Corrib natural gas

16. 207212

Corrib Gas Field Development

Response to Request for Further Information Reg. Ref: P03/3343

Prepared in respect of the proposed Bellanaboy Bridge Gas Terminal and associated Srahmore Peat Deposition Site.

Appendix A:
Traffic Management Plan

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and

Corrib natural gas

Bellanaboy Bridge Terminal

Transport Management Plan

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GALWAY AND CASTLEBAR
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February, 2004

Prepared by TOBIN Consulting Engineers for Shell E&P Ireland Limited

DOCUMENT AMENDMENT RECORD

Client	Shell E&P Ireland Ltd.
Project	Bellanaboy Bridge Terminal
Title	Transport Management Plan

Project No.	2044	**Document Ref:**	2044 Shell E&P Irl. Ltd. - Transport Mgt. Plan

Revision	**Purpose / Description**	**Originated**	**Checked**	**Authorised**	**Date**
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1. INTRODUCTION AND TERMS OF REFERENCE

1.1 PREAMBLE

Shell E&P Ireland Limited (Shell), as operator of the Corrib gas field and in partnership with Statoil Exploration (Ireland) and Marathon International Petroleum Hibernia Limited, is proposing to develop a gas terminal at Bellanaboy Bridge, County Mayo and an associated peat deposition site at a Bord na Móna cutover peatland at Srahmore, near Bangor Erris.

The Corrib Field is an accumulation of natural gas located in the Atlantic Ocean, about 70km west of Ireland. The gas is contained in rocks that lie at a depth of approximately 3km (2 miles) below the seabed. Water depth in the area is about 350m (1,100 feet). From expert estimations, it is believed that there is approximately 870 billion cubic feet of recoverable natural gas contained in the field and that, at the proposed depletion rate, it is estimated that the field will have a life of 15 to 20 years.

A planning application for the proposed development was submitted to Mayo County Council on December 17th 2003. An Environmental Impact Statement (EIS) prepared in respect of the proposed development (Bellanaboy gas terminal and associated Srahmore peat deposition site) was submitted in support of the application. In order to construct the terminal, it is necessary to remove up to 450,000 cu.m of peat from the terminal footprint. It is proposed to place this peat at a cutover peatland site at Srahmore.

The planning application seeks permission for the gas terminal and associated peat deposition site at Srahmore, as part of the overall Corrib gas field development. The remainder of the Corrib development (i.e. the offshore and onshore pipeline and sub-sea wells) are dealt with under a Foreshore Licence, a Petroleum Lease, a Plan of Development and a Pipeline Consent (under Section 40 of the Gas Act 1976) all of which have been granted by the Minister and are administered through the Department of Communications, Marine and Natural Resources.[1].

Extensive consultation with third parties, including the roads authority / Mayo County Council, the Gardaí, Bord na Móna and local businesses and residents, was carried out prior to the submission of the planning application and the draft Transport Management Plan was discussed with a number of parties. As a result of Mayo County Councils request for additional information (dated February 17th 2004), this document has now been update and is submitted to assist in the assessment of the project's environmental impact, specifically during the period of construction of the terminal and associated facilities.

[1] Foreshore Licence, Petroleum Lease, Plan of Development and Pipeline Consent issued for the development on May 17th 2002, November 15th 2001, April 15th 2002 and April 15th 2002 respectively.

The development of a peat deposition site at Srahmore is an integral part of the proposed gas terminal development. The Srahmore cutover peatland is located to the west of Bangor Erris, approximately 11km south of the proposed Bellanaboy Bridge Gas Terminal site. The peat will be transported from the proposed terminal site via county roads R314, L1204, (Bellanaboy Bridge – Srahmore), part of the R313 (Bangor – Belmullet) regional road and the L12044. The construction and operation of this peat deposition facility will be carried out by Bord na Móna and will require a Waste Licence under the 1996 Waste Management Act. The process of transporting the peat to the Srahmore site will be the responsibility of Shell E&P Ireland Limited. The subsequent process of receiving, placing, stabilising and monitoring this peat will be carried out by Bord na Móna.

Bord na Móna's cutover peatlands of Srahmore have the capacity to accommodate the 450,000 cu.m of peat to be transferred from the Bellanaboy gas terminal site. Bord na Móna is satisfied that the peat transferred from Bellanaboy can be stabilised and incorporated sustainably into the Srahmore cutover peatland landscape.

The impact of the projected levels of Peat Haulage traffic will be significant and the needs of the residents with respect to this traffic increase must be addressed. These impacts are addressed in the Environmental Impact Statement.

This document is intended to be a "living document"; it will be used to plan and manage transport operations throughout the construction project and it will be amended and updated as and when necessary to reflect the detailed construction programme, as well as input from Shell's contractors, the relevant authorities and local residents.

1.2 OVERVIEW

Prior to the construction of a gas terminal on the designated Bellanaboy Bridge site, it is necessary to excavate the peat overburden from the footprint area of the proposed terminal, its circulation areas and the adjacent areas which need to be worked to achieve proposed finished ground levels around the terminal.

It is also necessary to draw in enabling materials to provide access to and to open up the Srahmore Deposition site and the Terminal site and thereafter to develop the working footprint of the Terminal as the peat overburden is removed. Unsuitable excavated material will also need to be taken offsite to a place permitted for deposition. This Plan concludes that strengthening of the pavement structure of the arterial haulage route from Bangor to Bellanaboy will be required; this operation itself requires pavement materials to be brought to where they are required.

Opening up of the landward section of the gas pipeline from Glengad to the Terminal requires preparation and stoning of wayleaves in soft areas and the drawing in of pipeline materials. Overground construction materials for the Terminal itself must also be brought to site. Consideration of the timing and extent of all of these material movements is a necessary context for discussion of the main material movement, which is the haulage of surplus peat from Bellanaboy to Srahmore.

Detailed contour surveys of the site and definition of the formation levels of the Terminal complex, have resulted in a pre-works measured quantity of 417,000 cu.m of peat which, with a contingency allowance, is estimated at 450,000 cu.m. for transport planning purposes. Bord na Móna have confirmed the feasibility of the option to transport the surplus peat to a cut over peatland site within the ownership of Bord na Móna near Bangor. The proposed Deposition Site is located in the townland of Srahmore, directly opposite the junction between the R313 Belmullet Road and the L1204 Road towards Pollatomais and Glenamoy.

Movement of such a volume of peat, from the proposed Bellanaboy Terminal Site to the Bord na Móna Deposition Site on the outskirts of Bangor, requires detailed planning of the logistics of the operation:

(a) in order to resource the transport fleet properly,
(b) in order to describe the environmental impacts adequately and particularly those on adjacent residences and other road users,
(c) in order to highlight and address potential imbalances in the filling, transport and deposition operations, potentially leading to queuing and inefficient application of resources
(d) in order to assess the demands upon the road infrastructure in the area, together with other project material flows,
(e) in order to highlight risks and contingencies,
(f) so as to conduct a thorough Health and Safety review of the operation.

This Transport Management Plan examines the logistics of filling transport vehicles at the Bellanaboy Terminal Site, transporting the peat via a dedicated Haul Road to the Srahmore Deposition Site and discharging the payload at that site, with all of the associated traffic controls, recording systems and the necessary work procedures and codes of good practice that are required to support a planned, coherent operation. It also analyses transportation issues relating to lesser volumes of other bulk materials, both concurrent with and sequential to the above operation.

At February 2004, the prospects are that the peat haulage operation would possibly take place in two separate time periods, the initial period being Autumn 2004, followed by an

interruption for the winter season and a resumption and completion of the operation in late Spring 2005. In the alternative, haulage of peat would commence in Spring 2005.

1.3 DRAWINGS

The following Drawings accompany this Transportation Plan.

Drawing No.	Title
2044-1000	Layout Plan showing Road Network and Distance Signage
2044-1001	Layout Plan showing Terminal Site, Haul Route and Peat Deposition Site
2044-1002	Key Plan to Layout Plans
2044-1003	Layout Plan showing Road Signage details for L1204
2044-1004	*(Reserved number for future drawing)*
2044-1005	Layout Plan and Longitudinal Section of Haul Road - Sheet 1 of 7
2044-1006	Layout Plan and Longitudinal Section of Haul Road - Sheet 2 of 7
2044-1007	Layout Plan and Longitudinal Section of Haul Road - Sheet 3 of 7
2044-1008	Layout Plan and Longitudinal Section of Haul Road - Sheet 4 of 7
2044-1009	Layout Plan and Longitudinal Section of Haul Road - Sheet 5 of 7
2044-1010	Layout Plan and Longitudinal Section of Haul Road - Sheet 6 of 7
2044-1011	Layout Plan and Longitudinal Section of Haul Road - Sheet 7 of 7
2044-1012	Layout Plan & Longitudinal Section of Return Route – R313 & L12044
2044-1013	Typical Cross Sections of Road, Types A- H
2044-1014	Existing & Proposed Details of Glenturk Beg Bridge
2044-1015	Existing & Proposed Details of Piped Crossing at Cloontakilla
2044-1016	Existing & Proposed Details of Bridge at Cloontakilla
2044-1017	Details of Proposed Terminal Access Junction

1.4 DISTINCT MATERIAL FLOWS

The distinct material flows and their planned sequence assuming a late summer 2004 start date are as follows:

(a) Haulage of stone, blinding materials and wearing course materials along the R313 to create the access road, tipping apron of the Deposition Site and to construct the first phase of the internal bog road network in Quarters 3 and 4 2004.

(b) Haulage of roadmaking materials along the L1204 as part of the pavement upgrade operation to be undertaken by Mayo County Council in Quarter 3 2004.

(c) Haulage of stone and cement binder along the L1204 to open up the Terminal site access road in Quarters 3 and 4 2004.

(d) Haulage of sheet piling and an initial intake of concrete piles and mass concrete onto the Terminal Site in Quarter 3 & 4, 2004.

(e) A provisional preliminary withdrawal of some surplus peat from the Terminal site, the quantity depending on the weather window, with deposition at Srahmore in late 2004. It is more likely that peat haulage will not commence until Q2 of 2005.

(f) Haulage along the L1204 of pipeline materials, trenching lining and wayleave stoning materials for the landward section of the gas pipeline from the foreshore to the Terminal, during Q1, 2005.

(g) Haulage of stone and blinding materials to implement the construction of the internal bog road network in Q1 and Q2, 2005.

(h) Haulage of up to 450,000 cu.m. of peat, net of the provisional amount in (e) above, from the Terminal site to Srahmore commencing in Q2, 2005 and running into Q4, 2005.

(i) Haulage of unsuitable material offsite along the L1204 during autumn of 2005, or as interruptions in the peat haulage operation may permit.

(j) Haulage of the Terminal overground construction materials and pavement and wearing course materials for the Terminal site, as scheduled in Appendix No. 4.

(k) Haulage along those parts of the L1204 providing access to the wayleave, of pipeline materials, trenching backfill and wayleave stoning materials for the Bórd Gáis Éireann landward pipeline from the Terminal to Bangor mainly in Q4 2005 but continuing at lower intensity during the run up to commissioning of the Terminal in 2006.

(l) The likely haulage of materials ex Srahmore site resulting from the decommissioning of the internal bog roads, tipping apron and access road in Q3 and Q4, 2006.

1.5 PEAT TRANSPORTATION

Of the foregoing material flows, the largest and most weather dependent is the transportation of peat and its deposition at Srahmore. Accordingly the main features of the transportation operation are described with respect to this operation, but the other materials flows are also taken into account.

2. THE PROPOSED HAUL ROUTE

For the purposes of this Plan and for reckoning chainage distance along the route, the proposed Haul Route commences at the gate of the Terminal Site and terminates at the entrance to the proposed Deposition Site, although the access roads to both the loading and deposition sites form part of the required haulage distance. The main section of the Haul Route lies along the L1204 county road, linking Bellanboy to the R313 at Bangor. Drawing No. 2044-1001 indicates the limits of the Haul Route and the road numbers which collectively form it.

The entire L1204 route and sections of the R314and R313 have been surveyed for line, crossfalls and level related to Ordnance Datum (Malin Head) and the road layout and longitudinal sections are shown on Drawing No's. 2044-1005 to 2044-1011 inclusive.
A significant number of other national, regional and local roads have also been surveyed for pavement condition, including the L12044.

The L1204 is the principal artery and materials flows will be preferentially directed onto the upgraded pavement on this route.

3. EXISTING TRAFFIC AND ROAD CONDITIONS

The sections of Haul Road and the chainages from a Chainage Zero at the gate of the Terminal Site, are as follows:-

Road	From	To	Distance	Existing Road Width
Terminal Access Road	Filling Location	Proposed Terminal Entrance on R314	0.39 km	na
R314	Proposed Terminal Entrance	R314 / L1204 Junction	1.3 Km	5.9 m
L1204	R314 / L1204 Junction at Bellanaboy	L1204 / R313 Junction at Bangor	9.5 km	5.4 m
R313	L1204 / R313 Junction at Bangor	Entrance to the Deposition Site	0.01 km	6.1 m
Deposition Site Access Road	Entrance to the Deposition Site	Tipping Location	0.43 km	na

Table 3.1 – Peat Haul Route Sections

In broad terms, peat transportation traffic leaving the proposed Terminal Site will travel a short distance west along the R314 before taking a left hand turn south onto the L1204. Other than for side roads, serving housing clusters off the L1204, there are no further main junctions until the junction with the R313. Since this is directly opposite the proposed entrance point to the Deposition Site, a straightforward crossing of the R313 is involved, with the remainder of the Haul Route along the access road within the Deposition Site itself.

Empty trucks, following wheelwash, will emerge onto the R313 by Traffic Director control and will proceed along the R313 north-westwards for a distance of 0.98 km before turning right under Traffic Director control onto the L12044 minor road, which leads this traffic back to the L1204. It is proposed that a central right turning lane will be delineated on the R313, for the duration of the haulage works, to regulate traffic turning onto the L12044. There is consequently a looped system of one way truck travel proposed in this area of the haul route, which minimises the effects of poor carriageway width on the L1204 near the grotto and poor sight distances and turning circle clearances at the L1204/R313 junction.

3.1 EXISTING TRAFFIC

Taking the initial section along the R314 from the Terminal Site Gate heading westwards, peak hour baseline traffic counts on this section of road during 2003 (factored for the tourist period Ref: EIS Vol. 1 Section 16.4) were 79 vehicle movements in the morning and 56 vehicle movements in the evening, at present. (All movements quoted are in two directions).

The main section of the route, the L1204, caters mainly for logging traffic and private cars of residents living in the housing clusters which are accessed off the L1204 itself. Peak hourly traffic counts along the L1204 typically average 73 vehicle movements in the morning and 75 vehicle movements in the evening.

