Environmental Statement Public Inquiry

Direction Order Public Inquiry

Vesting Order Public Inquiry

Stopping Up of Private Accesses Public Inquiry

Submission on Construction of Section 3

(Ref: 718736-0000-R-030)

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Table of Contents

Appendices

1. PERSONAL STATEMENT

Introduction

1.1 My name is Stephen McCaffrey. I am the Section 3 Deputy Project Manager for the Graham Farrans Joint Venture.

1.2 The Graham Farrans Joint Venture is the contracting organisation appointed to construct the Scheme should the Scheme progress to construction.

Qualifications and Experience

1.3 I graduated from Queens University Belfast in 1996 with a Bachelor of Engineering Degree in Civil Engineers with First Class Honours. I joined Farrans (Construction) Limited in June 1996 and have been employed by them since this date. I have been a Chartered Engineer since 2002 and I am a member of the Institution of Civil Engineers and Engineers Ireland.

1.4 Over the past 10 years I have been a senior manager on major civil engineering projects having gained experience preparing and managing bids as well as construction delivery of same. During this time I have been involved in a number of highway schemes. I was Design Co-ordinator for the tender and delivery of the A2 Replacement of Tlllysburn Railway Bridge and Design Manager on Roads Service DBFO 1 M1 / Westlink / M2 Upgrade.

1.5 I have experience working within Joint Ventures and with other contractors to deliver major civil engineering projects. I worked with Farrans' Joint Venture partner Graham on the delivery of Roads Service DBFO Package 1 as well as on the tender for this Scheme and other tenders for highway projects. Whilst working on the Victoria Square development I was part of the FGA (Farrans – Gilbert Ash Joint Venture) team. I have also been a member of the Earth Tech – Farrans Joint Venture team on a number of water tenders and construction projects.

Involvement in the Scheme

1.6 I led the tender team that was successful in being awarded the Early Contractor Involvement Contract for Section 3 of the A5 Western Transport Corridor. I have subsequently been involved in my current role as Deputy Project Manager for Graham Farrans JV.

1.7 Graham Farrans JV was selected by Roads Service as the Contractor for Section 3 of the A5 Western Transport Corridor through an 'Early Contractor Involvement' (ECI) procurement process. This has meant that Graham Farrans JV was appointed earlier in the process than typically would be the case. It has allowed Graham Farrans JV to provide value input to the design and to provide advice and cost input on construction related issues.

1.8 To assist delivery the overall A5 Project has been split into three sections. Separate contracting consortia have been appointed through the ECI process to deliver Sections 1 and 2.

1.9 My role as Deputy Project Manager is, in conjunction with the Project Manager, to take responsibility for assisting Roads Service and their Agent with advice and support throughout Phase 1 (Specimen Design development Stage) in relation to this section of the A5 and for the management and delivery of the subsequent detailed design and construction of the project. In this role I am assisted by a resource of engineers and designers.

1.10 I appear at this Public Inquiry to provide evidence on the construction aspects of the Scheme on behalf of Roads Service.

Graham Farrans Joint Venture Relevant Experience

1.11 Graham Farrans JV brings together the resources, skills, knowledge and experience of Northern Ireland's largest locally based civil engineering contractors Graham and Farrans and combines this with the expertise knowledge and skills of our designer Scott Wilson Halcrow Barry JV. Both Farrans and Graham are long established local companies who have a well established reputation for the delivery of large infrastructure projects throughout Northern Ireland, the Republic of Ireland and Britain. Both companies have successfully carried out numerous highways projects in a safe and efficient manner both individually and in joint venture partnership with each other.

1.12 Similar Projects with relevant highway experience include

i. M80 Stepps to Haggs
ii. Roads Service DBFO Package 1
iii. N52 Tullamore Bypass
iv. Glasgow Harbour On and Off Site Roads
v. A75 Overtaking Opportunities
vi. Limavady Bypass

vii. A2 Replacement of Tillysburn Railway Bridge

viii. Dunleer to Dundalk Motorway

ix. Belfast Cross Harbour Road and Rail Bridges

x. A8 Doagh Road to Colemans Corner Dualling

1.13 Graham Farrans JV has an established relationship with Scott Wilson Halcrow Barry JV having worked together on an individual basis or in Joint Venture on a number of different projects in the past.

2. SCOPE AND STRUCTURE OF EVIDENCE

Introduction

2.1 In Section 3 I briefly explain the input of the Contractor during Phase 1 of this project

2.2 In Section 4 I discuss the proposed construction programme and the key construction elements

2.3 In Section 5 I discuss construction methodology that would be adopted and provide some explanation on why particular methods have been chosen.

2.4 Section 6 covers proposed temporary works and facilities to support the construction of the project. This would cover the estimated construction work force and anticipated logistics necessary to support construction.

2.5 Section 7 outlines that management systems and procedures that would be implemented during the construction of the Scheme.

2.6 In Section 8 I discuss key issues and objections.

2.7 In Section 9 I present my conclusions in respect of the construction evidence that demonstrate that the programme, construction methods, land use and management systems are appropriate for this Scheme.

3. CONTRACTOR INVOLVEMENT

3.1 Roads Service selected 'Early Contractor Involvement' (ECI) as the route to procure their construction delivery partners on this project. This approach involves dividing the project into 2 phases. Phase 1 covers the development of the A5 WTC project from the Preferred Route Announcement to the Decision to Proceed to Construction, including (but not limited to) Publication of Orders, Public Inquiry and Statutory Procedures. Phase 2 covers the detailed design and construction of the works from the Decision to Proceed to Construction to the settlement of the final account including mobilisation, detailed design, construction of the works and maintenance through the maintenance period.

3.2 During Phase 1 it has been Graham Farrans JV's role to provide Roads Service and their Agent Mouchel with advice and support in relation to Section 3 of the A5 WTC. Graham Farrans JV brings its experience and expertise in buildability and provides advice to Roads Service on construction issues. Graham Farrans JV along with their designers Scott Wilson Halcrow Barry JV have actively participated in promoting value engineering and have provided costs estimates to assist managing Scheme development.

3.3 Mouchel, acting as Road Service's Agent is responsible for the development of the Specimen Design of the Scheme during Phase 1

3.4 At the end of Phase 1, subject to certain conditions being met Graham Farrans JV's appointment would progress to Phase2. At the start of Phase 2 it is expected that Graham Farrans JV would take full ownership of the Specimen Design and develop it into a detailed design for construction. Scott Wilson Halcrow Barry JV would develop the detailed design on behalf of Graham Farrans JV. Graham Farrans would subsequently manage the construction of Section 3 of the A5 WTC.

