevation 1
Scale: 1:100



Bridge Elevation 2
Scale: 1:100



Detail 1 - Duct Specification in Flat Formation
Scale: 1:10

tli GROUP

Head Office
Beereigh,
Abbeydorney,
Tralee, Co. Kerry
Ireland
Tel: 00353 66 7135710

Regional Office
Basepoint Business Centre
Stroudley Road, Basingstoke,
Hampshire,
RG24 8UP, UK
Tel: 00 44 1256406664

PROJECT

110kV Underground Cabling for Upperchurch Wind Farm Grid Connection

CLIENT

ECOPOWER
TOTAL WINDFARM SOLUTIONS

CONSULTANTS

NOTES: -

LEGEND: -
- Proposed 110kV Underground Cable
- Proposed Road Build-Up

Appendix 15.4: Stage 1 Road Safety Audit and Review

ISSUE/REVISION

06	16.09.19	Issued for Planning
05	06.09.19	Issued for Planning
04	17.07.19	Issued for Planning
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01	25.06.19	Issued for Planning
00	05.06.19	Issued for Information
I/R	DATE	DESCRIPTION

PROJECT NUMBER

05-652

SHEET TITLE

Bridge 2 (W7)
Crossing Details

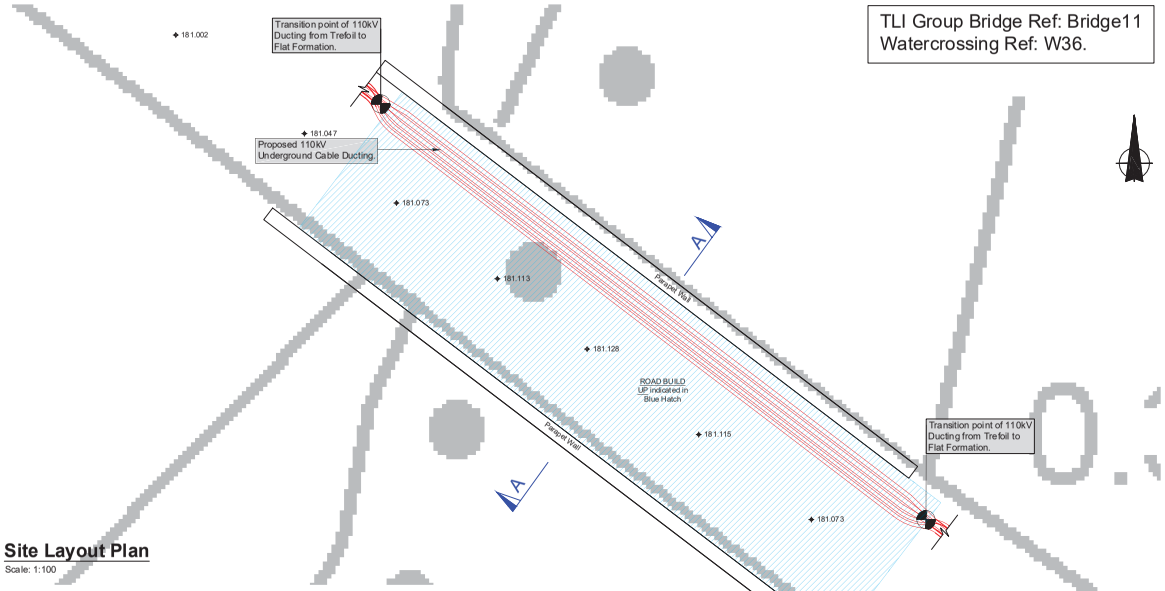
SHEET NUMBER

05652-545

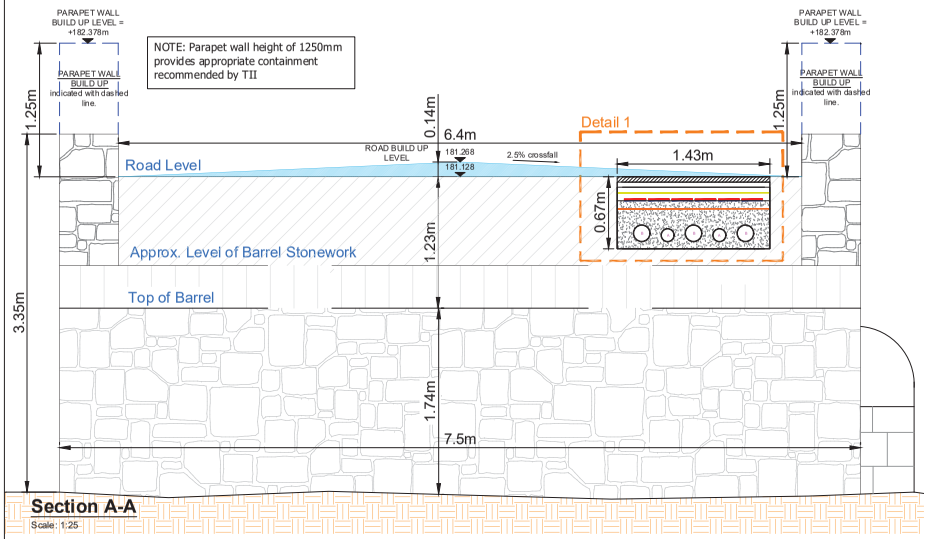
Project Management Initials: Designer: GD Checked: SK Approved: RG

ISO A1 594mm x 841mm

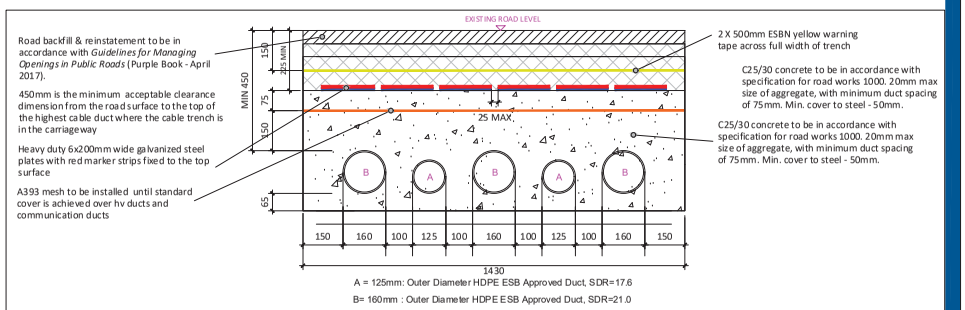
TLI Group Bridge Ref: Bridge11
Watercrossing Ref: W36.



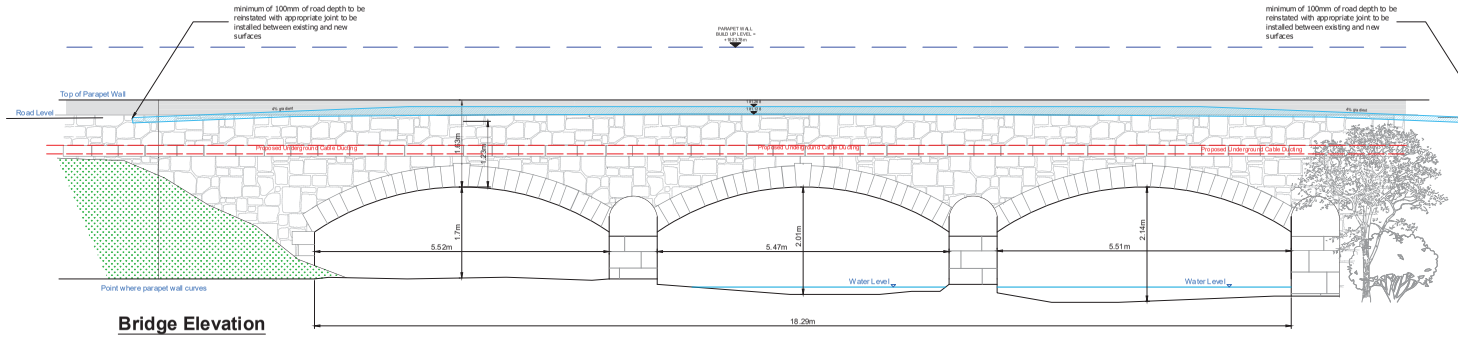
Site Layout Plan
Scale: 1:100



Section A-A
Scale: 1:25



Detail 1- Proposed 110kV UG Cable Ducts in Flat Formation Crossing Bridge
Scale: 1:10



