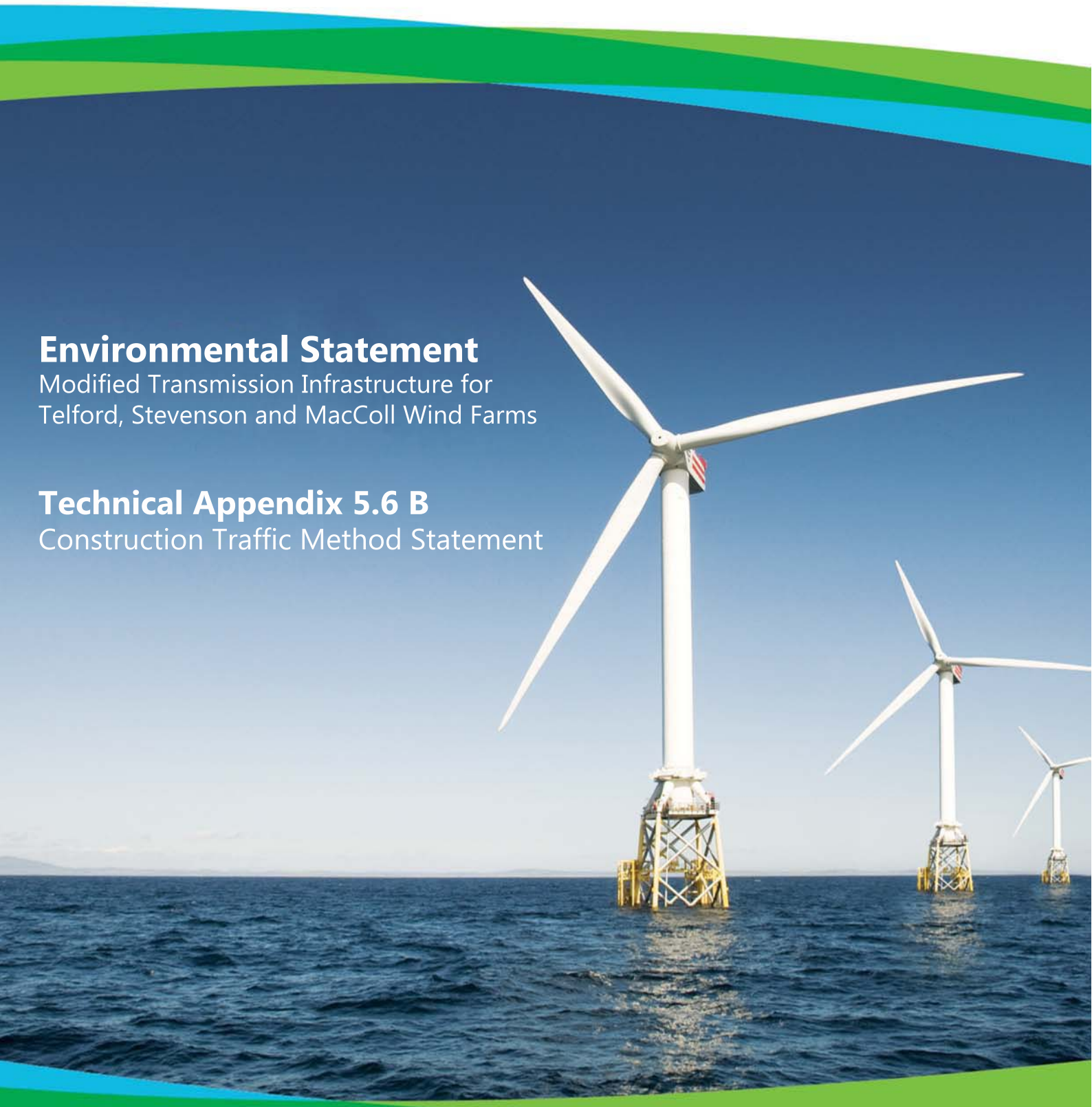
moray offshore renewables ltd

Developing Wind Energy In The Outer Moray Firth



Environmental Statement

Modified Transmission Infrastructure for
Telford, Stevenson and MacColl Wind Farms

Technical Appendix 5.6 B

Construction Traffic Method Statement

edp renewables

This document was produced by WYG on behalf of Moray Offshore Renewables Ltd

Document Owner	**Craig Jolly**
Document Status	**Final**
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Revision	Date	Description	Originated By	Checked By	Approved By
A1	19/06/14	Final	Craig Jolly	Gordon Buchan	Gordon Buchan

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Table of Contents

1 Introduction

1.1 Background

WYG has been commissioned by Moray Offshore Renewables Ltd (MORL) to produce a Construction Traffic Method Statement as part of a Transport Assessment for a planning in principle application for the installation of modified Transmission Infrastructure (modified TI) to connect the three consented wind farms (Telford, Stevenson and MacColl offshore wind farms) to the grid. This study focuses on the modified onshore transmission infrastructure (OnTI) which includes the onshore aspects of the export cable and two substations to the south west of New Deer.

This report has been prepared in accordance with instructions from MORL on the above project details. No liability is accepted for the use of all or part of this report by third parties.

WYG has been commissioned to prepare this construction access study as a source of guidance. The report reviews the key access issues associated with the construction of the OnTI as advised by MORL.

1.2 Report Structure

Following this introductory chapter the report is structured as follows:

- **Chapter Two** outlines the assumptions for the construction access study;
- **Chapter Three** outlines the standard layouts for the construction accesses and passing places;
- **Chapter Four** summarises the potential locations for the access points and passing places; and
- **Chapter Five** provides a summary of the report and an outline of suggested further works, actions and recommendations for consideration by MORL.