3.5 The advantages of the selected ECI route include:

i. Buildability issues, (i.e. the methodology and activities that an experienced contractor would be expected to undertake to enable the construction of the works in the safest, most efficient and effective manner) are more fully assessed and the impacts considered within the developing design before draft Orders are published.
ii. Realistic cost estimate input to steer the development of the design to budget.
iii. Independent review of developing design and challenge of assumptions.
iv. Engagement of supply chain, where appropriate
v. A better understanding of construction issues at an early stage

vi. A better understanding of possible environmental impacts and development of appropriate mitigation strategies

Design Development

3.6 Graham Farrans have assisted Roads Service and Mouchel to develop the design and as such are familiar with many of the details proposed in the Specimen Design. The involvement of Graham Farrans JV has provided an opportunity for the construction preferences, sequencing and programming and the safety of technique and methodology to be considered and where appropriate integrated into the project.

3.7 The design has followed an iterative process lead by Mouchel with input from Graham Farrans JV. Graham Farrans JV have given buildability consideration, cost estimates and value engineering input at a number of stages to ensure that the most appropriate solutions have been identified and developed.

3.8 Consideration has been given during the development of the design to minimise vehicular movements to and from the site by where practical designing out the requirement to import material or export material off site.

3.9 Suitable areas for the disposal of material have been identified along the site.

3.10 Preferred methods including but not limited to construction of structures, watercourse diversions, earthworks activities have been considered and identified to Roads Service and Mouchel

3.11 Graham Farrans JV in collaboration with the contractors for Sections 1 and 2 and the various Mouchel Design Disciplines has participated in a series of technical working groups during the development of the Specimen Design. These technical working groups provided the opportunity for discussion and challenge on the developing design and the sharing of knowledge and expertise to the benefit of the project..

4. CONSTRUCTION PROGRAMME

Introduction

4.1 The construction programme has been developed assuming that approval is given to proceed and all Statutory Orders would be in place to allow construction to commence in September 2012. The construction activities and programme may be subject to change both during detailed design and construction phases. The timings, durations and sequences are a best estimate based on our understanding of the constraints and activities. The section discusses the provisional overall construction programme and the planned sequence of operations.

Overall Duration

4.2 Construction work would commence in September 2012 and it is anticipated that the works would be completed in approximately 3 years.

4.3 An outline programme providing a summary of the main construction activities has been produced and is presented in bar chart form in Appendix A

4.4 The Contractor's responsibility for the maintenance of the completed Scheme will continue for a period of 1 year after completion of the works. After this period Roads Service would take over responsibility for maintenance of all aspects of the completed scheme.

Key Elements

4.5 There are several key elements of the construction strategy which determine the key interactions and programme duration. These include:

i. Main earthworks carried out during the 'earthworks season' between April 1st and October 31st each year. Earthworks activities may be undertaken outside the 'earthworks season' if weather conditions are favourable.

ii. Archaeological and Environmental mitigation early in key areas before bulk earthworks activities commence.

iii. River diversions and culvert construction to enable haul routes to be constructed in key areas as and when programme dictates including the installation of a temporary bailey bridge to facilitate access across Routing Burn.

iv. Main site clearance completed outside the bird nesting season.

v. Early interaction with stats providers to enable early diversions to plant to ensure construction programme is not affected.

vi. Other main construction activities which will impact on the programme include the construction of a piled road slab to Doogary Bog, bulk excavation and replacement at Seiskinore Bog, surcharging to Ballygawley Water structure and the upgrade to the Ballygawley junction.

Sequence of Operations

4.6 The detailed programme would be produced in a manner that would enable the project to be delivered on time and with minimum disruption to the local environment.

4.7 Initial construction activities would include, archaeological and soil investigations, environmental mitigation, establishment of the site offices, Statutory Undertaker's diversions, site clearance, early river diversion works and culverting and the commencement of key river and road structures.

4.8 The earthworks operations would form the basis of the programme and will be co-ordinated in a manner that;

i. enables cut/fill operations to be carried out within zones if possible,
ii. reduce lorry movements on existing road networks by constructing haul roads and lorry crossing points,
iii. enable environmental mitigation measures to be addressed before work commences,
iv. allow excavation of rock to be carried out early and during the winter months,
v. allows for upgrades to existing side roads to reduce site traffic movements on the existing A5 road
vi. allow continuous traffic flow on main roads through the use of detailed and thorough traffic management proposals.

4.9 To assist with the management of the scheme, Section 3 has been divided into four sections, they are;

i. Omagh to Kilnaheery , approximately 10km in length
ii. Kilnaheery to Ballynasaggart, approximately 10km in length
iii. Ballynasaggart to Ballygawley approximately 10km in length
iv. Ballygawley to Aughnacloy , approximately 4.75km in length

4.10 The main construction activities within these areas are shown in Table 1 below:

Table 1 Sample Description of Main Works Locations

Location	Chainage	Description
Omagh to Kilnaheery		
Seskinore Road Junction	62+000	➢ Construction of a grade separated junction to carry the Seskinore Road over the proposed A5.
Seskinore Rd (B83)	62+065	➢ Construction of new over bridge to Seskinore Road
Doogary Bog	64+394	➢ Construction of a piled road slab to proposed A5.
Moylagh Road Junction	68+700	➢ Construction of new underpass and roundabout linking the Augher Point Road and Moylagh Road
Kilnaheery to Ballynasaggart		
Springhill Road	73+770	➢ Construction of new underpass on the Springhill Road
Tullanafoile Road	75+849	➢ Construction of new underpass on Tullanafoile road allowing proposed A5 to pass over.
Tycanny Hill	77+200	➢ Large rock cutting
Rarogan Road	78+426	➢ Construction of new underpass
Glenhoy Road	80+231	➢ Construction of new over bridge allowing Glenhoy Road to pass over proposed A5
Ballynasaggart to Ballygawley		
Ballygawley Junction	83+400	➢ Construction of at grade roundabout linking the proposed A5 with the existing A4 and upgrading the Annaghilla link road.
Ballygawley Water - A4	1+150	➢ Construction of new river over bridge
Ballygawley Water - Tullybryan	0+900	➢ Construction of new river over bridge
Ballygawley Water - A5	83+785	➢ Construction of new river over bridge allowing proposed A5 to pass over Ballygawley river
Tullywinny Road	84+397	➢ Underpass beneath A5 allowing

Location	Chainage	Description
Tullyvar Junction	88+500	Tullywinney road to pass beneath ➢ Overbridge and associated slips roads will be constructed to allow the existing A5 to pass over the proposed A5
Ballygawley to Aughnacloy		
Carnteel Road (B35)	90+309	➢ Construction of new over bridge
Rehaghy Road (B128)	90+812	➢ Construction of new under bridge
Caledon Road Junction	91+900	➢ This at grade roundabout will be constructed at the intersection of the A28 and the new A5.

