

**DERREENACRINNIG WIND
FARM**

PROPOSED ACCESS ROUTE

ENERCON



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WESTOF SCOTLAND COMPANY PROFILE

West of Scotland Heavy Haulage has been transporting abnormal loads throughout the UK since the early 1950's. Currently based in Cumbernauld, Strathclyde we operate a fleet of modern trailers and tractor units which range from plant low loaders to a Scheuerle modular system which can handle loads of up to 500 tones. We also have a range of trailers specifically for transporting wind turbine components, including blade trailers of up to 55.0m in length.

West of Scotland's operation is run from the Cumbernauld depot, the traffic office employs a fully integrated and computerized traffic system which works hand in hand with a satellite tracking system which not only enables the company to run more efficiently but also allows us to know the precise location of our vehicles. This also gives us piece of mind when our vehicles are sometimes working many miles from the public roads on forestry tracks or wind farms.

Also at our Cumbernauld site we have our own in house workshops where we maintain our own equipment. We also have 2 acres of uncovered storage with our own on site cranes giving a lifting capacity of 100 tones. In addition to this we have 60,000 square feet of covered warehousing.

Over the last 60 years West of Scotland has amassed a wealth of experience in different fields of heavy haulage such as open cast mining, construction equipment, offshore industry and the wind industry.

Further details of the company and services is available on our website

www.westofscotlandheavyhaulage.com

1. EXECUTIVE SUMMARY

The following table shows a summary of the required works / measures to be taken to enable delivery of the turbine components.

<u>ROUTE MARKER</u>	<u>LOCATION</u>	<u>ISSUES / REMEDIAL WORKS</u>	<u>DRAWING REF.</u>
4	N28 / Marian Terrace Roundabout	Vehicles to travel contraflow	N/A
5	Shannonpark Roundabout	Vehicles to travel contraflow	N/A
13	N71 / Cork Rd. Roundabout	Long Vehicles to travel contraflow	N/A
18	Left hand turn onto Unnamed Rd. at Old Creamery	Clear and utilise existing widened area	N/A
19	Primary School on Unnamed Rd.	Parking Restrictions	N/A
20	Right hand turn prior to River Ilen	Widening works required in adjacent field	N/A
21	Final 1 mile approach to site	Road to be widened and upgraded in line with relevant Enercon Specification	N/A
22	Site Entrance	To be constructed in line with relevant Enercon Specification	N/A
			N/A
			N/A


2. INTRODUCTION

The route survey was carried out to highlight any pinch points or problems that may be encountered when transporting Enercon E48 and E44 Turbine components from the Docks in Ringaskiddy to the site entrance of Derreenacrinnig Wind Farm.

Figure 1 overleaf shows the approx. position of the site entrance.

The route survey was carried out on Thursday 21st January 2016 by Ally MacPherson of West of Scotland Heavy Haulage and revised by Peter Bainbridge December 2016.

The critical components for the route survey were based upon the following information supplied by Enercon;

Pos.		Quantity	Description	Stackable	Deck option	Max. length m	Max. width m	Max. height m	Single gross weight t	Storage m ²	Volum m ³	Total gross weight t
 ENERCON GmbH Dreekamp 5 D-26605 Aurich Last Change of Packing List: 27.08.2015												
Project:											Revision	0
26/01/2016											1 E-44/S/54/3K/01	
Emden-												
PROVISIONAL PACKING LIST - ESTIMATED PACKING DETAILS - FINAL PACKING LIST TO FOLLOW!												
CONVERTER												
1	1	nacelle on wooden supports; net length 4,10m;	no	no	4.10	4.40	3.25	6.00	18.04	58.63	6.00	
2	1	generator on wooden supports	no	no	5.08	4.95	3.10	24.30	25.15	77.95	24.30	
3	1	rotorblades E-44 1 set blade frames 40' with overlength both ends	yes	yes	21.44	2.44	2.72	8.40	52.31	142.29	8.40	
4	1	spinner, lower part MH, concrete, stairs (20' s.o. FR seatransport only) - on direct transport without 20' FR together with Pos. 1 or 5, to be checked	yes	yes	6.10	2.44	2.60	7.00	14.88	38.70	7.00	
5	1	electrical accessories (20' s.o. FR seatransport only)	yes	no	6.10	2.44	2.60	9.00	14.88	38.70	9.00	
5		TOTAL SHIPMENT (Converter):							125.27	356.27	54.70	
TOWER												
						max. transport dimensions incl. lashing eyes & transport saddles						
1	1	steel tower E-44 section 1 (length 19,92m flange diameter 1,49m/1,81m) unpacked on saddles incl. Lashing eyes	no	yes	20.07	1.81	1.96	13.58	36.33	71.20	13.58	
2	1	steel tower E-44 section 2 (length 17,00m flange diameter 1,81m/2,41m) unpacked on saddles incl. Lashing eyes	no	yes	17.14	2.41	2.56	17.96	41.31	105.75	17.96	
3	1	steel tower E-44 section 3 (length 17,03m flange diameter 2,41m/3,58m) unpacked on saddles incl. Lashing eyes	no	yes	17.18	3.58	3.73	32.24	61.50	229.41	32.24	
4	1	pre delivery foundation basket 6 weeks before	yes if containerized	yes if containerized	8.00	2.45	2.00	3.90	19.60	39.20	3.90	
4		TOTAL SHIPMENT (Tower):							158.74	445.56	67.68	
TOTAL GROSS WEIGHT (Converter + Tower)											122.38	



ENERCON GmbH
Dreekamp 5
D-26605 Aurich

Last Change of Packing List:
27.08.2015

Project:

26/01/2016

1 E-48/S/55/3K/01

Emden-

PROVISIONAL PACKING LIST - ESTIMATED PACKING DETAILS - FINAL PACKING LIST TO FOLLOW! Revision date: 05.09.2013

Pos.	Quantity	Description	Stackable	Deck option	Max. length m	Max. width m	Max. height m	Single gross weight kg	Storage m ²	Volumn m ³	Total gross weight kg
CONVERTER											
1	1	nacelle on wooden supports; net length 4.10m;	no	no	4.10	4.40	3.25	6.00	18.04	58.63	6.00
2	1	generator on wooden supports	no	no	5.08	4.75	3.10	24.30	24.10	74.72	24.30
3	1	rotorblades E-48 1 set blade frames 40' with overlength both ends; overwidth one side	yes	yes	24.65	2.59	2.71	9.00	63.84	173.02	9.00
4	1	spirner, lower part M.H., concrete, stairs 20' s.o. FR seetransport only) - on direct transport without 20' FR together with Pos. 1 or 5, to be checked	yes	yes	6.10	2.44	2.60	7.00	14.88	38.70	7.00
5	1	electrical accessories 20' s.o.FR seetransport only)	yes	no	6.10	2.44	2.60	9.00	14.88	38.70	9.00
5		TOTAL SHIPMENT (Converter):							135.76	383.77	55.30
TOWER											
max. transport dimensions incl. lashing eyes & transport saddles											
1	1	steel tower E-48 section 1 (length 19,92m flange diameter 1,49m/1,87m) unpacked on saddles with lashing eyes	no	yes	20.07	1.87	2.02	13.83	37.53	75.81	13.83
2	1	steel tower E-48 section 2 (length 17,70m flange diameter 1,87m/2,53m) unpacked on saddles with lashing eyes	no	yes	17.85	2.53	2.68	18.71	45.16	121.03	18.71
3	1	steel tower E-48 section 3 (length 16,93m flange diameter 2,53m/3,58m) unpacked on saddles with lashing eyes	no	yes	17.08	3.58	3.73	29.18	61.15	228.08	29.18
4	1	pre delivery foundation basket 6 weeks before	yes if containerized	yes if containerized	8.00	2.45	2.00	3.90	19.60	39.20	3.90
4		TOTAL SHIPMENT (Tower):							163.44	464.12	65.61
TOTAL GROSS WEIGHT (Converter + Tower)										120.91	



Figure 1: Approx. Position of Site Entrance

3. ROUTE

The turbine components are proposed to be brought into Ireland via either the Port of Foynes in County Limerick or Ringaskiddy in County Cork.

Both ports have seen recent turbine deliveries and have very few obstructions to loads of this size exiting the port.

The ports themselves have storage space adjacent to the quay for turbine components therefore speeding up the unloading of the delivery vessel.

The routes to site are as follows;

From the Port of Ringaskiddy

- From the docks turn right onto the N28
- At the roundabout take the 2nd exit and stay on the N28
- At Shannonpark Roundabout take the 2nd exit and stay on the N28
- Keep left at the fork and follow signs for the N25/South Ring (East) / N27 / N71 / N22 / Airport and merge onto the N40
- Take the exit
- At Bandon Rd Roundabout, take the 1st exit onto Bandon Road/N71
- Turn right on to unnamed road.
- Turn left R586
- Continue on R586 to Dunmanway.
- Turn left Sackville Street
- Continue Quarry Road

- Rejoin R586 and continue to Drimoleague
- Turn right onto W End/Quarry Road
- Turn right onto Unnamed Road
- Turn left onto Unnamed Road
- Turn left onto Unnamed Road at Old Creamery
- Turn right onto Unnamed Road prior to River Ilan
- Turn right into Site Entrance (Not yet constructed)

The total distance is approx. 50 miles (80km). Please refer to Figure 2: Route Map from Ringaskiddy.