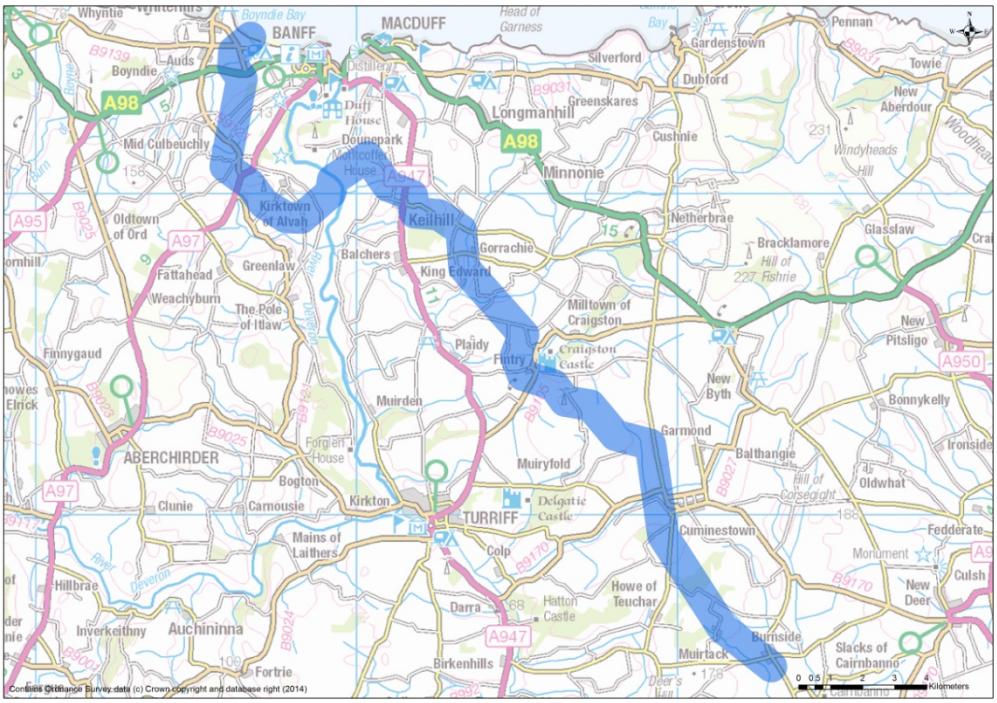
2 Construction Traffic Background

2.1 Project Description and Location

The modified export cable landfall is to be located at Inverboyndie bay to the west of Banff on the northern coast of Aberdeenshire, and will run in a generally south easterly direction to the substation site situated approximately 5.5 km south west of New Deer.

The location of the modified export cable corridor is illustrated in Plate 2.1

Plate 2.1: Modified Export Cable Corridor



2.2 Construction Methodology

The modified OnTI falls into three distinct construction elements, namely:

- Landfall Point;
- Modified Export Cable Route; and
- Substations.

WYG has liaised with the developer and Balfour Beatty, MORL's advisors in relation to the onshore electrical infrastructure, to develop a suitable indicative construction methodology at this relatively early stage of the project to determine the number of construction traffic vehicles on the network. The following sections describe the assumptions made in order to develop traffic flows for the construction phase. It is worth noting however that these assumptions are indicative at present and exact methodologies will be determined at the detailed application stage.

2.3 Landfall Point Construction Assumptions

The landfall point may be part constructed from land, with a coffer dam structure potentially being constructed to tie into the underwater cable.

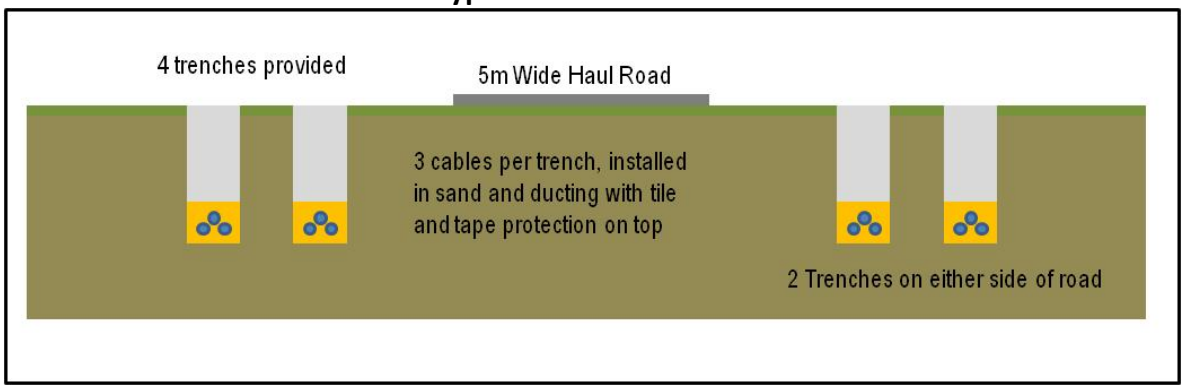
The coffer dam will be constructed from sheet piles and will be imported along with concrete blocks, concrete, cabling sand and construction plant.

Construction at the landfall point is predicted to take up to three months.

2.4 Export Cable Construction Assumptions

The cable route is 33 km in length and will be constructed in two phases. A typical cross section is provided below in Plate 2.2.

Plate 2.2: Typical Cable Route Cross Section



In the initial cabling phase, up to two trenches are to be installed along with the access road. It is likely that all road and river crossings for all four trenches would be installed in this first phase to reduce disruption. The remaining one or two trenches would be installed in the final cabling phase.

A 5 m wide access track with passing places would be installed alongside the cable trenches to allow the installation of the cables and the movement of plant, material and staff.

Up to four trenches, each containing three cables in a trefoil arrangement will be installed in total. All cables will be sheathed in ducting and surrounded in cabling sand. Cable tiles and warning tape would be installed on the top of the cabling sand and the trench backfilled.

Excavated material would be used for the backfilling process and excess material could be used in the site restoration process. However, to provide a robust assessment, WYG has assumed that all excess material would be removed.

Construction of the cable route involves the import of cables, ducting, cable tiles, rock (to construct the access track), cabling sand and fencing materials. Plant and staff access will be required, as will concrete to form the buried cable joint boxes. Exported material will include excess excavated material and recovered road way material (recovered at the restoration phase at the end of the second cable phase).

The cable drums required for the supply of cabling are not considered as Abnormal Indivisible Loads (AIL) loads and would be transported on standard low loader trailers.

To supply the cable route, access junctions will be provided at suitable points where the route crosses (or is in close proximity) to the existing public road network. Crossing accesses of the existing public road are also required to allow the movement of staff along a route, although is it proposed that Horizontal Directional Drilling (HDD) will be used to enable the cable to cross roads and major waterways. This methodology reduces pollution risks and will reduce the effect on traffic and road damage.

For the purposes of construction, it is assumed that three construction teams will be engaged in developing the route in three distinct sections.

The construction process is estimated to last 6 months for each phase.

2.5 Substation Construction Assumptions

The substations feature the development of buildings, hard standings, access roads and concrete pad foundations to accommodate the various electrical switchgear and transformers.

Concrete, cabling stand, rock (for the hard standings), prefabricated building sections and general construction supplies will be required to construct the MORL and Transmission Owner (TO) substation facilities. A small number of AIL will be required to transport the transformers and reactors to the site as well as the heavy lift cranes (and supporting vehicles) required to discharge the AILs and position the equipment within the site.

TO and MORL substation facilities will require 24 months to completely develop and commission the substation facilities.

2.6 Construction Programme

The material required to construct each of the construction elements has been estimated and applied to an indicative construction programme, commencing in 2016, assuming a successful consenting outcome.

The indicative construction programme is provided in Appendix A to this report and includes two way flows (inbound + outbound traffic flows) for each element and for each major task.

The peak of construction occurs in May 2018 and the figures associated with this peak period have been used as the worst case scenario for the surrounding road network. The effects of these traffic flows on the road network are presented in the accompanying Transport Assessment in Technical Appendix 5.6A.