5 CONSTRUCTION METHODOLOGY

Introduction

5.1 This section sets out how we anticipate undertaking the construction of Section 3 of the A5 Western Transport Corridor. It also sets outlines the anticipated site working hours, methods and sequencing that would be adopted to construct the Scheme. I also outline the mitigation and control measures that would be implemented throughout the construction process to minimise the impact on people and the environment.

Working Hours

5.2 Normal working hours would be from 7.00am to 7.00pm Monday to Friday and 4.30pm on Saturday. During summer months the earthworks activities would extend to 9.00pm. There would be no normal working on Sundays or bank holidays. Any exceptions to normal working hours would be agreed with the relevant authority.

5.3 Where the construction works would impact on neighbouring properties or businesses the Contractor would advise the affected parties in advance of the works. Appropriate measures would be implemented to minimise disruption and impact of the works. A Public Liaison Officer would be appointed by the Contractor to work closely with the public and keep them informed of significant developments.

Early Activities

5.4 The first activity to be carried out would be setting out the extents of the site. This would be followed by fencing and site clearance. Site clearance would be affected by seasonal constraints and would be planned and executed accordingly. Sensitive areas involving protected or rare species would be managed in accordance with the relevant legislation.

5.5 Access to the Scheme would generally be from the existing A4 and A5 along approved routes. It would be necessary to upgrade some of the existing local roads to support construction traffic and minimise the impact on public road users. These works would be carried out in advance of the main construction activities.

Utilities

5.6 The works would impact on a large number of existing utilities. The Statutory Authorities have been consulted to determine the services which would be affected and to incorporate the services into the design and planning of the Scheme. The statutory services affected include water, electricity, communications and sewerage. Privately

owned services have also been identified and would be given the same consideration as statutory owned services.

5.7 Utility works are covered in 3 main groups. Services which are to be maintained and would require protection for the duration of the works. Services which are to be temporarily diverted to facilitate construction or which would be permanently diverted to support existing infrastructure. New services to support the proposed Scheme such as street lighting.

5.8 Consultation with all Statutory Authorities has taken place to ensure any new services to be installed can be located to avoid impact from the proposed Scheme.

5.9 Temporary services would be required to provide electricity, communications, water and sewerage for the main office compound, section offices and satellite office compounds. Consultation with the relevant body would ensure the proper procedures are implemented for obtaining and decommissioning temporary services.

Earthworks

5.10 The Scheme has been designed to maximise the use of materials within the footprint of the Scheme and minimise the requirement for import from quarries and other sources.

5.11 Some material arising from the construction would be modified or recycled for incorporation within the Scheme

5.12 To avoid sending material to landfill, material would be incorporated into landscaping mitigation areas or placed in deposition areas immediately adjacent to the Scheme

5.13 By maximising reuse of material including modification of material the import requirement of general fill has been reduced to 1.6Mm^3 to achieve an earthworks balance. This material would be sourced locally and delivered to the Scheme by road lorries.

5.14 The earthworks strategy would aim to achieve an earthworks balance over short sections to minimise the haulage requirements.

5.15 Two areas of potential hazardous waste have been identified. Hackett's yard off the Springhill Road and a breakers yard off Routingburn Road. Should contaminated material be found, this material would be exported under the appropriate license to a registered disposal location. There is no further expected requirement for export of material off site.

5.16 The weather has a significant effect on earthworks activities. Wet weather would impact on safety, quality and environmental aspects of the Scheme. The main environmental implications are increased risk of silt entering watercourses and mud on the local road network. The earthworks season would generally run from April to October but seasonal fluctuations could impact the normal season.

5.17 The management of topsoil is a key aspect of earthworks activities. This would follow on from the site clearance and fencing operation. Topsoil would be stripped from the site and set aside for reuse. Stockpile locations would be carefully selected to minimise double handling. They would also be sealed and seeded where long term storage is anticipated to prevent erosion and assist with dust suppression.

5.18 The Scheme would require the movement of approximately 7.5Mm^3 of material. A summary of the major earthworks quantities is provided in Table 1 below.

5.19 Haul roads would be constructed within the site. Provision would be made at key structures to facilitate passage of construction traffic. Temporary crossing points would be required at some stream crossings, these would be installed using approved standard practise to avoid ecological impact. Other crossing points would be implemented at all interfaces with the local road network and would be appropriately supervised.

5.20 Bulk earthworks would be carried out using large earthmoving equipment; 40T articulated dump trucks, bull dozers, large excavators and heavy compaction plant. The earthmoving equipment would work within the confines of the site. 20T road lorries would be used to import materials to the site and occasionally to transport material within the site.

Table 1 Major Earthworks Quantities

Activity	Approximate Volume (m^3)
Excavation of Topsoil	632,300
Excavation of Sand & Clay	2,185,000
Excavation of Rock and other Hard Material	448,000
Excavation of Unsuitable material from cuttings & soft ground	2,602,900
Import of granular fill	1,618,200
Total Excavated and Imported Volume	**7.486,400**
Processing of rock for selected aggregate	448,000
Processing of unsuitable clay into suitable	700,600
Deposition of Topsoil	632,300
Deposition of Acceptable Material	3,333,600
Deposition of Imported Material	1,618,200
Deposition of fill adjacent to the works (on site)	1,901,800
Disposal of Unsuitable Material	500
Total Deposited and Exported Volume	**7,486,400**

Drainage

5.21 Pre-earthworks drainage is a key part of controlling silt run off during the construction of the Scheme. Drains and V-ditches would be constructed along the perimeter of the Scheme to intercept surface run-off. Settlement ponds would be constructed to provide attenuation and prevent silt from entering watercourses. The ponds would also provide a natural source of water for controlling dust during periods of dry weather.

5.22 Construction of the drainage networks would be driven by the earthworks operations. Culverts would be installed as required prior to construction of fill embankments and carriageway drainage would follow after the completion of cuttings and embankments. Materials for execution and completion of the drainage works would be delivered to the site along approved routes.

5.23 In some cases it would be necessary to temporarily divert watercourses during the construction of the permanent culvert or outfall. This would be carried out following consultation with the relevant governing body and in line with approved standard practices.