At the southern end of the L1204, it will be necessary to cross the R313 to gain access to the Deposition Site. This section of the R313 is the main road to Belmullet and the Erris peninsula. It carries a wide range of traffic including cars, heavy goods vehicles, buses, aggregate and concrete transport coming to and from local quarries and light industrial traffic. Peak hourly traffic counts on this section of road are 220 vehicle movements in the morning and 238 vehicle movements in the evening under present traffic conditions.

Overall daily road traffic counts of approximately 2000 vehicles per day have been recorded on this section of road, of which a significant amount are heavy goods vehicles and these counts were at a time when peat harvesting operations by Bórd na Móna at their Srahmore site were not in progress.

3.2 ROAD PROFILE

Commencing at Chainage zero at the Terminal Site entrance and proceeding towards the R314 / L1204 Junction, the road profile is a gentle downgrade and the carriageway width is 5.9 m. Horizontal alignment approaching the junction with the minor road to Aghoos / Pollathomas results in poor sight distance at this point. The road surface has broken down in

lateral banding, probably due to heavy vehicles associated with forestry or quarrying payloads.

The Haul Route turns south onto the L1204 road from the R314 - L1204 Junction and runs at generally level grade for 380m into the double bends at the Muingeroon Bridge over the Bellanaboy River, in a section with mean width 5.4m and good sight distances across open country. Moving southwards from the Muingeroon Bridge, there is a steady climbing grade over a distance of 1km to a small dip followed by a second length of 0.7km on a rising grade.

At Ch. 4.0 km, there is a sharp bend at a section of restricted sight distance, followed by a 400m downward grade to a local pinch point where residential development and farm outbuildings have constricted available carriageway width. From this point to Ch. 5.15km, horizontal alignment is poor and two active logging roads adjoin the haul route either side of a narrow bridge crossing. A second housing cluster limits carriageway width at Ch. 6.7km and sight distances are limited at both this location and Ch. 7.65km. Another sharp bend occurs at Ch. 8km, after which point there is a 1 km section of road with good visibility and sight distance.

Over the final kilometre, approaching the R313/L1204 Junction and at a distance of 900m from the junction, there is a long horizontal bend, with not only poor sight distance along the carriageway, but limited sight distance for those private residence driveways exiting westwards onto the L1204. These locations have been given particular attention in the upgrade works for the Haul Road, in the development of a safe alternative looped traffic approach and in the procedures for Haulage Fleet methodology and driver behaviour.

Apart from housing directly fronting onto the L1204, there are three distinct clusters of housing forming villages served by side roads off the Haul Route and dependent on it as a means of access and egress from the properties concerned.

3.3 EXISTING PAVEMENT STRUCTURE

Despite its generally wider cross section the pavement of the short section of the R314 can be regarded as similar in its construction and maintenance history to that of the L1204 and a single description will suffice for both.

In general these roads are founded on peat deposits of depths ranging from perhaps 0.5 metre to as much as 2.5 to 3.0 meters, except where the widespread peat deposits have been eroded over time, particularly in areas of steep contours towards the southern end of the L1204 and in the vicinity of the numerous stream and river crossings where fluvial action has either eroded the peat layer or has perhaps deposited effluvium from upstream.

The pavement construction in both cases is quite basic with overall depth of granular material overlying peat typically not exceeding 300mm. This depth is comprised of successive layers of surface dressing applied to the original basic pavement of local gravel or aggregate applied to hand spalled stone.

In places this may be added to by a regulation layer of graded granular material (in more recent times clause 804 or 810 material) sealed with a double surface dressing. In general the overall pavement construction is insufficient to accommodate the wheel and axle loads imposed by modern day Heavy Commercial Vehicles both because of its insufficient depth and the lack of cohesion between its constituent elements.

This is compounded by the fact that the pavement is founded in general on a highly compressible peat sub grade, which is subject to distortion under loading. This can result in the creation of longitudinal rutting where the upper pavement has a reasonable degree of strength and in the creation of a regular "washboard" transverse cracking pattern where the upper pavement is weaker still and failure is widespread.

In general this type of damage may be resisted more easily in prolonged periods of low rainfall than when the underlying peat dries out and experiences compression more readily in the absence of pore water pressure from moisture trapped in the peat fibre matrix.

As has been stated above, along certain sections of the L1204, the pavement is founded directly on the underlying granular subgrade with the result that overall pavement strength is greater and its behaviour under loading more predictable.

A visual inspection and video record of the L1204 and a stretch of the R314 was carried out by Pavement Management Services Ltd. at the request of Shell advisers on October 18th, 2003.

A modified version of the United States Army Corps of Engineers Pavement Condition Index (PCI) methodology was used to identify pavement distress and produce an overall condition rating.

The survey was divided into three sections:

Section 1 – R314 from the Terminal Site Entrance to the R314/L1204 junction – "Poor" rating category;
Section 2 – Approximately 5km of the L1204 (north) – "Very Poor" rating category;
Section 3 – Approximately 5km of the L1204 (south) – " Fair" rating category.

Along the section of the R314, the most dominant distresses are bleeding and ravelling (medium severity). The next largest quantities of distress are rutting (low and medium severity) and longitudinal and transverse cracking (low severity). There are also considerable quantities of rutting (high severity), patching (medium severity) and ravelling (low severity) on this section.

Along the full length of the L1204, the most dominant distress that can be seen is patching (high severity), with the next largest quantities of distress are rutting (low severity) and bleeding. There are also very considerable quantities of ravelling, (medium severity), rutting (low, medium and high severity), longitudinal and transverse cracking (low severity) and patching (medium severity).

4. PROPOSED ROAD IMPROVEMENTS

4.1 BACKGROUND

From the foregoing description of the R314 and L1204, it is clear that in their present condition they are incapable of sustaining the level of loading required to transport up to 450,000 cu.m of peat from Bellanaboy to Srahmore within a limited period of time.

The haulage of the enabling materials, pipeline materials and other construction materials to the Terminal site along this route would be likely, in the absence of a pavement upgrade, to cause a general deterioration of the pavement structure in the weaker sections.

The route deficiencies are threefold.

1. The road pavement is generally too weak to carry the cumulative loading envisaged.
2. The road cross section, (and in places) alignment and forward visibility are insufficient to safely cater for the level of traffic involved.
3. The route proposed contains a small number of bridge or culvert structures, whose behaviour under such loading cannot be relied upon.

Accordingly, it is proposed that with the agreement of Mayo County Council, a programme of route improvements would be carried out in advance of the main haulage operation at the expense of the developer.

These works would be comprised of:-

1. A widening of the Haul Route to provide a minimum of 5.5m paved width throughout its length.

2. The removal of visibility deficiencies through a combination of minor realignments and hedge trimming.
3. The replacement of weak bridge structures at Cloontakilla and Glenturk Beg and a piped culvert at Cloontakilla.
4. The carrying out of pavement strengthening works over the full extent of the route.

4.2 ROAD IMPROVEMENT DETAILS

In discussions with Mayo County Council, the most appropriate rehabilitation method for the haul route in this context was to use the Department of the Environment and Local Government "Guidelines on the Depth of Overlay to be used on Rural Non National Roads". With an existing granular thickness of not less than 201 to 300mm and an Annual Average Daily Traffic in the range 201-1000 vehicles, it is recommended to overlay the road with a minimum layer of 150mm thick Wet Mix Macadam for a Subgrade CBR of 1.5-3%, (Table 5 of DoE guidelines). However due to the intensity of lorry movements for the haulage exercise, it is considered that an overlay of 200mm thick Wet Mix Macadam would assist in spreading the load through to the sub-grade and prolong the life of the pavement. This 200mm thick Wet Mix Macadam is equivalent to 150mm of a stabilised Wet Mix Macadam, (Table 6 of DoE guidelines).

As the subgrade of the road is peat along the majority of the route, a CBR of less than 1.5% is envisaged. Therefore it is recommended to use a geogrid to reinforce the overlay construction.

It has been agreed with Mayo County Council that the strengthening of the haul route shall consist of the following:-

- A regulating layer of Foam Mix Macadam of 40-100mm (or more where the carriageway is to be re-shaped);
- A layer of geosynthetics in the form of geogrid;
- 150mm Foam Mix Macadam
- Apply double surface dressing to carriageways / Asphalt to junctions
- (Foam mix macadam is a stabilised wet-mix macadam, with a cement binder / modified bitumen emulsion).

This maintenance technique has an estimated life of 10 years under normal operating conditions. However it is important to note that the level of intensity of the proposed haulage exercise over a short summer period, coinciding with low water table levels and peat pore water pressures, exposes the pavement to a risk of differential settlement due to compressing of the peat layer, which is not precisely determinable at this time. The proposed mitigation of this risk with respect to the localised road widening is explained further overleaf.

According to the Department of the Environment and Local Government publication "Guidelines on the Rehabilitation of Roads over Peat", it would be desirable to surcharge any embankment widening prior to any pavement rehabilitation works. However due to the timescales involved, it would be necessary to traffic the route as soon as practicable. With this in mind, the widened section of pavement will apply extra loading to the underlying peat subgrade and induce settlement relative to the existing pavement, as it may prove impracticable to remove all the peat under the widened sections of road. It may be envisaged that during the haulage operation, there could be noticeable settlement in the widened section of road compared to the existing pavement edge. This drop in level may have to be maintained during the peat transportation and will have to be made up on completion of the haulage exercise.

In looking at the pavement design, we have had regard both to the loads arising from the enabling materials to be drawn to open up the Terminal and Deposition sites and to the materials to be drawn in association with the proposed pipeline construction and the above ground construction of the terminal all of which are referred to in Section 5 and Appendix 4 of this Plan.

It is envisaged that 450,000 cubic meters of peat will be exported from the terminal site and transported to the deposition site in 10 cubic metre loads over a period of approximately 120 working days. A number of other activities, such as enabling works for the construction of the Terminal Site, imported materials to the Terminal Site, exporting unsuitable materials off-site and the transport of materials associated with the pipeline construction, will also be transported along the L1204, for the most part outside the peat haulage exercise, (see Section 5 and Appendix 4).

The table below demonstrates the number of laden loads to be transported along the haul route during various times of the project and translated into million standard axles (based on the formula set out in the D.O.E. / N.R.A. Design Manual for Roads and Bridges - HD 24/96 "Pavement Design and Maintenance – Traffic Assessment"):

Activity	Quantity (Loads)	Loads Per Day	Duration of Haulage (Days)	MSA
Construction Equipment	534	0.65	804.1	0.002
Miscellaneous Items - Cabins etc	187	0.45	685.9	0.001
Services	1450	1.25	875.1	0.003
Rock	10410	18.9	614.95	0.035
Cement / Binders	1680	11.8	141.9	0.005
Precast Piles	240	2.5	94.6	0.001
Sheet Piling	140	1.5	94.6	0.000
Drainage	0	0	0	0.000
Peat Haulage	45000	375	120	0.135
Unsuitable Materials Haulage	3300	34.9	94.6	0.010
Black Top	550	5.8	94.6	0.002
Concrete	2340	7.6	307.5	0.007
Structural Steel	70	0.4	165.6	0.000
Pipe Spools	135	0.6	236.5	0.000
Tanks & Vessels	15	0.1	118.3	0.000
Gas Equipment	18	0.1	141.9	0.000
Total in millions of standard axles				**0.202**

Table 4.1 – Calculation of millions of standard axles (msa)

The Department of the Environment "Guidelines on the Depth of overlay to be used on Rural Non-National Roads" specifies overlay thicknesses for various traffic levels. The traffic flows include for a 10% HGV content and the overlay thickness is based on a 20-year design life at a growth rate of 3%. Each HGV is related to a 'standard axle', which is defined as that exerting or applying a force of 80KN. (A 4-axle rigid lorry carrying a maximum 32T equates to approximately 78.5KN per axle).

The overlay design was based on the one-way AADT flow range of 201 to 1,000 (comprising of 10% HGV). This equates to approximately 0.45 to 2.25 millions standard axles, (assuming a wear factor of 3.0), over a 20 year design life. The 0.202 msa calculated for the combination of peat haulage, the other importing/exporting of materials for the construction of the Terminal Site and the Pipeline materials will be lower than the lower limit of the lower traffic band. However, due to the intensity of the haulage over the relatively short construction programme, it is conservatively proposed to overlay the road in the next traffic banding (i.e. 1001 to 2000 AADT), i.e. 150mm of stabilised wet mix macadam.

The selected pavement design is demonstrated to be adequate for the 0.202 million standard axles to be generated for the construction of the Terminal Site and the pipelines. However, due to the presence of an appreciable peat layer beneath the road pavement, it is not possible to predict with total accuracy the behaviour of the strengthened pavement at all locations along the route for the duration of the haulage exercise. Therefore it should be envisaged that

during the haulage operation, there would be noticeable settlement in the widened section of road compared to the existing pavement edge. This drop in level may have to be maintained during the peat transportation and will have to be made up on completion of the haulage exercise.

4.3 CARRIAGEWAYS

4.3.1 Two Way Carriageways

In order to accommodate the additional lorries travelling along the haul route, the carriageway will need to be widened along the majority of the route.

A typical width of a 4 axle rigid lorry is in the order of 2.5m. A carriageway at 5.5m in width allows all vehicles to pass each other, with an overall tolerance of 0.5m for the largest vehicles. This width will allow the largest vehicles to pass whilst travelling at speeds in the order of 30mph. Where physically possible and where available land between fences permits, a width greater than 5.5m is recommended.

Drawing No's. 2044-1005 to 1011 show details of the type of rehabilitation/widening proposed along the haul route and drawing 2044-1013 shows details of the typical cross sections along the route. In general there are three basic rehabilitation methods involved along the route and these are:-

- Strengthening and overlay of existing road without widening;
- Strengthening and overlay of existing with widening into existing verges;
- Strengthening and overlay of existing with widening by filling up road embankment and or realigning ditches.

4.3.2 One Way Carriageway

On the L1204 along the bend on the approach to the R313, there is little space between the road boundaries to widen the road to a desired minimum of 5.5m. It would be desirable to try and acquire sufficient lands to allow the improvement works to be completed, however, the necessary land acquisition may not be complete in the timescales involved. An alternative one-way route, the L12044, has therefore been assessed to run the un-laden HGVs a different route from the deposition site from the laden HGV going to the deposition site. This route is shown on Drawing No. 2044-1012.

4.4 BRIDGES & CULVERTS

A visual survey of all bridge and culvert structures on the route was carried out by TOBIN staff on 11th November 2003. This examination identified three structures concerning which there appeared to be doubt in relation to behaviour under the proposed loading conditions.

It is worth noting that, because of the low density of the peat, the loads arising from the haulage exercise are not expected to exceed 24 Tonnes Gross Vehicle Weight while the current legal limit for rigid 4 axle rigid body trucks is up to 32 Tonnes (laden).