2.7 Abnormal Indivisible Loads (AIL) Access

AIL traffic is excluded from this report and is described in detail in the accompanying AIL Route Survey Report in Technical Appendix 5.6C.

3 Access Junction Strategy

3.1 Introduction

Access junctions will be required to enable construction of all three elements of the development. Single points of construction access will be required for the landing point and substations, whilst 28 points of access will be required along the 33 km cable route.

Wherever possible, access junctions will be created at existing field accesses to minimise the effect on hedgerows and other environmental features and to minimise disruption to agricultural activities.

None of the affected road network in the vicinity of the development is located on or near the Trunk Road network, with all neighbouring links being the responsibility of Aberdeenshire Council (AC). The AC Roads Standards (Standards for Road Construction Consent and Adoption) have been used to develop access solutions that are considered appropriate for construction use.

Given that the detailed design of the landfall point and substations have not yet been undertaken and that the cable route sits within a 500 m buffer, it is not feasible at this stage to develop individual access junction proposals to suit each location. To overcome this issue, WYG has instead developed standard junction types that are appropriate to certain road types and conditions and these are described in further detail in the following sections.

3.2 Standard Junction Types

The standard junction types are illustrated in Appendix B to this report in drawing SK001. Two types of junction are proposed, namely:

- Type 1: Suitable for A / B Class Roads and Busy C Class Roads; and
- Type 2: Suitable for C Class and Unclassified Minor Roads.

The landfall point and substations will feature Type 1 junctions given the volume of traffic accessing them. The cable route will feature both junction types.

Common to both standard junctions are 15 m radii entrance curves to suit HGV traffic (the substations will feature slightly wider radii curves to the north to accommodate AIL traffic). The entry roads will be 7.3 m in width at the junction to allow HGV traffic to pass with ease and removes the potential for loads "hooking" into each other in the access junction causing accidents, or for loads to project back on the public road causing third party road safety issues.

Busy and high speed roads will feature junctions with a metalled road surface to reduce the possibility of the migration of site debris onto the public road. Further measures such as road sweepers and wheel washes will also be used.

All junctions will be designed in detail as part of the detailed design application and a full Section 56 application for works in the adopted road will be made at the appropriate stage, should the development be consented.

It is suggested that Industrial standard access road pavement formation is used for the metalled surface in accordance with the AC's design standards.

Visibility splays at each location will vary depending upon the location and design speeds of the various links that the cable junctions access onto. Using AC standards, three visibility splay options have been adopted and are illustrated in drawing SK002 in Appendix B.

The proposed visibility splays are minimum splays and are as follows:

- Type A: 4.5 x 120 m for high speed and high capacity roads;
- Type B: 4.5 x 90 m for medium speed and low – medium capacity roads; and
- Type C: 2.4 x 59 m for low speed and low capacity roads.

The junction type and visibility splays can be combined to provide a suitable access solution at each of the access locations.

The detailed design stage would also feature Road User Safety Audits (RUSA) reviews for the development as a whole to ensure the highest standards of road safety.

3.3 Crossing Types

At various points, the export cable will cross roads and it will be necessary for a road access to be provided to allow the transport of staff from one side of the road to the other. Two types of standardised crossing are provided and are provided in indicative form on drawing SK003 in Appendix B of this report.

It is not MORL's intention to dig trenches through the public road and it is likely that crossing works would be undertaken by HDD to minimise disruption. The crossing points would only be used to move staff and plant as the cable run develops.

Bulk material deliveries will be concentrated to the principal access junctions and not focussed on crossing points. Turning facilities and passing places will be provided on site to accommodate this requirement.

All crossing points would be signposted and would feature appropriate traffic management measures. Access across them would be regulated by the site agents to an absolute minimum.

3.4 Passing Place Provision

Due to the rural nature of sections of the OnTI there are sections where construction traffic may route along narrow rural unclassified roads that are less than 5.5 m in width. In these sections, it is proposed that a network of passing places are developed to allow the passing of HGV traffic with agricultural traffic.

An indicative proposal for such passing facilities is illustrated in Appendix B of this report in drawing SK004. The exact design and location of these passing places would be set at the detailed design stage in close consultation with AC. It is possible that the passing places are formalised post construction as an enhancement to the public road.

3.5 Permanence of Road Infrastructure

The access junction for the substations will be made permanent. All other junctions and crossing points would be removed following the completion of construction works and the land would be restored as appropriate.

3.6 Roads (Scotland) Act

Once the confirmed delivery routes have been established at the detailed design stage, MORL will enter into a Section 96 agreement with AC to ensure that any damage on the more rural road network is monitored and repaired as appropriate.

Section 56 permissions will be sought for all access and enabling works located within the adopted road area.

4 Potential Locations for Accessibility Works

4.1 Location Criteria

The type of junction will be set by the type of road that it will access onto, the use of the access junction, if it is a crossing point or principal access and the speed of the road.

WYG have undertaken a speed survey during the traffic count exercise (see Transport Assessment). Automatic Traffic Counters (ATC) collected vehicle speed data as well as vehicle classes. Analysis of the 85th percentile vehicle speeds over the 7 day period has been undertaken to develop a view on the speed of current traffic.

4.2 Principal Access Points

Bulk material deliveries would be focussed on principal access points to ensure that HGV traffic is focussed on roads that are suited to construction traffic flows. As a result, 10 principal access points have been identified for the modified export cable route, namely:

- A98 west of Inverboyndie;
- B9121 north of Tipperrty;
- A97 south of the B9121 Fintry;
- A947 north of Keilhill;
- C7S west of Gorrachie;
- B9105 south of Fintry;
- B9105 south of Fintry;
- B9170 west of Cuminestown;
- C29S south of Cuminestown; and
- C121B west of the C295.

These access points would handle the bulk of cable route deliveries, with other accesses, being reserved for crossing points only.

4.3 Suggested Access Locations

There are up to 28 possible crossing points of the public road network on the modified export cable route. These are shown in indicative form in drawings SK05 and SK06 in Appendix C of this report.

Table 4.1 illustrates the proposed junction types, visibility splays, recorded 85th percentile speeds and crossing points suggested for the proposed cable route. The final location will be dependant upon the detailed design of the modified export cable route and detailed application stage discussions with AC.

