# LANGHOPE RIG WINDFARM

## TRAFFIC MANAGEMENT AND HAULAGE ROUTE SCHEME

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1. INTRODUCTION

1.1 Scope of Document

1.1.1 This document concerns the proposed activities associated with Traffic Management required for works in connection with the construction of the consented Langhope Rig Windfarm site in the Scottish Borders. This document has been prepared specifically in accordance with the requirements of Planning Condition 14, which states:

**Condition PT1**

A traffic management plan for the construction period shall be submitted for the approval of the planning authority before the development is begun and once approved shall be implemented in accordance with the terms and timescales set. The plan shall include agreed measures to address any damage to the public road by construction traffic and a travel plan to reduce site worker traffic.

1.1.2 This traffic management scheme has been prepared as a Traffic Management and Haulage Route Plan in respect of the proposed construction of the 10 turbine Langhope Rig Windfarm. The scope of this document relates to Civil Infrastructure Contractor (CIC) works and Wind Turbine Supply (WTS) elements of the project, and includes Abnormal Indivisible Loads (AIL). The Road Works Contractor (RWC) shall be responsible for the design and build of the required works along the public highway.

1.1.3 This document will/has been developed in conjunction with the following consultees:

- Scottish Borders Roads Department
- Scottish Borders Planning Authority
- Members of the local Community Council

1.1.4 This document was prepared to provide preliminary information of the traffic management and haulage route proposals prior to the appointment of the CIC, RWC and WTS. Any amendments to this document, proposed or required by the CIC, RWC or WTS are required to be discussed and agreed with the above parties, and then to be ratified with the Scottish Borders Planning and Roads Departments.

1.2 Location Information

1.2.1 The Site is defined as the Langhope Rig Windfarm in the Scottish Borders, as shown on the Site General Arrangement Figure in Appendix A.

1.2.2 Works required along public highways to facilitate windfarm construction traffic (specifically turbine component delivery) are termed “off-Site” Works and are outlined in Section 2.3.

1.3 Health and Safety

1.3.1 Health and Safety is of the highest importance. All Traffic Management and Haulage Routes works are considered potentially dangerous activities, requiring rigorous health and safety processes to be in place at all times. Specific risk assessments and supplementary method statements shall be required to be developed by the CIC, RWC and WTS, as appropriate, prior to the onset of the works.

1.3.2 It is important that all Traffic Management and Haulage Routes works should be flexible and adaptable to take account of the general public / other road users, changing conditions, particularly
in relation to weather, road and traffic conditions, ground conditions and any protected species that may be encountered during the works.

1.3.3 The Health and Safety requirements for the Site will be fully detailed in the Construction Phase Health & Safety Plan (CPHSP) in accordance with the Construction (Design & Management) Regulations 2007 (or as amended).

1.3.4 The Principal Contractor for the off-Site works shall be the RWC. The proposed RWC must be accepted by the local roads authority.

1.4 **Plant and Equipment**

1.4.1 The works will be undertaken in strict accordance with the Provision and Use of Work Equipment Regulations “PUWER” 1998 (or as amended) covering all types of plant and equipment found on construction sites.

1.4.2 All site operatives shall be appropriately trained, experienced and hold certification of training achievement issued by CITB or other construction industry approved schemes.

1.4.3 All site plant and equipment (on and off site) shall be fitted with effective silencers / insulation in accordance with the information submitted in response to the requirements of **Condition 13**.

1.5 **Definitions**

Unless defined within the body of this document, capitalised terms used herein are defined as follows:

**Access Track(s):** any new, or upgraded, track alignment within the site boundary for the construction of, and delivery to, the works. These shall typically be unbound consisting of a crushed rock construction, and may include geotextiles within their fabric. Earthworks (embankments or cuttings) may also be required to maintain levels and gradients. They do not include tarmaced roads for use by the general public (public highway) and consequently are not the subject of this Traffic Management and Haulage Route Plan.

**AIL:** Abnormal Indivisible Loads – these are those loads whose dimensions (either length, width, height or weight) exceed normal Heavy Goods Vehicle (HGV) classifications. These are typically the transformer, turbine blade, tower section and nacelle deliveries.