Bridge Elevation
Scale: 1:50

Notes:
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7. Hand dig only within 500mm of existing services.
8. All co-ordinates are referenced to ITM.
9. Drawings are in compliance with ESBN specification requirements for shallow formation, bridge crossings, etc.

tli GROUP

Head Office
Beenreigh,
Abbeydorney,
Tralee, Co. Kerry
Ireland
Tel: 00353 66 7135710

Regional Office
Basepoint Business Centre
Stroudley Road, Basingstoke,
Hampshire,
RG24 8UP, UK
Tel: 00 44 1256406664

PROJECT

110kV Underground Cabling for Upperchurch Wind Farm Grid Connection

CLIENT

ECOPOWER
TOTAL WINDFARM SOLUTIONS

CONSULTANTS

NOTES: -

LEGEND: -

Proposed 110kV Underground Cable
Proposed Road Build-Up
Proposed Parapet Wall Build-Up

Appendix 15.4: Stage 1 Road Safety Audit and Review

ISSUE/REVISION

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02	25.06.19	Issued for Planning
01	12.03.19	Issued for Information
00	06.03.19	Issued for Information
I/R	DATE	DESCRIPTION

PROJECT NUMBER

05-652

SHEET TITLE

Bridge 11 (W36).
Crossign Details

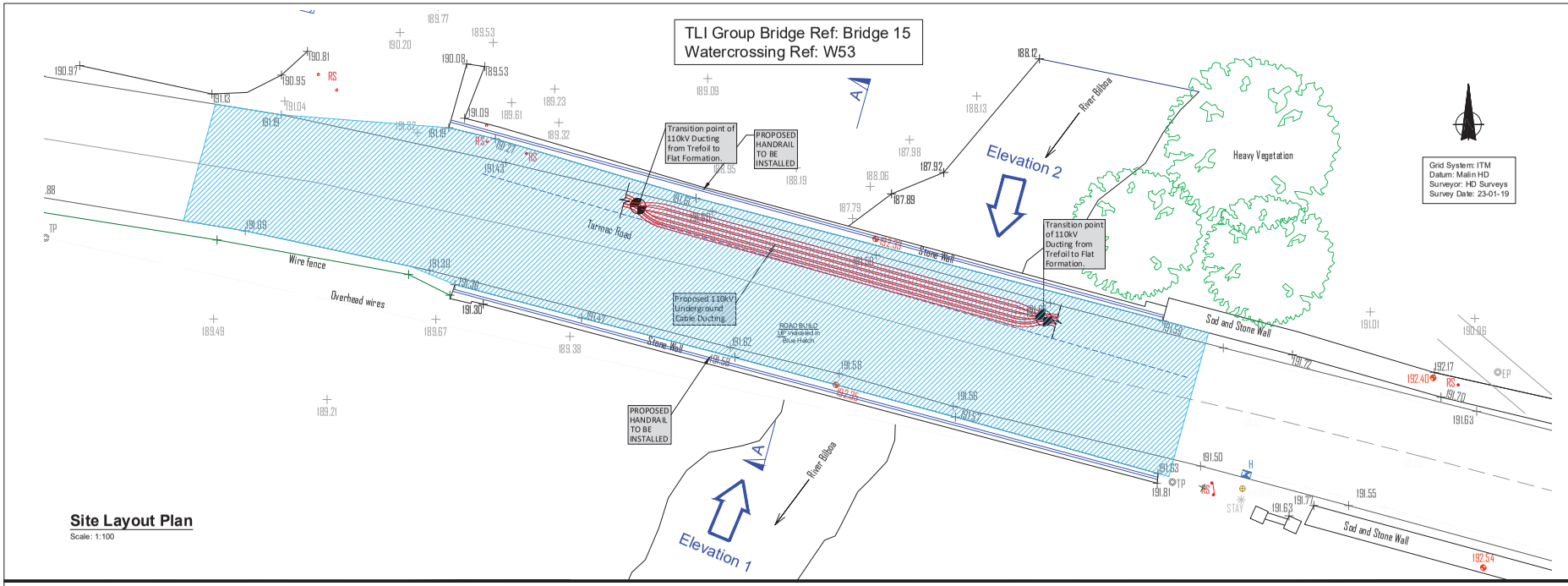
SHEET NUMBER

05652-525

Approved:
Checked:
Designer:
Project Management Initials:

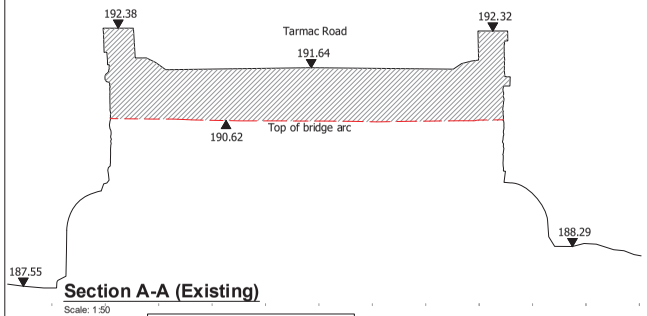
ISO A1 594mm x 841mm

TLI Group Bridge Ref: Bridge 15
Watercrossing Ref: W53



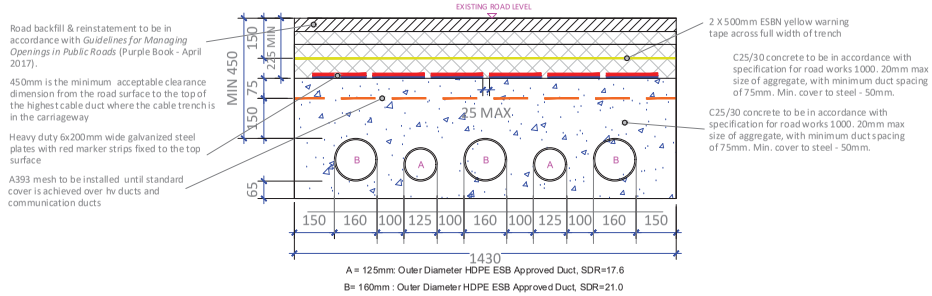
Site Layout Plan

Scale: 1:100



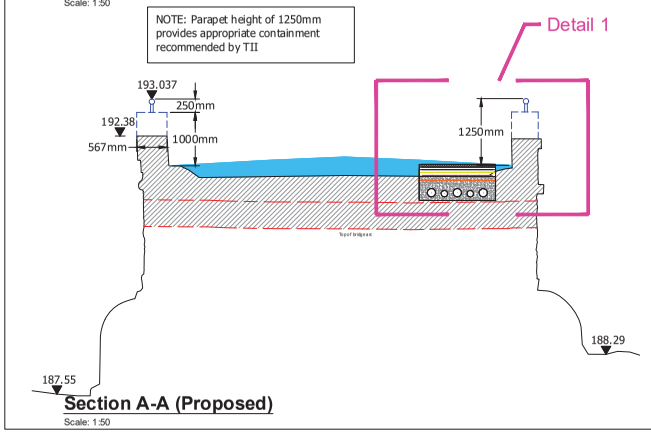
Section A-A (Existing)

Scale: 1:50



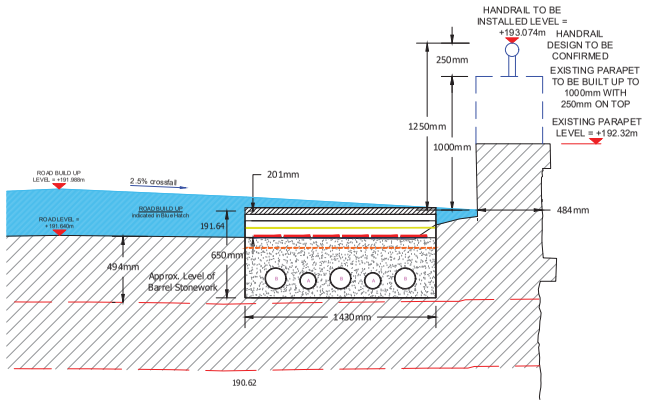
Proposed 110kV UG Cable Ducts in Flat Formation Crossing Bridge