Table 4.1: Proposed Access Point Description

Access Point	Major Road Class	85th Percentile Speed (MPH)	Principal Junction	Junction Type	Visibility Type
1	B	53	Crossing	Staggered	A
2	B	44	Crossing	Staggered	B
3	A	53	Principal	1	A
4	C	44	Crossing	Straight	B
5	B	44	Principal	1	A
6	C	46	Crossing	Straight	C
7	A	61	Principal	1	A
8	C	46	Crossing	Straight	B
9	C	46	Crossing	Straight	B
10	C	46	Crossing	Straight	B
11	C	56	Crossing	Straight	A
12	A	67	Principal	1	A
13	C	56	Crossing	Staggered	A
14	C	56	Crossing	Straight	A
15	C	58	Principal	1	A
16	C	56	Crossing	Straight	A
17	C	46	Crossing	Straight	C
18	C	56	Crossing	Straight	A
19	C	46	Principal	2	A
20	B	46	Principal	1	A
21	C	45	Crossing	Straight	C
22	C	55	Crossing	Staggered	A
23	B	55	Principal	1	A
24	C	45	Crossing	Straight	C
25	C	56	Principal	2	A
26	C	45	Crossing	Straight	C
27	C	45	Crossing	Straight	C
28	C	45	Principal	1	A

5 Summary

WYG has been commissioned by Moray Offshore Renewable Limited to undertake a Construction Traffic Method Statement to review the construction access issues associated with the proposed export cable development.

The review has focussed on the non-AIL transport elements of the project and illustrates the assumptions developed in terms of estimating the traffic generation of the construction proposals.

At present it is not possible to provide detailed design of all the access junctions and crossing points associated with the export cable proposals. To provide a high level review of potential arrangements, WYG has prepared a set of indicative access junction types for use along the route of the project. These standard types have been applied to the various access points to inform the likely form of access.

The exact access design will need to be established at the detailed design stage and fully worked up detailed access drawings will be provided with Stage 1 RUSA reviews at that stage.

Appendix A – Indicative Construction Programme

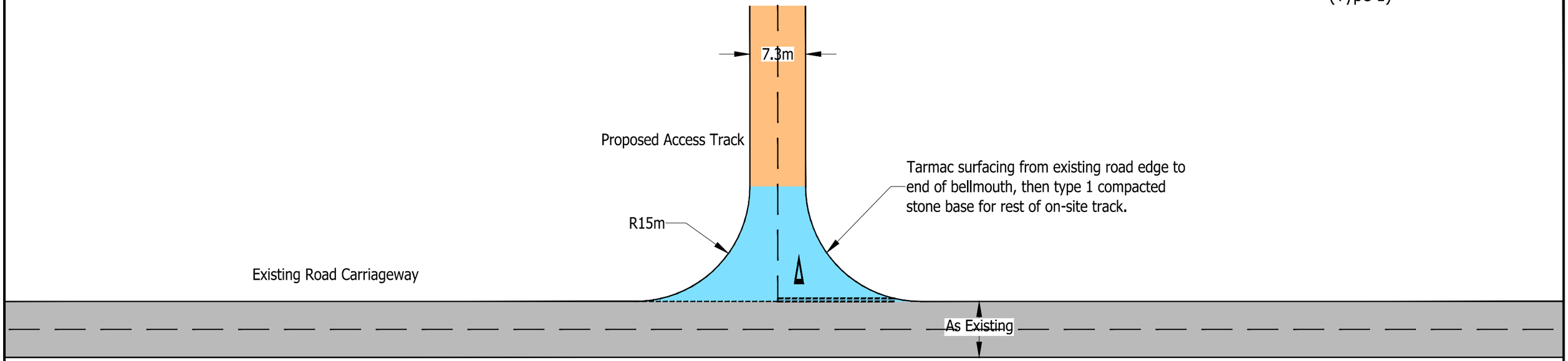
Transport Indicative Construction Programme

Vehicle Classes

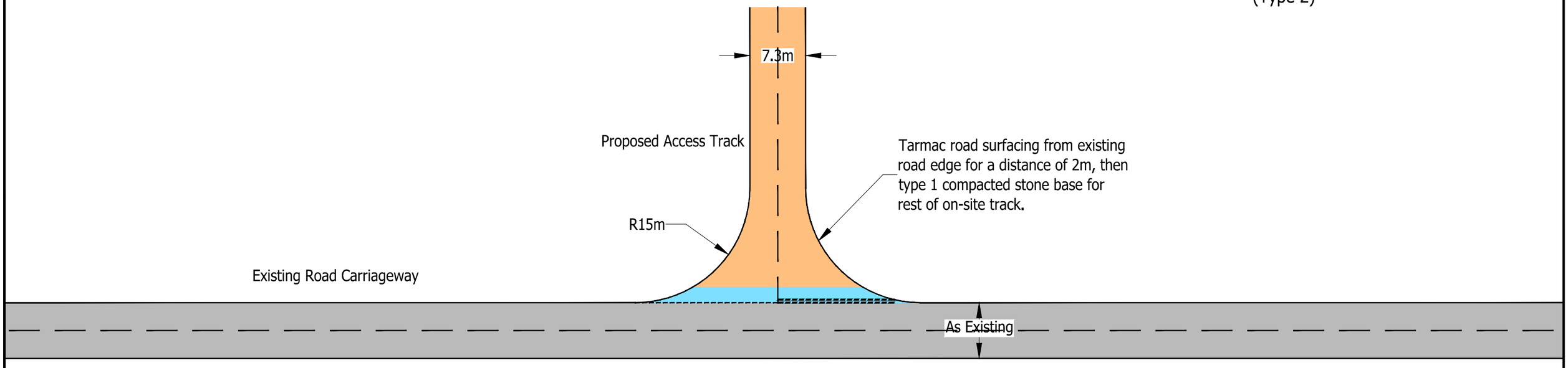
	2016								2017												2018												2019												2020	Total	Cars & Lights	HGV
	May	June	July	August	September	October	November	December	January	February	March	April	May	June	July	August	September	October	November	December	January	February	March	April	May	June	July	August	September	October	November	December	January	February	March	April	May	June	July	August	September	October	November	December	January			
Landing Point																																															
Set Up																							116																						116		116
Excavation																							34	34																					68		68
Piling																								34																					34		34
Construction Works																								16	16																					31		31
Cable Instalation																									32																					32		32
Remediation																									58																					58		58
General Supplies																							16	16	16																					48	48	
Staff																							240	240	240																					720	720	
Cable Run																																															
Set Up																					160																									320		320
Excavation																							6074	6074	6074	6074																			32093		32093
Laying																								631	631	631	631																			5051		5051
Jointing																									76	76	76																			456		456
Backfil																									17	17	17																			104		104
Remediation																											87	87																			6501		6501
General Supplies																					44	44	44	44	44	44	44	44																			572	572	
Staff																					864	864	864	864	864	864	864	864																			11232	11232	
Substation																																															
Set Up				204																																									204		204
Site Preparation					43	43	43																																							128		128
Foundations							251	251	251	251	251																																			1256		1256
Buildings											60	60	60	60	60																													300		300
AIL deliveries																44	44	44																												132	96	36
Installations																			150	150	150	150																							600		600
Commissioning																							64	64																					128		128
Remediation																									43	43	43																				128		128
General Supplies				40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40																			960	960	
Staff				396	396	396	396	396	396	396	396	396	396	396	396	396	396	396	396	396	396	396	396	396	396	396	396																			9504	9504	
Total Per Month	0	0	0	640	479	479	730	687	687	687	747	496	496	496	496	480	480	480	586	586	586	1654	7888	8453	8547	8186	2198	995	0	0	0	0	0	160	2857	3488	3582	3582	4796	4071	0	0	0	0	0	70776	23132	47644
Assumed Working Days	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24			
Total Per Day	0	0	0	27	20	20	30	29	29	29	31	21	21	21	21	20	20	20	24	24	24	69	329	352	356	341	92	41	0	0	0	0	0	7	119	145	149	149	200	170	0	0	0	0	0		33%	67%