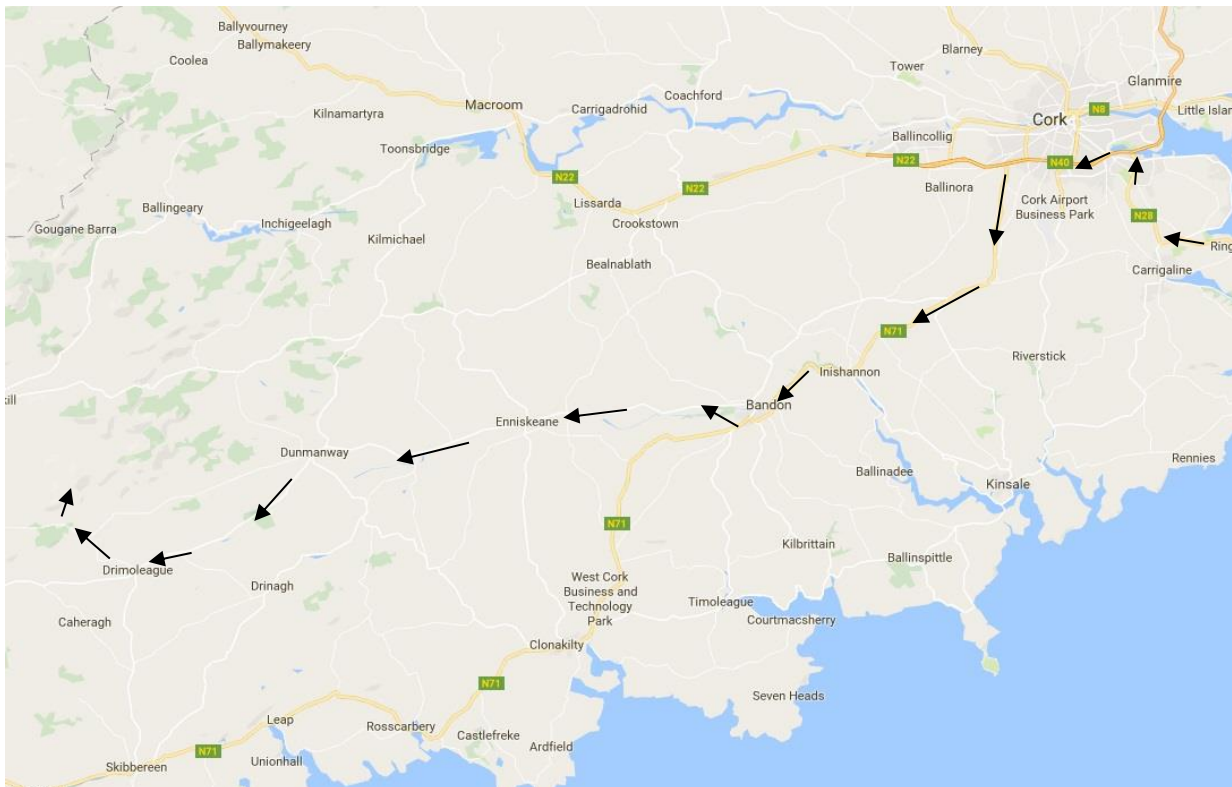
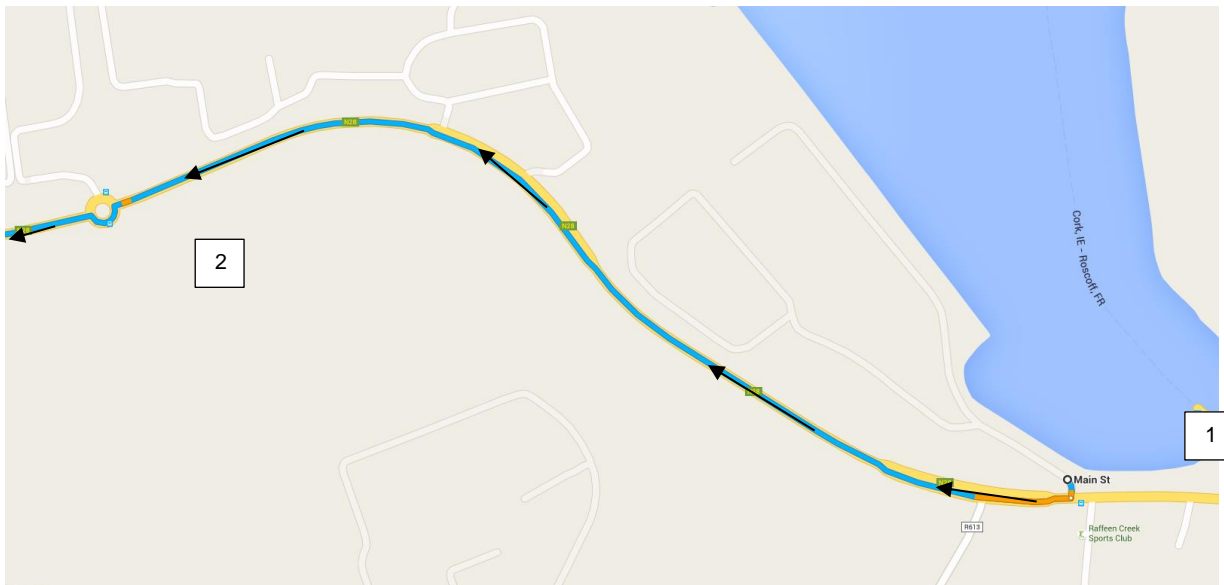


Figure 2: Route Map from Ringaskiddy

4. ROUTE DETAILS



4.1 ROUTE MARKERS 1 & 2



4.1.1 AERIAL VIEW OF ROUTE MARKERS 1 & 2



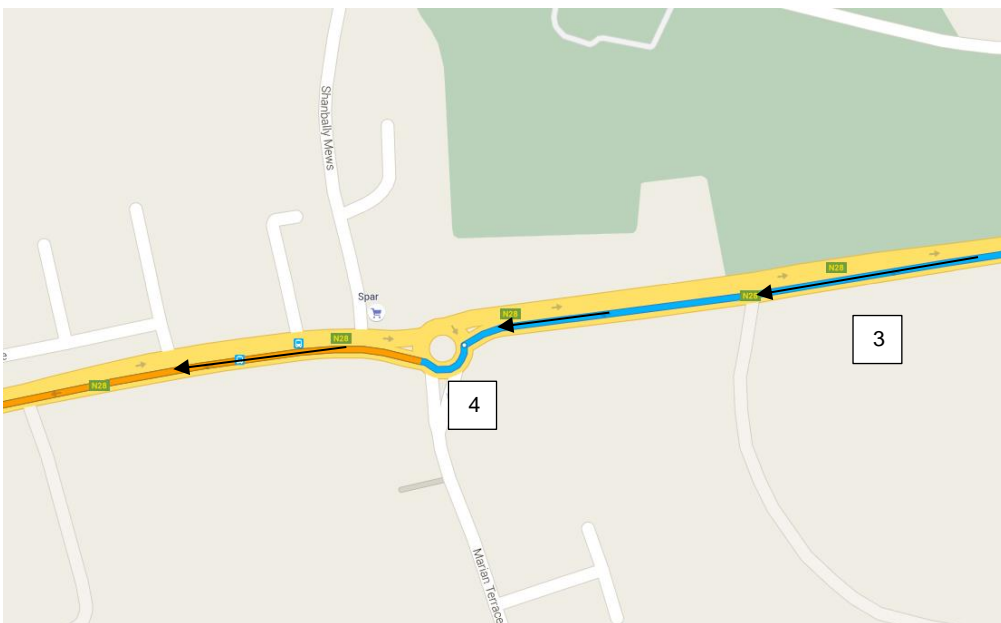
Route Marker 1 – Exit from Docks. All vehicles will negotiate this gate without issue.



Route Marker 1 – Exit from Docks onto N28. All vehicles will negotiate this junction without issue.



Route Marker 2 – Roundabout at Pfiser Factory. All vehicles will negotiate this roundabout without issue.



4.2 ROUTE MARKERS 3 & 4



4.2.1 AERIAL VIEW OF ROUTE MARKERS 3 & 4

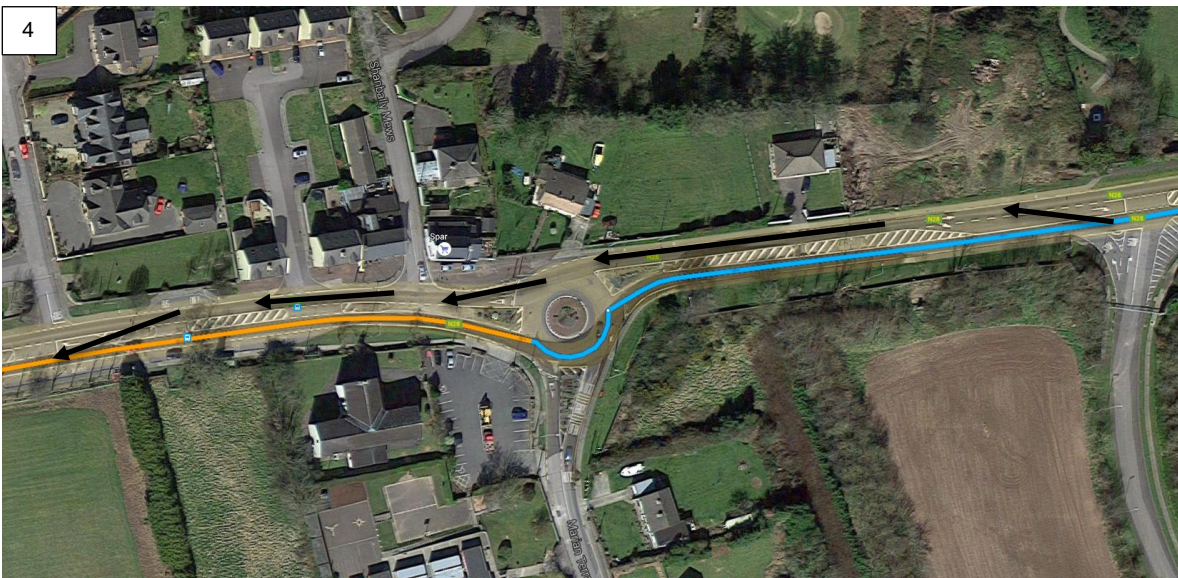


Route Marker 3 – Traffic Calming Splitter Island entering Shanbally. Wide loads will be required to travel contraflow around the splitter island.