**CIC:** The Civil Infrastructure Contractor appointed to design and build the civil infrastructure for the project. They shall also be designated the “Principal Contractor” as defined by the CDM Regulations (2007) for the on-Site works.

**Public Highway:** any designated road route outwith the site boundary (as shown in Appendix A) that is not privately owned. The relevant roads associated with this project (assuming component delivery to Grangemouth Dock) being principally the M9, M8, A702, A68, A698, B6399, A7 and the B711 (as shown in Appendix B), and described in Section 2 (below) as possible Haulage Routes.

**RWC:** the Road Works Contractor appointed to design and build the off-Site road modifications for the project. They shall also be designated the “Principal Contractor” as defined by the CDM Regulations (2007) for the off-Site works.
**WTS:**

The Wind Turbine Supplier responsible for supply and installation of the Wind Turbine Generators (WTG) for the project.
2 Haulage Routes

Haulage Routes are defined as those parts of the Public Highway designated for access to, or egress from, the Langhope Rig Windfarm site. The Site Access location is on the B711, west of Alemoor Loch Reservoir and is the sole proposed access for all construction traffic.

2.1 Preliminary Assessments

2.1.1 A number of studies and surveys have been undertaken relating to traffic and transport issues for the proposed Langhope Rig Windfarm development, including walkover survey and preliminary swept path analysis.

Walkover Survey

2.1.2 A preliminary visual inspection of the route identified potential restrictions associated with the junction of the A7 and the B711 (Martins Bridge) and the requirement for strengthening verges at a number of points on the A698 and B711 to facilitate abnormal load deliveries. A pinch point at an ‘S’ bend on the A698 – adjacent to the war memorial in Denholm – was also highlighted as a potential constraint to WTG component delivery. Submission of condition PC14 outlines the pinch points identified.

2.1.3 Other issues identified related to street furniture and the clearance of overhanging trees to maintain the statutory minimum clearance of 5.2m.

Swept Path Analysis

2.1.4 Based on the above, a Swept Path Assessment (SPA) for the delivery of turbine components, based on the largest anticipated candidate turbine at that time, was prepared for the ‘S’ bend in Denholm and along the proposed haulage route from the A7 along the B711. Previous surveys had confirmed it was possible to transport the maximum component lengths through Hawick, although traffic management measures would be required.

2.1.5 The SPA identified that modification of public roads, primarily the B711, would require modification (local verge widening and strengthening) to allow over-sail and to support anticipated axle loadings. Submission of condition PC14 outlines all areas of works for verge widening to allow oversail of AIL.

Pre-Condition and Post-Condition Survey

2.1.6 The CIC and RWC will be required to undertake a pre-condition survey of the B711 and associated infrastructure, in conjunction with the SBC Roads Maintenance Officer, to record the condition of the road and bridges (Martins Bridge and Alemoor Loch) prior to the commencement of any construction activities. This survey will serve as a record to identify any remedial works required during and / or following the works. Due to the works on the B711, there will be a survey undertaken prior to these works, then another base line post these works – prior to the start of the wind farm works.

2.1.7 The CIC and RWC will be required to undertake a post-condition survey of the B711 and associated infrastructure, in conjunction with the SBC Roads Maintenance Officer, to highlight any areas of road or infrastructure that have been effected by construction activities associated to the Langhope wind Farm project. The pre-condition survey will serve as the baseline for the post-condition survey. The areas of road or infrastructure identified as having been effected will be recorded and agreed between all parties. A package of remedial works (including timescales and construction standards / details) associated with the agreed areas of road or infrastructure effected will be will be agreed by all parties. The remedial works will be undertaken in accordance with the agreed package of works.
2.2 **Haulage Routes**

2.2.1 The primary haulage route for the project relates principally to the delivery of the wind turbine components under the WTS Contract. In addition, this is likely to be the main route for the delivery of plant and materials to the site under the civil contract.

2.2.2 Unless otherwise identified within this document as a proposed haulage route, construction HGV's and AILs associated within the Langhope Windfarm shall not use alternative routes (except where a Police or Roads Authority diversion is being enforced on an approved Haulage Route). Specifically, the trafficking of the C19 and C20 minor roads (Ashkirk to Roberton) by all construction related traffic is strictly prohibited.