Nevertheless in order to ensure that damage will not be sustained by the weaker structures identified it is proposed with the agreement of Mayo County Council that these will be replaced by modern structures capable of carrying HA and HB highway loading in advance of the haulage exercise. Alternatively temporary structures could be utilised.

In order to maximise the speed of construction, while minimising the potential disruption to the stream / river beds and aquatic life, it is proposed to employ the use of precast structural elements for the locations concerned. These structures will be delivered to site in prefabricated box culvert units of varying cross sections in lengths of 1.5m, 2.0m or 2.5m.

The existing and proposed cross sections are lists below:

Bridge Location	Existing Cross Section	Proposed Cross Section (standard sizes)
Bridge @ Glenturk Beg	5.2m wide x 1.75m high	5.1m wide x 2.4m high
Bridge @ Cloontakilla	4.0m wide x 1.3m high	4.2m wide x 2.4m high
Culvert @ Cloontakilla	2no. piped culverts	1.5m wide x 1.0m high

It is envisaged that the three structures concerned would be installed in quick succession so that the cost of cranage, pumping and other specialist items could be shared with resulting economies and minimisation of disruption due to road closures. The condition of the Glenturk Mór masonry bridge and the Bellanaboy Bridge does not at this stage warrant advance works, but a contingent provision will be made to ensure they are strengthened if required.

4.5 METHODOLOGY

1. Any installation of these structures would be carried out in close consultation with the NWRFB.
2. In so far as is possible, installation will also be confined to periods of low water in the streams concerned.

3. Construction methods would ensure that no fresh concrete, hydrocarbons or other toxic material would be permitted to enter the waterway.
4. Pumping, where necessary to dry out portions of the waterway channel for levelling / regulation would be arranged so as to discharge pumped water into on-site temporary stilling lagoons to ensure that no silt is carried over into the waterways proper.
5. All regulation work will be carried out using clean graded material.
6. Concreting where necessary will be carried out in the dry and will not be flooded by river water until set.
7. Any flow diversions work will be carried out with the utmost caution to avoid mobilizing silt or fine peat particles into the waterway flow.

5. TRANSPORT MANAGEMENT PLAN

This Transport Management Plan is an evolving document and will ultimately require the continuing input of the Gardaí, the Local Authority, the residents and the appointed Earthworks Contractor in order to be complete. Initial discussions with the Gardaí on its contents have taken place and their views are incorporated. Nonetheless, at the Planning stage of the project, it quantifies the transportation operation and makes the necessary commitments to permit stakeholders to engage with it and respond to its approach.

A suitably experienced Transport Operations Manager will be appointed by the developer's Contractor and will have responsibility for the running of the operation overall and for assisting the developer in liaison with the Gardaí, the Emergency Services, the Roads Authority and the residents along the haul route. He will also assist the developer in managing communications with the media and with the public at large. He will operate the central communications system with truck drivers, he will prepare the toolbox briefings each morning and he will oversee compliance by the Earthworks Contractor with the Code of Good Practice for drivers employed on the haulage contract.

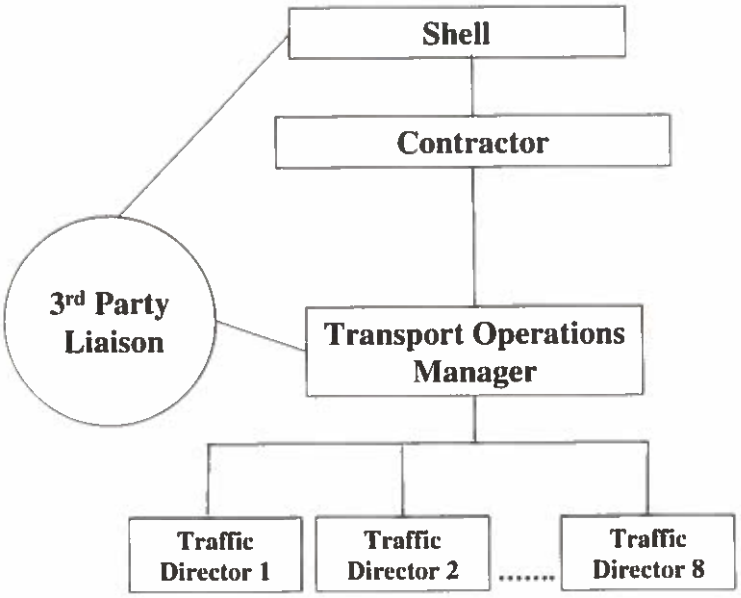

Figure 5.1 – Earthworks Contract Transportation Management

Broadly speaking, there are four distinct elements of materials haulage associated with the Terminal itself and these are:

(a) Enabling materials to construct roads, circulation areas, loading areas and workforce facilities at both the Terminal and the Peat Deposition Site at Srahmore, with simultaneous upgrade of the L1204 by Mayo County Council,

(b) Foundation materials importation and unsuitable materials stockpiling and export,

(c) Peat excavation, windrowing and removal to Srahmore, and

(d) Terminal overground construction materials importation.

To construct the Terminal and take the Terminal into service, there will also be materials importation to construct the landward section of the marine pipeline between the foreshore and the Terminal. The main activities relating to the construction of the BGÉ pipeline from the Terminal to the Block Valve at Bellacorick will take place in the latter half of the overall construction program.

5.1 ENABLING WORKS MATERIALS IMPORT

5.1.1 Enabling Materials to the Terminal Site

Prior to extracting the surplus peat from the Terminal Site and right at the commencement of the project, it will be necessary to construct the initial access road and construction compound on the Terminal Site. It is estimated that this will require approximately 126,400 tonnes of imported rock, concrete and cement/filler binder material. These quantities will be

drawn as 6320 loads over a period of seven months, prior to April 2005 when the bulk of the peat haulage commences.

It is estimated that a further 36,000 tonnes of similar materials will need to be brought to site along the L1204 at the same time as the peat is being transported and this will result in an average of 300 loads per month along the L1204, in addition to the peat loads traveling in the opposite direction. This is a conservative assumption however, in that it may be possible to move this material at times that peat transport has been stood down for whatever reason and the possibility of directing some empty trucks to carry stone in the reverse direction has also been discounted in this assessment, in order to present a worst-case scenarios with respect to traffic movements.

After the peat has been hauled from the Terminal Site, there will still be a requirement for bulk stone, concrete and binder materials, amounting to 54,000 tonnes and this will be drawn along the L1204 at a rate of 400 loads per month over 8 months.

5.1.2 Enabling Materials to the Srahmore Site

Similarly at the Srahmore Deposition Site, at February 2004 we estimate that 21,800 tonnes of rock, road making materials and precast concrete units will need to be imported, as 1,090 loads over 4 months, to construct the access road and deposition platform during Q3 and Q4 of 2004. Later on, at Q1 and Q2 2005, a further 18,000 tonnes. of rock and surfacing materials will be required to develop the internal haul to the deposition site as well as, if required, maintain the access road and apron and these will be brought to Srahmore as 300 loads per month, over three months, but these loads will not travel on the L1204 route.

5.1.3 Enabling Materials for the L1204 Upgrade

Mayo County Council will themselves need to draw materials along the L1204 as part of the upgrade works on the pavement of the haul route and while these do not impact on the pavement design, they do impact on traffic movements. A total of 68,000 tonnes of roadmaking materials will be drawn along successive lengths of the L1204 over a three month period, averaging 1133 loads per month during the pavement upgrade.

The programme for the upgrade of the L1204 Peat Haul Route envisages that the upgrade work itself would commence immediately planning permission is granted for the project. It will nevertheless be possible to use the L1204 at that time to draw the other simultaneous enabling materials to the Terminal site, even though the L1204 will itself be the subject of upgrade work at the time, by timing such runs each day for windows in the upgrade works, by agreement with the Council.

It is only proposed to draw the preliminary enabling material, over the same 10 week period which it is expected it will take to upgrade the L1204 to a point where haulage of peat can commence.

On this basis, it is expected that 600 laden vehicles of stone per month and 280 laden vehicles of cement/filler binder materials per month will use the L1204 as a haul route to the Terminal Site at the commencement of the project, at the same time as the upgrade works are being carried out, making the full and unladen journeys each day. These 40 loads daily will not be particularly disruptive in the context of the L1204 road upgrade materials haulage itself going on at the same time.

5.2 OTHER IMPORTED MATERIALS

Once the L1204 is upgraded, the timing of the importation of the remainder of the materials to the Terminal site and export of unsuitable material from the site, will for the most part, not coincide with the peat haulage operation, but will follow its conclusion. This will not always be the case however.

As the footprint of the working area expands on the Terminal Site, further quantities of stone and of cement/filler binder will be gradually required and will be drawn along the L1204 at a rate shown in Appendix. No 4 which details the various loads which are unavoidably scheduled on top of the average daily peat payload.

All suppliers of these materials will be required to have a certified weighbridge available to them as part of their contract of supply, so as to police legal weights throughout the project.

5.3 EXPORTED MATERIALS

It is estimated that 66,000 tonnes. mineral soils may be removed off site during the construction operation, as material unsuitable for the construction purpose on site, but suitable for site remediation elsewhere, as may be regulated by Permit by Mayo County Council.

It is important to note however, that for presentation purposes only, the export of unsuitable material offsite has not been shown as if it represented additional HGV movements on top of the peat transport in movement summaries. In practice, it is expected that unsuitable material will be moved offsite opportunistically, as and when the peat haulage operation is interrupted for weather or other reasons and it is not assumed that trucks delivering stone might be deployed to carry unsuitable material on the return journey, which is a realistic prospect. In the event that the restoration site for the material being removed off the Terminal Site coincided with the source of the rock and drainage stone imports, then it might be expected

that vehicle movements between the two operations would be minimized by having trucks travel laden in both directions.

Neither have we allowed any margin of reduction to cover the possibility that stockpiled material, initially termed unsuitable, would become usable by virtue of condition improvement in the stockpile under favourable weather. Overall, we expect that movements of unsuitable material which might unavoidably be simultaneous with peat transport, will be of the order of 3% of the traffic load otherwise on the L1204 during that period. As a further control, this will be scheduled so that the overall number of HGV trips daily on the L1204 will not exceed 400 movements, or 800 trips. If peat haulage productivity needs to be limited temporarily to achieve this upper limit, this will be done.

This unsuitable materials haulage operation will be partly conducted after the peat haulage operation has ceased and would be expected to run continuously at a level of 825 HGV loads per month, or 37 loads per day approximately.

5.4 PEAT TRAFFIC MANAGEMENT

The following elements will collectively form the Transport Management Plan. This Plan, will be amended following consultation with stakeholders, will be part of the tender documents for procurement of the Earthworks Contract and it will be part of the commitments lodged with Mayo County Council and the Gardaí as part of the process of planning the transport operation safely and efficiently.

5.4.1 Expected Travel Times and Working Day

The cycle to be completed by each vehicle, several times per day, includes the following basic elements:

(a) Filling of the Payload, followed by wheelwash
(b) Haulage of the Payload
(c) Weighbridge and electronic recording procedures
(d) Manoeuvre into tipping position, tipping and truck deck lowering followed by wheelwashing
(e) Return trip unladen
(f) Manoeuvre into loading position.

Having examined each element of the cycle, we have estimated the time involved to complete that element and the cycle overall. We anticipate the following times:

Cycle timing	No Queuing at Terminal	Queuing at Terminal loaders
Filling Time & wheelwash	6.25 mins	10.50 mins
Laden Transport time	16.10 mins	16.10 mins
Deposit time, recording & wheelwash	6.83 mins	10.17 mins
Unladen Transport Time	16.10 mins	16.10 mins
Minimum Cycle Time	**45.3 mins 0.75 hrs**	**52.9 mins 0.88 hrs**

Overall therefore, we anticipate that the cycle time will lie between 45 mins and 53 mins approximately and given a starting time of 7 am, two fifteen minute morning and afternoon breaks and one 40 minute break at lunchtime, then 11 to 12 cycles are possible depending on the development of queues at the loading machines, at the wheelwashes, at the weighbridge and at the tipping area.

Overall, we have conservatively assumed that an average of 10 cycles per working day is possible for volume rate of flow calculations and a total of between 40 and 46 vehicles per hour will arrive at the Filling and Tipping Areas, but in a daily volume of the order of 4000 cu.m/d of peat moved. The overall peat haulage operation will, on this basis, take approximately 120 working days.

The following is the expected typical working day:

- 06.00 hrs Minibus collects drivers from their residential accommodation. Machine Fitters in parking areas visually check over all vehicles.
- 06.30 hrs Transport Operations Manager briefs all drivers in canteen at Terminal Site, minibus transports drivers starting at opposite end of haul route to their vehicles.
- 06.40 hrs Drivers visually check vehicles, tyres, oil, fuel, windscreen washer, mirrors, fuel level, spare tyre, wheel nuts.
- 06.45 check docket books, note records of work done by fitters.
- 06.50 hrs Drivers complete tachograph details for the day and wait clearance to depart parking area.

At this point, the working day evolves as queuing permits, as follows:-

Typical Vehicle Day (refueling for all and first load for half of the fleet in place by 7 am)

"With Queues" Trip lengths			"Without Queues" Trip lengths		
07.00 hrs - 10.31 hrs	3.52 hrs	4 trips	3.02 hrs	4 trips	07.00 hrs - 09.55 hrs
10.31 hrs -10.46 hrs	0.25 hrs	break	0.25 hrs	break	09.55 hrs -10.10 hrs
10.46 hrs – 13.24 hrs	2.64 hrs	3 trips	2.26 hrs	3 trips	10.10 hrs - 12.21 hrs
13.24 hrs - 14.01 hrs	0.62 hrs	break	0.62 hrs	break	12.21 hrs - 12.58 hrs
14.01 hrs - 15.46 hrs	1.76 hrs	2 trips	3.02 hrs	3 trips	12.58 hrs - 15.53 hrs
15.46 hrs - 16.01 hrs	0.25 hrs	break	0.25 hrs	break	15.53 hrs - 16.08 hrs
16.01 hrs – 17.47 hrs	1.76 hrs	2 trips	1.51 hrs	2 trips	16.08 hrs - 17.35 hrs
	10.81 hrs	**11 trips**	**10.93 hrs**	**12 trips**	

- 17.50 hrs Return to assigned parking area, submit dockets & report sheets, submit tachograph records
- 17.50-19.00 Those trucks assigned to the Loading Area load up and park in loaded and wheelwashed condition. Empty trucks are wheelwashed before being parked.
- 17.50-19.30 hrs Fitters and assistants refuel trucks, change any damaged tyres, carry out essential repairs, rotate trucks out for maintenance etc. Route maintenance crew attend to road sweeping and running repairs to the pavement.

The Gardaí have commented on the need for effective road cleanliness plant and the need to permit adequate daylight time for road cleaning and maintenance works when haulage has ceased for the day. They have also highlighted the obligation to maintain tachograph records for at least 7 days for inspection.