Appendix B – Standard Access & Passing Place Layouts

Access from A & B Class Roads
(Type 1)



Access from C Class & Unclassified Roads
(Type 2)



Notes:

1. This is not a construction drawing and is intended for illustrative purposes only.
2. White lining is indicative only.
3. Junction standards are based on Aberdeenshire Council's standards for Industrial Access Roads.
4. Existing Road Carriageway shown is an example only and while based on Aberdeenshire standards the example is not intended to accurately reflect any of the roads from which access is to be taken.

Key:

- Indicative Kerbline / White Lining
- Existing Road Surface
- Proposed Tarmac Surface
- Proposed Compacted Stone Surface

MORL Modified Onshore Transmission Infrastructure

LOCATION:

Indicative Access Junction Layouts

DRAWING TYPE:

Indicative Dimensions & Surfacing

DRAWN:	CHECKED:	DATE:	SCALES:
CJ	GB	June 2014	1:500 @ A3

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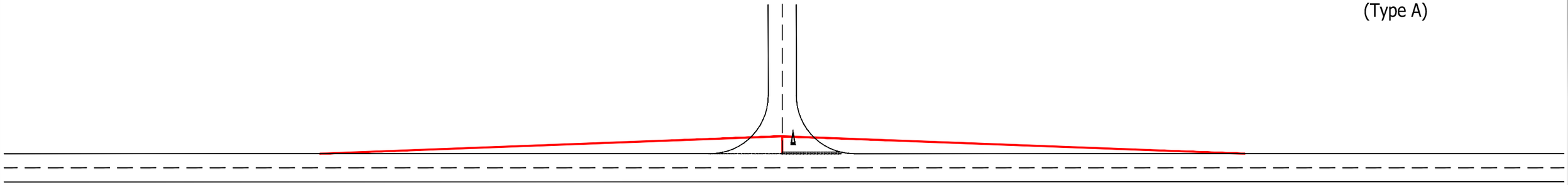
PROJECT NUMBER:	DRAWING NUMBER:	REVISION:
A087928	SK001	·

Access from A Class Roads
(Type A)



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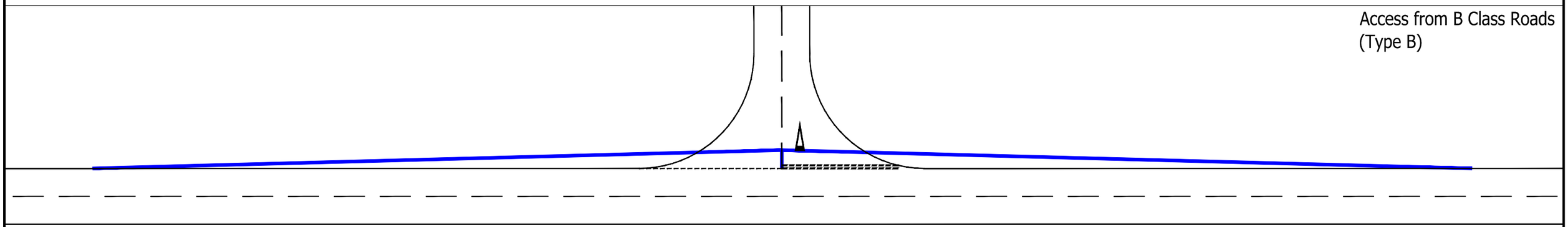
Access from B Class Roads
(Type B)



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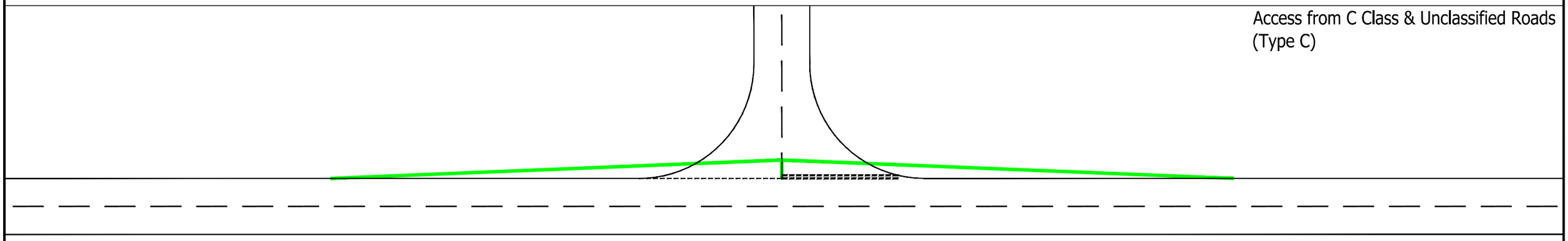
Access from C Class & Unclassified Roads
(Type C)



1:500 @ A3

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Key:

- Indicative Kerbline / White Lining
- Indicative 4.5m x 120m Visibility Splay
- Indicative 4.5m x 90m Visibility Splay
- Indicative 2.4m x 59m Visibility Splay

MORL Modified Onshore Transmission Infrastructure

LOCATION:

Indicative Access Junction Layouts

DRAWING TYPE:

Indicative Visibility Splay Requirements

DRAWN:	CHECKED:	DATE:	SCALES:
CJ	GB	June 2014	As Shown

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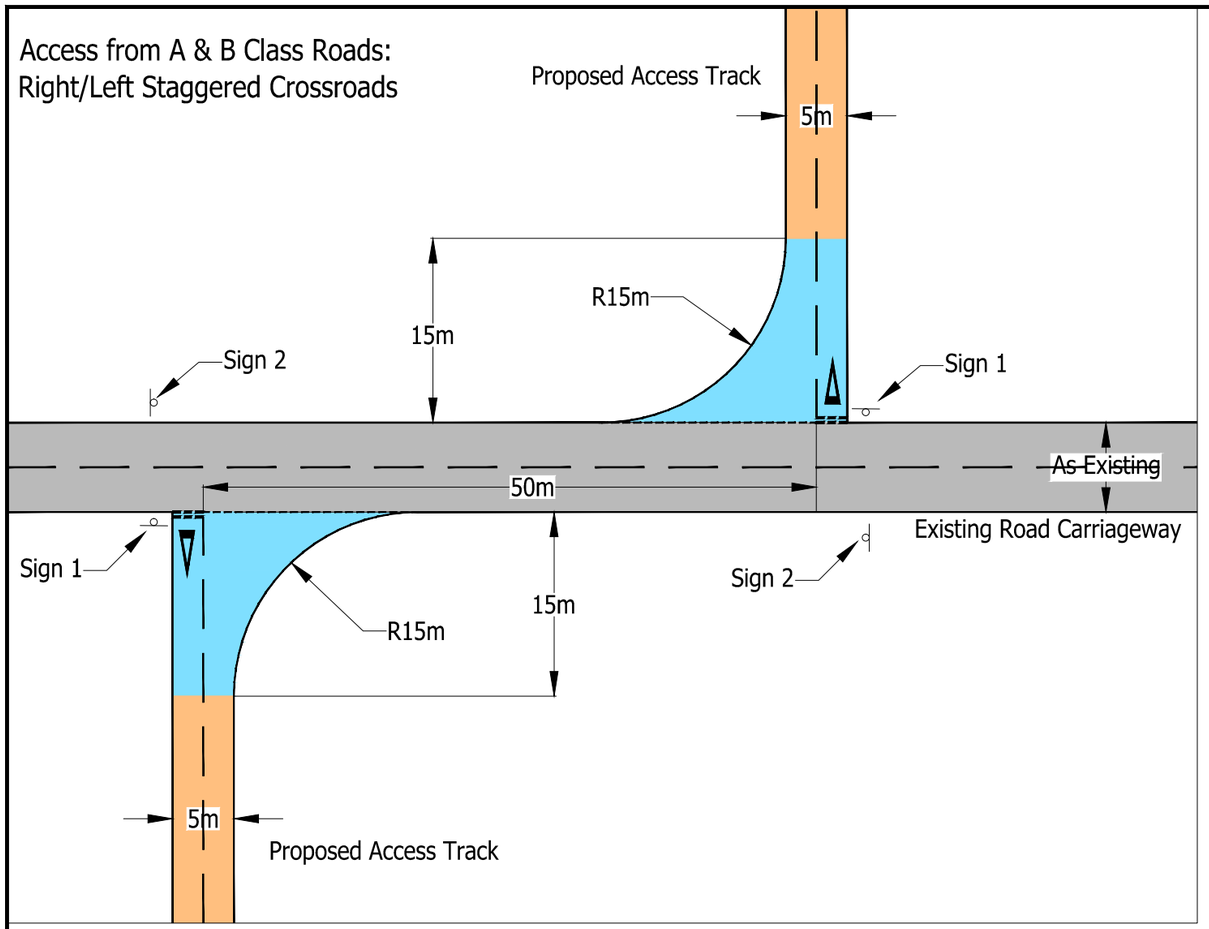
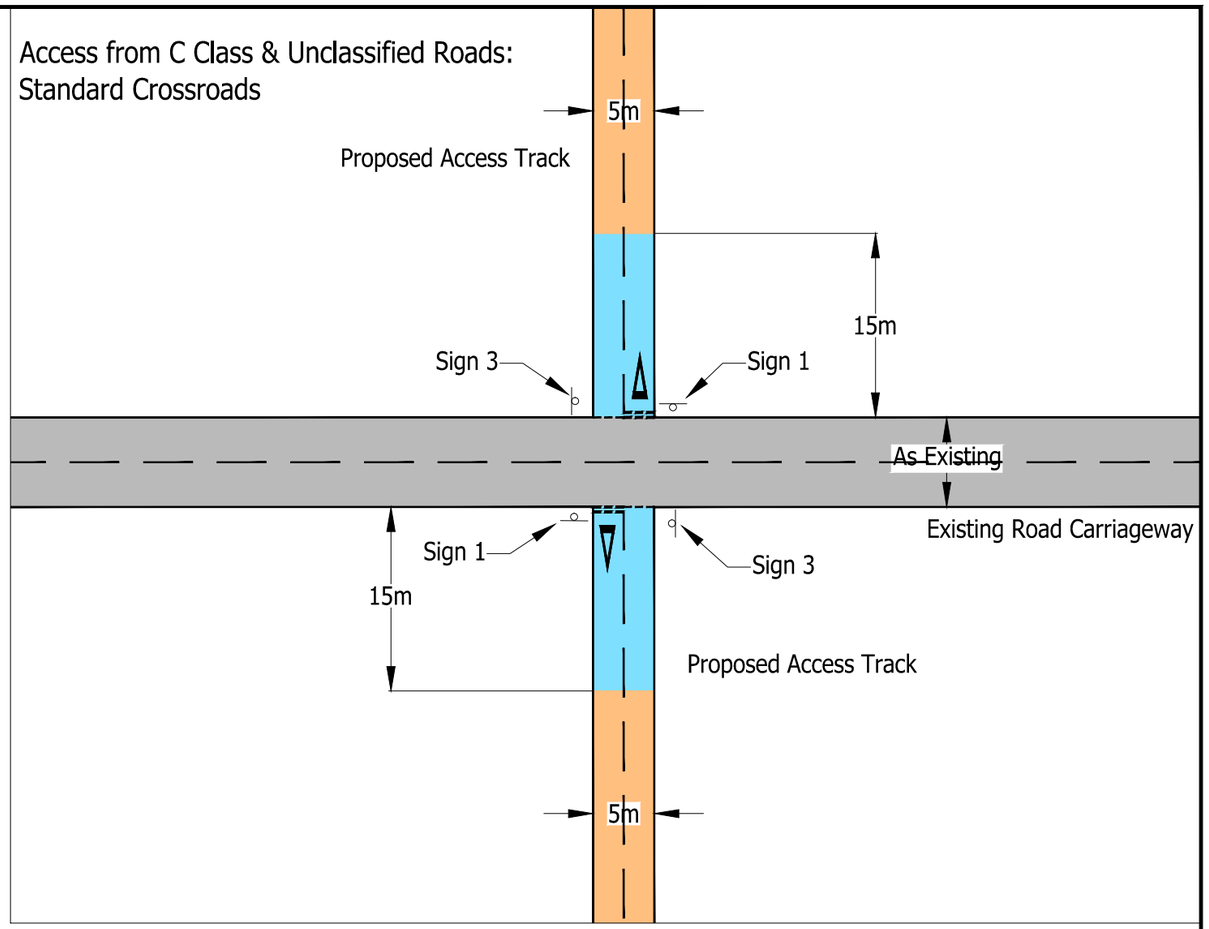
PROJECT NUMBER:	DRAWING NUMBER:	REVISION:
A087928	SK002	·





Sign 1: Give Way Sign (Sign 602)

Sign 2: Crossroads sign with Heavy Plant Crossing attached below

(Sign 504-1 with Sign 511-A below)

Sign 3: Staggered right/left crossroads sign with Heavy Plant Crossing attached below

(Sign 507-1R with Sign 511-A below)

Notes:

1. This is not a construction drawing and is intended for illustrative purposes only.
2. White lining is indicative only.
3. Junction standards are based on Aberdeenshire Council's standards for Industrial Access Roads & DMRB TD 42/95
4. Existing Road Carriageway shown is an example only and while based on Aberdeenshire standards the example is not intended to accurately reflect any of the roads from which access is to be taken.