Pavement

5.24 The pavement construction would follow on from the other roadwork activities. The construction sequence would be driven by the key access points along the Scheme. All materials required for the pavement construction would be sourced from local quarries and would be planned and executed in order to minimise the impact on the local road network.

5.25 Road pavement construction would be carried out using conventional equipment, including graders, blacktop pavers, smooth rollers and other ancillary plant.

5.26 Following completion of the earthworks and pavement construction other roadwork activities would be carried out, including installation of safety barrier, traffic signs, road markings and landscaping.

Structures

5.27 There are 38 public structures within Section 3. These include road over bridges, under bridges and river bridges.

5.28 The construction of structures would be undertaken all year round as they are not affected as much by the weather as earthworks activities. The structures are generally situated close to the existing road network and would be accessed from the respective side road to minimise the amount of mud being carried from the site onto the road.

5.29 A number of structures would require piled foundations. Piling operations would be carried out during normal working hours and any interface with the public and local communities would be advised in advance.

5.30 Some major activities such as erecting bridge beams or pouring in-situ concrete deck slabs may require working outside normal working hours. In some circumstances these operations would require road closures and working outside of normal hours would reduce the impact on road users.

Interface with local road network and local communities

5.31 The Scheme has been developed and planned with the local road users in mind. The Contractor has consulted with Road Service to gather information of bus routes, cycle routes and other key routes. A strategy has been developed to maintain access along key routes for the duration of the Scheme. Where necessary a temporary road would be

constructed to facilitate access during construction works. Temporary diversions would be constructed to a high standard, would be well maintained and kept to a minimum duration.

5.32 Other key routes required to service construction of the Scheme would receive permanent upgrades with carriageway widening or passing points to reduce the interface between construction traffic and public road users.

5.33 A number of strategic junctions are to be constructed as part of the proposed Scheme. These are located at;

i. Seskinore Road
ii. Moylagh/ Augherpoint Road
iii. Ballygawley A4
iv. Tullyvar A5
v. Aughnacloy

5.34 Temporary works would be constructed at these locations to facilitate construction of the Scheme and minimise disruption to the local road network. The junction at Seskinore Road and the existing A5 would require short periods of alternate 1-way running for construction of the proposed roundabout. Alternate 1-way running may also be required for short periods during the construction of other junctions on the scheme.

5.35 There would be a requirement to close some of the minor routes along the Scheme for periods of time. Closures would be kept to a minimum for critical phases of the construction process. Appropriate consultation would be carried out prior to any road closures. The Public Liaison Officer would work closely with the local communities to avoid impact on any significant events. Suitable, agreed diversion routes would be implemented. They would be appropriate signed and maintained for the duration of the closure.

Landscaping

5.36 Landscape mitigation would be implemented to reduce the visual impact of the works on neighbouring properties and dwellings. Landscape mounds would be top soiled to support the landscape planting. Landscape planting would take into consideration seasonal constraints and would be implemented as soon as possible to ensure optimum coverage prior to the Scheme opening.

Mitigation and control measure

5.37 The emission of dust would be controlled by a number of mechanisms

i. Tractor and water tanker dampening haul routes
ii. Sealing/ seeding top soil stockpiles
iii. Properly fitted and maintained dust suppressors on plant and equipment

5.38 Dirt on the local road network would be reduced by incorporating haul roads within the site. Where it is necessary to import / export plant and materials to/ from the site the dirt would be managed by road sweepers. Haul road crossing points would be appropriately manned and kept clean.

5.39 The impact of noise on the local community and neighbouring land owners would be minimised by controlling site working hours as described above. Where it is necessary to work outside the normal working hours appropriate approval would be obtained and relevant parties informed. These operations would be kept to a minimum for critical activities. Plant and equipment would be well maintained and fitted with the appropriate silencers.

5.40 Surface water run-off would be controlled largely by the installation of pre-earthworks drainage as described above. At key locations such as structures and culvert construction additional mitigation measures would be implemented to control suspended solids from entering watercourses such as settlement skips and flow control structures.

6 TEMPORARY WORKS AND FACILITIES

Introduction

6.1 This section describes the facilities required for the construction workforce, the construction traffic generated and the way traffic would be managed in order to construct the Scheme.

Site Establishment and Construction Workforce

6.2 The estimated peak number of personnel working on the Scheme would be 500. Works would be phased over 3 years.

6.3 It is anticipated that the main site compound would be located in the Ballygawley area. The main site compound for each section would typically contain the main site offices, site laboratory, canteen, welfare facilities, materials storage areas, , car parking, waste management area, vehicle washing facilities and batching plants if necessary. Efforts would be made to situate the main site compound away from any built up areas.

6.4 It would be necessary to erect a secure perimeter fence, monitoring and surveillance equipment and security lighting. The complex would be adequately screened from neighbouring properties.

6.5 It is anticipated that other secondary compounds would be located in the areas of Seskinore Road Junction, Moylagh Junction and Tullyvar Junction. These would be serviced from the existing A and B Class road networks.

6.6 Satellite compounds would be required for shorter durations at key structures and other areas. These would be selected as required and would be used by a smaller proportion of the work force. They would be necessary to provide office accommodation, welfare facilities and storage areas and would generally be located within the site boundaries.

Storage of Topsoil

6.7 Careful planning prior to commencement of earthworks activities would be required to ensure suitable locations for storage of topsoil are selected to prevent double handling and minimise haulage distances within the site.

Site Traffic

6.8 Haul routes would generally be within the confines of the site. Provision has been made at structures and other pinch points to ensure passage of construction traffic throughout the duration of the works. It would be necessary to construct temporary crossing points over existing streams and roads.

6.9 Haulage to and from the site would be supported by the local road network, a number of these routes requiring upgrade works to facilitate the interface between construction traffic and public road users. There is an 8km stretch towards the centre of the Scheme from Springhill Road to Ballynasaggart Road where there is no adequate route to support construction traffic. It would be necessary to construct a haul road within the confines of the site over this stretch to aid haulage of materials within the site and to and from the site.

6.10 Deliveries to and from the site would occur on a daily basis. The majority of materials would be delivered directly to specific locations on site where they are required for the construction works. Specialist materials will be delivered to the site compounds from which point they will be distributed via the internal haul road to where they are required.

6.11 The estimated number of Heavy Duty Vehicles (HDV) that would access the site is up to 400 per day at the peak of construction activities. In addition, Light Duty Vehicles (LDV) to transport construction workers to and from the site would be approximately 350 trips per day at the peak.