5.4.2 Logistics at the Tipping Area from 7am to 7pm daily

Bord na Móna plan to operate moving material from the Tipping Apron into the Haku Trailers. The Tipping Area is broadly shaped as a "hammer head" with two wings acting as peat buffer storage areas.

All traffic will first cross the weighbridge, to record the payload of each vehicle. It is intended that this will be done electronically by means of a bar code fixed to the door of each vehicle, whose tareweight is prerecorded and so that time and paperwork are kept to a minimum. Traffic will then be directed toward one of the two buffer areas for tipping purposes, while the other area is being worked by the BnM mechanical shovels, moving tipped peat into the Haku Trailers for placement. Once one side is exhausted, the shovels will move to the other side and redirect tipping traffic to the side which has just been emptied.

The buffer is necessary both to prevent the two streams of traffic crossing each other's circulation area and to provide enough storage for the productive working of the shovels in early morning and late evening when material is not being transported.

5.4.3 Logistics of the Loading Area

Each evening, half of the Truck Fleet will be parked at the Deposition Site hardstand and half will be parked at the Loading Area. This proportion may change slightly depending on operational conditions encountered. Those vehicles which are parked at the Loading Area, will be preloaded for the following morning before parking and where practicable will be wheelwashed before being parked, so that they commence their first cycle ready to depart with a loaded payload, which will give productive working for the mechanical shovels at the Tipping Area almost immediately.

All vehicles will have been fuelled and safety checked during downtime at either the Loading or Tipping Sites and the Loading Area excavators will commence to fill those trucks which have travelled empty from the Deposition Site as they commence their cycle each day.

We have examined the option of parking the entire fleet for loading overnight at the Loading Area, but we have ruled this out because of the impact which it would have on the initial startup cycles in the morning, with a heavier than usual traffic count on the Haul Road potentially disrupting the lives of residents attempting to move out to work and school. There is also the risk of large queues developing when the fleet returns empty to the loading area following the first cycle and on balance, we have recommended against this approach unless particularly pressing circumstances warrant it.

It will take time to develop the working front at the Loading Area, to provide sufficient space to allow trucks to approach the filling excavators and circulate safely, without queues longer than one vehicle developing. This will require a ramping up of the fleet size over the first two to three weeks of hauling material, so that all trucks operate productively and do not overload the available circulation space in the working area. We accordingly see the initial fleet size as being of the order of 20-25 vehicles, increasing to 40 over a short period.

We have assumed as a matter of planning principle that any tendency for queues to develop will be accommodated on the access roads to the Terminal and Deposition Area. The flagmen and vehicle spacing guidelines will otherwise ensure that the mean frequency of one truck passing in either direction every 90 seconds at a given point on the Haul Route is not persistently exceeded by unplanned formation of clusters of trucks-in-convoy. If delays develop, this frequency as experienced by residents along the L1204 will be allowed to drop and we may have to compensate by marginal payload increase over our self imposed limit of 10 cu.m (if the condition of the peat permits), or accept a corresponding increase in the duration of the operation in 2005. This approach places particular importance on being able to keep the internal site access roads free of breakdowns or obstructions and emergency haul-in areas will be necessary midway on these roads so that a breakdown does not lead to uncontrolled queuing spilling onto the public road.

5.4.4 Signage

New Road Signs will be erected on the approaches to the Haul Route from Bangor, Glenamoy and Belmullet, at locations to be agreed with Mayo County Council, but typically 2- 3 km from any point of traffic control. These signs will be as detailed in the attached Schedule, Sign Type 1, customised for each location and will act as a preliminary warning to road users of works traffic and traffic controls extending over a stated time period, as well as advising of possible restrictions and alternative routes. A Freephone Number to permit the public to raise queries on conditions on the day will be prominently displayed on the main approach signs.

Nearer to the interface points, specific instruction signs, to National Roads Authority standard, will caution drivers of crossing or emerging traffic and will request cooperation with flagmen.

Along the Haul Route signage, in accordance with Drawing No. 2044-1003, will be erected to:

(a) mark Chainage points for easy reference of potential breakdown, road deterioration or other hazard such as stray animals,
(b) mark particular hazards, such as bends, sections of poor sight distance for residents emerging onto Haul Route, etc.
(c) warn of priority rules at locally narrow sections of road,
(d) warn drivers to check brakes, or slow at school bus pickup points etc.

The position of signs of different type, are shown on Drawings No. 2044-1000, 2044-1003 and Schedule No. 1 details the sign types required. Speed limits particular to the Contract Drivers will necessarily be written into the Drivers Code and conditions of employment rather than be signposted per se, since speed control for traffic at large is a matter for the Gardaí and Roads Authority.

5.4.5 Communication by radio, telecoms and print media

Regular progress reports will be given to Midwest Radio and to Radio na Gaeltachta, with details of any significant milestones anticipated over the coming week. A special supplement will be prepared, in advance of the commencement of Peat Haulage Operations and circulated with the local newspapers. A leaflet drop will be made as required to advise the residents and road users on progress and of any unusual developments. A special effort will be made to raise the awareness of schoolchildren of increased traffic volumes.

A freephone number will be provided and listed on all communications, to permit the public:

(a) to comment on the driving standards they encounter with individual fleet drivers, identified by a truck number, and

(b) to raise queries, report accidents or hazards, or register complaints.

This number will be manned during working hours, with appropriate voicemail outside of such hours and all calls will be logged and responded to. The operator on this number will have priority access to the Transport Operations Manager.

5.4.6 Road Cones and Traffic Separation Barriers

We have identified the separation of the Tipping Traffic from the Mechanical Shovels at the Peat Deposition site as an important safety measure to streamline the different traffic at the Deposition Apron. This will most likely be achieved by concrete red and white interlocking barriers, which will be moved during the working day, as the tipping area of the apron is exchanged with the shovelling area once a day.

To control traffic at junctions and to maintain queue discipline for flagmen, it is important to lay out road cones and traffic barriers. These must be removed and repositioned each day, kept clean and ballasted and supplemented to cover theft or damage, with reflective surfaces renewed, by the haul route maintenance team.

5.4.7 Lighting of Junctions and Working Areas

Regardless of daylight conditions and in response to the Mayo County Council promotion of dipped headlights in daytime, trucks will normally operate on dipped headlights. This will assist in mitigating risks of road accidents particularly in poor daylight. In order to address particular interfaces at the junctions with the R314 and R313, it is proposed to illuminate these promptly at lighting up time.

5.4.8 Areas of restricted Carriageway Width

There are a number of sections of road where residential development and farm buildings close to the road locally restrict carriageway width. Some bridge parapets also reduce the width locally so that two trucks cannot safely pass at such points. At such points, the Code of Practice for Drivers will define a priority system to allow the right of way to the laden vehicle and signage at such locations will warn drivers to this effect, with provision for a pause point for the yielding vehicle, with appropriate lane control and road markings.

Locally widened sections of carriageway at locations of poor sight distance have been recommended in the Risk Assessment and accommodated in the road pavement widening and upgrade proposals, to permit vehicles encountering one another to proceed with due caution, without the need for reversing. These have been incorporated in the road widening proposals and in the rules of priority for laden and unladen traffic.

5.4.9 Speed Limits and Separation Distances

A maximum non-statutory speed limit of 40 mph will be imposed for contracted haulage vehicles on the Haul Route. A lesser maximum speed limit of 30 mph will locally apply on bends, marked by appropriate contract-specific signage and will be implemented and enforced for all fleet vehicles. The Transport Operations Manager will deploy a pacing vehicle as part of the enforcement of this requirement and feedback from the Freephone number will be used to police the speed limits on the route.

In addition to this speed control, upper limits will be placed on daily productivity, so that there will be no financial incentive for the Contractor to tolerate breaches, or for the drivers to infringe speed limits.

The operation of the wheelwash will tend to partly act as a separating mechanism for traffic emerging from the loading or tipping operation, assuming that the Traffic Directors at the entrance gates can maintain this separation as they direct traffic onto the Haul Route proper. Traffic Directors will be instructed to feed vehicles onto the Haul Route properly spaced and to ensure that no queue extends to the public road. Thereafter, drivers will be instructed to maintain, as far as possible, the separation between vehicles travelling in the same direction at 800m-900m, so that the space available for locally widened sections at areas of poor sight distance and where unladen traffic must yield, need not be designed to accommodate more than two vehicles waiting.

In any queuing situation on the access road to the Filling Area or the Tipping Site, drivers will be instructed to maintain a minimum separation of 20m so that safe visibility around each vehicle can be maintained.

5.4.10 Accommodating the needs of local residents.

There are approximately 50 households on or adjacent to the L1204, there are also houses on or adjacent to the minor roads which serve the villages of Muingingaun, Glenturk More, Glenturk Beg, Glencullin Lower and Upper, Lenanadurtaun and Cloontakilla.

It will not be necessary to close the L1204 Road to public traffic. Peat haulage traffic must share the route with forestry traffic, local residents, school bus and other road users. Road

signage will discourage use of the L1204 as a through-road for the duration of the operation, favouring the L5284 on the western shore of Carrowmore Lake for travel to the Barnatra / Pollathomais area during the haul periods. The common usage of the L1204 by haulage and local traffic nevertheless presents risks, which have been assessed in Appendix No. 1 and which can be mitigated by:-

- Road signs: New road signs will be erected on the approaches to the Haul Route as described in Section 5.4.4.
- Communication: Regular updates will be given to Midwest Radio and to Radio na Gaeltachta, with details of any significant activities anticipated over the coming week.
- Minibus: A minibus service will be established to transport local residents to towns in the local area.
- School bus runs: The timing and organisation of school bus runs will be discussed with the appropriate authorities in order to avoid conflict with haul route traffic.
- Driver training: All drivers will have site specific safety training.
- Speed controls; A maximum non-statutory speed limit of 40 mph will be imposed for contracted haulage vehicles on the Haul Route. A lesser maximum speed limit of 30 mph will locally apply on bends, marked by appropriate contract-specific signage and will be implemented and enforced for all fleet vehicles.
- Tachographs; In order to ensure compliance with national regulations on maximum working hours and break intervals for drivers, vehicle tachographs and GPS position recorders will be fitted to all haulage vehicles. These will be recorded to archive and analysed for compliance with work duties, productivity limits and the like on a daily basis.
- Driver communication: Two way VHF radio communications will be provided between each vehicle and the Transport Operations Managers office. Each Traffic Director and the weighbridge records office will also have access to this communications system and will be trained in its use and in the priorities and disciplined usage necessary for effective communication.
- Wheel washes and road sweepers: These will be used to minimise the transfer of mud onto the public roads.
- Traffic Directors at junctions: This activity will serve to minimise queuing at junctions and ensure safe passage for all traffic.

The Gardaí have highlighted the fact that pension payments take place over Thursday and Friday each week and that other social welfare payments take place on a Tuesday, so that particular attention may need to be given to minibus service on these days.

It has been and will continue to be a matter for consultation with the residents and with the school bus operators and drivers to define how they consider the additional minibus service can best be designed to meet the local needs.

5.4.11 In-cabin communications and record keeping

Two way VHF radio communications will be provided between each vehicle and the Transport Operations Managers office. Each Traffic Director and the weighbridge records office on the Bord na Móna site will also have access to this communications system and will be trained in its use and in the priorities and disciplined usage necessary for effective communication.

In order to ensure compliance with national regulations on maximum working hours and break intervals for drivers, vehicle tachographs and GPS position recorders will be fitted to all haulage vehicles. These will be recorded to archive and analysed for compliance with work duties, productivity limits and the like on a daily basis. Open book access to these records will also be made available to the Gardaí in their monitoring of statutory load limits.

An electronic bar code based record system will be designed and customized to record essential and relevant information for each load of peat removed off site. This bar code on the door of each vehicle would be read to record as standard the vehicle owner's name, the vehicle registration number, or fleet identification number, the tareweight of the vehicle and then would be supplemented to include the assigned driver name, date and time of loading and unloading, payload carried and deposition area arrival time for speed and productivity compliance.

With respect to driver usage of personal mobile phones, it is proposed that trucks all have hands free mobile phone kits fitted, not withstanding this all driver training will cover the issues on use of such equipment and the possible effects on driver concentration.
Other report sheets would be designed for the driver to record any incident, or vehicle maintenance requirement and a disposable camera would be provided in each cab for the use of the driver in the event of accident or other reportable incident.

5.4.12 Driver Training

The elements to be included in the training of each vehicle driver are listed in the Code of Practice at Appendix No. 2. Training will be customized to the requirements of this particular operation and new and replacement drivers will receive the same training before being permitted to take up duty. The Gardaí have requested that a general requirement for haulage vehicles to pull in at a safe location and give way to following private traffic would

be helpful in avoiding driver frustration and this amendment has been included in the Driver Code.

5.4.13 Vehicle Maintenance Yard

It is proposed to maintain all trucks in a central vehicle maintenance yard and to otherwise fuel them and park overnight at either the Loading or Deposition Sites as the Traffic Operations Manager may direct. Overnight security at each site will be available and all fuel storage will be appropriately bunded. Alternatively, refueling by dedicated mobile tanker each evening will be carried out.

Drivers will be transported to and from the parking areas by minibuses, to avoid congestion in the working areas and to ensure timely and coordinated arrival for tool-box briefings at the start of the working day.

5.4.14 Productivity Restrictions and Operational Hours

Working hours for the fleet in terms of public road haulage are expected to extend from 07.00 hrs to 18.00 hrs Monday to Friday and 07.00 to 16.00 hrs on Saturdays. Preparatory work within the parking areas, end of day loading for half the fleet and briefings will take place outside of these hours.

In order to avoid any incentive towards reckless productivity, the Haulage Contract documents will clearly define an anticipated safe maximum daily productivity, having regard to speed limits, necessary break periods and the requirements of due care and attention. Above this productivity ceiling, penalties will apply to discourage unsafe practices.

5.4.15 Road Condition Maintenance

The extent of the heavy vehicle traffic movements and the nature of the payload may create problems of:

(a) fugitive spills of peat water from tailgates,
(b) localised areas of subgrade and wearing surface failure

Wheelwashes will be utilised at the Bellanaboy and Srahmore sites to clean all vehicles prior to vehicles entering the exit lane of the access road.

Internal circulation roads leading the vehicles to the loading plant will be kept as clean as operations permit, by means of regular trimming of the circulation road surface by onsite graders and topping off with clean maintenance coatings on a regular basis.

Use of private cars by plant drivers and fleet drivers in the confines of the Loading and Deposition Sites will be discouraged.

Filling procedures at the Loading Area will ensure that the driest peat is placed at the rear of the truck deck, nearest the tailgate. This is intended to absorb as much as possible of free water draining from the remainder of the payload during transit to the Deposition Site. Pre-drainage of the peat in situ will substantially reduce the water content of the excavated peat. The subsequent windrowing of the peat will ensure the shedding of any remaining free water.