2.2.3 The proposed Haulage Routes are shown in **Appendix B**.

**Construction Haulage Routes**

2.2.4 The proposed site access is at the boundary of a managed forest adjacent to Alemoor Loch Reservoir (NT 390 149), on the B711, approximately 5km southwest of the Development Site (as shown in **Appendix A**). The access routes for the CIC’s vehicles shall be from southwest or northeast on the A7, along the B711 to the site access (as shown in **Appendix B**). It is reiterated that no construction traffic shall be permitted on the C19 / C20 Ashkirk to Roberton roads.

**Turbine Component Haulage Routes**

2.2.5 The delivery of turbine components under the WTS Contract shall be from a sea port, potentially Grangemouth, or other, to be confirmed. Irrespective of port of delivery, all WTS deliveries shall have a common route along the A720 to the Millerhill Junction on to the A68. The route proceeds southbound on the A68, passing through a number of towns and villages, notably Pathhead, Lauder and Earlston, eventually crossing both the River Tweed and River Teviot. The route then proceeds westbound along the A698 through Denholm and into Hawick to briefly join the B6399, following on southbound on the A7 (Buccleuch Street). All traffic will then cross Martins Bridge and then directly on to the B711 to the site entrance.

2.2.6 The route described in **Section 2.2.5** shall be the sole access route for the WTS and primary access for construction traffic. However, some construction HGVs may also access the B711 from the northbound A7.

**Forestry Haulage Routes**

2.2.7 The proposed Access Track infrastructure layout through Wester Alemoor Forest was developed to utilise, where possible, existing tracks and borrow pits and thus reduce the requirements for unnecessary forestry management. However, it is anticipated that some felling will be required during the construction works. Any proposals to transport timber from the site will be coordinated between SSER, the CIC, forestry contractor and SBC to minimise impacts of local roads.

2.3 **Works Required**

2.3.1 Some road modifications / protection measures may be required to prepare the proposed access routes for the CIC and WTS Contracts and are described as follows.

**Construction Deliveries**

2.3.2 No physical works are deemed necessary for the passage of HGV vehicles, including plant and materials delivery, associated with the Civil Contract for the project. However, it may be considered appropriate for the introduction of:
• advisory speed restriction signage at various locations, particularly on the B711, where forward visibility is considered to pose a potential hazard for delivery vehicles.
• directional signage along the B711 to guide construction traffic along the proposed access route.

2.3.3 Any such specific modifications shall be agreed, in writing, with Scottish Borders Council.

**Turbine Component Deliveries**

2.3.4 During the assessments stage, see Section 2.1, above, a number of locations were identified where the swept path of the largest components (turbine blades) require the trailer to over-sail the road margins, or, in some cases, the road margins are required to be modified or prepared to accept the axle loadings of such vehicles. All these works have been designed and submitted to the local road authority for approval. All works will be completed prior to the main works starting on the Windfarm site.

2.3.5 The junction of the A7 and the B711 (Martins bridge) require structural upgrade. These works have been submitted to SBC and will be carried out by SBC Contracts.
3 TRAFFIC MANAGEMENT

3.1 Traffic Movements

3.1.1 Anticipated traffic movements, associated with construction and turbine delivery traffic, are presented below.

Construction Traffic

3.1.2 The Civil Contract requires for the following works to be undertaken:

- Construction and upgrading of approximately 15km of site Access Tracks (upgrade 10km of existing forestry track and construct 5km of new Access Track) and associated infrastructure.
- Construction of foundations for 10 wind turbines and associated infrastructure, including crane pads and cabling.
- Construction of on-site substation and temporary laydown and construction areas.

These main elements of work will require the Contractor to mobilise to site:

- General construction plant, including:
  - Tracked and wheeled excavators
  - Dozers and compaction plant
  - Dumper trucks
  - Graders
  - Crushers
  - Low-bed transporters for delivery of cabling, office accommodation, sub-station equipment, etc

3.1.3 The majority of the Civil Contractor’s site-plant will be required to be delivered to the site within the first 2 months. Concrete will be transported to the site from an off-site plant (tbc) following completion of the access track infrastructure. On-going deliveries of fuel and other materials will occur throughout the period of the works.

