5 TRANSPORT PROGRAMME

This section aims to set out the volume and frequency of traffic anticipated during the different phases of the wind farm construction. The type of vehicle used for each function is also described.

5.1 Timber Extraction

FCS currently operate four separate established accesses into the Clashindarroch Forest. These are regularly used by haulage trucks for existing timber operations and are found at the following locations (see Figure 8):

- Bailiesward
- Bogancloch
- Drumfergue
- Mytice

In an average year FCS harvest 30,000 to 40,000 tonnes of timber in Clashindarroch Forest. The felling required to clear the wind farm area will result in 100,000 tonnes of merchantable timber being extracted from the forest over a 3 year period. In the third year, the vast majority of the felling will be non-merchantable timber which will be laid to waste, resulting in significantly less lorry movements in the third year (except for the potential to supply the Christmas tree market).

The felling required for the wind farm will therefore more than double the amount of timber extraction over a two year period. It is proposed to spread the removal of timber over the four routes listed above, so that there is not likely to be a significant net increase in physical or environmental impact on the internal and external road infrastructure.

Activity	Activity Duration (weeks)*	Total Movements (25 tonne load per truck)	Average Movements per Day Over 2 year Period (Total Movements / No. of Days)
Tree Felling in Years 1 and 2	80	4,000	8
Tree Felling in Year 3	40	300	1

Table 6 Summary of average traffic movements during timber extraction
*Based on an average 6 day working week for 10 months per year

5.2 Construction and Turbine Delivery Traffic

The following table summarises the vehicle movements and frequency for the different phases of the wind farm construction. As described above, there are four access routes suitable for construction delivery vehicles. These vehicles will use the appropriate access route depending on the source and destination of the construction materials. There is one additional access route suitable for turbine delivery vehicles (see Section 5.5.2).

The number of vehicle movements is dependent on whether the roadstone required for site roads and foundations is sourced on or off site, and also whether the concrete required for the foundations is batched on or off site. The following tables show the anticipated vehicle movements during construction for three different building scenarios (see Section 6 for details):

- Scenario 1 - Roadstone sourced on-site and concrete imported from external source;
- Scenario 2 - Roadstone sourced on-site and concrete batched on site (preferred option)
- Scenario 3 - Roadstone and concrete imported from external source (worst case scenario)

Activity	Activity Duration (weeks)	Movements per turbine	Total movements (No. of Turbines x Movements per Turbine)	Average Movements per Day (Total Movements / No. of Days*)
Turbine Delivery	30	8	376	2
Turbine Electrical Equipment	6	-	14	1
Turbine Foundation Construction (Concrete Imported)	14	46	2,162	26
Access Road Construction (Roadstone sourced on-site)	25	-	20	1
Miscellaneous (e.g. plant, site huts, switchgear)	10	-	200	3
TOTAL	-	-	**2,772**	**33**

Table 7 Anticipated vehicle movements during construction for Scenario 1
* Based on a 6 day working week

Activity	Activity Duration (weeks)	Movements per turbine	Total movements (No. of Turbines x Movements per Turbine)	Average Movements per Day (Total Movements / No. of Days*)
Turbine Delivery	30	8	376	2
Turbine Electrical Equipment	6	-	14	1
Turbine Foundation Construction (Concrete batched on-site)	14	-	1,441	17
Access Road Construction (Roadstone sourced on-site)	25	-	20	1
Miscellaneous (e.g. plant, site huts, switchgear)	10	-	200	3
TOTAL	-	-	**2,051**	**24**

Table 8 Anticipated vehicle movements during construction for Scenario 2
* Based on a 6 day working week

Activity	Activity Duration (weeks)	Movements per turbine	Total movements (No. of Turbines x Movements per Turbine)	Average Movements per Day (Total Movements / No. of Days*)
Turbine Delivery	30	8	376	2
Turbine Electrical Equipment	6	-	14	1
Turbine Foundation Construction (Concrete Imported)	14	46	2,162	26
Access Road Construction (Roadstone Imported)	25	-	15,400	103
Miscellaneous (e.g. plant, site huts, switchgear)	10	-	200	3
TOTAL	-	-	**18,152**	**135**

Table 9 Anticipated vehicle movements during construction for Scenario 3
* Based on a 6 day working week

In terms of vehicle movements Scenario 3 represents the worse case and is the least preferred option. Initial geological studies show rock suitable for road construction can be sourced on-site (see Section 6.4) and therefore the importation of roadstone can be avoided.

The delivery of the forty seven wind turbines will require the movement of a maximum of 376 lorries to the site. The following number of vehicles will be required per wind turbine:

- Tower 3
- Blades 3
- Nacelle 1
- Misc 1

The turbine foundations will require approximately 2,162 vehicle movements, however if concrete is batched on-site this figure will reduce to 1,441.