On the access roads and the public sections of the haul route, two road sweepers will be continuously employed. The Gardaí have requested that these be suction type rather than merely sweeping surface deposits. In the event of accidental loss of payload, the follow-on driver will report this to the Transport Operations Manager, who will dispatch the route maintenance crew to deal with the spilled material. This work detail would also be responsible for maintenance of road drainage systems, including interception catch-pits, the positioning and collection of road cones and the maintenance of all road signs, protective barriers and illumination equipment. They will also be required to maintain the condition of boundary walling of residential property from soiling by splash in wet weather.

As the haulage operation progresses, the condition of the haul road itself will come under pressure. Localised depressions, if not repaired, would quickly deteriorate under the actions of repeated load and localised waterlogging in depressions would quickly cause potholing. Drivers will be required to be vigilant for the first signs of wearing course or subgrade failure; they will be encouraged to report this by reference to the nearest Chainage Marker Posts along the route and the maintenance crew will attend to these, on a continuous basis and will announce their daily location at tool-box talk time.

5.4.16 Traffic Control at Main Junctions and Filling Area/Deposition Area approaches

Traffic arriving at the junctions with the R314 and R313 will be kept in lane discipline by a row of traffic cones leading to the yield point on the road.

Traffic during haulage hours will be controlled by trained Traffic Directors, using Stop (red) and Go (green) reflective boards. These Traffic Directors will be trained personnel, in communication with one another by radio and with the Transport Operations Manager. Drivers will be instructed to obey these Traffic Directors at junctions and they will be instructed on minimum clear distances one vehicle from another, when queuing awaiting an instruction to proceed. The Gardaí have indicated that they view the calibre of people recruited to the position of Traffic Directors and the training given before they are deployed at each junction, to be essential to the smooth running of the operation.

Because traffic at the deposition site will directly cross the road, trucks will have a reflective lateral band so that drivers approaching the area in poor light conditions will visually interpret the crossing traffic correctly.

Discipline and the avoidance of driver frustration is essential to successful traffic management at interface points with the public. For this reason, the use of traffic lights is not envisaged. The risks of forming queues through unbalanced green/ red periods and the inflexibility of lights to respond to changing conditions leads us to commit to demand based traffic management at the four main junctions on the Haul Road.

Haulage vehicles will not be allowed to queue, or reverse on to or off the public road during normal operational conditions at the Loading or Tipping Sites and the circulation systems within the Loading and Tipping Areas will incorporate all necessary turning circles. Each Site Access road will also have local emergency lay-bys in the event that a truck stalls in this location, causing a back up of trucks behind.

5.4.17 Emergencies and Contingencies

It is important that during the Haulage Operation, emergency services can gain ready access to any household along the Haul Route, or indeed can gain priority usage of the Haul Route for travel to and from Pollathomais, Barnatra, or Glenamoy to Bangor and onwards to Castlebar. The Transport Operations Manager will agree emergency procedures and contact numbers with all the Emergency Services in County Mayo. On being notified of a priority condition, he will direct all vehicles either to park at the Loading or Deposition sites if they are already at those locations, or to the nearest lay-by position, if on the Haul Route proper, giving right of way to the emergency vehicles until the need for priority access has passed.

With respect to an emergency condition arising on the Terminal or Deposition Site itself, priority access to and from these sites will be given to ambulance or firetenders by a similar general stand down order and by clearance of the access lane to the affected site.

The Gardaí, in reviewing these proposals, have requested consideration be given to a contingency whereby part of the Terminal Site or Deposition Site might itself experience an emergency and might even be declared a Preserved Scene. Shell have committed to suspending operations in the event of such an occurrence, for as long as Gardaí might direct.

The local emergency services will be provided with mapping of the Chainage Marker system so that it can be used for rapid direction of emergency vehicles to any accident location along the Haul Route.

5.5 EXPECTED SCHEDULE OF AVAILABLE PLANT

The expected level of vehicles and supporting plant and personnel is as follows:

- Total number of Vehicles in Fleet: 40 vehicles
- Total number of active vehicles at any one time in Fleet: 35 vehicles

This level is slightly lower than that indicated in the EIS, whereby a fleet size of 45 was proposed to ensure 40 working vehicles. We have reviewed our fleet allowances against the requirement to ensure that materials necessarily required simultaneously with the peat haulage operation, can be fed into the traffic stream on the L1204, without exceeding the limit of 400 HGV round trips on the L1204 daily.

It is expected that the Contractor will need to provide for 40 drivers to allow for the impacts of sickness, special leave, absenteeism and the variability in the actual number of vehicles out of service for routine or special maintenance. In addition to these, the fleet will require:

- Two Road Sweepers
- One Recovery Truck
- Fourteen traffic control flagmen, ten on duty at any time, two relief flagmen at each end of the Haul Route to cover for breaks, sickness etc.
- One Traffic Operations Manager
- One Supervisor with pacing vehicle.
- One JCB, Dumper and Pickup with Maintenance Crew of three operatives and operations truck for traffic cones.
- Minibuses (early morning and late evening driver transport, then local service for residents).
- One clerk-typist and Freephone response person.
- One Administrator at weighbridge and document control.

This level of resourcing will be kept under review as the Plan develops under consultation with stakeholders.

5.6 TRANSPORTATION OF MATERIALS ASSOCIATED WITH PIPELINE CONSTRUCTION

5.6.1 Onshore Pipeline to Terminal

In addition to the above enabling materials, it is also necessary to set down the expected traffic associated with the delivery of pipe materials and the stone and imported backfill associated with placing the pipeline in trench along the route from the foreshore to the Terminal.

Table No. 5.1 indicates the expected number of loads of materials of different kinds which will have to be transported to the pipeline route as part of its construction. This includes pipe lengths, construction machinery and quantities of imported roadmaking materials and trench backfill, required mainly to form the traveling route along the pipeline wayleave for construction equipment to move alongside the trench. The expected unit load size in tonnes is also given in the table. In total, 200 loads of pipework, each 20 tonnes in unit load will be required. However, wayleave stoning and road materials will amount to 2310 loads, each again 20 tonne in unit weight. Imported backfill to the pipeline will amount to 195 loads, each 20 tonne in unit size and the remainder consists of traffic bringing the construction equipment itself to site and moving from one part of the site to another.

In terms of the selected Haulage Route for pipeline materials, it is proposed to use the improved L1204 to draw materials from Bangor and wider afield in Ireland. Referring to Drawing No. 2044-1000, it is then proposed to bring the lesser quantity of materials required at Glengad along the L5244, (or the Aghoos road west of the Terminal Site) and along the L1202 through Pollathomais, unless the Mayo County Council indicate a preference for the alternative route via Inver.

Pipework and Materials to be drawn between the Terminal Site and the Glenamoy River crossing would use the same L5244, but only as far as the western access road to the Terminal and it would then be drawn through the Terminal Site and along the pipeline wayleave itself to the River.

Pipework and Materials destined for the Rossport side of Sruwaddacon Bay will be routed from the L1204, eastwards along the R314 and then on the Carrowteigue Road, the L1203, as far as the L5245 turn near Rossdoagh and from there to the pipeline wayleave, which would be used to transport materials along the pipe route parallel to the shore.

Overall, the approach is to use the pipeline wayleave itself as a haul route to the maximum possible extent and to bring materials on public haul roads only when there is no alternative wayleave haul route option.

In terms of the timing of the haulage of this material, it is projected to complete the movement of stone for wayleave construction and equipment mobilization in Febraury and March 2005, before haulage of surplus peat from the Terminal Site commences.

Haulage of the total projected 2831 loads over a two month period would result in approximately 67 HGV round trips per working day and the developer plans these deliveries so as not to coincide with the peat haulage operations.

Item	Description Distance - km	Weight Tonnes	Road From To	R313 Bangor L-1204 A 1.5	L-1204 R-313 R-314 B 9.5	R-314 L-1204 L-5244 C 0.2	L-5244 R-314 Terminal D 0.7	L-5244 Terminal L-1202 E 2.6	L-1202 L-5244 Glengad F=E 5.1	R-314 L-5244 L-1203 G=C-D++ 4.2	L-1203 R-314 L-5245 H=G 6.4	L-5245 L-52453-0 Rossport S I=G 2.0
	SUMMARY											
1	Pipe Movement		Killybegs	200	200	200	85	30	30	115	115	115
2	Umbilical Reels	15	Ireland	18	18	18	9	3	3	9	9	9
3	Umbilical Winch	8	Ireland	2	2	2	2	0	0	2	2	2
4	Outfall	10	Ireland	12	12	12	5	2	2	7	7	7
5	Umbilical Conduit	10	Ireland	20	20	20	10	4	4	10	10	10
	Equipment											
6	Sidebooms - 15	45	Ireland	40	40	40	60	15	15	40	40	40
7	Excavators - 20	25	Ireland	60	60	60	60	20	20	60	60	60
8	Pay welders - 6	16	Ireland	12	12	12	20	10	10	12	12	12
9	Weld Tractors - 5	8	Ireland	10	10	10	20	8	8	10	10	10
10	R/C Winch -1	30	Ireland	2	2	2	2	0	0	2	2	2
11	Bending m/c -1	13	Ireland	4	4	4	2	2	2	4	4	4
12	Landfall Winch - 1	50	Ireland	2	2	2	2	2	2	0	0	0
13	Pull wires -4	10	Ireland	10	10	10	2	2	2	8	8	8
13A	Fuel / Water etc.	18	Ireland	100	100	100	40	16	16	60	60	60
14	20' Containers - 8	5	Ireland	16	16	16	8	8	8	8	8	8
15	20' Offices - 8	5	Ireland	16	16	16	8	8	8	8	8	8
16	Road Material - 10cm	20	Quarry	2400	2400	2400	1440	150	150	960	960	960
17	Import Backfill - 10cm	20	Quarry	210	210	210	115	0	0	95	95	95
	TOTAL			**3134**	**3134**	**3134**	**1890**	**280**	**280**	**1410**	**1410**	**1410**

Table No. 5.1 – Projected Loads associated with Onshore Pipeline Works

5.6.2 *Sales Gas Pipeline from Terminal to Bangor*

Bord Gáis Éireann will lay the pipeline from the sales gas grid at Craughwell in County Galway to the Terminal. This pipeline is required to be in place to commission the Terminal. The final section of this pipeline, in the Bangor-Bellanaboy area, is expected to be constructed from Q4 2005 onwards. While this is outside the scope of the current works at the Terminal, a complete description of construction traffic over the period of construction requires examination of the materials haulage to construct that pipeline, in so far as it might affect the L1204.

In broad terms, it has been estimated that the materials required for the section from Bellanaboy to Bellacorrick will be approximately 38,000 tonnes. of rock applied to the wayleave for tracking of construction machinery along it and a further 8000 tonnes of pipe materials. It is intended to use the wayleave itself to move these materials alongside the trench, but there will be a necessity to gain access to the wayleave at a number of points, rather than haul all materials sequentially along the wayleave. It is expected at this stage to draw 500 loads per month of rock over a three month period commencing in Q4 of 2005. This would be supplemented by a further 100 loads per month of backfill material over a four month period commencing in March 2006, with the pipe materials drawn in the intervening period.

5.7 COLLECTIVE PROFILE OF MATERIALS FLOW

The overall movement of HGVs associated with the materials flow set out in Appendix No 4, is shown graphically in Figure 5.7(a) and 5.7(b), which plot the average trips per day for each month of the project construction period, both as a total of movements to the Srahmore and Bellanaboy sites and as movements along the L1204 route alone. It will be seen that a strategy to move materials as much as possible off the shoulders of the intense period of peat haulage is feasible and has been achieved. An upper limit of 400 HGV trips daily on the L1204, corresponding to 800 vehicle movements counting outward and return journeys, has also been achieved with the planned materials flow.

5.8 PRIVATE VEHICLE MOVEMENTS

The schedule of traffic at Appendix No. 4 also projects the expected trips of private cars and vans onto the Terminal Site and the Deposition Site at different stages of the project. It is not possible to be specific as to where these journeys will originate at this time, but the expected pattern is for a peak near 200 round trips to occur around the time of the peat haulage operation, followed by a slight decline before numbers pick up towards 250 round trips daily as the Terminal construction and commissioning period reaches its busiest section.

As a matter of policy, the developer will require construction staff to avoid driving cars along the L1204 route after peat haulage commences at 7 am each day and they will encourage the use of a minibuses provided to bring drivers and other construction operatives to work at the Terminal and Deposition Sites. Bord na Móna will similarly encourage staff to plan their journeys so as to minimize the impact on the L1204 during times of material haulage on that route. Proper catering facilities at each center of activity will reduce any tendency for lunchtime trips and car pooling will be encouraged in the workforce as well as the use of park and ride, using the minibuses described above, working from the site to areas where there is a concentration of the work force residing.