Scale: 1:10



Section A-A (Proposed)

Scale: 1:50



Detail 1 - Proposed 110kV UG Cable Ducts in Flat Formation Crossing Bridge

Scale: 1:20

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PROJECT

110kV Underground Cabling for Upperchurch Wind Farm Grid Connection

CLIENT

ECOPOWER
TOTAL WINDFARM SOLUTIONS

CONSULTANTS

NOTES: -

LEGEND: -

Proposed 110kV Underground Cable
Proposed Road Build-Up
Proposed Handrail

Appendix 15.4: Stage 1 Road Safety Audit and Review

ISSUE/REVISION

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00	12.03.19	Issued for Information

PROJECT NUMBER

05-652

SHEET TITLE

Bridge 15 (W53)
Crossing Details: Site Layout Plan & Duct Details - Sheet 1 of 2

SHEET NUMBER

05652-536

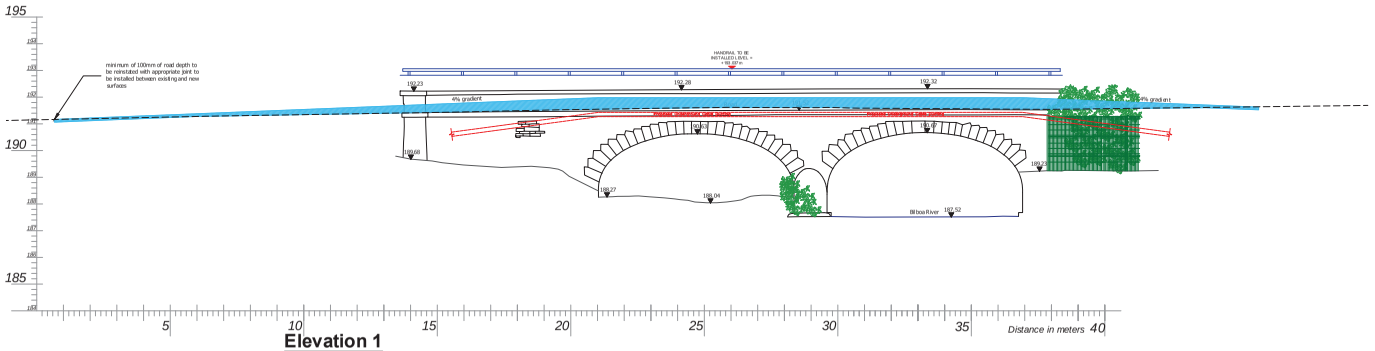
Project Management Initials: Designer: GD Checked: SK Approved: RG

ISO A1 594mm x 841mm

Project Management Initials: Designer: GD Checked: SK Approved: RG

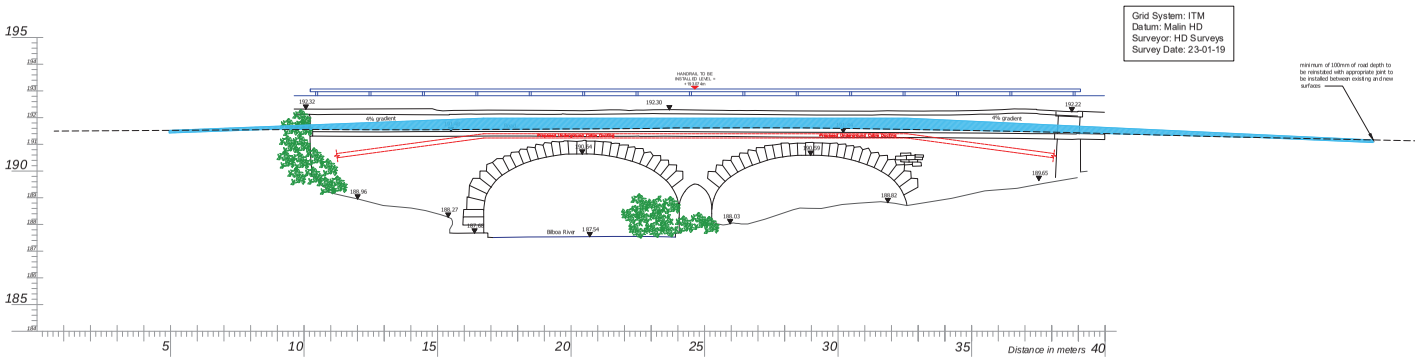
TLI Group Bridge Ref: Bridge 15
Watercrossing Ref: W53