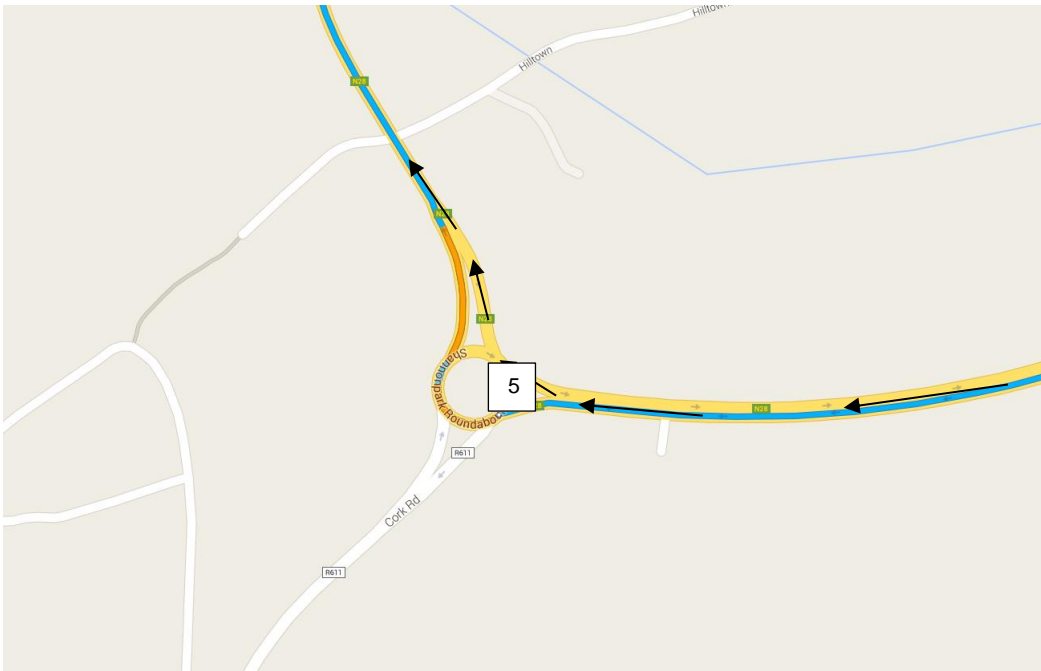
NOTE: Ensure trailers with a bed height of 1m with a raise and lower facility are utilised to negotiate low bollards, kerbs traffic calming measures etc.



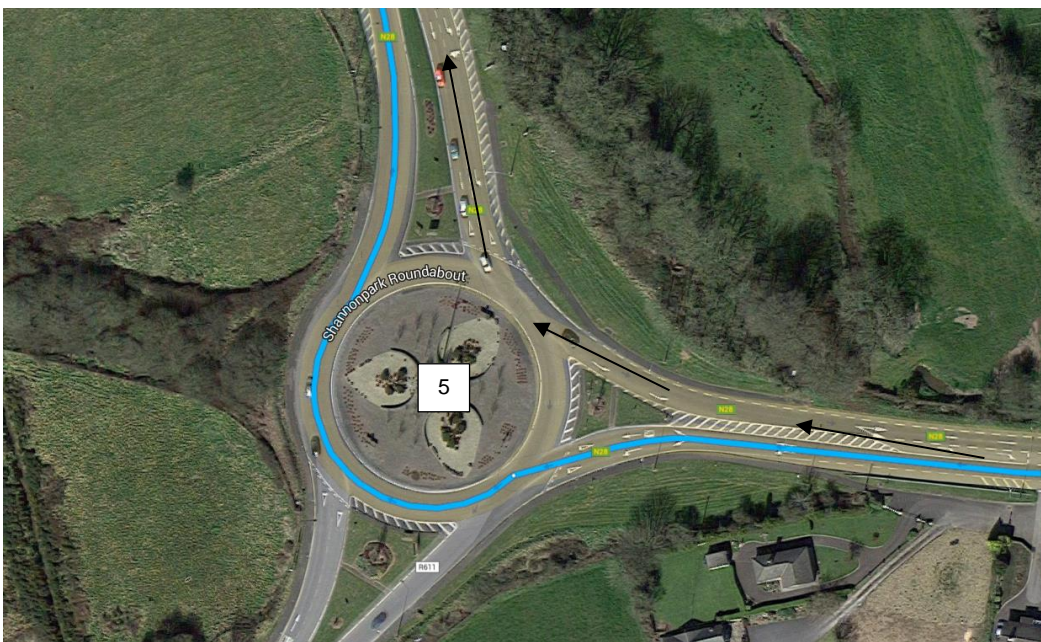
Route Marker 4 – N28 / Marian Terrace Roundabout. All vehicles will be required to travel contraflow around the roundabout and splitter islands as shown below.



Route Marker 4 – N28 / Marian Terrace Roundabout.



4.3 ROUTE MARKER 5



4.3.1 AERIAL VIEW OF ROUTE MARKER 5

5

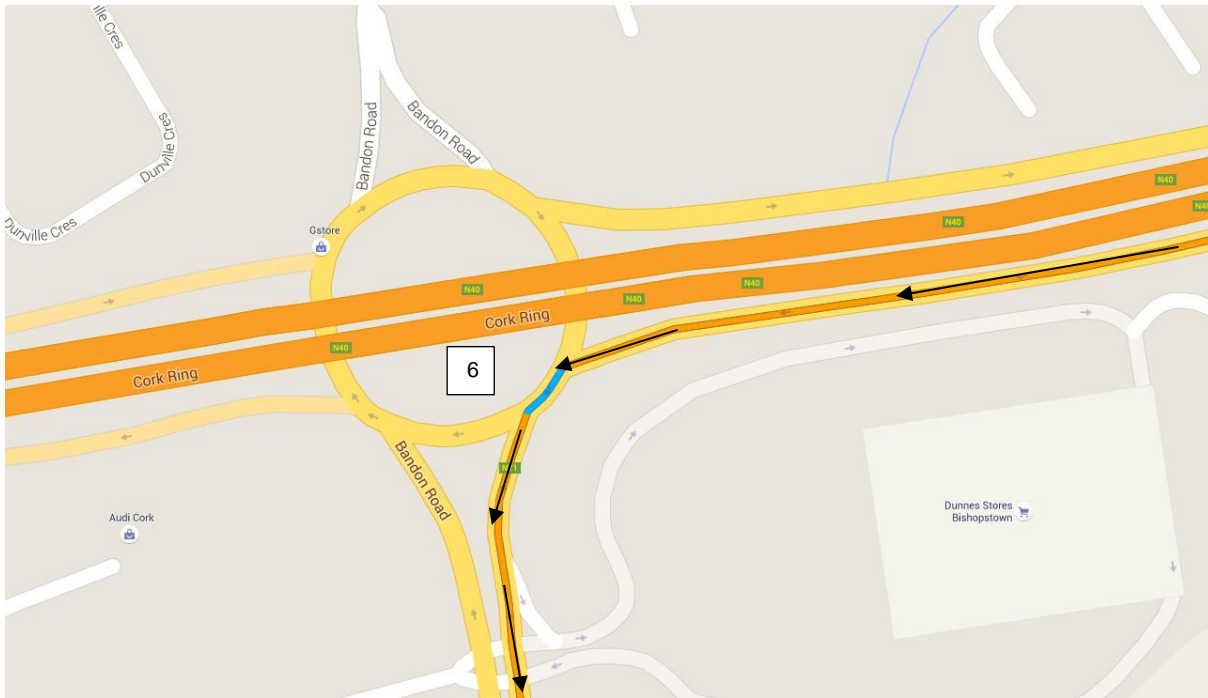


Route Marker 5 – Shannonpark Roundabout. The longer delivery vehicles such as the blades will require to travel contraflow around this roundabout. Shorter loads will be able to negotiate the roundabout in the usual manner.

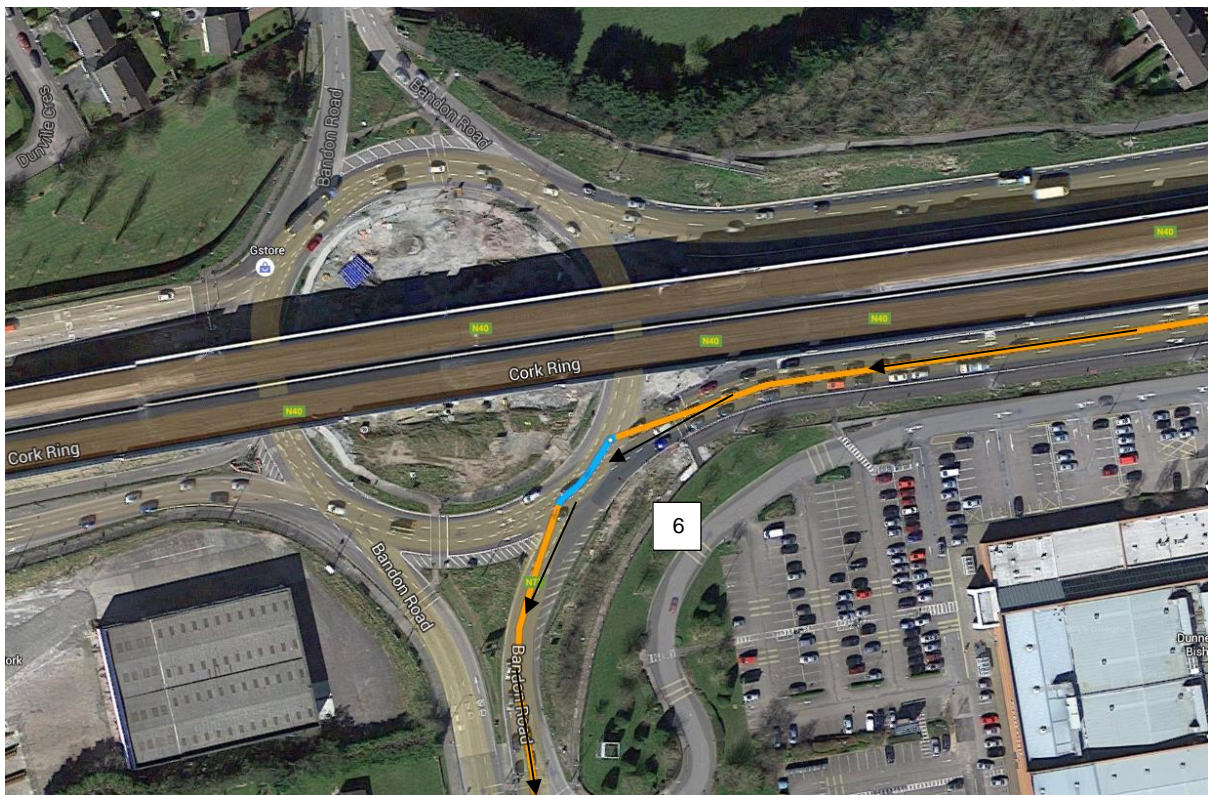
5



Route Marker 5 – Shannonpark Roundabout. The longer delivery vehicles such as the blades will require to travel contraflow around this roundabout. Shorter loads will be able to negotiate the roundabout in the usual manner.