Key:

- Indicative Kerbline / White Lining
- Existing Road Surface
- Proposed Tarmac Surface
- Proposed Compacted Stone Surface
- Road Sign Location

MORL Modified Onshore Transmission Infrastructure

Moray Offshore Renewables Ltd

LOCATION:

Indicative Construction Crossing Junction Layouts

DRAWING TYPE:

Indicative Dimensions & Surfacing

DRAWN:	CHECKED:	DATE:	SCALES:
CJ	GB	June 2014	1:500 @ A3

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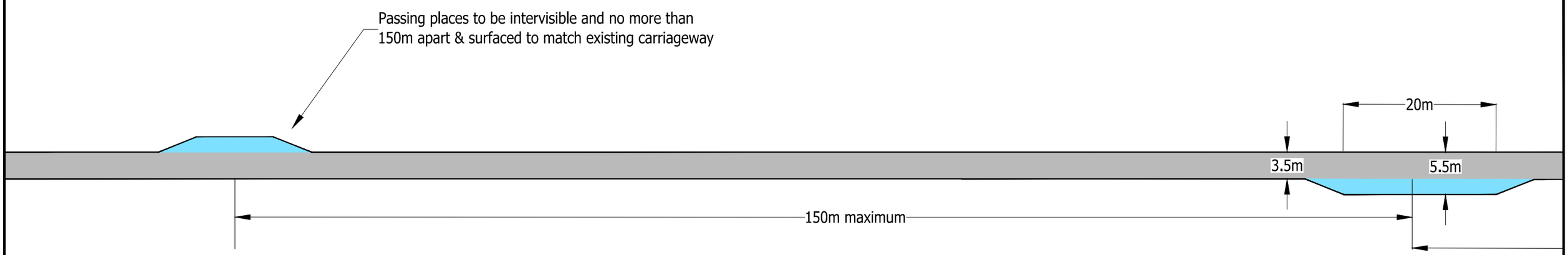
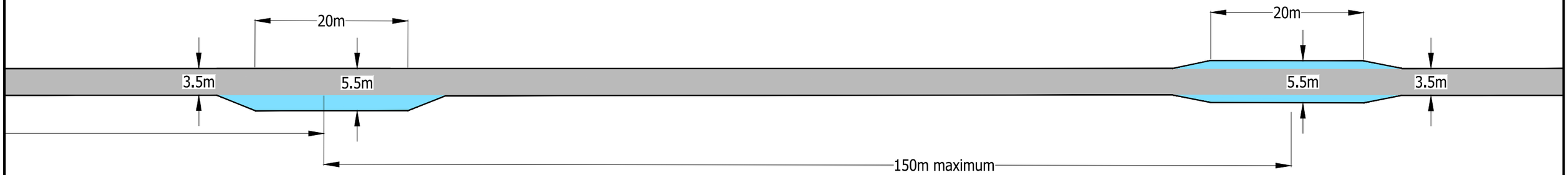
PROJECT NUMBER:	DRAWING NUMBER:	REVISION:
A087928	SK003	-



Passing places required where existing road width is below 5.5m; minimum width of 3.5m required with additional 2m for passing places.

Passing place widening to single side of existing carriageway



Passing place widening to either side of existing carriageway

Notes:

1. This is not a construction drawing and is intended for illustrative purposes only.
2. White lining is indicative only.
3. Junction standards are based on Aberdeenshire Council's standards for Rural Passing Places.
4. Existing Road Carriageway shown is an example only and while based on Aberdeenshire standards the example is not intended to accurately reflect any of the roads from which access is to be taken.

Key:

- Indicative Kerbline / White Lining
- Existing Road Surface
- Proposed Passing Place

MORL Modified Onshore Transmission Infrastructure

Moray Offshore Renewables Ltd

LOCATION:

Indicative Passing Place Layouts & Positioning

DRAWING TYPE:

Indicative Dimensions & Surfacing

DRAWN:	CHECKED:	DATE:	SCALE:
CJ	GB	June 2014	1:500 @ A3

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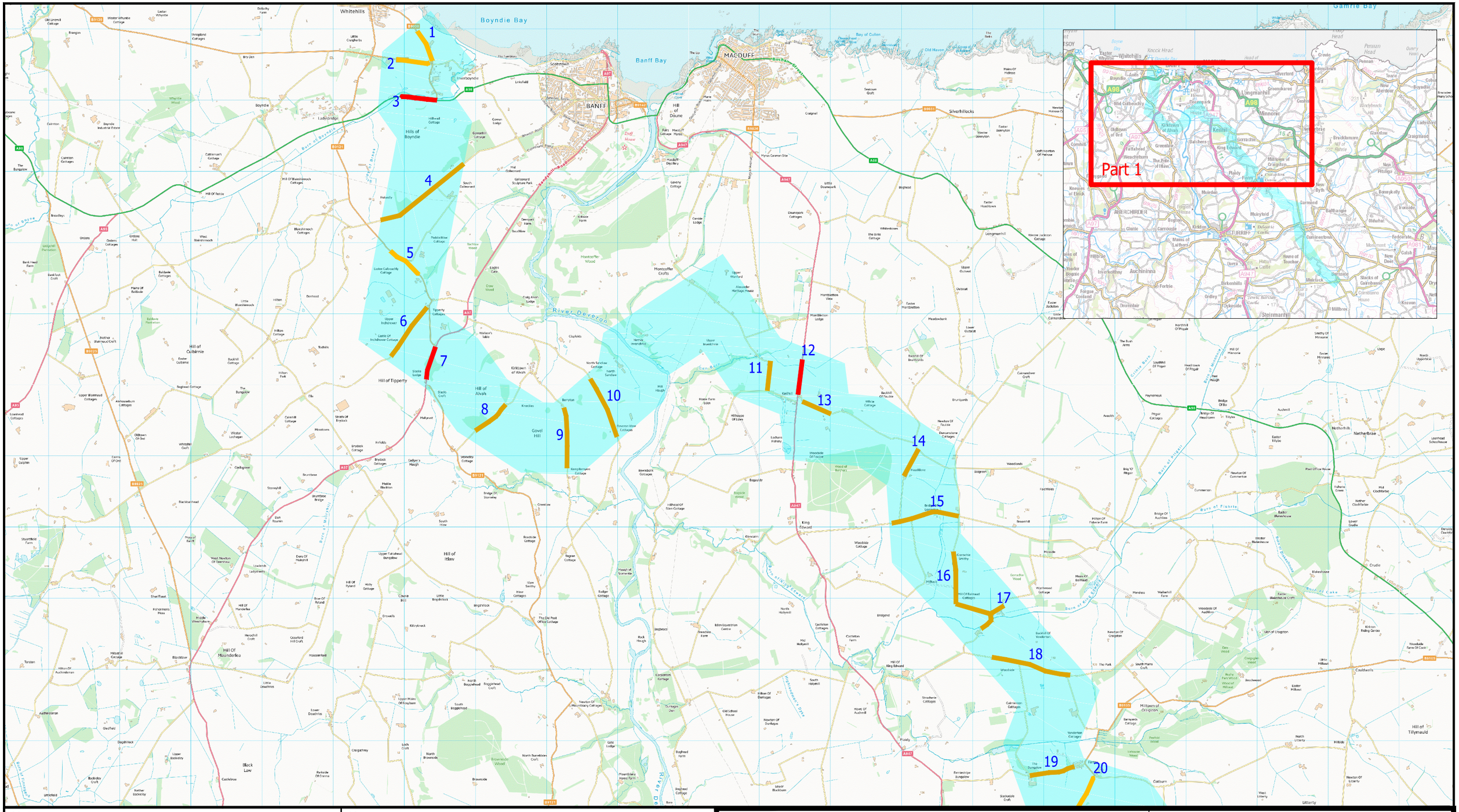
PROJECT NUMBER:	DRAWING NUMBER:	REVISION:
A087928	SK004	·