Traffic Management

6.12 The Scheme would have am impact on a number of routes. These include the A4 Belfast to Enniskillen Road, the existing A5 from Aughnacloy to Omagh and the A38 Armagh Road. A Scheme wide traffic management plan would be implemented on these routes to notify the public road users of the works, temporary speed control measures and any possible delays as a result of the works. This would be carried out by, for example, installing Variable Message Sign (VMS) boards on these major routes which would be updated as necessary.

6.13 Other key routes which would be affected by the works are Seskinore Road, Springhill Road, Carnteel Road and Rehaghy Road. Following consultation with Road Service these routes have been identified as principal routes with no suitable diversion. As a result any impact on these routes would be mitigated by construction of a temporary diversion to facilitate road users for the duration of the works. Temporary diversions

would be designed and constructed to the appropriate standard including drainage and pavement construction. Suitable temporary traffic management schemes would also be designed and implemented to take into consideration signing, lighting, road markings and protection of road users and construction staff for the duration of the works.

6.14 The Scheme would also impact on a number of smaller local roads. Separate traffic management schemes would be implemented to provide suitable diversion routes where necessary. These would be agreed with Roads Service prior to implementation. Local communities and affected residents would be notified in advance of any scheme. Diversion routes would be adequately signed and maintained. Careful planning would be required to ensure the road closures and associated diversion routes do not conflict with each other.

6.15 Where local roads are accessed from the existing A5 traffic management would be implemented to accommodate construction vehicle turning off and onto the A5. This would involve road markings to create right turn dwell areas, speed restrictions to ease turning movements and appropriate signage to warn road users of construction traffic.

6.16 All traffic management schemes would be designed, implemented, maintained and removed by the properly trained and qualified personnel. They would endeavour to provide;

i. Safe passage through the works
ii. Safe working area for construction workers
iii. Minimise disruption and delay to road users
iv. Comply with traffic management regulations

Public Liaison

6.17 With a scheme of this size issues may arise regularly where residents, road users and other affected parties would have concerns or queries in relation to the works. It is key that all such communications are dealt with in an appropriate and timely manner. A suitably qualified and experienced Public Liaison Officer (PLO) would be appointed by the Contractor to receive, record and respond to communications from stakeholders affected by the Scheme. The PLO would also be responsible for providing a service which would inform the public of progress on the Scheme and any significant activities which may affect them such as road closures and major works.

7 PROJECT MANAGEMENT

Introduction

7.1 Graham and Farrans operate their own Business Management Systems and these would provide the foundation for managing this project.

7.2 As Deputy Project Manage I would have direct responsibility supporting the Project Manager on a day to day basis for the successful implementation of the project Business Management System throughout the duration of the construction period.

7.3 This section discusses the Business Management System and the associated Health and Safety, Quality, and Environmental Business Plans that would used to manage the project.

Business Management Systems

7.4 The Business Management System (BMS) will provide an integrated approach to the management of all operations and incorporate specific requirements for dealing with quality, health, safety and environmental matters.

7.5 Both Graham and Farrans Management Systems are accredited to the following standards:

i. BE EN ISO 9001:2008 Quality Management Systems
ii. BS EN ISO 14001: 2004 Environmental Management Systems
iii. BS OHSAS 18001:2007 Health & Safety Management System

7.6 Independent audits by accredited certification bodies regularly test the appropriateness of these systems against these relevant standards and the level of implementation and compliance within the company.

Project Management Plan

7.7 Graham Farrans JV would develop a Project Management Plan which would adopt one of either Graham's or Farrans' accredited management systems for each of Health & Safety, Quality and Environmental management. This approach has worked successfully on projects such as Roads Service DBFO 1 in the past

7.8 The objective of the Project Management Plan (PMP) is to provide a co-ordinated approach to the management of the Project. Its purpose is to clearly define the policy, organisation, procedures and other documentation relevant to the project.

7.9 The Plan would provide a cohesive and comprehensive approach to project management removing duplication and integrating tasks where appropriate. Design & Construction Quality, Environmental management and Health and Safety Management plans are contained or referenced within the PMP.

7.10 The main headings within a PMP are as follows:

i. **Introduction** – Description of Scheme and scope of services
ii. **Policies** – Strategic policies for the project
iii. **Project Objectives** – Jointly agreed project objectives
iv. **Project Performance Indicators** – Agreed KPI's
v. **Project Organisation & Structure**
vi. **Key Team Members and Responsibilities**
vii. **Management System Arrangements** including General Arrangements, Management of Project Processes, Health and Safety Management, Construction Environmental Management, Communication and Liaison, Control of Documentation, Project Planning, Design Control, Control of Resources, Commercial, Measurement Analysis and Improvement, Non-conformance, Management System Audit and Review.
viii. **Core Project Processes** – Maps of core project processes
ix. **Schedule of Procedures** – List of applicable procedures

Construction Environmental Management Plan

7.11 The Construction Environmental Management Plan (CEMP)] will be prepared prior to the start of construction works and comply with the requirements of ISO 14001. The CEMP would dictate how environmental management would be achieved during the construction phase, so as to minimise the impact of all activities on the surrounding environment. The CEMP would describe all the means of demonstrating that the contract's environmental requirements, the Public Inquiry environmental commitments and all the environmental legal requirements, standards and guidelines are met.

7.12 All members of the Project team would be responsible for the implementation of the Plan but the Project Manager would take overall responsibility. The plan would clearly describes how the Construction Team would implement environmental management systems on this project to meet the specified contractual, regulatory and statutory requirements, environmental report mitigation measures and all planning conditions.

7.13 The CEMP would define the roles and responsibilities of key staff, including the Project Manager, the Environmental Manager, the Public Liaison Officer and Environmental Specialists. Environmental Specialists would be appointed prior to the start

of construction to monitor and oversee specific environmental works. The specialists would include but not limited to the Project Archaeologist, Site Ecologist, Landscape Clerk of Works and Site Soil Specialist .