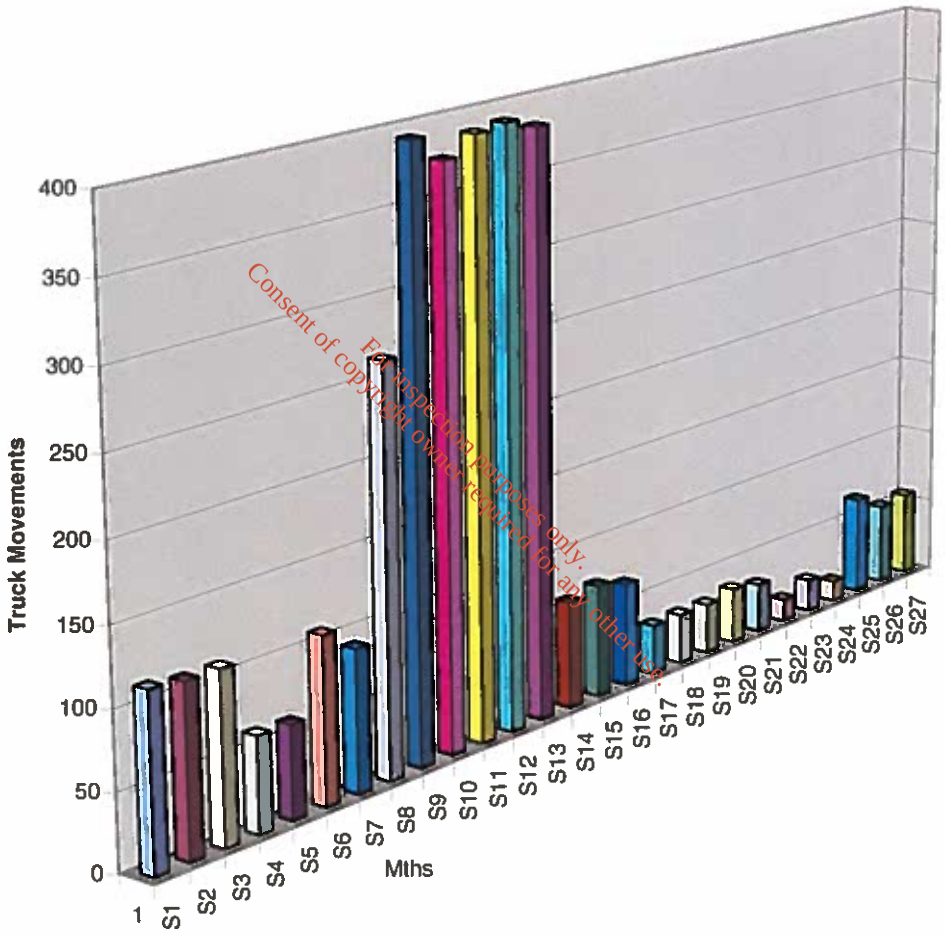

Figure No. 5.7(a) – Daily Average Truck round trips to Terminal and Deposition Sites

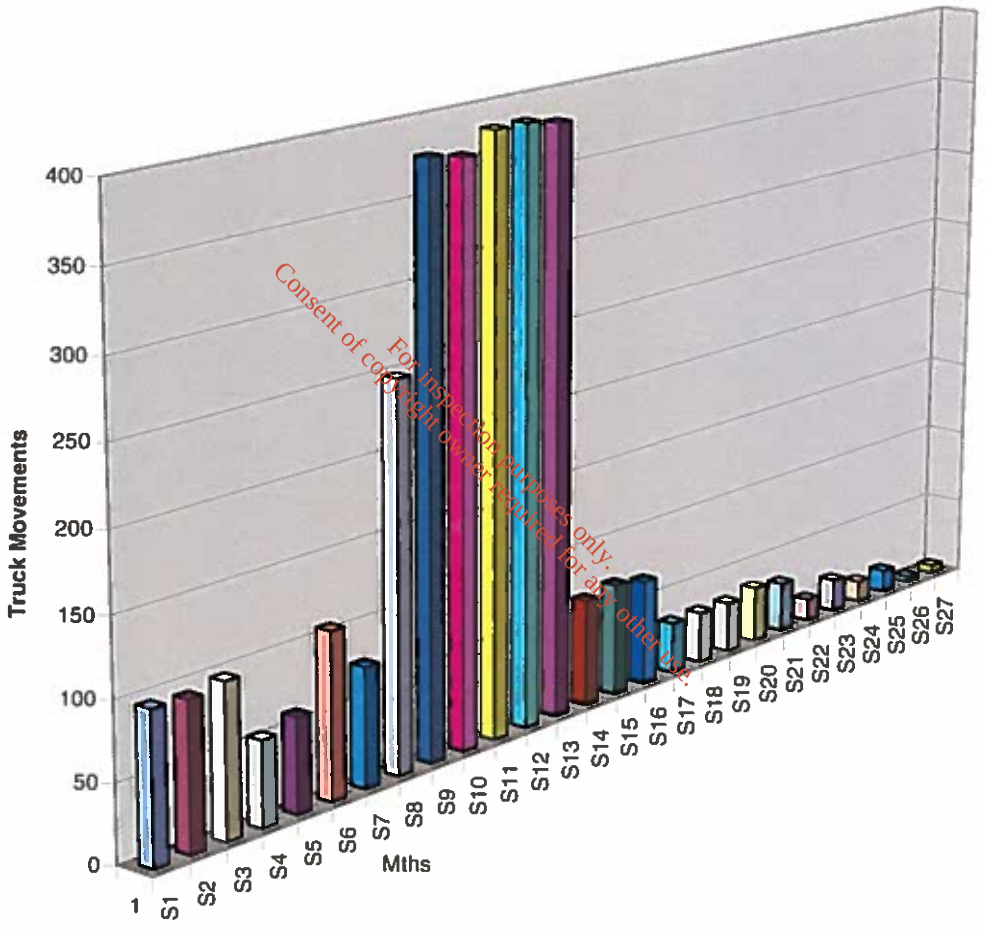

Figure No. 5.7(b) – Daily Average Truck round trips along L1204 route

6. REVIEW AND UPDATING

This Transport Management Plan has thus far been developed to the Planning Stage, so that the necessary steps are taken throughout the planning proposals to support an efficient, safe transportation operation, with the least possible impact upon the lives of the residents living alongside, or close to the Haul Route.

The Plan must evolve through the process of consultation with the people of the area, with Mayo County Council and on a continuing basis with the Gardaí. It will then become part of the Contract Documentation for of the Earthworks Contractor, who will be obliged to address it in his submission and whose tender will be obliged to fully reflect those requirements and restrictions which have been incorporated into a Plan which strikes the best balance between getting the job done and impacting on the lives of others as its done. The successful Contractor will be required to constructively contribute towards customising the Plan, improving it, adhering to it and reviewing his performance against its objectives.

Given that the haulage operation will possibly take place over two distinct haulage periods, any experience and lessons gained in the initial period will be studied and drawn upon to correct any deficiencies, in consultation with all the stakeholders, between the two periods. If, as appears likely, the haulage operation should be delayed to Spring 2005, the intervening winter period will be taken advantage of to draw and stockpile other materials, so that simultaneous haulage of peat and other materials is minimised.

Once the basic requirements of this Plan are carried into the Earthworks Contract Document and the procurement process for that Contract is complete, a further update of this Plan will take place, customising it to the appointed Contractor and reflecting the further comments of the stakeholders and adapting it for any conditions imposed by the planning authority. The Plan will eventually form part of the Safety File for the completed project, if the project is permitted to proceed.

1 Appendix No.1
Risk Matrix for L1204 Haul Route

2 Appendix No.2
Driver Training Code of Practice

3 Appendix No.3
Schedule of Road Signs

4 Appendix No.4
Materials Flow

5 Appendix No.5
Drawings

Art.No.: 6251
4 021627 062512
Made in Germany

Corrib natural gas

Peat Haulage Route

Risk Assessment Matrix

This document summarises the potential health and safety risks associated with the Peat Haul Route and the Haulage Methodology and allocates appropriate ownership of them between Shell and the Haulage Contractor.

Shell is Shell retained risk

BnM is a Bord na Móna site specific risk on the Restoration Site

C is Contractor retained risk to be addressed in methodology

MCC is Mayo County Council retained risk to be addressed in Road Upgrade Works

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RESTRICTED-COMMERCIAL

RISK ALLOCATION ASSESSMENT PROCESS

Objectives

The analysis of the risks to be allocated to each party under the Earthworks Contract is undertaken to achieve a number of objectives:

- To understand and define how the risks are best allocated between the parties according to the responsibilities that each party takes.
- To monitor how the evolving Earthworks Contract Documents affect this allocation.
- To continue to monitor the revisions to risk allocation that may be required as a result of changes to the operation of the loading area, tipping area, or haul road, or the haulage methodology during the Earthworks Contract.

Description of Risk Areas

The headings used in the risk assessment cover all facets of the operation.

Category	Description of risk
Design impacting Risk	The risks associated with the existing conditions along the Haul Route, and the proposed configurations of the Loading and Tipping Areas
Transitional Risks	The risks associated with transferring responsibility for the Road & Culvert Improvement Works to the Council, including the transfer of the upgraded Haul Road into the Contractors' primary but not exclusive control.
Operational Risks	The risks associated with operating the services during the contract period, including those associated with the costs of unavailability and under performance of the services, damage or loss to equipment and property, third-party claims for compensation or damages and the impact of Force Majeure or Relief events.

Volume Risks	The costs and risks associated with duration of the contract may differ from those estimated at the outset because volume estimates for the material to be moved, or the unit carrying capacity, vary from the levels assumed.

Risk Allocation Principles

The purpose of risk allocation is to identify which party should bear the impact of any identified risk (i.e. has the ownership of the risk).

Specifically:

- Where a risk is identified as being owned by the Contractor, the financial impact of the risk and the responsibility to provide for it will fall within the scope of the Earthworks Contract.
- Conversely, where a risk is identified as being owned by Shell, the risk must be covered in the design of the Haul Route and the temporary works areas for loading and tipping. In the Deposition Area, these risks need to be addressed by BnM.

The principles of risk allocation need to be summarised in the following table (examples of probable principles included for discussion).

Risk Area	Key principles (examples)
Design impacting risk	Shell are responsible for producing a safe loading area, properly lit and traffic controlled, with clear signage for hazards, and clear road markings for circulation. BnM carry this risk at the Deposition Site. MCC have a responsibility to ensure the L1204 upgrade addresses design inadequacies which exist at present.
Transitional Risks	MCC has overall responsibility for the timely delivery of the upgraded Haul Route into service to avoid later risks associated with un-seasonal working. The responsibility falls on Mayo County Council to keep on an agreed programme of upgrade works.

Operational Risks	The Contractor has the practical responsibility for the health and safety aspects of his haulage operation, but Shell carry the responsibilities that attach to the Client in such circumstances. The Contractors' approach to this may be expected to take the form of a Code of Practice for fleet drivers, with proper safety induction sessions, and real sanctions against infringers. Shell is responsible for defining appropriate performance measurement standards that are set as safety limits in the Earthworks Contract Documents.
Volume related Risks	Shell carries the risks associated with prolongation of the work due to underestimation of the volume to be moved, or the condition of it at the time it requires to be moved.

RISK AREA Design Impacting Risks

	RISK	COMMENTARY	OWN.	LIKE.	IMPACT
A1	Sight distances to the L1204/R313 Junction from Bangor side are inadequate given the hazard represented by crossing haul traffic.	Warning signs accompanied by a flashing light are required prior to the crest of the hill between Bangor and the junction. All trucks should carry reflective lateral bands to increase visibility in dusk conditions. Junction to be Traffic Director controlled, Hi-Viz jackets and torch-lit batons to be provided.	C	M	M
A2	Circulation of haulage traffic and peat placement vehicle loading shovels in the deposition platform cause vehicle accident or injury to Traffic Director	BnM risk, to be addressed by safe working procedures for BnM staff operating shovels, and delineation of working area by water filled barriers separating shovels from Haul Route traffic. Lighting of the platform must be addressed by BnM. Haul Route Contractor to obey Traffic Directors at Deposition Site.	BnM	M	M
A3	All risks arising between the BnM loading shovels and the end placement of peat in position in the Restoration Area	These are all to be addressed by BnM as part of their safety procedures for the site. These have no interface with the Haulage Contractor	BnM	L	L
A4	Queuing along the Deposition Area Access Road reduces sight distance and causes hazard for personnel circulating on foot.	Include a Specified Requirement that Queuing vehicles remain a minimum distance of 20m apart.	C	L	L
A5	Driver distraction in the deposition area causes accident or injury when tipping or lowering the truck deck post tipping.	No in cabin radios to be permitted to play in the Deposition Site, no movement of empty truck off the apron to be permitted until deck has been lowered into fully down position.	C	H	H
A6	Driver confusion in the wheelwash approach area causes accident or injury .	Those charged with directing trucks into the tipping position have not completed the task until they have so ordered priority at the tipping face that they have effectively directed the empty truck into the queue for the wheelwash.	BnM	L	L
A7	Trucks stall or breakdown crossing the L1204/R313 Junction.	Traffic Director on the junction must control the safe movement of traffic there. Tow Vehicle must be on standby to remove broken down trucks causing traffic hazard.	C	L	M
A8	Mechanical failure of braking systems, or poor tyre condition, cause accident or injury in the congested conditions of the Deposition Area.	Onus is on Haulage Contractor to have a regular visual check of any element of the Fleet, the failure of which could cause death or injury. Procedures to track hours-to-service of trucks and to record service mechanic notes to be in place as Specified Requirement. Insurance status of accidents in the Deposition Area to be established with BnM, who may be self insured.	C	L	H

Owner: Shell = Shell retained risk; C = CONTRACTOR retained risk; S = Shared risk, BnM = Bord na Móna risk, MCC = Mayo County Council retained risk

Likelihood: L=1-20%; M=20-50%; H>50% **Impact: L = Low, M = Medium, H = High**

	RISK	COMMENTARY	OWN.	LIKE.	IMPACT
A9	Fouling of the circulation area by accidental discharge of peat causes accident or injury in the congested conditions of the Deposition Area.	BnM are obliged to sweep or wash down the deposition area to prevent this risk developing. They are also responsible for maintaining the wheelwash in working condition. Regular surfacing of the Access Road to the Deposition Area must make it possible to sweep that surface, notwithstanding the wheelwash.	BnM	H	L
A10	Stayed Utility Pole along the R314 at Chainage 290m marginally overhangs carriageway on empty truck return lane, and presents a collision risk at truck cabin roof level	Utilities should be requested to realign, and to tighten stays on poles generally along the route, many of which have loosened so as no longer to be effective lateral restraints.	Shell	L	L
A11	Low level transverse utility service cables at Chainages 630m and 880m, from pole to customers on a downward catenary represent potential collision risks	Utilities should be requested to realign,	Shell	L	L
A12	Lateral restraint barriers are missing at Bellanaboy Bridge, and parapet ends are poorly defined as front-on hazards. These present risks of collision, or significant fall risk into water.	Armco or equivalent Barriers required at this location	MCC	L	H
A13	High Voltage cables crossing at Chainage 1475m	Unlikely to represent a significant risk because of their elevation. Position to be noted for other plant of exceptional height	Shell	L	L
A14	Lateral restraint barriers are missing on approach bends to and at **Muingeroon Bridge**, and parapets are structurally light vis a vis collision hazards. These present significant fall risks into water.	Armco or equivalent Barrier required at the northern approach bend on the outer edge of the curve, structural assessment of the parapet walls to withstand collision by laden truck is required.	MCC	L	H
A15	Lateral restraint barriers are missing on second bend at **Muingeroon Bridge; this bend represents a collision hazard for any truck with failed brakes on the return journey**	Armco or equivalent Barrier required at the southern approach bend on the outer edge of the curve, consideration to be given to stockpiling sand on available ground as a collision precaution against brake failure on northwards approach incline	MCC	L	H
A16	Diminished sight distance at Chainage 2800 due to vertical road profile causes unplanned braking and collision hazard	Consider a layby for returning unladen vehicles to pause near Chainage 2900	MCC	L	L
A17	Diminished sight distance at Chainage 3550 due to vertical road profile causes unplanned braking and collision hazard	Consider a layby for returning unladen vehicles to pause near Chainage 3725m and 3875m	MCC	L	L
A18	Lateral restraint barriers are missing on outer bend at Chainage 4075m; this bend represents a runoff and drop hazard for any returning unladen truck	Armco or equivalent Barriers required at this location	MCC	L	L
A19	Properties and outbuildings form a pinch point at Chainage 4475m, and High Voltage cables cross the carriageway	Reduced sight distance and increased risks of vibration damage to structures, consider vibration monitoring and local widening to form a passing area. Cables unlikely to represent a significant risk because of their elevation. Position to be noted for other plant of exceptional height	Shell	M	M