It is anticipated that the site roadstone will be won on-site, as described in Section 6. If this is the case then the road construction will require 20 vehicle movements.

In addition it is likely that at any one time approximately 10 cars or vans would be on site being used by site engineers and other construction staff. This would generate approximately 10 small vehicle movements each day (where each journey is a return trip).

The primary transport impacts occur during the construction phase, notably through the construction of site roads, delivery of turbines and movements of HGV's carrying aggregates or concrete to the site. There would also be transport impacts during the decommissioning phase and during the export of timber from the site.

5.3 Typical Vehicle Specification

5.3.1 Turbine Delivery Vehicles

It is proposed that the turbines and their components will be transported to the site using modified articulated lorries that can negotiate tight corners by steering with the rear axle. The maximum axle load would be 16 tonnes and the longest vehicle would be the blade delivery lorry at 38 metres. The transport weight of the heaviest vehicle (articulated lorries carrying turbine components) would be 80 tonnes. The lorries transporting the nacelles would be the highest at 4.8 metres.

5.3.2 Vehicles To Be Used During Construction

During the construction period, one journey would be made by an 850 tonne crane, which would be the main crane used to erect the turbines. One journey would also be made by a second smaller tail crane, which would also be required for the erection of the turbines. This would be a 150 tonne capacity mobile crane.

In addition to this, standard Heavy Goods Vehicle (HGV) type lorries will be used for other construction activities such as timber extraction, roadstone transportation etc. These site delivery vehicles will be restricted to agreed working hours only.

The Council, Police and nearest residents will be consulted prior to the movements of large vehicles and plant and such movements will be subject to the requirements of an agreed Traffic Management Plan.

5.4 Use of Helicopters

The use of helicopters during the construction phase has been investigated and found not to be a feasible option. A 1.75 MW turbine nacelle weighs approximately 60 tonnes whilst the maximum commercially available helicopter payload is only 4 tonnes.

5.5 Proposed Access Route

5.5.1 Route on the Public Road

It is proposed that the turbines and their components will be transported to the site using purpose built articulated lorries. A preliminary road survey has been carried out in partnership with a leading transport specialist, which has identified the following route (see Figure 7) as an option for the delivery of turbines typically consisting of a tower (three separate sections) and 33m blades. This demonstrates that it is feasible to deliver turbines to the site.

This route may not necessarily be the route that is ultimately used. Following the award of the contracts for turbine supply, AMEC will enter into detailed discussions with the supplier regarding their proposed delivery methods and schedules. These discussions will cover the ‘pre-tender’ proposals and access surveys but will develop the scheme to address specific road safety and traffic management issues. These will include junction visibility, any necessary speed restrictions and, if required, temporary signals. In the development of these detailed plans, AMEC will consult fully with BEAR, Aberdeenshire Council, Police and residents. The results of these discussions will form the basis of a Traffic Management Plan.

It is proposed that all turbine components will be brought by sea to the harbour at either Buckie or Inverness. Should the harbour at Buckie be chosen, it is proposed to use the following route:

- Exit Buckie Harbour via Commercial Road Eastbound
- Turn Right in Freuchny Road
- Turn Left March Road eastbound to join A98
- Turn Right Westbound on the A98
- Turn Left Southbound on the B9016
- Turn Left Eastbound on the A96 via Keith to Huntly

If the harbour at Inverness is chosen instead, it is proposed to use the following route:

- Exit Inverness Docks via B9168 Longman Drive onto the A9
- Turn Left Southbound on the A9
- Turn Left Eastbound onto A96 via Nairn, Forres, Elgin, Fochabers and Keith to Huntly

As described above, both routes join the A96 until Huntly and then proceed along the following route:

- Turn Right onto the A920 to the River Deveron Bridge
- Turn Left onto the C115S until the identified forest track access

Any upgrade to public roads will be carried out to a scope of works agreed with BEAR and the local Council.