7.14 The Environmental Manager would have experience of managing construction related environmental issues on similar construction projects. The role of Environmental Manager would include:

i. Disseminate information issued by the Project Manager and JV Companies' Company Environmental Manager, including changes to legislation, to relevant employees.
ii. Providing an input to construction method statements to ensure that any environmental requirements are met
iii. Identify employees that require environmental training, provide or organise the training and maintain training records.
iv. Provide advice; deal with queries and correspondence on environmental issues.
v. Identify significant environmental risks and impacts for the Project.
vi. Maintain the Project-Specific Environmental Management Plan.
vii. Undertake inspections to ensure controls are in place and working effectively.
viii. Monitor the progress in closing out Corrective Action Requests and Observations raised during audits.
ix. Provide report to the Project Manager for delivery at progress meetings.
x. Complete Environmental "Action Lists", when required, and forward to the Project Manager each month.
xi. Ensure all records are retained and are readily available
xii. Chair monthly environmental forums
xiii. Provide information to inform the CEEQUAL assessment.
xiv. Report major incidents to the Project Manager immediately, the JV Companies' Environmental Managers, the Company Insurance Department, the NIEA and other statutory authorities where required.
xv. Carry out thorough investigations and provide reports to the Project Manager and JV Companies' Environmental Managers after an environmental incident.
xvi. Log and monitor incidents and non conformances.

7.15 The CEMP would include a series of environmental action plans that would define the scope, key roles, responsibilities and control procedures that would be required. These specialist procedures would include:

i. Water
ii. Waste
iii. Fuels, Oils and Chemicals
iv. Noise and Vibration

v. Air and Dust Emissions
vi. Landscape and Visual
vii. Agriculture
viii. Archaeology
ix. Ecology
x. Public Interface

7.16 The CEMP would be subject to regular documented review by the Environmental Manager.

Construction Mitigation Measures

7.17 Measures would be taken during the construction phase to minimise, as far as is reasonably practicable, the impact of construction activities on the surrounding area.

7.18 During the construction phase all activities undertaken would be subject to a health and safety and environmental risk assessment. Where works require the consent or approval of any external body or authority, this approval would be obtained prior to construction works proceeding.

7.19 At the start of construction, an up to date set of 'constraints drawings' would be prepared. These drawings would be based on the information presented in the Environmental Statement and on any additional environmental surveys that are undertaken between the Public Inquiry and the start of construction. The constraints drawings would provide the construction team with information on all the environmental constraints relating to the Scheme.

7.20 The assessment of risk for any site operation would include reference to the constraints drawings to ensure that any environmental impact is adequately assessed and addressed prior to any specific construction operation commencing.

7.21 Site operations would be subject to regular inspection by site personnel trained in health and safety and environmental protection. Particular attention would be paid to site tidiness and litter. Inspections of work sites, compound areas and workmen's mess facilities would be undertaken and recorded, and actions required to achieve improvement would be monitored.

7.22 Inspections would include all aspects of health and safety, with respect to the work force and the general public. All environmental issues would be checked but specifically:

i. waste management,
ii. material storage,
iii. protection of vegetation,

iv. ecological habitats,
v. site access points and plant crossings,
vi. noise and dust control.

7.23 Records of all inspections would be maintained on site.

7.24 Where works would have an impact on neighbouring properties, businesses and buildings, the occupants of these premises would be advised of these works prior to their occurrence. The nature and extent of any such works, which might include bored piling, night-time works on road tie-ins, would be agreed with the appropriate relevant authority

Community Relations

7.25 Even with all the environmental controls and traffic control measures that would be adopted for the Scheme it is inevitable that there would be some inconvenience and disruption to residents, travellers and the local community. It is therefore very important to ensure that there are procedures and channels of communication in place to keep all stakeholders informed of activities and to quickly address any complaints or queries in a fair and timely manner.

7.26 Prior to construction, the Contractor would register with the national Considerate Contractor Scheme and establish a forum to disseminate construction information to the statutory authorities, advisory bodies, landowners, local interest groups and the general public. An experienced Public Liaison Officer would be appointed who would be responsible for these specific tasks.

7.27 The main principles of the national Considerate Contractor Scheme of relevance to the minimisation of the impacts upon the community by the Published Scheme include:

i. **Consideration** – All work is to be carried out with positive consideration to the needs of the traders and businesses, site personnel and visitors, pedestrians, shoppers, the general public and the environment in general.
ii. **Environment** – Noise from construction operatives and all other sources is to be kept to a reasonably practicable minimum at all times. Consideration should be given to the selection and use of resources - local resources should be used wherever practically possible. Attention should be paid to waste management and the avoidance of pollution - recycling of surplus materials is to be encouraged.
iii. **Cleanliness** – The working site is to be kept clean and in good order at all times. Temporary safety barriers, lights and warning signs are to be maintained in a clean and safe condition. Surplus materials, rubbish etc. shall not be allowed to

accumulate on the site or spill over to the surrounding environment. Dust etc. from construction operations shall be kept to a minimum.

iv. **Good Neighbour** – Full and regular consultation with neighbours including adjacent traders and businesses regarding programming and site activities shall be maintained from pre-start to completion. General information regarding the scheme for those neighbours using the area shall be provided.

v. **Respectful** – Respectable and safe standards of dress, appropriate to the weather conditions, shall be maintained at all times. Lewd or derogatory behaviour and language would not be tolerated under threat of severe disciplinary action. Pride in the management and appearance of the site and the surrounding environment would be shown at all times.

vi. **Safe** – Construction operatives and site vehicle movements would be carried out with great care and consideration for the safety of the general public, traders, shoppers as well as site personnel. No construction activity shall be a security risk to others.

vii. **Responsible** – Considerate Constructors would ensure that all site personnel, specialist sub-contractors, drivers and any other persons working on the site understand and implement the obligations of this Code and monitor their compliance with it.

viii. **Accountability** – Posters relating to the Scheme would be displayed around the site, giving names and telephone numbers of staff who can be contacted in response to issues raised by the general public, traders, shoppers and others affected by the site operation.

7.28 We would work interactively with all stakeholders through a process of listening, informing, consulting, reviewing and acting. Our aim being to ensure that all stakeholder concerns are addressed whilst the Scheme requirements are achieved.

8 Key Construction Issues

General

8.1 In order to address concerns members of the public may have in relation to the construction of the Scheme, I have identified a number of potential issues and how we are committed to implementing the appropriate mitigation measures as contained within the ES.

8.2 The following are a number of potential construction issues / concerns members of the public may have;

i. Control of sediment and pollution of watercourses
ii. Noise and dust during construction
iii. Principal haul routes and access locations
iv. Severance of access across the Scheme to adjacent fields etc

Control of Sediment and Pollution of Watercourses

8.3 In order to minimise the risk of environmental incidents, all drainage activities would be carried out in accordance with the Construction Environmental Management Plan (CEMP) – Principles and Guidance (Appendix 6G in Volume 3 of the Environmental Statement).