4.4 ROUTE MARKER 6

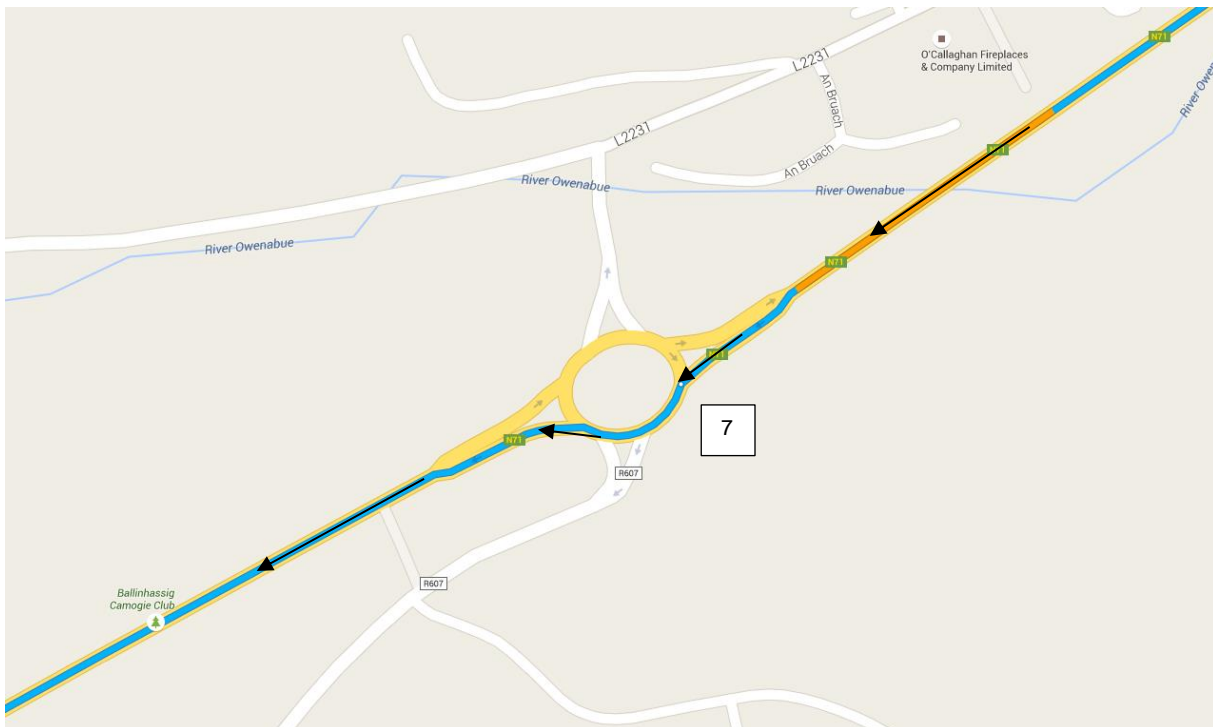


4.4.1 AERIAL VIEW OF ROUTE MARKER 6

6



Route Marker 6 – Bandon Rd. Roundabout. All vehicles will negotiate this roundabout without issue.



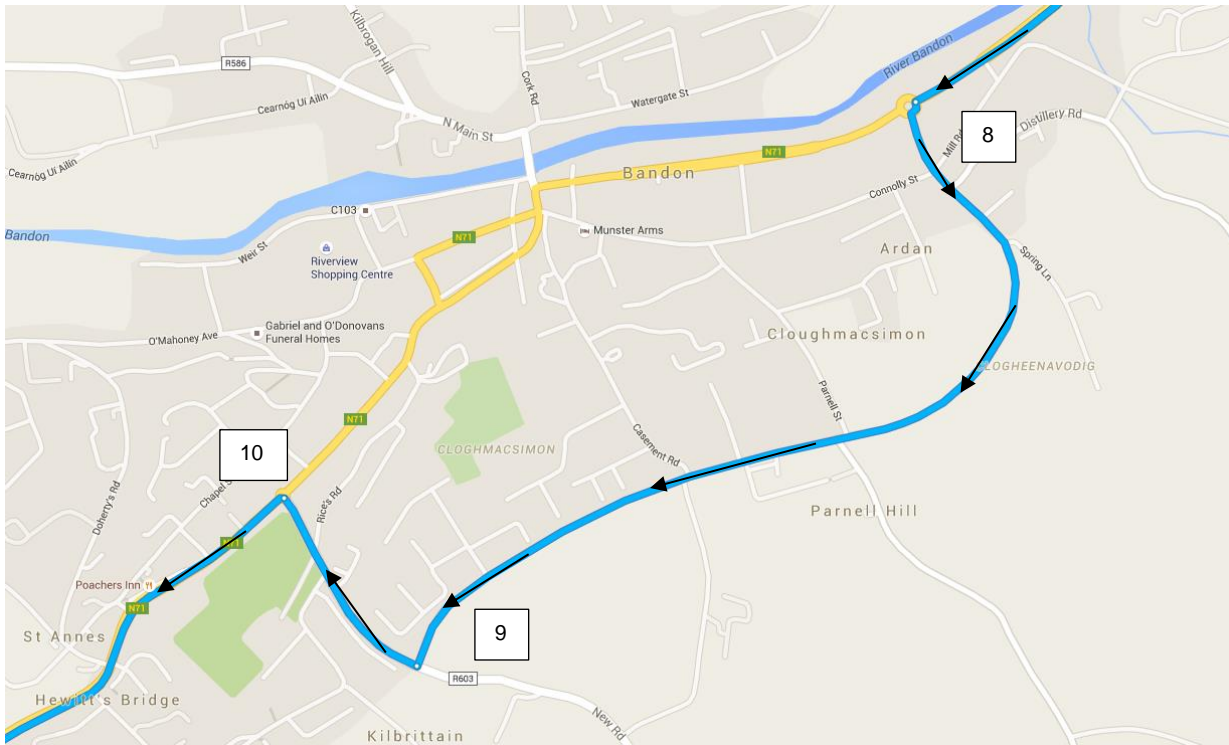
4.5 ROUTE MARKER 7



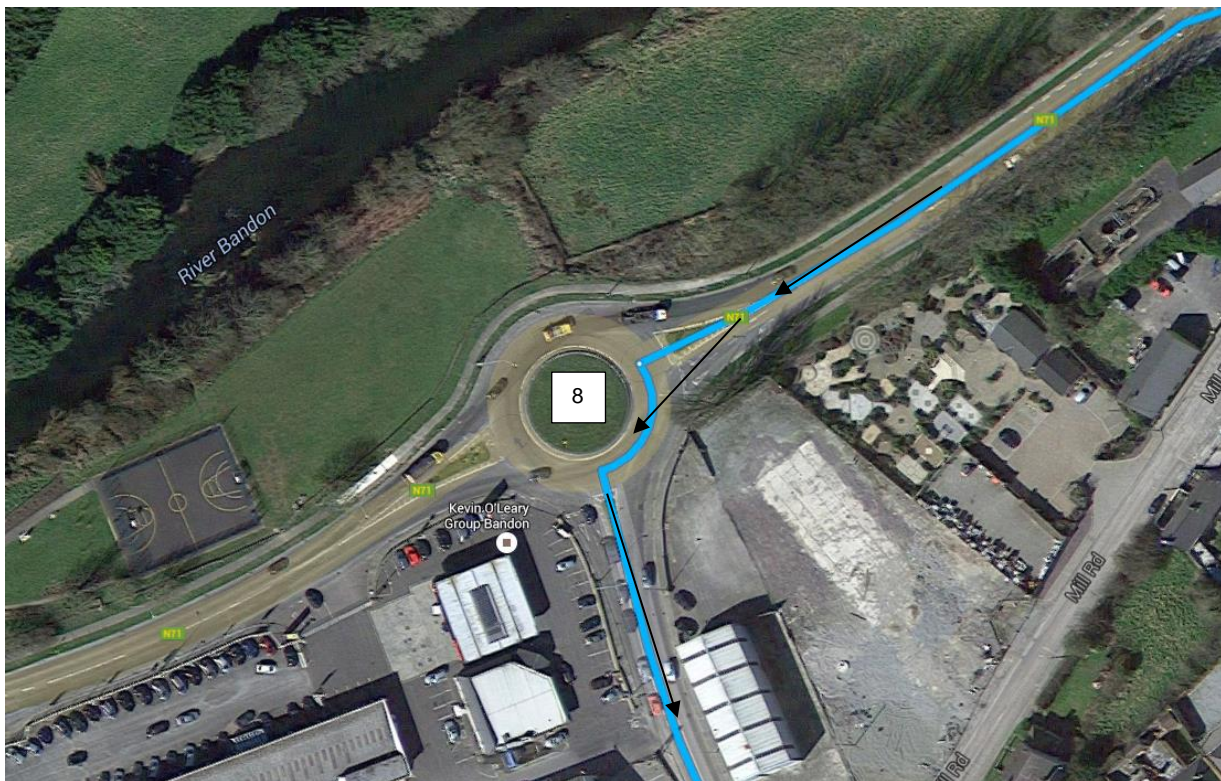
4.5.1 AERIAL VIEW OF ROUTE MARKER 7



Route Marker 7 – N71 / R607 Roundabout. All vehicles will negotiate this roundabout without issue.