Grid System: ITM
Datum: Malin HD
Surveyor: HD Surveys
Survey Date: 23-01-19



Elevation 1
Scale: 1:100

Grid System: ITM
Datum: Malin HD
Surveyor: HD Surveys
Survey Date: 23-01-19



Elevation 2
Scale: 1:100

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PROJECT

110kV Underground Cabling for Upperchurch Wind Farm Grid Connection

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ECOPOWER
TOTAL WINDFARM SOLUTIONS

CONSULTANTS

NOTES: -

LEGEND: -

Proposed 110kV Underground Cable
Proposed Handrail
Proposed Road Build-Up

Appendix 15.4: Stage 1 Road Safety Audit and Review

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00	12.03.19	Issued for Information
I/R	DATE	DESCRIPTION

PROJECT NUMBER

05-652

SHEET TITLE

Bridge 15 (W53)
Crossing Details:
Elevations - Sheet 2 of 2

SHEET NUMBER

05652-537

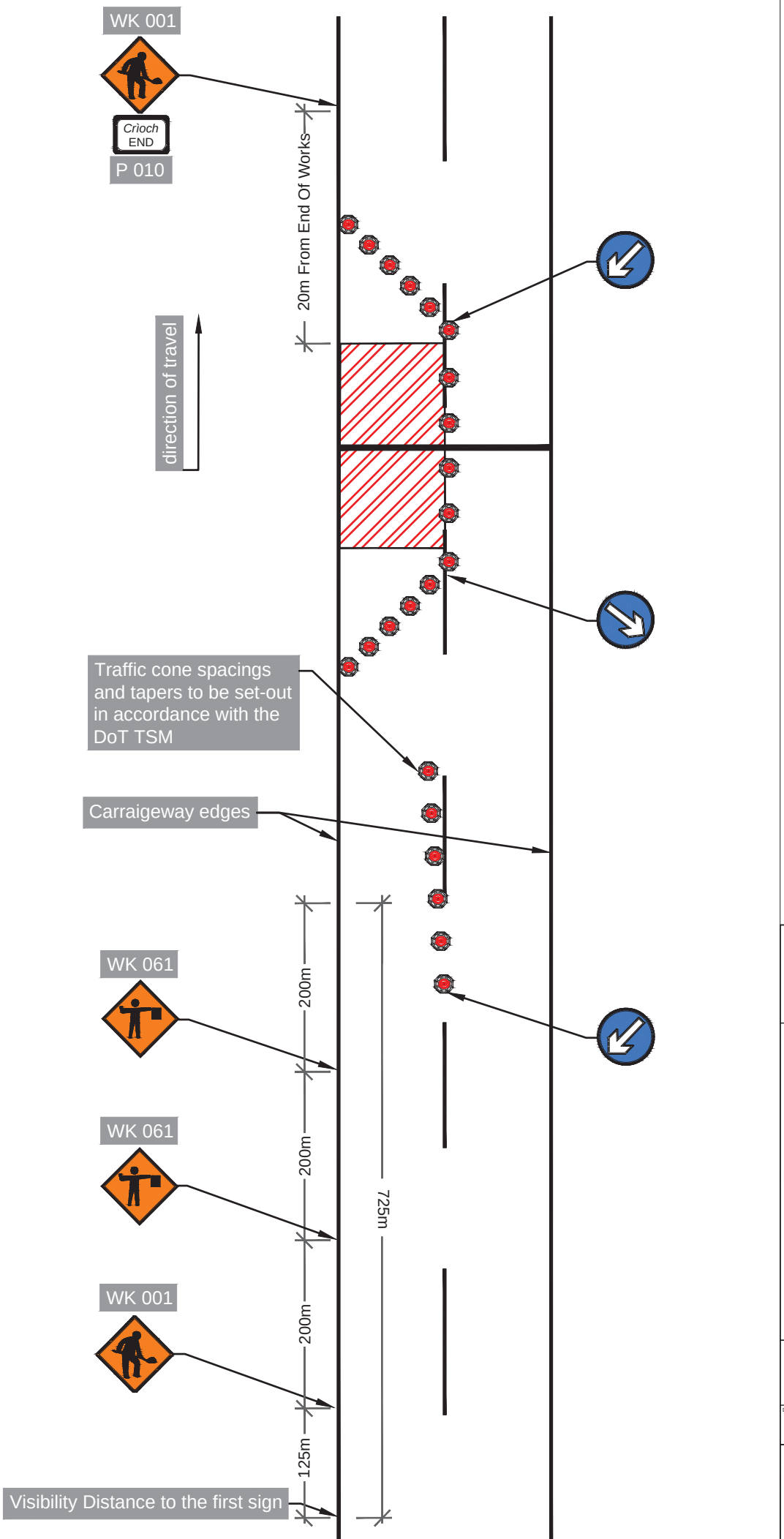

Figure GC 5.24

Advance Warning Signage
for Road Works on 80km/hr Roads

Designed in conjunction with

Malachy Walsh and Partners
Engineering and Environmental Consultants
Cork | Tralee | Limerick | London

Note: This drawing is not to scale

Department of Transport
Traffic Signs Manual 2010 (DoT TSM)

Project:
UWF Grid Connection (2019)

Drawn by:	Checked by:	Date:	Sheet Size:
AB	PK	October 19	A3

Aoife Butler
Ecopower Developments Ltd
Zetec House,
Purcellsinch Business Park, Kilkenny
TEL: +353 56 7750140
MOB: +353 83 8805644