8.4 Particular consideration would be given to the areas designated for fuel and oils storage, storage of materials subject to Control of Substances Hazardous to Health (COSHH) assessments, generator sites, liquid waste storage, hazardous waste storage. Methods of containment and specifics of control measures would be adopted in accordance with Northern Ireland Environment Agency guidelines and construction industry standards and set out in the CEMP.

Noise and Dust during Construction

8.5 The CEMP will include a series of environmental action plans that would define the scope, key roles, responsibilities and control procedures that will be required. These specialist procedures would include the management of noise and dust during construction.

8.6 There will be a complaints procedure and register established to ensure all noise and dust environmental issues would be investigated / checked, resolved and closely monitored. Records of all inspections would be maintained on site.

Haul Roads and Access Locations

8.7 Wherever possible, haul roads would be located within the Scheme footprint.

8.8 Haul of earthworks is typically done by articulated dump trucks, however the use of road lorries would be necessary to transport material to locations where only lorry access is feasible.

8.9 All deliveries of materials required for construction would access the site at the designated Site Access Locations along the haul route as outlined in Appendix B from Table 6G.19 Site Access Locations (Appendix 6G in Volume 3 of the Environmental Statement).

8.10 The majority of materials would be delivered directly to specific locations on site where they are required for the construction works. Specialist materials will be delivered to the site compounds from which point they will be distributed via the internal haul road to where they are required.

Severance of Access

8.11 Prior to erecting fencing or severing lands / access, the Public Liaison Officer will contact those affected landowners / occupiers / businesses to discuss both the short term and long term access arrangements including our programme of works. Suitable temporary access arrangements will be put in place and maintained for the necessary duration until the permanent arrangement is substantially complete.

Conclusion

8.12 I reiterate my commitment to the Schedule of Environmental Commitments as contained within Volume 1 Chapter 18 of the Environmental Statement.

9 CONCLUSION

Construction Programme

9.1 Subject to approval to proceed with the Scheme construction works would commence in September 2012.

9.2 The site works would last approximately 3 years. The programme is realistic and achievable.

9.3 The programme is based upon normal site working hours with a minimal amount of 24-hour and night time working required.

9.4 The sequencing of operations have been carefully planned to ensure the Scheme is built in accordance with the Roads Service's requirements and to ensure that minimum disruption occurs to the local environment during the construction process.

Construction Methods

9.5 The construction methods have been selected with due consideration for the environment and the impact of the works on residents, road users and recreational activities.

9.6 The Scheme has been designed to maximise the re-use of materials available within the site, minimise the import of materials from outside the site and minimise the need for inert material disposal.

9.7 Public rights of way would need to be closed for short periods with alternative diversion routes implemented to ensure the safety of the public during the construction phase.

9.8 Environmental mitigation and control measures would be discussed and agreed with the appropriate authorities and would be implemented throughout the construction process to reduce the impact of the works upon; local residents, land use, air quality, water quality, the natural environment and cultural heritage.

Temporary Works and Facilities

9.9 A peak workforce in the region of 500 is envisaged. The site facilities required for this workforce have been assessed and provisions made for the necessary site compounds.

9.10 The areas required for temporary diversion routes, construction working and material deposition have been allowed for within the Draft Vesting Order.

9.11 Site traffic would normally travel within the confines of the site boundary. In conjunction with the careful design of the site access routes, the effect of this increase in traffic on the local road network would be minimal.

Project Management

9.12 By the implementation of a robust Project Management Plan and strict adherence to the Construction Environmental Management Plan the works would be delivered safely to the required standards and with careful consideration of the environment.

Summary

9.13 The Contractor Involvement (ECI) process has ensured that buildability and construction issues have been fully addressed during the design development phase prior to the publication of draft Orders. In particular, temporary land requirements have been identified and included within the draft Vesting Order,

9.14 An outline construction programme has been produced and a clear understanding of environmental impacts and risks during the construction phase, including the necessary mitigation measures, has been developed.

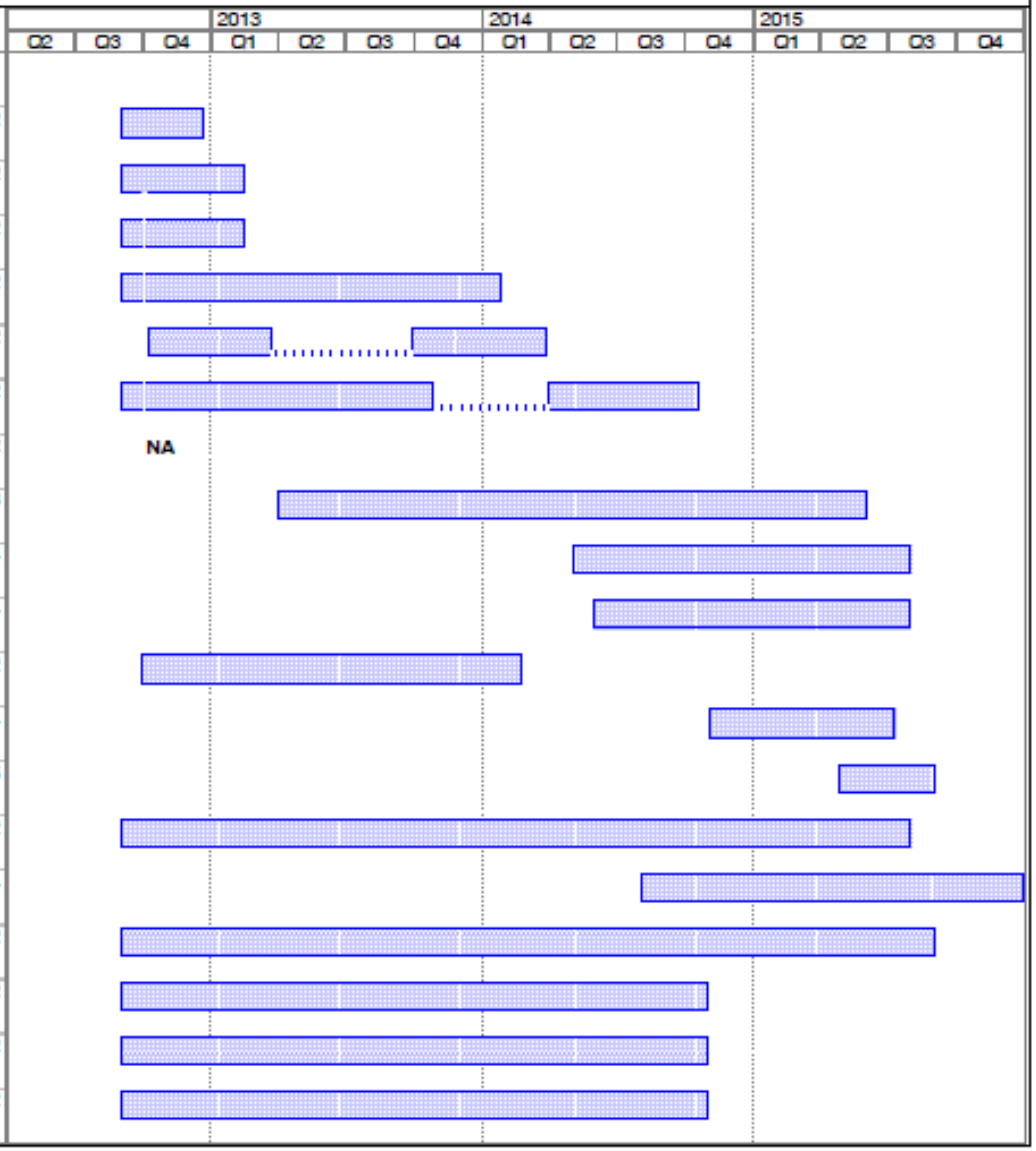
APPENDIX A
Outline Construction Programme