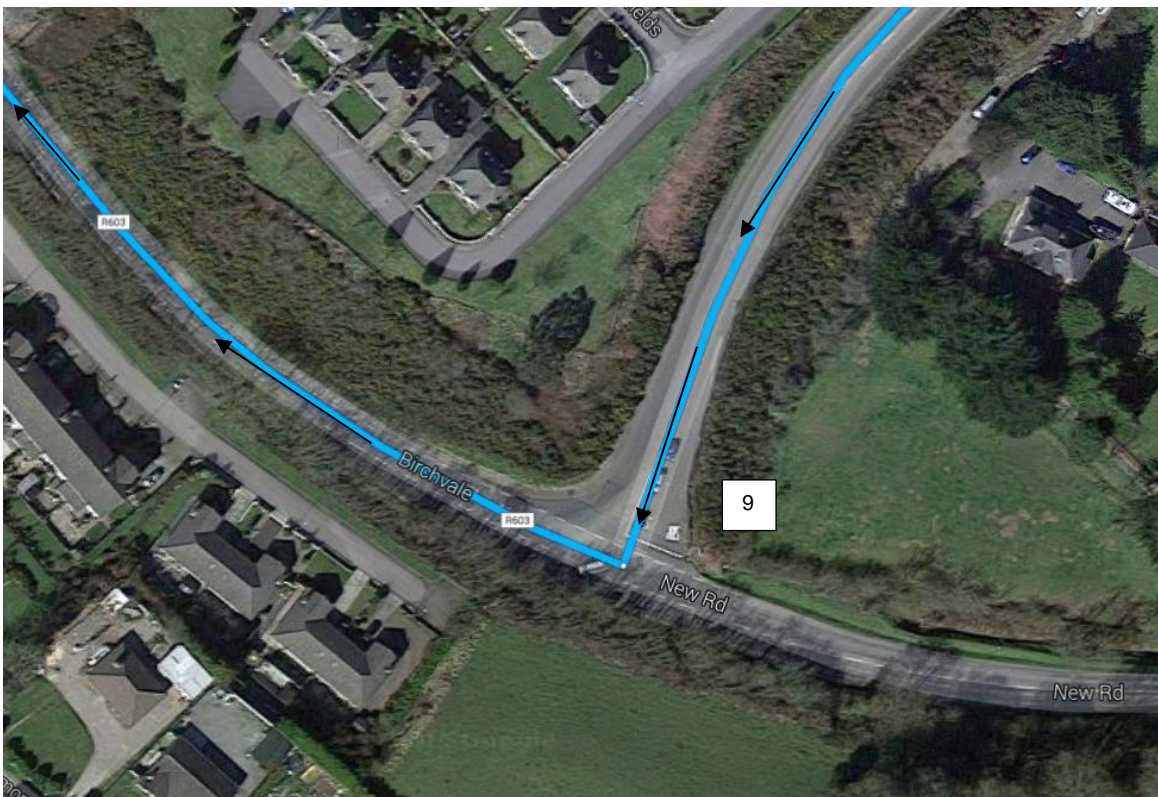
4.6 ROUTE MARKERS 8 TO 10



4.6.1 AERIAL VIEW OF ROUTE MARKER 8



Route Marker 8 - Cork Rd. / Relief Rd. Roundabout. All vehicles will negotiate this roundabout without issue.

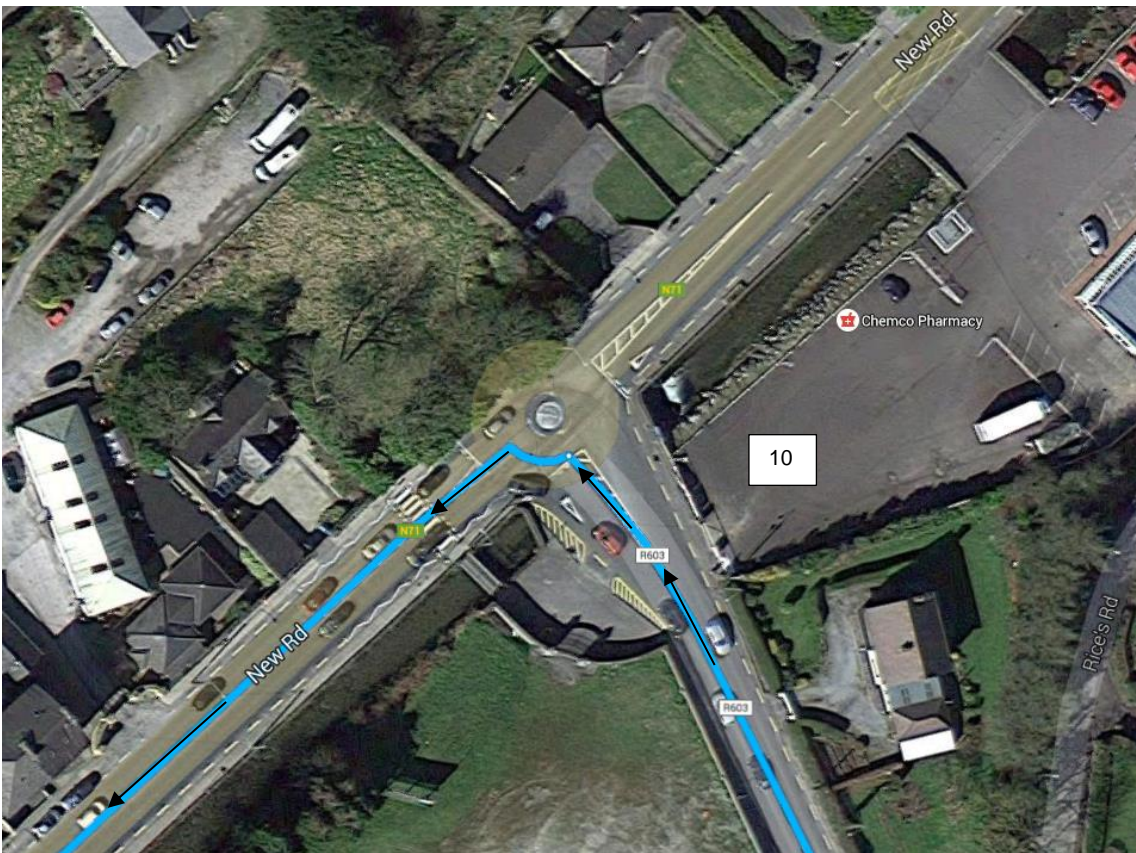


4.6.2 AERIAL VIEW OF ROUTE MARKER 9

9



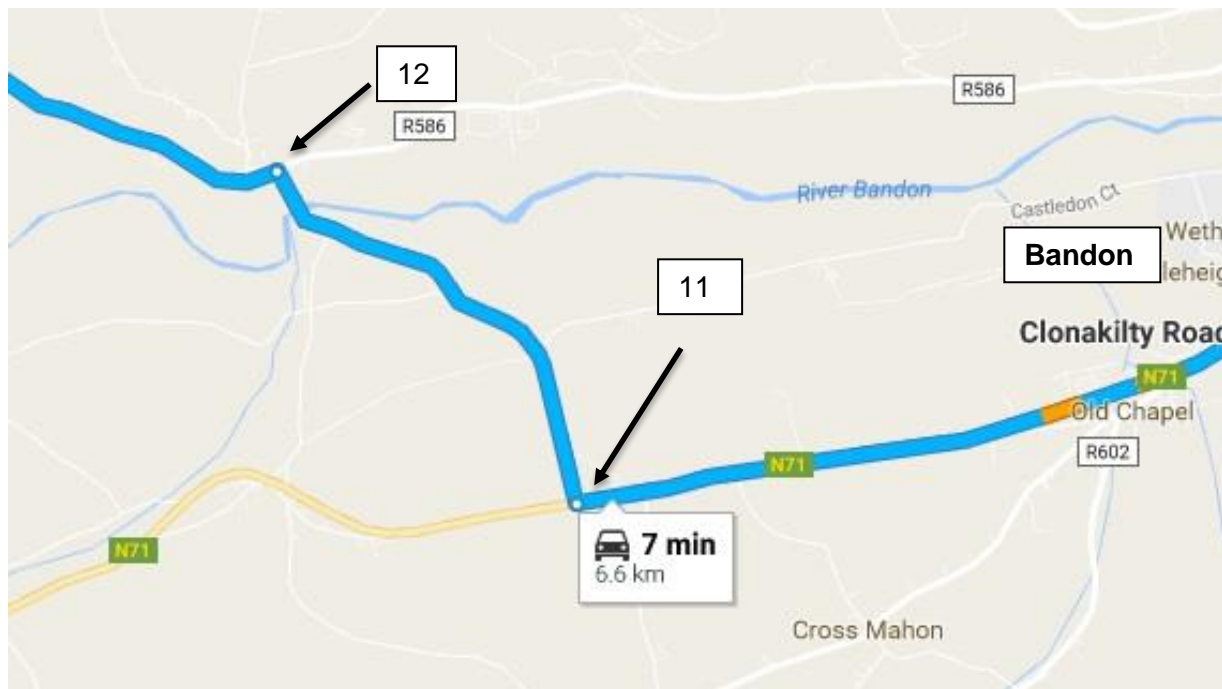
Route Marker 9 – Relief Rd. / R603 Junction. All vehicles will negotiate this junction without issue.



4.6.3 AERIAL VIEW OF ROUTE MARKER 10



Route Marker 10 – R63 / N71 Roundabout. All vehicles will negotiate this roundabout without issue.



5.7 Route Marker 11 and 12

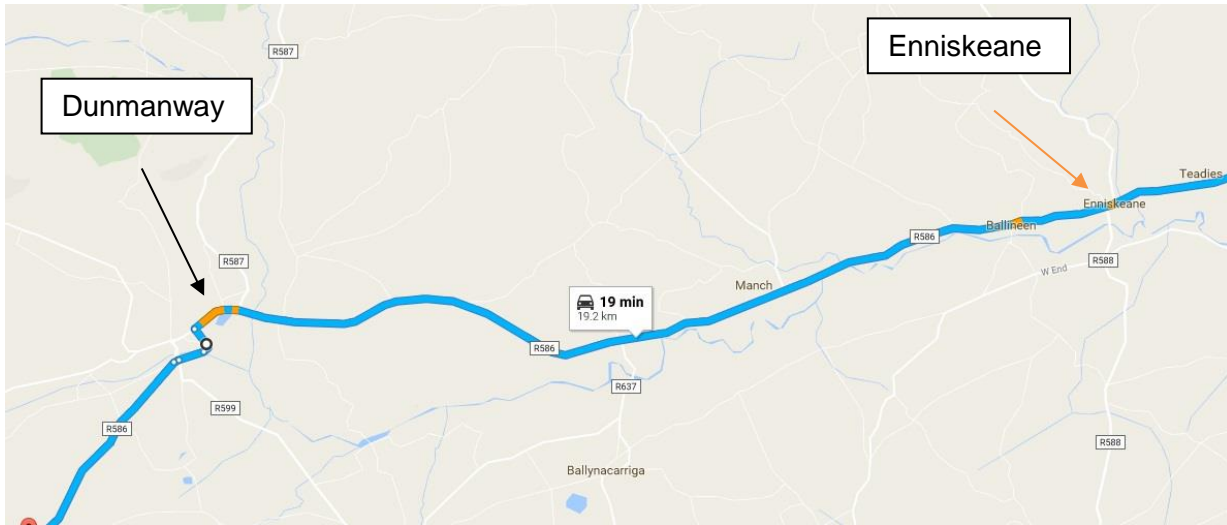
Exit Bandon on the N71 Travel for approx. two miles and turn right on unnamed road. Continue on road for 1.5 miles and turn left on to R586.