Owner: Shell = Shell retained risk; C = CONTRACTOR retained risk; S = Shared risk, BnM = Bord na Móna risk, MCC = Mayo County Council retained risk

Likelihood: L=1-20%; M=20-50%; H>50% **Impact: L = Low, M = Medium, H = High**

	RISK	COMMENTARY	OWN.	LIKE.	IMPACT
A20	Diminished sight distance at Chainage 4800 due to horizontal road profile causes unplanned braking and collision hazard	Little scope for mitigation; consider pause point if the adjacent side road junctions are otherwise likely to become unapproved pause points	MCC	L	M
A21	Bridge parapet at Chainage 5525 m represents a pinch point hazard and walls are not delineated at the front edges, increasing collision hazard	Paint Hi Viz delineation on front edges, provide widened section on the approaches for unladen trucks to pause and give right of way to oncoming laden traffic.	MCC	L	L
A22	High Voltage cables crossing at Chainage 5675m	Unlikely to represent a significant risk because of their elevation. Position to be noted for other plant of exceptional height	Shell	L	L
A23	High Voltage cables crossing at Chainage 6125m	Unlikely to represent a significant risk because of their elevation. Position to be noted for other plant of exceptional height	Shell	L	L
A24	House cluster forms a pinch point at Chainage 6750m, and diminished sight distance presents a collision risk	Provide widened section on the approaches for unladen trucks to pause and give right of way to oncoming laden traffic. Monitor for vibration levels.	MCC	L	H
A25	High Voltage cables crossing at Chainage 6875m and 6975m	Unlikely to represent a significant risk because of their elevation. Position to be noted for other plant of exceptional height	Shell	L	L
A26	Diminished sight distance at Chainage 7625m and its vicinity due to vertical road profile causes unplanned braking and collision hazard	Form a pause area on the nearby outer bend at Chainage 8000 m	MCC	L	L
A27	Outer bend at Chainage 8000 m lacks restraints against runoff of a truck and a fall hazard.	Armco or equivalent Barriers required at this location	MCC	L	L
A28	Low Voltage cables crossing at Chainage 9575m	Unlikely to represent a significant risk because of their elevation. Position to be noted for other plant of exceptional height	Shell	L	L
A29	High Voltage cables crossing at Chainage 10120m	Unlikely to represent a significant risk because of their elevation. Position to be noted for other plant of exceptional height	Shell	L	L
A30	Seriously restrictive sight distances in vicinity of Chainage 10100m -10300m, blind exits from private dwellings represent significant collision hazard	Consider provision of convex mirrors opposite entrances. This may not be enough to mitigate what we consider to be a significant risk here. Local speed limit and alternative L12044 route to be pursued to mitigate this risk. Risk must be kept under operational review. Beam break strobe light a possible solution.	MCC / Shell	H	H
A31	Low Voltage cables crossing at Chainage 10375m	Unlikely to represent a significant risk because of their elevation. Position to be noted for other plant of exceptional height	Shell	L	L
A32	Three strand HT Cables at Chainage 10775	Unlikely to represent a significant risk because of their elevation. Position to be noted for other plant of exceptional height	Shell	L	L

Owner: Shell = Shell retained risk; C = CONTRACTOR retained risk; S = Shared risk, BnM = Bord na Móna risk, MCC = Mayo County Council retained risk

Likelihood: L=1-20%; M=20-50%; H>50% **Impact: L = Low, M = Medium, H = High**

RISK AREA Transitional Risks

	RISK	COMMENTARY	OWN.	LIKE.	IMPACT
B1	The initial establishment of the Loading Area footprint leads to restricted circulation space, limited visibility during manoeuvre and causes accidents	Contractors drivers need to be advised of hazardous circulation areas at the start-up phase of the work at the Loading Area	C	L	L
B2	Reduced initial output from the Loading Area causes extended queuing of fleet on access road with potential for accidents	Specification should include a ramp-up provision where the fleet is brought up to full productivity as the Loading Area is opened	C	L	M
B3	Traffic Directors are initially unfamiliar with overall plan, communication systems, emergency procedures, priority rules, leading to disjointed operation control at key junctions, and public complaints or increased risk of accidents through frustration.	An Induction course needs to be held for Traffic Directors, who should be experienced, capable people, with adequate relief provision of the same calibre. Extensive " What if?" scenario testing should be pursued with them. BnM Traffic Directors also need training.	C	L	M
B4	Drivers are initially unfamiliar with overall plan, communication systems, emergency procedures, priority rules, leading to disjointed action at points of decision, and increased risk of accidents .	An Induction course and Canteen Safety Update Talks need to be held for Drivers, particular care needs to be taken with new or replacement drivers, who should be mentored on the route hazards by accompanying experienced drivers for at least one trip.	C	M	M
B5	Gardaí or Mayo Co. Council issue overriding local instructions which conflict with the transport plan	A Liaison Meeting with these, and the Contractor, at which the Plan is discussed and if necessary adapted, is required before operations commence.	Shell	L	L
B6	Signposting of Haul Route and adjacent roads not in place at commencement of operation	Mayo County Council need to be aware that completion means signs and road markings	MCC	M	H
B7	Haul Road upgrading works are delayed, leading to consequent unseasonal haulage	A contingent strategy of windrowing and Loading Area Development needs to be developed, consider later transport of driest material stockpiled against bad weather windows	MCC	M	H
B8	School bus drivers and pupils are unaware of the scale of the transport operation, and fail to commence their own safety measures in the first weeks	The detailed schedule of the school buses serving the area needs to be identified, communicated to drivers, and bus drivers need to be warned in good time of the start of the operation, so they can pass advice to pupils in the manner they are used to hearing such things.	Shell	L	H

Owner: Shell = Shell retained risk; C = CONTRACTOR retained risk; S = Shared risk, BnM = Bord na Móna risk, MCC = Mayo County Council retained risk

Likelihood: L=1-20%; M=20-50%; H>50% **Impact: L = Low, M = Medium, H = High**

RISK AREA Operational Risks

	RISK	COMMENTARY	OWN.	LIKE.	IMPACT
C1	A truck collides with animals broken out or being moved along the L1204	Situations of escaped animals are common along this road. The Contractor must emphasize the need for alert driving, particularly in areas of reduced sight distances along the L1204	C	L	M
C2	A Fuel Spill on the Haul Road causes hazardous driving conditions	Contractor must place an onus on drivers to report an event leading to hazardous driving conditions. Maintenance Crew providers must include facilities to make safe a road surface affected by diesel spill	C	L	L
C3	A driver under the influence of alcohol or drugs causes an accident resulting in death or injury	The Contractors' safety statement and procedures must be proactive and decisive on such issues. Any driver presenting in unfit condition will be sent home and will be subject to sanction.	C	L	H
C4	Truck breakdown in an area of poor sight distance results in accident or injury	The Contractors system of in-cab communications and vehicle recovery must address response time and general warning of hazards by Chainage references to curtail risk. Reflective triangle warning signs must be regularly checked as part of the truck safety inventory	C	L	H
C5	Loading or Deposition Site affected by failure of power supply for lighting or pumping where BnM or Shell does not have back-up for the site	Shell Site Safety Officer must have authority to call for temporary cessation in operations when this occurs. Parking facilities should be examined for ability to accept more than half the fleet on an emergency basis if vehicle movements present a hazard on the affected site	Shell / BnM	L	H
C5	Road surfaces become hazardous due to fugitive spillages from payload	Road brushing vehicle needs to be on call to supplement routine brushing as conditions require	C	L	M
C6	Breaches of security or sabotage with safety implications occurs to the fleet vehicles when parked overnight	Overnight security to be provided at the parking areas on each of the Loading and Deposition Sites, Contractor and BnM will address.	C / BnM	L	H
C7	Localised purging of the haul road, or failure of the subbase, causes rolling of the load or loss of steering control by drivers	A system of reporting from the Drivers, by reference to Chainage Markers on posts, of road condition needs to be coordinated into a response of temporary repairs by an assigned repair party, with suitable safety gear to restrict traffic on areas being worked	C / MCC	H	M

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Likelihood: L=1-20%; M=20-50%; H>50% **Impact: L = Low, M = Medium, H = High**

	RISK	COMMENTARY	OWN.	LIKE.	IMPACT
C8	An adjacent civil engineering operation commences and disrupts transport routes	Check with Mayo County Council Planning Section & Area Office	Shell	L	M
C9	Action by third parties, perhaps with threats to drivers or contractors staff, impacts on the Haulage Operation	All Staff require instruction on how to deal with such situations. Procedures to be developed to deal with such events.	C / Shell	L	M
C10	Weather conditions deteriorate, fog, ice, or intense rainfall	Operation rules in fog may need to consider temporary cessation, Met Eireann ice warnings need to be availed of, perhaps via Mayo County Council	C / Shell	L	M
C11	Injury to Contractor staff from exposure to Truck Machinery, Electrical Shock or other injury from defective equipment	Contractor's risk having instructed staff clearly on the trucks they drive, and on repairs or adjustments they should not attempt without qualified assistance	C	L	H
C12	Injury to Contractor staff on account of Repetitive Strain, Posture, Back or other Strains from improper working conditions.	All Drivers must take the work breaks they are entitled to; no "flexitime" compromises on this issue ought to be permitted.	C	L	L
C13	Pollution/loss/degradation of 3rd party land/assets as a result of Load loss, fuel spill brought about as a result of accident; and all costs arising.	This must be covered against a background of proper insurance, operations on best practice and identification of particular risk points. Maintenance Crew to be trained and available to respond to situation. Emergency call out procedures will be developed.	Shell / C	L	L
C14	Pollution/loss/degradation of 3rd party land/assets as a result of malicious action by Contractor staff or subcontractor staff (and all costs arising)	Contractors Risk; Operations Manager must maintain a diary of attendance by drivers, and a work history by date for each driver and vehicle	C	L	L
C15	School children standing at road junctions on the L1204 in low visibility winter wear are an injury risk	Drivers need to be cautioned not to use junctions as pause points without due care, and to be extra vigilant at a paused school bus. Consider providing hi-viz armbands to pedestrians, and transport which avoids pupils standing by the roadside on the L1204 in poor light conditions. No passing of a school bus.	C	L	H

Owner: Shell = Shell retained risk; C = CONTRACTOR retained risk; S = Shared risk, BnM = Bord na Móna risk, MCC = Mayo County Council retained risk

Likelihood: L=1-20%; M=20-50%; H>50% **Impact: L = Low, M = Medium, H = High**

RESTRICTED-COMMERCIAL

RISK AREA Volume or Material Condition Risks

	RISK	COMMENTARY	OWN.	LIKE.	IMPACT
D1	The volume of material to be moved is greater than expected, resulting in prolongation of the haulage operation into unseasonal weather and light conditions.	Quality Assurance of the initial volume estimate should be carefully examined. Availability of the Contractors fleet on an extended basis should be ascertained in the tender documents, and limits on the deposition season should be established with BnM.	Shell	L	L
D2	The volume of each payload is less than anticipated resulting in prolongation of the haulage operation into unseasonal weather and light conditions.	This risk is low.	C	L	L
D3	The available active fleet is reduced because of higher than expected frequency of breakdown or absenteeism, leading to slippage in programme into more hazardous working season	Contractor Selection procedures need to address the reliability issue, and contingent response to signs of slippage in operation needs to be agreed even before work commences	C	L	M
D4	The transport operation is delayed to a point where material condition deteriorates and BnM are obliged to cease accepting the peat for Deposition	The precise conditions under which this may occur must be agreed with BnM; and a contingent plan developed for on site storage of residual surplus peat at the Terminal Site, for following season removal, needs to be evolved.	Shell / C	M	H
D5	Mixing of material at interface layers makes the material unsuitable for transport to the Deposition Site	Rules for handling marginal material need to be agreed with BnM; plant at the Loading Area and experienced operators must be selected to minimise the mixing of suitable with unsuitable during excavation.	C	M	L

Owner: Shell = Shell retained risk; C = CONTRACTOR retained risk; S = Shared risk, BnM = Bord na Móna risk, MCC = Mayo County Council retained risk

Likelihood: L=1-20%; M=20-50%; H>50% **Impact: L = Low, M = Medium, H = High**

Outline Code of Practice for Truck Drivers operating on the Peat Haul Route

This outline code is indicative of a standard which will be specified in the Haulage Contract Document. It is not exhaustive and it will be customised by the successful Contractor for his own workforce.

A. Driver Behaviour

A1 Drivers are required to be respectful towards, and courteous to other road users, towards residents, and towards those reporting problems or registering complaints, at all times. Discourtesy will not be tolerated.

A2 Drivers are required to be attentive to in-cabin communications, formal training days and daily morning briefings, where they shall sign in for work.

A3 Drivers shall obey speed limits and signpost directions throughout the Haul Route and on the Filling and Tipping Sites.

A4 Drivers are to adhere to working hour limits, productivity limits and payload limits which are set for health and safety reasons, and to obey any statutory limits on working hours, and are obliged to take such break periods as may be specified.

A5 Drivers shall maintain such bar codes as may be attached to their vehicles for the purpose of records of loads transported, tonnages etc., and shall keep and produce such other records as they may be requested to keep on request by an authorized person. They shall cooperate courteously with others whose responsibility it is to record tareweights and payloads.

A6 Drivers shall wear such high visability clothing and protective gear as may be provided for their use when walking in the Loading or Deposition Areas.

A7 Drivers shall not report for work under the influence of alcohol or other drugs, nor shall these substances be consumed during working hours, and shall submit to testing to verify compliance with this requirement on request. Failure to submit to a test shall be taken as a test failure.

A8 Drivers shall not operate in cabin radio, CD or cassette players in a manner which would detract from their awareness of their surroundings so as to present a hazard to pedestrians or other road users. Drivers shall not use mobile phones except in handsfree sets, and in accordance with law.

A9 Drivers shall, in addition to the rules of the road, observe such other rules on priority rights of way etc., and such directions from authorized traffic management personnel, as may be laid down for the optimum operation of the transportation operation overall.

A10 Drivers shall use toilet and eating facilities that are provided for them.

A11 Drivers shall not park their vehicles, in such a manner as to cause a hazard or obstruction to other road users.

A12 Drivers are obliged to note road pavement conditions, traffic hazards etc., and to report these to the Traffic Manager for onward advice to other users and for pavement maintenance. Drivers shall use such chainage identification posts as may be provided to assist him in reporting the location of such problems.

A13 Each Driver shall adopt good driving practices, anticipatory of hazards, including periodic safe testing of brakes.

A14 Each Driver shall maintain a minimum distance of 20m from the vehicle in front when queuing, so as to maintain adequate visibility around the vehicles. Drivers shall cooperate in maintaining average distances between vehicles on the Haul Route, other health and safety matters permitting.