Appendix C – Potential Locations for Access Points



Notes:

1. This is not a construction drawing and is intended for illustrative purposes only.
2. White lining is indicative only.
3. Junction standards are based on Aberdeenshire Council's standards for Rural Passing Places.
4. Existing Road Carriageway shown is an example only and while based on Aberdeenshire standards the example is not intended to accurately reflect any of the roads from which access is to be taken.

Key:

- Onshore Export Cable Corridor
- A-Class Road Access / Crossing
- B-Class Road Access / Crossing
- C-Class & Unclassified Road Access / Crossing

MORL Modified Onshore Transmission Infrastructure

LOCATION:

Indicative Onshore Export Cable Corridor - Part 1

DRAWING TYPE:

Potential Road Sections for Access Junction & Crossing Point Locations

DRAWN:	CHECKED:	DATE:	SCALE:
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PROJECT NUMBER:	DRAWING NUMBER:	REVISION:
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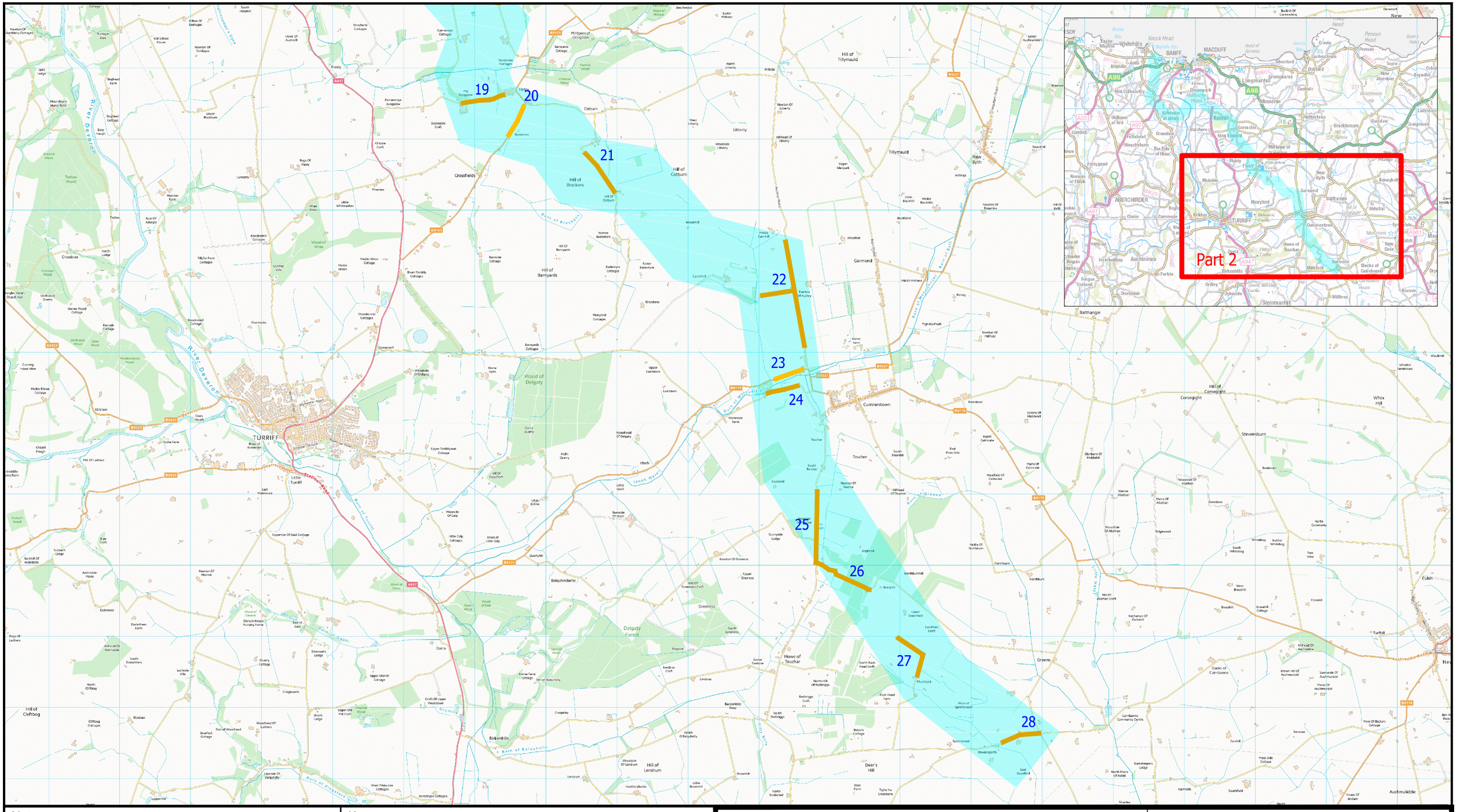

Notes:

1. This is not a construction drawing and is intended for illustrative purposes only.
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3. Junction standards are based on Aberdeenshire Council's standards for Rural Passing Places.
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Key:

- Onshore Export Cable Corridor
- A-Class Road Access / Crossing
- B-Class Road Access / Crossing
- C-Class & Unclassified Road Access / Crossing

MORL Modified Onshore Transmission Infrastructure

Moray Offshore Renewables Ltd

LOCATION:

Indicative Onshore Export Cable Corridor - Part 2

DRAWING TYPE:

Potential Road Sections for Access Junction & Crossing Point Locations

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