Route marker 11 the right turn from the N71 can be made by all components without issue



Route Marker 12 the left turn on to the R586 can be made without issue.



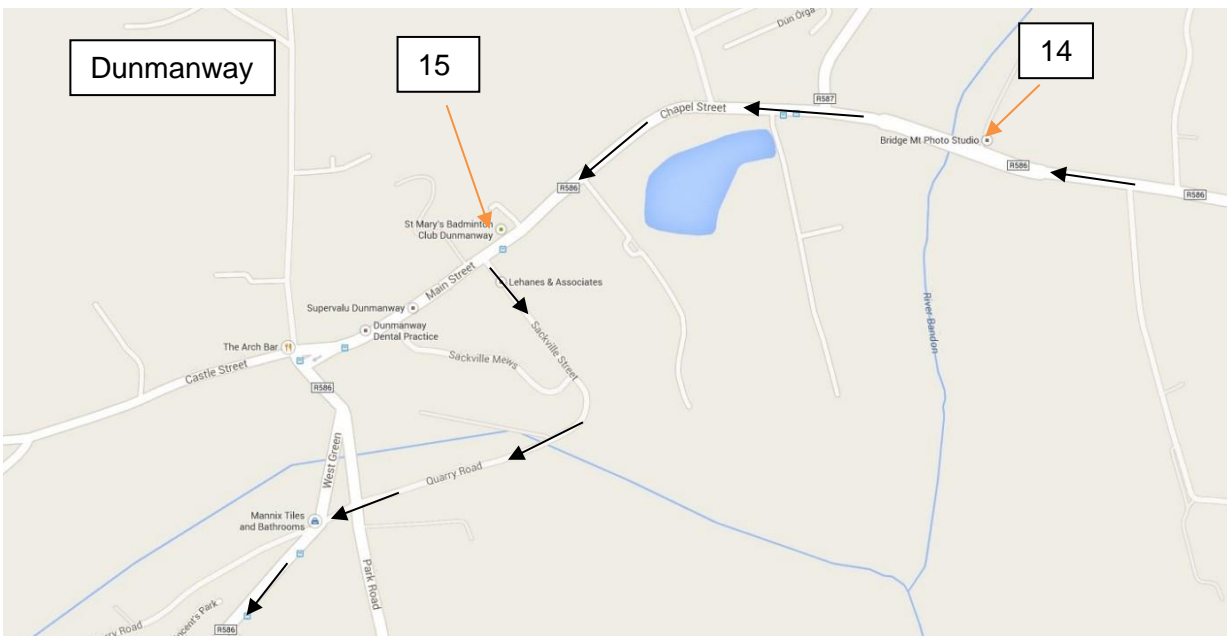
5.8 Route markers 13 through to 15



Route marker 13 there is a small amount of street furniture in the village of Enniskeane which in itself is not an issue as long as cars are not parked opposite it. Some consultation with the local residents would be needed prior to deliveries.



Route marker 13 above.



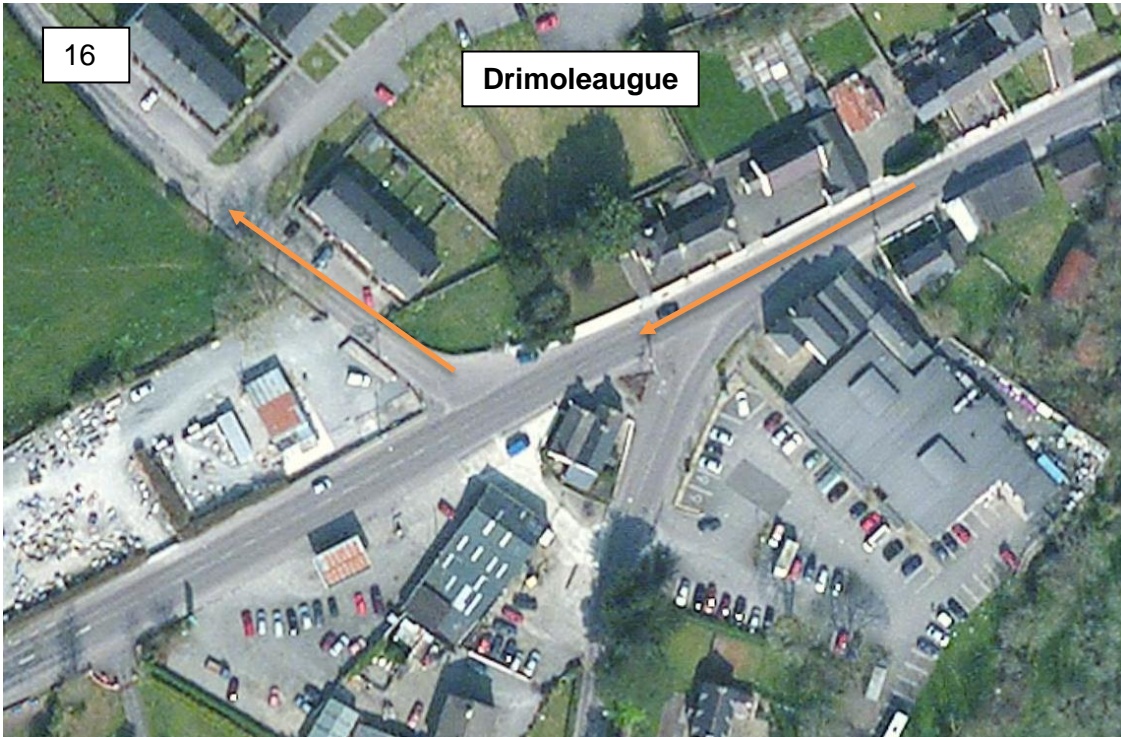
Route markers 14 and 15 in Dunmanway



Rout marker 14 there are no issues passing through the traffic calming on entering Dunmanway.

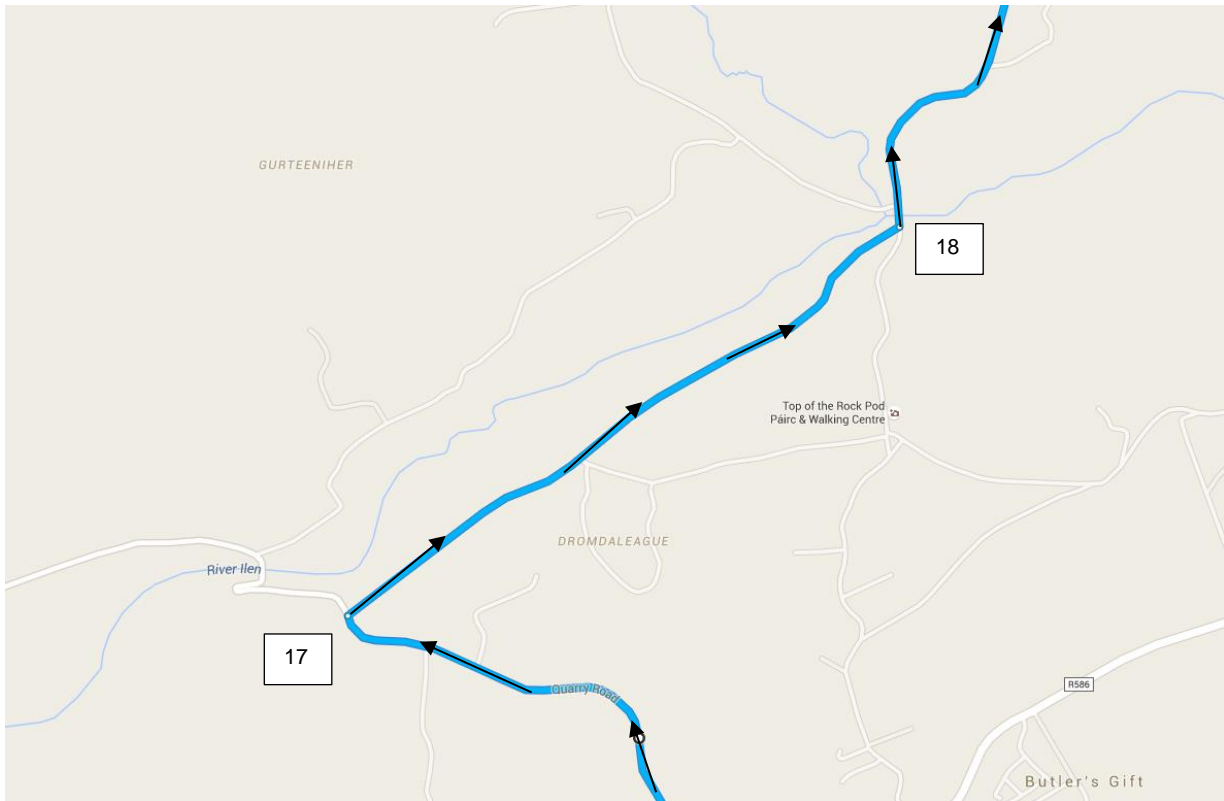


15 The left turn on to Sackville Street and the continuation on to Quarry Road is no issue.



Route Marker 16 – The right turn from the R586 on to Quarry Road is no issue.