3.1.4 Prior to the commencement of the works, the CIC and RWC shall provide details of measures to be undertaken to reduce the levels of site worker traffic for the duration of the Civil Contract. This Traffic Management and Haulage Route Plan will be updated according following appointment of the CIC and RWC. The requirement to reduce site worker traffic where possible is a standard client (SSE Renewables) policy which the CIC and RWC will be required to comply with through contractual agreement. The site worker traffic will be reduced by various means which include car sharing, collective transportation (i.e. minibus collections) and only travelling to site where it is necessary to do so (i.e. utilising telephone conferencing and organising larger team meeting at base offices).

3.1.5 The proposed borrow pits on site should quantify the projects requirement of stone for roads and hard-standings. The borrow pit activity’s of ripping crushing and blasting stone are extremely dangerous, as such the on site construction compound with welfare must be fully established prior to borrow pit activates starting. Therefore it is proposed that the stone required for the first 1400m of access track upgrade and the construction compound laydown area is imported, and the welfare units for the compound are delivered and established, prior to any borrow pit works starting onsite.

3.1.6 An estimated breakdown of Civil related construction traffic can be found in appendix A.
3.1.7 The WTS Contract requires for the following to be undertaken:
  – Delivery and erection of two permanent meteorological masts;
  – Delivery of foundation components;
  – Delivery of WTG components (blades, nacelles, hubs, tower sections, transformers); and
  – Delivery of cranes for turbine erection

These main elements of work will require the WTS to mobilise to site the following vehicles:
  – Low-bed transporters for meteorological masts, foundation components, cranes, hubs and transformers; and
  – Abnormal loads for blades, nacelles, tower sections.

3.1.8 It is anticipated that the meteorological masts and foundation components will be required to be delivered to site during the first quarter of 2014, with the main turbine components being delivered in the second quarter of 2014.

3.1.9 The proposed WTG design consists of 2 tower sections, 3 blades, 1 hub and 1 nacelle per turbine. Each delivery of WTS component’s will deliver either two or three ALI at the same time. Therefore it is projected that there will be between 23 and 35 escorted convoys required to be taken t site.

3.1.10 The Forestry Contractor requires for the following to be undertaken:
  - Delivery of harvesters and forwarders to Site; and
  - Export of felled timber from Site.

3.1.11 It is anticipated that the felling works will be undertaken as first priority on site, and the majority of timber will have been removed from site by November 2012.

3.2 Transport Management (Mitigation Measures)

It is anticipated that a number of mitigation measures are required to reduce the impact of the traffic flows, in terms of traffic flows and road safety.

Trial-Run

3.2.1 A trial-run, with an empty trailer bed, under police escort, will be undertaken, post completion of all the offsite road works, to ensure that all assessments and works are suitable prior to any abnormal load deliveries taking place. The provisional date for this trial run is December 2013.

Speed Limits

3.2.2 Speed limits shall be enforced during a drivers induction, held on site for frequent delivery drivers and site personnel. Advisory speed limits of 30mph are proposed on the B711 for construction related traffic and shall be agreed with SBC RD, Lothian and Borders Police.

Notices of Abnormal Loads

3.2.3 Prior to any abnormal load deliveries being undertaken, notices are to be posted at key locations along the proposed haulage route for the information of the general public. The content and locations of these notices is to be agreed in advance with Lothian and Borders Police and Scottish
Borders Council (SBC). Additionally, road signage shall be used to advise of proposed delivery times along key routes.

3.2.4 Notice of Abnormal loads will also be available on the SSE website and the project Community Liaison Officer shall co-ordinate a letter-drop to affected properties along the B711 route.

*Road Cleaning*

3.2.5 The CIC shall provide a street-cleaning machine to ensure the site entrance junction with the B711 is kept clean and clear of any muck and debris, should any get onto the Public Highway.

*Road Signage*

3.2.6 The CIC shall be responsible for providing, and maintaining, appropriate signage warning about construction traffic in all places on the Access Route with insufficient visibility envelope and appropriate signage warning of construction works at the Site (the RWC shall be responsible for providing and maintaining any signage associated with their works along the Access Route).

3.2.7 Advisory speed restriction signs (subject to approval by SBC and L&B Police), within or along the Site boundary will be managed and enforced by the CIC.