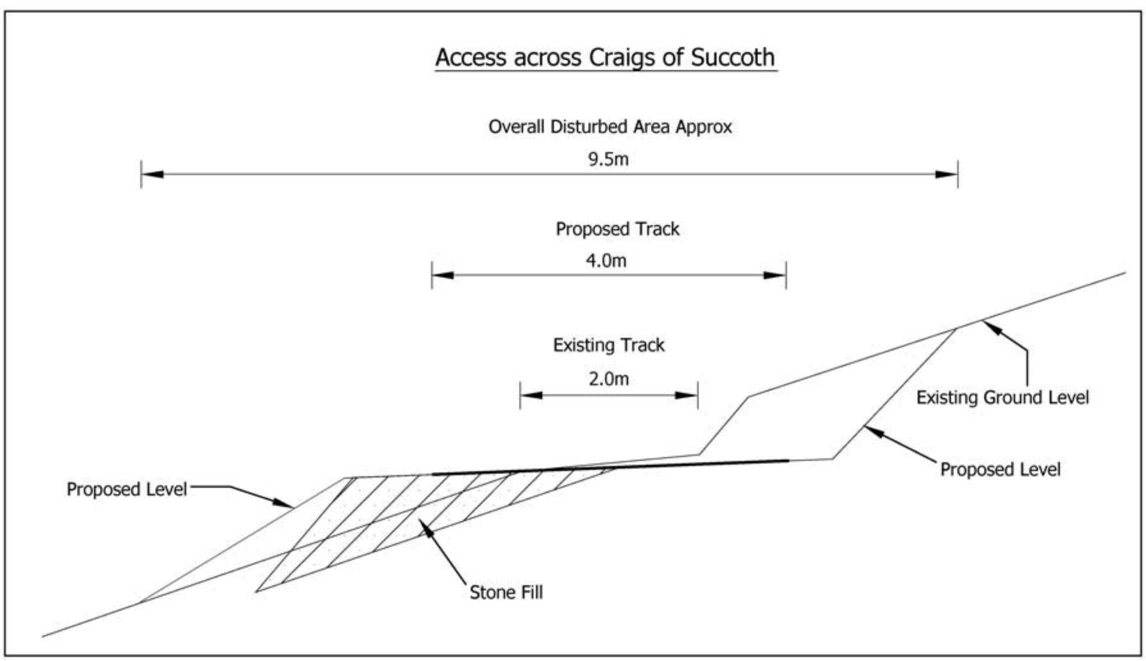
Prior to any works to local roads, a condition survey will be carried out in conjunction with the local Council's Highways Department to ensure that roads will be restored or maintained to their current standards. Aberdeenshire Council's Transportation and Infrastructure Department have been consulted about the proposed routes.

5.5.2 Route through Private Land

The public road ends once the access route leaves the C115S and enters private land. The route then leads through forestry, as shown on Figure 8, to a point at the north of the site boundary. A 100 metre stretch of this proposed route uses an existing track across the Craigs of Succoth Site of Special Scientific Interest (SSSI). The Craigs of Succoth SSSI was designated because of the presence of serpentine rock which outcrops at the surface. This leads to the presence of plant species such as juniper, spring sandwort and common scurvy-grass, amongst others.

5.5.2.1 *Access through the Craigs of Succoth SSSI*

There is an existing track through the Craigs of Succoth and AMEC propose to upgrade a 100 metre stretch. The drawing below shows the dimensions of the proposed upgrade.



There is an existing track through the Craigs of Succoth and AMEC propose to upgrade this. The length within the SSSI is 100 metres. The drawing below shows the dimensions of the proposed upgrade.

The route would be an improvement to an existing forest track and would aim to maintain the existing alignment as shown in Figure 8. The standard road width is 5m, but over this stretch this would be reduced to 4m to minimise disturbance over this sensitive area. The existing track has a vegetated dry ditch running along much of its inner (eastern) side within the SSSI, plus a camber and side cuts to shed water downslope to the west. Material removed from the track is piled as a bank 0.5 - 1.2 m high on the outer (western side), forming a zone of disturbed soil which is up to 3 m wide. This has revegetated with a mix of heath and neutral - acidic grassland species, plus about 30 juniper bushes up to 1.3 m high and varying in diameter between 0.5 and 4.5 m. A search for the nationally rare or scarce plant species known from the SSSI was made in the existing route corridor by a professional ecologist in June 2003 and none was found.

Track widening would largely be applied to the disturbed area on the downslope side (about 2 m wide on average), with possibly a narrow zone up to a further 4 m wide used to give a firm road foundation and batter for restoration. The grassland and heath turf from the existing bank might be usable for restoration but the stone and soil content would be removed from the SSSI to form a new bank a short distance uphill. The ditch on the upslope side would probably need slight deepening, with insertion of cross-drains to take runoff downslope. All cross-drains would end in a silt trap to retain any suspendid solids load.

Prior to the commencement of works, a geo-technical survey would be undertaken to establish the stability of the Craigs and to set out an appropriate methodology for works along the track. An ecological survey will also be undertaken to establish appropriate methods for the handling of soil, turf and juniper and for their reinstatement when the work is finished. A working method statement will be prepared and agreed with SNH and Aberdeenshire Council prior to the commencement of works along this track.

5.5.3 Traffic Management Measures

The following general recommendations are made as an indication of some of the issues which may need to be addressed during the construction phase.

- A police escort would be required throughout the whole transportation of turbines on public roads
- All bridges on the route will be investigated to determine if they are acceptable for the proposed vehicles
- A trial run with an extendable turbine blade trailer will be carried out
- Street furniture must be removed temporarily in appropriate places along the route to allow a minimum envelope on the road
- Marking of vehicles as long or abnormal loads
- Warning signs for other road users

A Traffic Management Plan would be prepared and agreed prior to construction with the local Council Highways Department and the Police.