Stephen T McCaffrey, BEng, CEng, MICE, MIEI
Document Number: 718736-0000-R-030
15th April 2011

A5 Western Transport Corridor

Section 3 - Outline Programme

ID	Task Name	Duration	Start
1			
2	Mobilisation & Site Establishment	4 mons	Mon 03/09/12
3	Environmental Exclusion Works	6 mons	Mon 03/09/12
4	Archaeological Resolution Works	6 mons	Mon 03/09/12
5	Fencing	365 days	Mon 03/09/12
6	Site Clearance (incl Demolition)	12.5 mons	Mon 08/10/12
7	Topsoil Strip	445 days	Mon 03/09/12
8	Comms Ducting	0 days	Mon 03/09/12
9	Earthworks	567 days	Mon 01/04/13
10	Pavement	325 days	Mon 05/05/14
11	Safety Barrier Systems	304 days	Mon 02/06/14
12	Service Diversions & Statutory Authority Works	365 days	Mon 01/10/12
13	Road Lighting	180 days	Mon 03/11/14
14	Road Studs, Markings & Signage	90 days	Tue 28/04/15
15	Accommodation Works [Excludes Fencing & Ducting]	760 days	Mon 03/09/12
16	Landscaping	369 days	Mon 04/08/14
17	Traffic Management	781 days	Mon 03/09/12
18	Culvert Structures	565 days	Mon 03/09/12
19	River Bridges	565 days	Mon 03/09/12
20	Overbridge & Underbridge Structures	565 days	Mon 03/09/12



Stephen T McCaffrey, BEng, CEng, MICE, MIEI
Document Number: 718736-0000-R-030
15th April 2011

APPENDIX B
Site Access Locations

Stephen T McCaffrey, BEng, CEng, MICE, MIEI
Document Number: 718736-0000-R-030
15th April 2011

Site Access	Mainline Chainage	Average Truck Movements (period)	Access Description	Comments
Blackfort Road	57000	20 per day (120 days)	From Section 3/ B83 Seskinore Rd.	Use existing and realigned Blackfort Road as temporary diversion until Overbridge complete.
Drumragh Road	57100	20 per day (240 days)	From Section 3/ B83 Seskinore Rd.	
Section 3				
Seskinore Road (B83)	62065	120 per day (540 days)	Use existing side road	Large quantities of export and import required.
Tattykeel Cottages North	62600	20 per day (360 days)	Use existing side road	
Tattykeel Cottages Central	62850	20 per day (360 days)	Acess directly from existing A5	Access to Doogary Bog
Tattykeel Cottages South	63800	20 per day (360 days)	Use existing side road	
Drumconnelly Road 1	64400	70 per day (450 days)	Use existing side road and realigned side road	Large quantities of export and import required.
Tullyrush Road	66000	35 per day (450 days)	Use existing side road with minor upgrade works	
Rarone Road	66900	25 per day (360 days)	Use existing side road with minor upgrade works	
Drumconnolly Road 2	67900	25 per day (360 days)	Use existing side road with minor upgrade works	
Moylagh Road	68700	50 per day (450 days)	Use existing side road	Large quantities of export and import required.
Augher Point Road	68800	30 per day (360 days)	Use existing side road and realigned side road	

Site Access	Mainline Chainage	Average Truck Movements (period)	Access Description	Comments
Greenmount Road	71150	65 per day (450 days)	Use existing side road	Large quantities of export and import required.
Springhill Road	73800	100 per day (720 days)	Use existing side road and temporary road	Large quantities of export and import required. No suitable alternative access between Springhill and Glenhoy.
Tullanafoile Road	75900	10 per day (200 days)	Use existing side road	
Tullycorker Road	76600	10 per day (200 days)	Use existing side road	
Rarogan Road	78450	10 per day (200 days)	Use existing side road	
Glenhoy Road	80300	100 per day (720 days)	Use existing side road and realigned side road	Large quantities of export and import required. No suitable alternative access between Springhill and Glenhoy.
Ballynasaggart Road	81650	40 per day (720 days)	Use existing side road with minor upgrade works	Large quantities of export and import required.
Feddan Road	83300	10 per day (200 days)	Use existing side road	
Tullybryan Road	83400	20 per day (360 days)	Use existing side road and realigned side road	
A4 Annaghilla Road	83500	100 per day (720 days)	Use existing side road	Large quantities of export and import required.

Site Access	Mainline Chainage	Average Truck Movements (period)	Access Description	Comments
Tullyvar Road (crosses A4)	N/A	20 per day (360 days)	Use existing side road	
Tullywinny Road 2	85500	130 per day (540 days)	Use existing side road accessed from Ballynany Road	
Lisginny Road	86800	200 per day (540 days)	Use existing side road with minor upgrade works	Large quantities of export and import required.
Old Chapel Road	88000	10 per day (240 days)	Use existing side road	
Tullyvar Road (A5)	88500	160 per day (720 days)	Use existing side road	Large quantities of export and import required.
Carnteel road (B35)	90500	110 per day (360 days)	Use existing side road and realigned side road	Large quantities of export and import required.
Rehaghy road (B128)	91050	50 per day (360 days)	Use existing side road and realigned side road	
Caledon road	92200	60 per day (360 days)	Use existing side road	
Monaghan Road (stopped up, turning head provided)	93300	30 per day (360 days)	Use existing side road	Large quantities of export and import required.