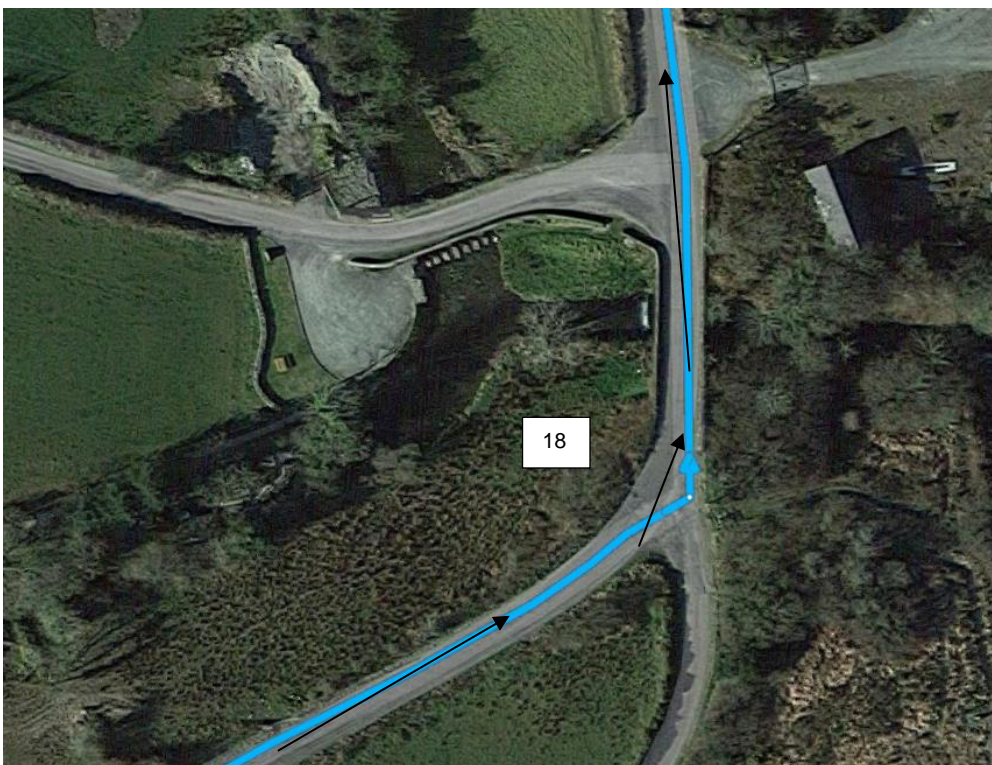
ROUTE MARKER 17 & 18



4.6.4 AERIAL VIEW OF ROUTE MARKER 17



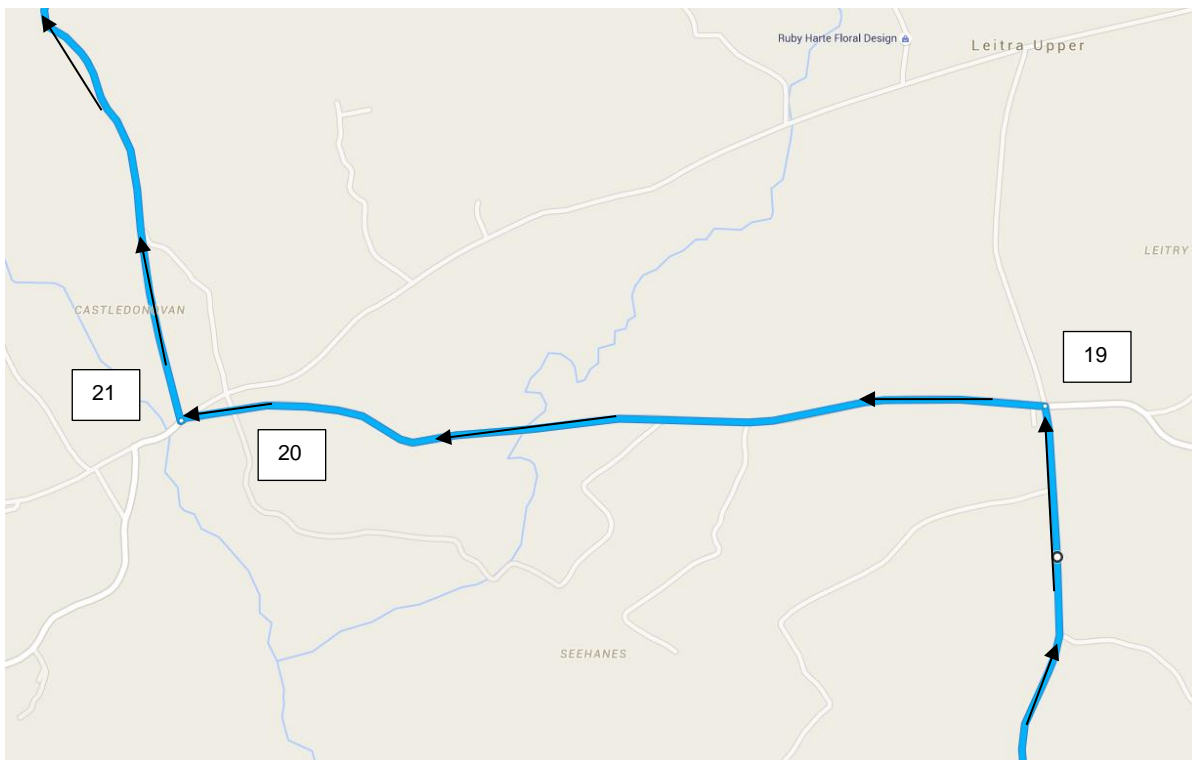
Route Marker 17 – Right Hand Bend & Junction on Quarry Rd. All vehicles will negotiate this corner / junction without issue.



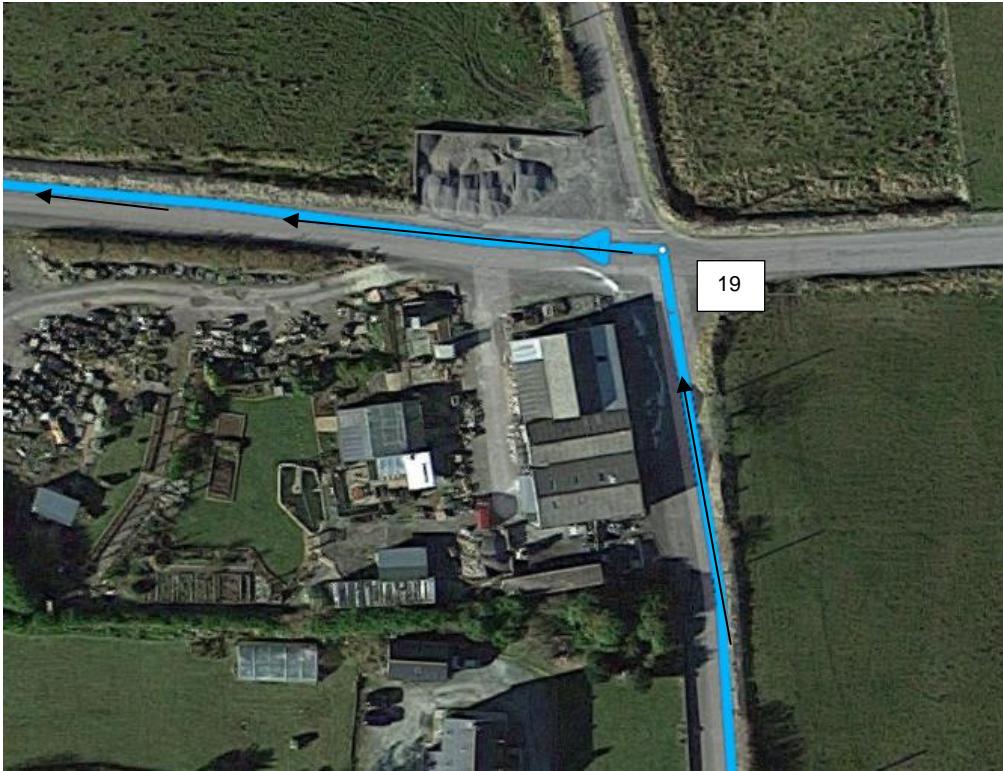
AERIAL VIEW OF ROUTE MARKER 18



Route Marker 18– Left Turn Prior to River Clodagh Crossing. All vehicles will negotiate this junction without issue.



ROUTE MARKERS 19 TO 21



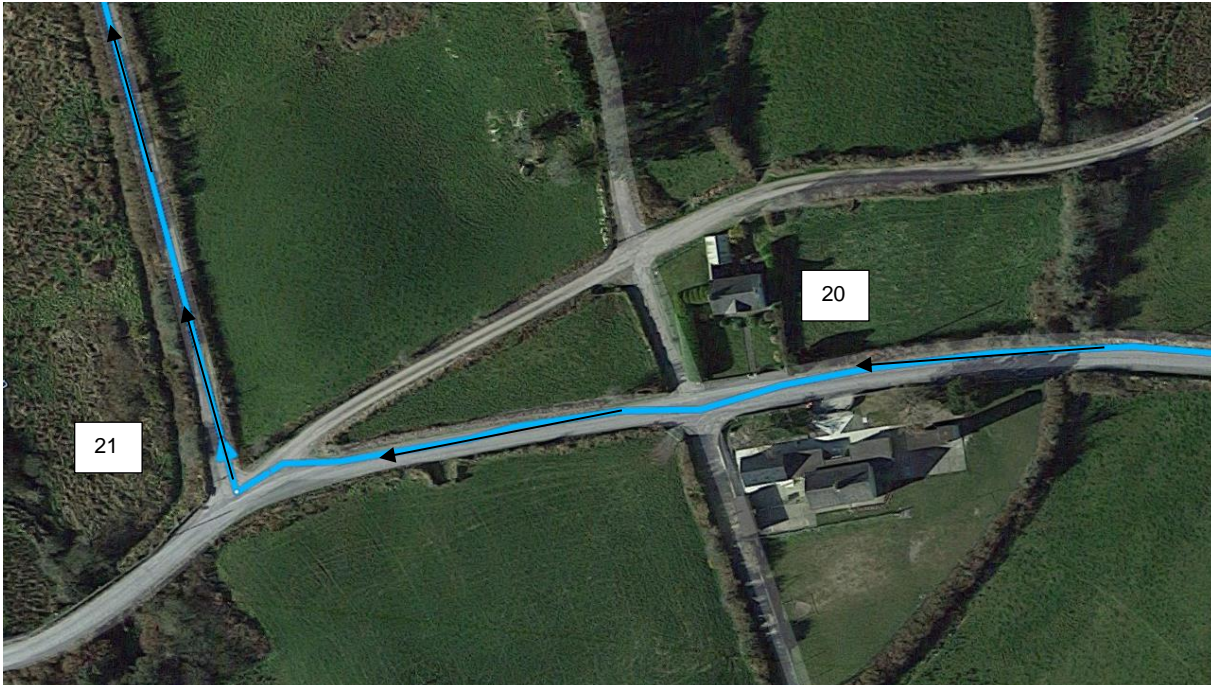
AERIAL VIEW OF ROUTE MARKER 19



Route Marker 19 – Left Hand Turn onto Unnamed Rd. at Old Creamery. In order for the longer vehicles to negotiate this turn the existing widened area is required to be used. This area is currently being used to store road-surfacing material.



Route Marker 19 – Left Hand Turn onto Unnamed Rd. at Old Creamery. In order for the longer vehicles to negotiate this turn the existing widened area is required to be used. This area is currently being used to store road surfacing material.