3.2.8 SSER take public safety very seriously. As has been done on previous projects, we shall not hesitate to have dismissed any Site Personnel who are observed flouting the agreed speed limit or route constraints for construction vehicles.

3.2.9 To aid in the identification of Site related traffic, where reasonably practical to do so, vehicles shall be given a unique identifier.

*Delivery Times*

3.2.10 In general, it is proposed that to avoid the periods of heaviest use by the general public (mornings and evenings, associated with journeys to and from school and work), that deliveries by HGV’s are generally undertaken outwith these periods.

3.2.11 Since all AIL deliveries are subject to police escort and B16 permits, delivery times of such components are controlled by the police.

*Haulage Routes*

3.2.12 Construction traffic shall be advised of the designated Haulage Routes. Breaches of these designations shall result in disciplinary action by SSER toward the relevant party.

3.2.13 All AILs will, subject to the agreement of the Police, require a convoy vehicle equipped with flashing lights to lead, and one to follow, the delivery of components. These convoy vehicles shall include Police escort vehicles, as appropriate, and also those provided by the WTS haulier. Once AILs are onto the B711, the convoy vehicle would proceed at a distance ahead of the lead abnormal load to halt on-coming traffic at designated points, asking them to wait. On-coming vehicles would be halted at these locations until the AIL had passed.

3.2.14 All turbine components will be delivered to the site under police escort. The exact times for these deliveries shall be co-ordinated between the WTS haulier, the local authority and the Police at the appropriate time, and will be subject to a permit being issued.
4 Programme for the Works

4.1.1 The construction period for the windfarm will last approximately 12 - 16 months. The Civil Contract works have not yet been awarded but are scheduled to commence at site in the in August 2013, with the turbine component deliveries under the WTS Contract likely commencing in the second quarter of 2014.

4.1.2 The offsite works are proposed to be completed prior to major works on site. These works are proposed to occur between March 2013 and August 2013.

4.1.3 An estimated programme of work and related indicative traffic figures due to these works are located in Appendix C.

4.2 Civil Contract.

4.2.1 The upgrade of the off sites roads are required to be completed prior to the start of the Civil works on site, the proposed start date of the main civil works is August 2014.

4.2.2 The formation of the access road between the B711 and the main part of the windfarm site will require upgrading and widening of approximately 10km of existing forestry tracks, including the placing of crushed rock as a sub-base for the track construction. It is anticipated that the majority, if not all, of these materials will be sourced from on-site Borrow Pits. It is anticipated that these works would take approximately 16 weeks. The Civil Contractor shall be required to ensure he employs a road sweeping device to keep the B711 clear of any muck and debris for the duration of the on-Site Works.

4.3 WTS Contract

4.3.1 The meteorological masts and associated equipment will likely be delivered to the site in two deliveries. Turbine components will begin delivery during second or third Quarter of 2014, and are likely to consist to 8 or 9 deliveries per turbine.

4.3.2 The programme will allow the installation and commissioning of the wind turbines by the end of the third quarter of 2014. The construction process will consist of the following principal phases of wor
Appendix A:

Site General Arrangement Figure
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**Appendix B:**

Construction and Turbine Delivery Route Plan
Turbine Haulage Delivery Route

Deliver and off load components to Grangemouth Dock. Travel to site via the
- Access the M9 at Grangemouth
- At Junction 2, exit on onto the M8, towards A720
- Merge onto the A720
- Merge onto the A68
- Merge west onto the A698 through Denholm and into Hawick to briefly join the B6399
- Merge south on the A7,
- Turn right onto the B711 to the site entrance.

Construction Traffic

Construction traffic will access the Site as per the turbine haulage route above and the A7 through Selkirk. Minor construction traffic may be required to access the site via alternative methods, if using local suppliers or contractors; this will be rare and will not be advertised as the official construction traffic route.
Appendix C:

Indicative Works programme and related traffic figures
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<td>Crane delivery for turbine erection, (Based on three stands per crane, two cranes, accented)</td>
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<td>Convey of turbine components</td>
<td>(Based on two or three Turbine components per convey made up from towers, hubs and nacelles - accented)</td>
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<td>External Turbine Footing substrations (1 unit per turbine)</td>
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<td>Total Movements per Week</td>
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Indicative traffic figures for Martins bridge current programme closure and site compound establishment, 01/03/13 – 18/08/13.
Indicative traffic figures for main civil works, including Christmas holiday period, 25/08/13 – 03/03/14.