ECOPOWER

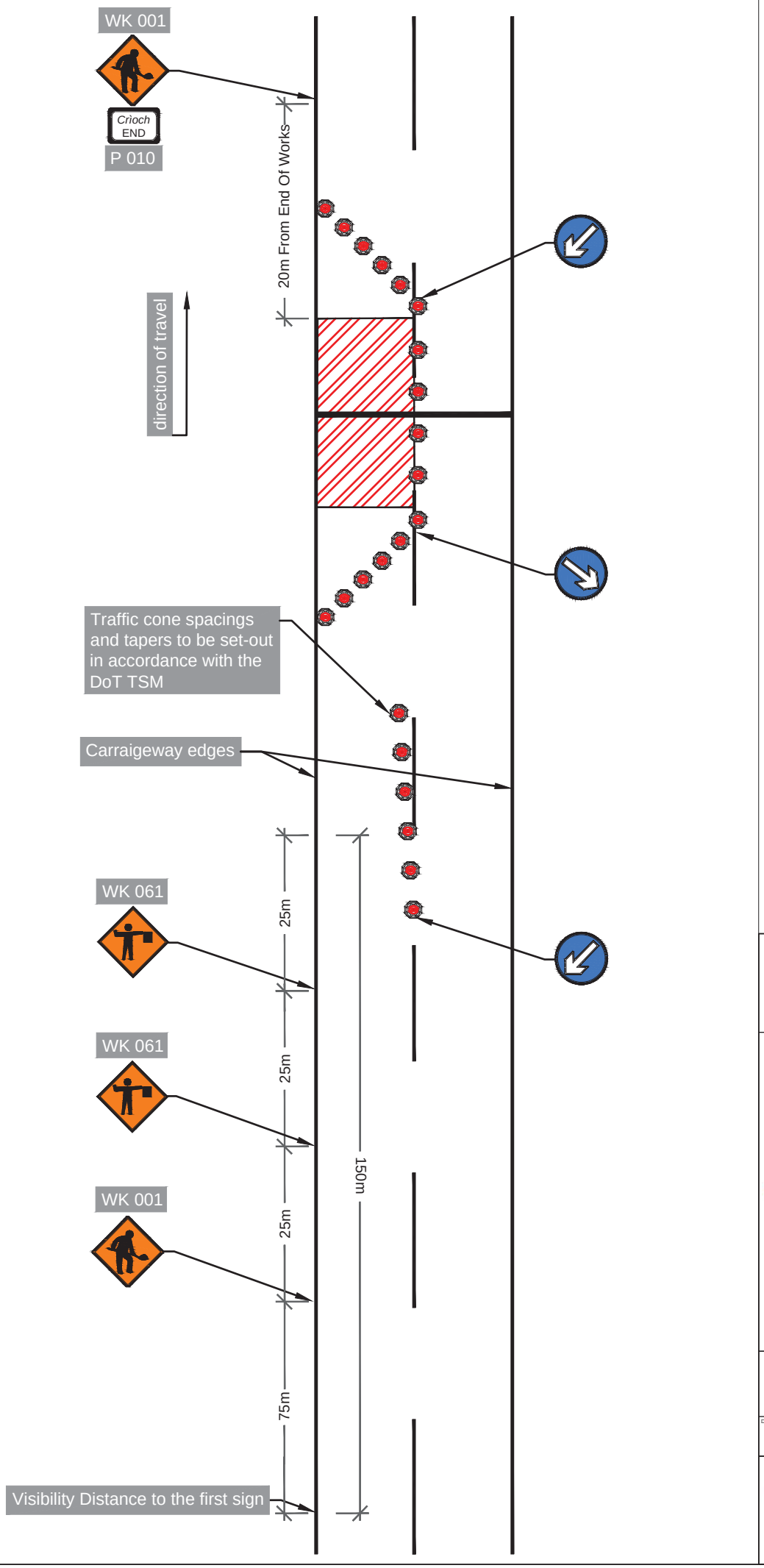

Figure GC 5.23

Advance Warning Signage
for Road Works on 50km/hr Roads

Designed in conjunction with

Malachy Walsh and Partners
Engineering and Environmental Consultants
Cork | Tralee | Limerick | London

Note: This drawing is not to scale

Department of Transport
Traffic Signs Manual 2010 (DoT TSM)

Project:
UWF Grid Connection (2019)

Drawn by:	Checked by:	Date:	Sheet Size:
AB	PK	October 19	A3

Aoife Butler
Ecopower Developments Ltd
Zetec House,
Purcellsinch Business Park, Kilkenny
TEL: +353 56 7750140
MOB: +353 83 8805644

ECOPOWER

ROAD SAFETY AUDIT FEEDBACK FORM

SCHEME: PROPOSED UPPERCHURCH WINDFARM GRID CONNECTION (UWF GRID CONNECTION), COUNTY TIPPERARY

ROUTE(S): L2166-10, L6013-0, L2156-0, L2157-0, L6009-0, R503, L2264-50 & L6188-0