AERIAL VIEW OF ROUTE MARKERS 20 & 21



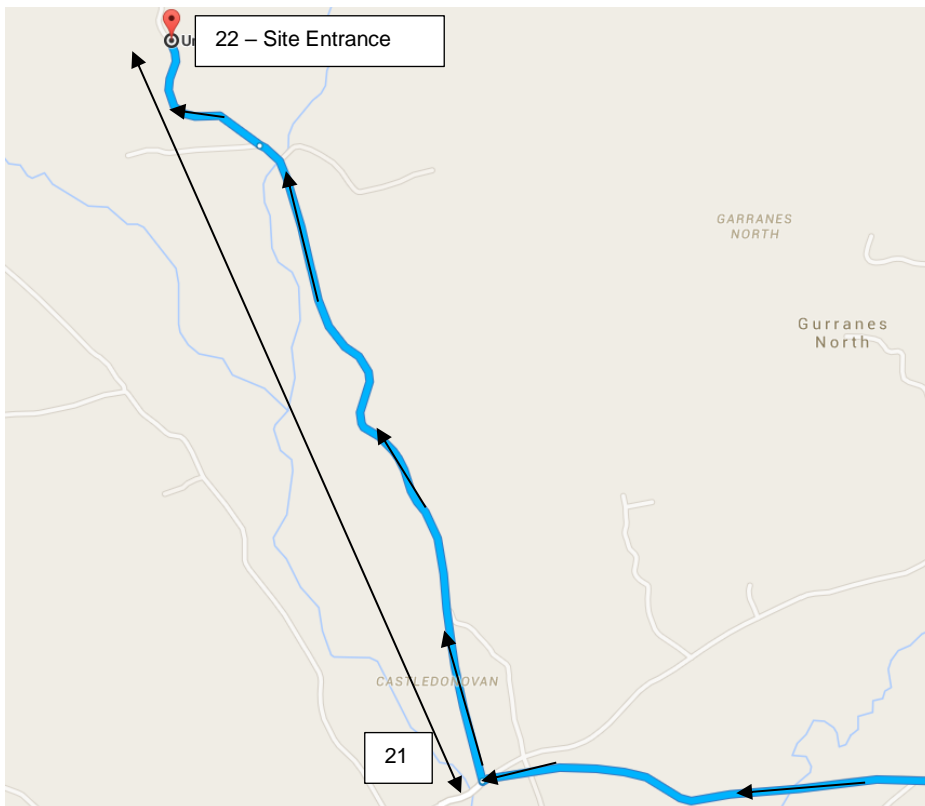
Route Marker 20 – Primary School. Parking restrictions will be required outside the school. However, deliveries would generally be outside of school start and finish times



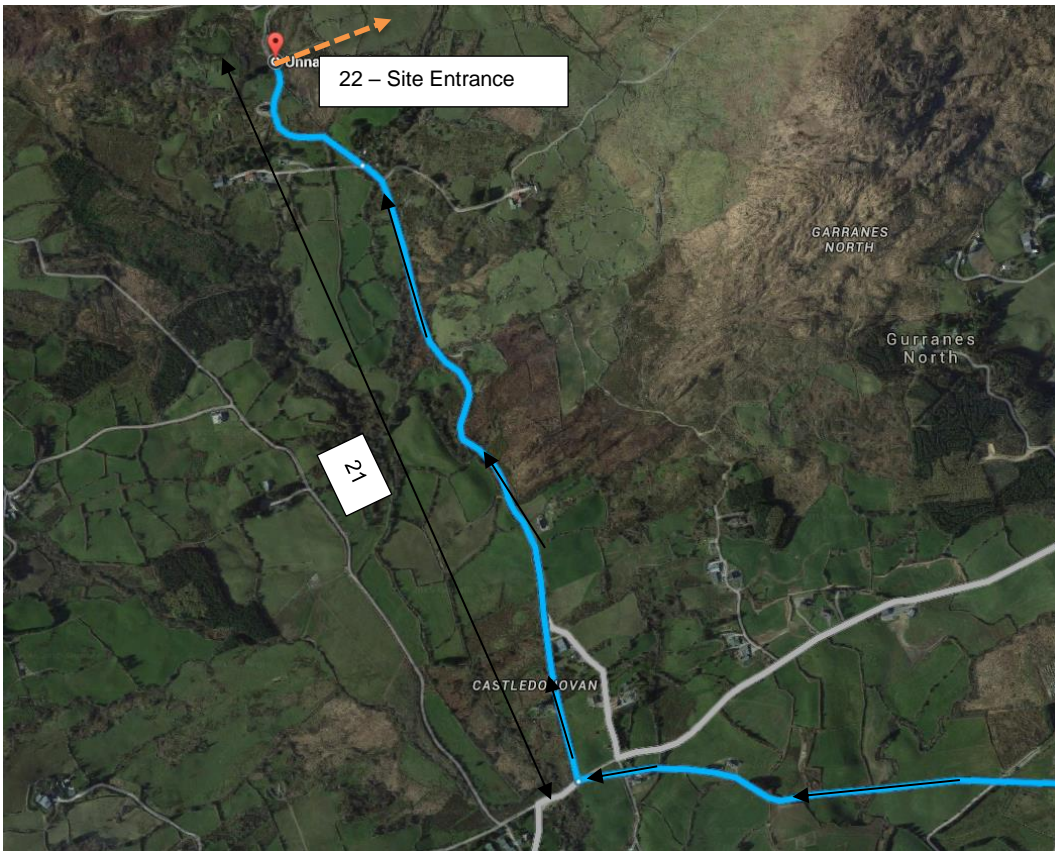
Route Marker 21 – Right Hand Turn Prior to River Ilen. Widening works are required to the off side in order for the delivery vehicles to negotiate this junction.



Route Marker 21– Right Hand Turn Prior to River Ilen. Widening works are required to the off side in order for the delivery vehicles to negotiate this junction.



4.7 ROUTE MARKERS 21 & 22



AERIAL VIEW OF ROUTE MARKERS 21 & 22

This last section of the route, Approx. 1.7km (1 mile), is not suitable for the turbine component delivery vehicles. The existing road is very narrow, 2.75m in locations, with steep “humps” that may cause a grounding risk and sharp corners. This section of road requires to be widened in line with the relevant Enercon Specification to allow the turbine delivery vehicles unrestricted access to the site entrance. This may involve the removal of a number of Overhead Line support poles. The following photos highlight some of issues along this stretch of road.



Route Marker 21 – Photo 1 Road and verges to be widened in accordance In accordance with Enercon specifications between markers 21 and 22



Route Marker 21 – Photo 2 Road side vegetation to be trimmed back



Route Marker 21 – Photo 3 There are number of points where the high banks will need to be Cut back/re shaped to allow the wide loads to pass



Route Marker 21 – Photo 4



Route Marker 21 – Photo 5 the road surface is narrow and in poor condition
Between 21 and 22, there are some undulations, which could cause a grounding
Issue if trailers with low ground clearance are used..



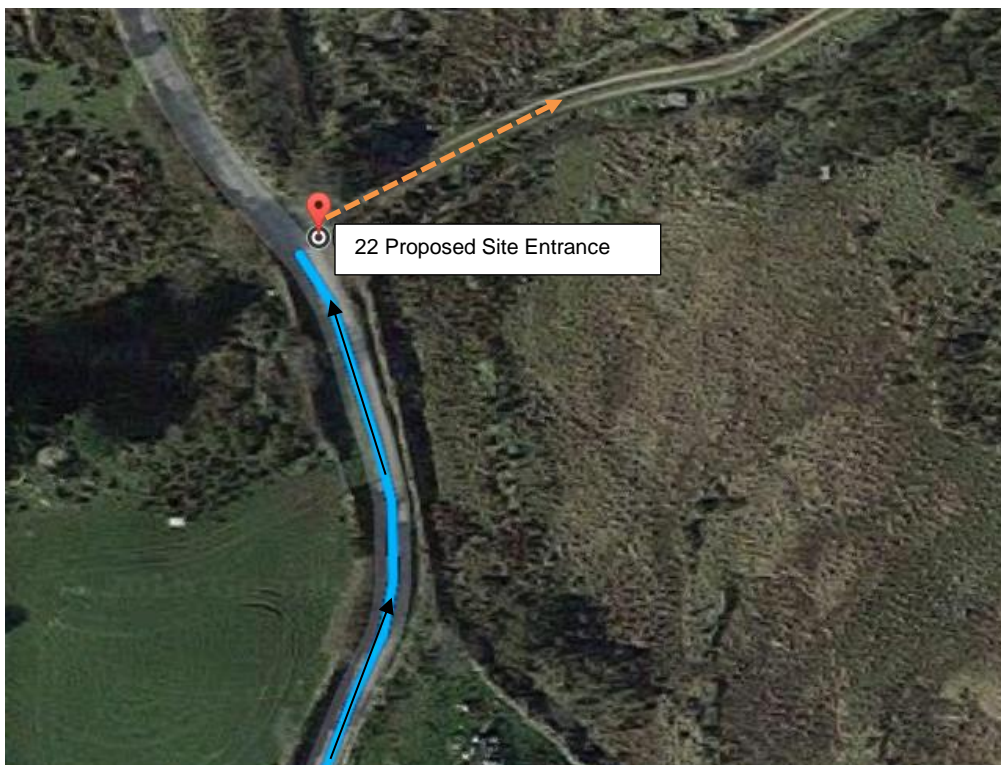
Route Marker 21 – Photo 6



Route Marker 21 – Photo 7



Route Marker 21 – Photo 7



4.7.1 AERIAL VIEW OF ROUTE MARKER 22



Route Marker 22 – Proposed Site Entrance. The entrance will require to be built in line with the relevant Enercon Specification to ensure unrestricted access for the turbine delivery vehicles.

5. CONCLUSIONS FOR ROUTE FROM RINGASKIDDY

The route as far as Drimoleague is without issue and has been used in the past for larger turbines in the past. The main issues are in the last few kms of the route between markers 21 and 22 where the road is not suitable for turbine deliveries in its present state. There is land take required to make the right turn at 21 as it would not be possible for the long vehicles to make this at the moment. The road surface is between 2.5 and 2.75m wide and is in poor condition with the edges crumbling away in places. This will be an issue for the erection crane as well as the road transport vehicles. Roadside vegetation, telegraph poles and fencing will need to be removed in places throughout this length to facilitate the wide Generators and Nacelle units. In short, this latter stage of the route should be modified in accordance with Enercon's specifications.