<table>
<thead>
<tr>
<th>Works</th>
<th>Greenfield construction - Access roads, Turbine Bases and hardstanding</th>
<th>Wind farm infrastructure works completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stone Deliveries</td>
<td><em>Based on 20 tonne delivery vehicles</em></td>
<td></td>
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<tr>
<td>Plant Deliveries</td>
<td><em>Based on unescorted HGV delivering plant, or unescorted material trucks</em></td>
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<tr>
<td>Concrete Deliveries</td>
<td><em>Based on 8 cubic meter road building vehicles, diesel required per base</em></td>
<td></td>
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<tr>
<td>Cable Drum</td>
<td>2 2 2 2</td>
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<tr>
<td>Steel for turbine bases</td>
<td>4 20 20 20 4</td>
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<tr>
<td>Other related Construction Traffic (<em>HGV’s, welfare units, Fuel, building sand, operation building materials</em>)</td>
<td>2 2 2 2</td>
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<tr>
<td><strong>Turbine Supplier Traffic (No per turbine)</strong></td>
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<tr>
<td>Crane delivery for turbine erection</td>
<td><em>Based on three lifts per crane, six cranes, associated</em></td>
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<tr>
<td>Convey of Turbine components</td>
<td><em>Based on two or three, Turbine components per convey made up from towers, hubs and nacelles - escorted</em></td>
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<tr>
<td>Mast and Components</td>
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<tr>
<td>Electrical turbine package sub-stations</td>
<td><em>1 unit per turbine</em></td>
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<tr>
<td><strong>Total Movements per Week</strong></td>
<td>14 16 16 24 36 52 108 22 90 18 90 14 90 2 2 2 2 2 86 18 96 28</td>
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<tr>
<td>Construction Traffic (per TMS)</td>
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<tr>
<td>Stone Deliveries <em>(Based on 10 tonne delivery vehicles)</em></td>
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<tr>
<td>- Plant Deliveries <em>(Based on Unescorted HGV delivering plant, or unescorted mobile crane)</em></td>
<td>40 40 10 10 6 6</td>
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<tr>
<td>Concrete Deliveries <em>(Based on 8 cubic meter ready-mix concrete)</em></td>
<td>80 10 90 10 80 10 80 10 70 6</td>
<td>4 8 8 8</td>
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<tr>
<td>Cable Drums</td>
<td>4 4 4 4 4 4 4 4 4 10</td>
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<td>Steel for turbine bases</td>
<td>20 20 20</td>
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<tr>
<td>Other related Construction Traffic <em>(HGV's, Welfare units, Fuel, building sand, operation building materials)</em></td>
<td>4 4 4 4 4 4 4 4 4 8</td>
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<tr>
<td>Turbine Supplier Traffic (As per TMS)</td>
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<tr>
<td>Crane delivery for turbine erection <em>(Based on three pairs per crane, two cranes, escorted)</em></td>
<td>6 6</td>
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<tr>
<td>Convey of Turbine components <em>(Based on two or three Turbine components per convey made up from towers, hubs and nacelles - escorted)</em></td>
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<tr>
<td>Met mast Components</td>
<td>6 6 6 6</td>
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<tr>
<td>Listen turbine Package substations <em>(1 unit per turbine)</em></td>
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<tr>
<td>Total Movements per Week</td>
<td>94 24 100 98 128 26 104 28 94 18 24 2 8 12 8 12 12 0 24 28 28</td>
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</tbody>
</table>
Traffic figure Notes.

Traffic graph is based on existing knowledge of current programme of works and past experience of Windfarm Construction.

Figures are not 100% accurate and cannot be accounted for as the total for each week. For clarification figures should not fluctuate more than 10% of the figure given.

If the project programme is majorly affected by unforeseen events an updated traffic figure programme can be created and submitted to Scottish Borders Council.

Weekly figures are based on the cumulative number of deliveries per week, although the nature of the delivers’ are different, the major aspects are outlined below.

Stone Deliveries – Stone will be delivered via HGVs with approximately 20 tonnes of stone per delivery. Stone will be ordered when needed, and this will be continues in frequency thought-out the day / week. For example 120 movements per week is based on 15-30 movements per day, evenly distributed.