AUDIT STAGE: STAGE 1 & REVIEW **DATE AUDIT COMPLETED:** 28TH AUGUST 2019

	To Be Completed By Designer			To Be Completed by Audit Team Leader
Paragraph No. In Safety Audit	**Problem Accepted (Yes/ No)**	**Recommended Measure Accepted (Yes/ No)**	**Describe Alternative Measure(s). Give Reasons for Not Accepting Recommended Measure**	**Alternative Measures Accepted by Auditors (Yes/ No)**
2.1	Yes	Yes		
2.2	Yes	Yes		
2.3	Yes	Yes		
2.4	Yes	Yes		
2.5	Yes	Yes		
2.6	Yes	Yes		
2.7	Yes	Yes		
2.8	Yes	Yes		
2.9	Yes	Yes		
2.10	Yes	Yes		
2.11	Yes	Yes		
2.12	Yes	Yes		
2.13	Yes	Yes		
2.14	Yes	Yes		

SIGNED: David Tennant C.ENG MIEI TLI GROUP **DESIGNER** **DATE:** 10/10/19

SIGNED: Seamus Quigley for MWP **AUDIT TEAM LEADER** **DATE:** 14/10/19

SIGNED: [signature] **EMPLOYER** **DATE:** 10/10/19

ECO POWER DEVELOPMENTS