Plant Deliveries – Major plant will be delivered on flat back HGV’s and will be required when needed. The weekly figures are based on early week deliveries and end of week off hires. For example 10 movements per week is based on 4 movements on Monday and Friday and 2 Movements on Tuesday and Thursday.

Concrete Deliveries – As the base is currently estimated to contain 280-300 m³ of concrete from design refinement, this will require 90 movements per base, based on a 6m³ concrete wagon. 80 of the 90 movements will be required in one day, the other 10 in one day as well, but a week after the main section of the base has cured. During a base pour, this will be the busiest day with regards to traffic movements during the project. The 80 movements will be equality distributed during the day, for 10 individual days, two weeks apart.

Steel Deliveries – 3 – 4 loads deliveries will be required per base. With 10 bases this will equal 60 – 80 traffic movements. Steel will be required only when bases have been excavated so the steel can be delivered adjacent to the base, this will result in approximately 20 movements a week over a short 5-6week period, as shown in the traffic graph.

Convoy of Turbine components - Component deliveries are based on each turbine consisting of 3 blades, 1 hub, 1 nacelle and 2 tower sections. Components are delivered in convoys, which there is currently a proposed maximum of 2 convoys a day. For example 1 convoy will contain either; 3 blades, 2 towers or a Hub and nacelle together.
Appendix D:

Indicative Traffic Signage
All signage to be as per the No. 311, Road Traffic; The Traffic Signs Regulations and General Directions 2002.

**Signage type A**

Sign 7305 from Schedule 12, Part IV – “WORKS TRAFFIC” and direction to be taken, 2 in number.
1. Bearing Left for traffic heading northbound on the A7 towards the junction of the A7 and the B711.
1. Bearing Right for traffic heading southbound on the A7 towards the junction of the A7 and the B711.

Example:

![Sign 7305](image)

**Signage Type B**

Sign 7303 from Schedule 12, Part IV – “WORKS TRAFFIC” and direction to be taken, 3 in number.
1. On the B711 westbound, post Todshawhaugh, prior to local northbound access road.
1. On the B711 westbound at Roberton, prior to local northbound access road
1. On the B711 westbound prior to road narrowing at Alemoor Reservoir.

Example:

![Sign 7303](image)

**Signage Type C**

Sign 7304 from Schedule 12, Part IV – “WORKS TRAFFIC” and direction to be taken, 1 in number.

Bearing Right for traffic heading westbound on the B711 prior to southbound local access road to Burnfoot.

Example:

![Sign 7304](image)
Signage Type D

Sign 7306 from Schedule 12, Part IV – “WORKS ACCESS ONLY - 200 YARDS” and direction to be taken, 2 in number.
1. Bearing Right for traffic heading westbound on the B711, 200 yards prior to site entrance.
1. Bearing Left for traffic heading eastbound on the B711, 200 yards prior to site entrance.

Example (with alternative Yard distance):

Signage Type E

Sign 7301 from Schedule 12, Part IV – “WORKS ACCESS -”, 1 in number.
1. Outside Site Entrance on the B711.

Example:

Signage Type F

Sign 7264 from Schedule 12, Part III – “NARROW LANES” to form top Panel plus
Sign 7270 from Schedule 12, Part III – “1.6 MILES” to form bottom Panel, 2 in Number
1. On the B711 heading westbound post the Green bank corner.
1. On the B711 heading eastbound post the Alemoor Reservoir crossing.

Example (with alternative Yard distance):
Signage Type G

Custom Signage as per Sign 7002 and 7275 from Schedule 12, Part I, miscellaneous Warnings
- “LANGHOPE RID WINDFARM CONSTRUCTION ACCESS ROUTE,” to form top Panel
- “WARNING : CONSTRUCTION RELATED HGV ON B711 BETWEEN 07:00 AND 19:00” to form mid panel
- “MAX SPEED 40” to form bottom panel

2 in number
1. On the B711 heading westbound, approximately 500 yard after Martinhouse bridge crossing
1. On the B711 heading eastbound approximately 800 yards prior to the site entrance.

Example (with alternative warnings):

![Signage Diagram]