A15 Drivers shall, safety considerations permitting, pull in and pause to give way to other following traffic, so as to avoid frustration and delay for other road users.

A16 No driver shall pass a school bus which is loading or unloading passengers.

B. Vehicle Maintenance

B1 Each Driver shall be obliged to inspect and maintain his vehicle in a clean condition, so that windshields, side windows, mirrors, headlamps, tail lights, registration plates, identification plates and reflective bands are unobstructed by dirt. He shall ensure that mudguards are in place and that the windshield washers are functioning at the start of each working day.

B2 Each driver shall ensure that he has a properly inflated and safe spare tyre, breakdown warning triangles and sufficient fuel to complete transit to a refuelling point.

C. Haulage Contractor Obligations

C1 The Contractor shall ensure that Health and Safety Induction of each Driver takes place, based on an approved Site Specific Safety Statement.

C2 The Contractor shall ensure that each replacement Driver receives the same Instruction as set out in C1, together with an introductory trip around the cycle of load, transport, tip, and return, with an experienced Driver before joining the fleet.

C3 The Contractor shall maintain and produce records of Insurances relating to Employers Liability, Public Liability and Motor Vehicle for each vehicle, including due dates for renewal for inspection by an authorized officer of the Employer.

C4 The Contractor shall maintain proper toilet, washup, changing and canteen facilities for the Drivers, all in a high standard of cleanliness.

C5 The Contractor shall maintain the fleet of vehicles in a roadworthy condition, with those elements of vehicle condition impacting on safety, such as tyre pressures, tyre condition, brakes, lights, reverse and tipping warning beepers checked daily as part of routine refuelling. Each vehicle shall be regularly serviced and a service record maintained for inspection.

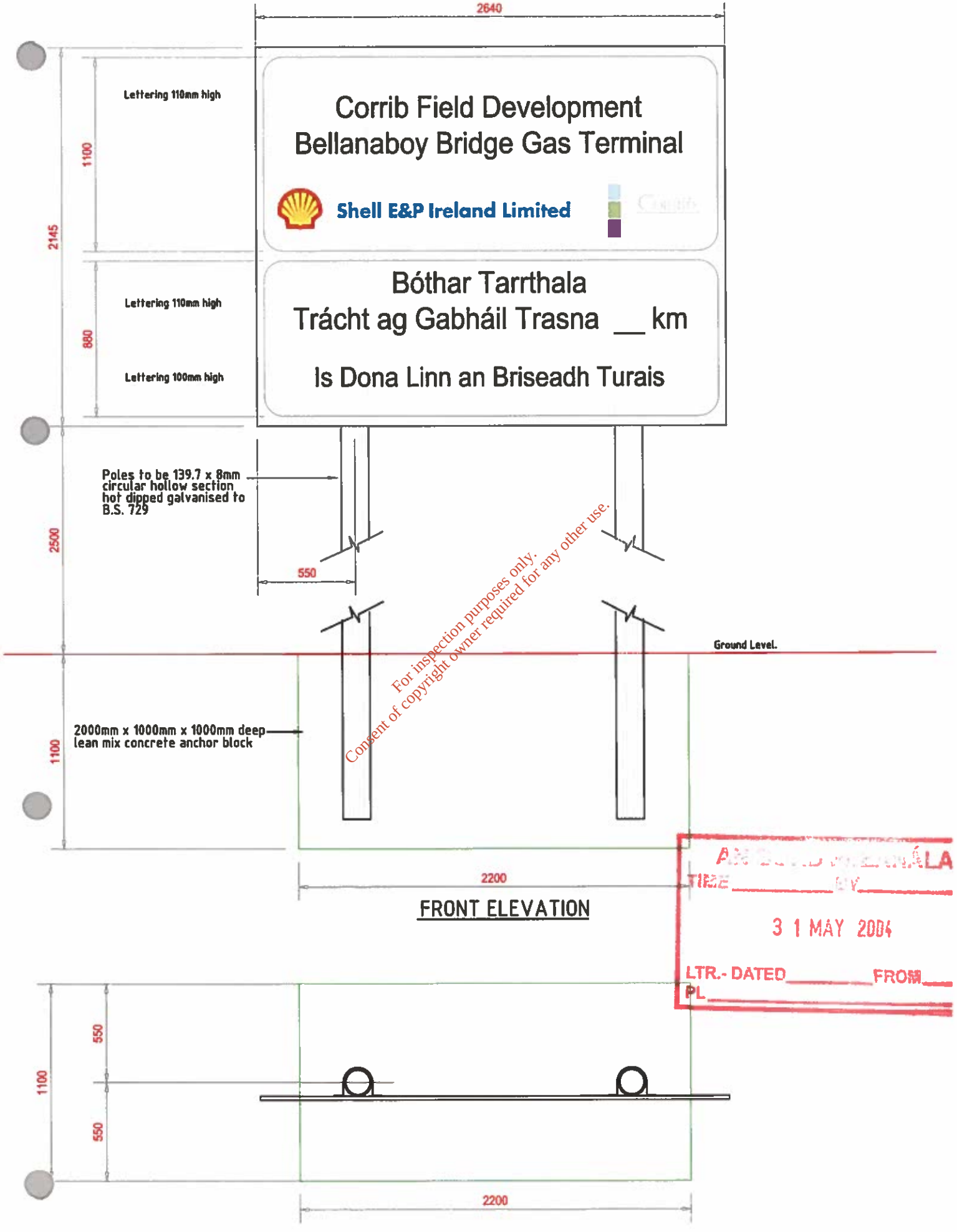
C6 The Contractor shall, in drafting his procedures and preparing his method statements and contingency plans, recognise that he is in partnership with the Employer, the Roads Authority, the Gardaí and the residents who live along the Haul Route, to ensure a planned operation, cognizant of the needs of residents and other road users.

D. Driver Training

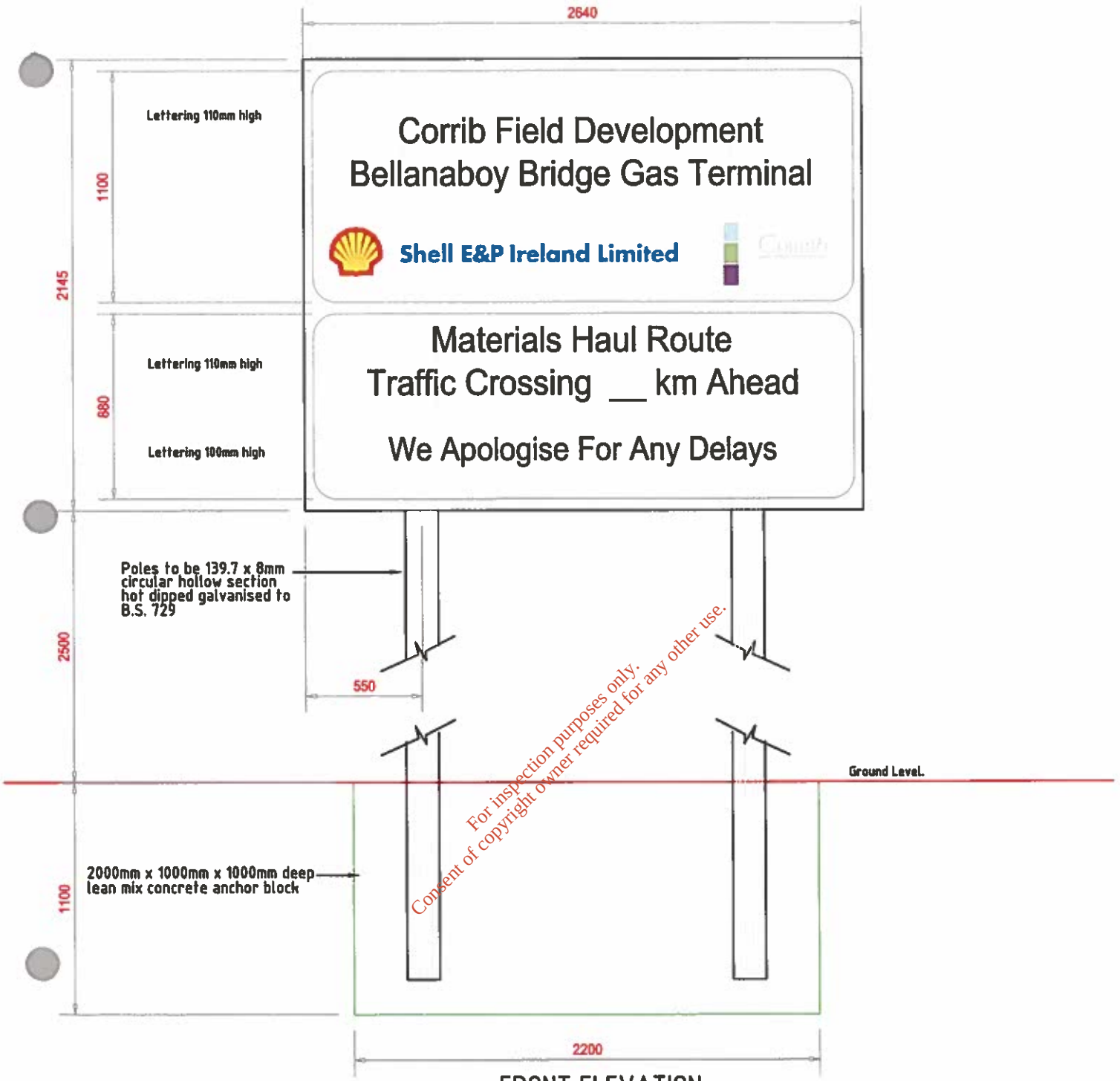
Driver Induction will take the form of a preliminary training day, with visual aids capable of being repeated for new and replacement drivers. This will be supplemented by tool box talks on particular issues of programming, temporary hazards and the like.

The training module will cover the following areas:-

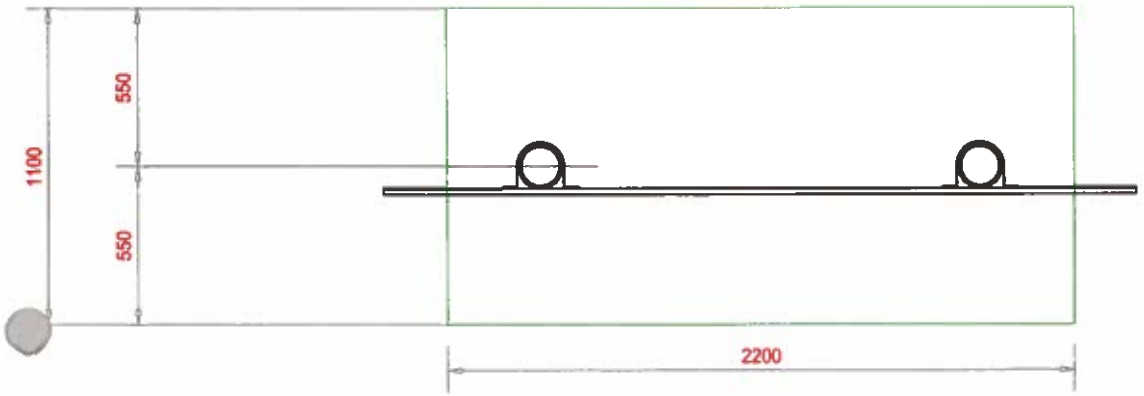
- Vehicle and driver documentation and insurance requirements.
- Vehicle familiarisation, technical specification.
- Introduction to the village clusters on the L1204 and adjoining roads, at Muingingaun, Glenturk More, Glenturk Beg, Glencullin Lower and Upper, Lenanadurtaun, Cloontakilla.
- Profile of the residential community, schoolgoers, workers, elderly, and those with special needs or access requirements.
- School bus routine and pick-up times.
- Standards of required Driver Behaviour.
- Local traffic regulations, agreements with Gardaí and the Council, traffic signs and markings.
- Role of the traffic controllers at exits, entrances and junctions.
- Priority rules for laden and unladen vehicles meeting on the road, for queuing
- Risk assessment and accident black spots.
- Record keeping, in-cab communications discipline, accident or incident reporting procedures.
- Rules on substance abuse, and behaviour in the community, outside working hours.
- Familiarisation with the peat payload, tendencies for load shift etc.
- Daily vehicle inspection routine, and maintenance requirement reporting.
- Road pavement condition reporting and hazard reporting by Chainage Marker.
- Emergency Procedures and Contingencies.



ROAD SIGN -TYPE NO. 1



FRONT ELEVATION



BASE PLAN

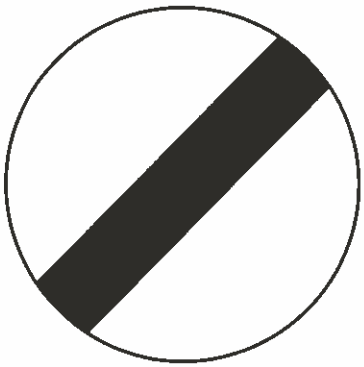
ROAD SIGN -TYPE NO. 1

TYPE 2
YEILD SIGN

TYPE 2A
GÉILL SLÍ SIGN

TYPE 3
40 MPH SIGN

TYPE 3A
30 MPH SIGN



TYPE 3B
END OF SPECIAL SPEED LIMIT

TYPE 4
STOP SIGN

ROAD SIGN -TYPE NO. 2,3 & 4

TYPE 5

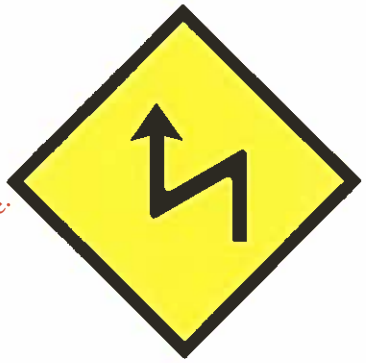
DANGEROUS CORNER AHEAD

TYPE 6

SERIES OF DANGEROUS BENDS AHEAD

TYPE 7

DANGEROUS BENDS AHEAD



TYPE 8

SERIES OF DANGEROUS CORNERS AHEAD

TYPE 9

TWO WAY TRAFFIC

TYPE 10

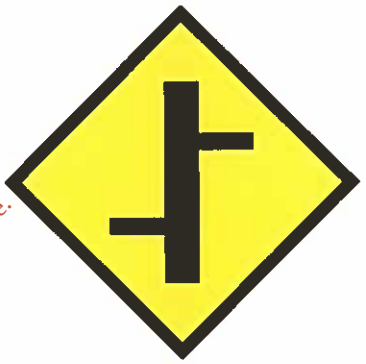
DISTANCE PLATE

ROAD SIGN -TYPE NO. 5,6,7,8 & 9

TYPE 11
CROSSROADS

TYPE 12
SIDE ROAD

TYPE 13
T - JUNCTION



TYPE 14
STAGGERED CROSSROADS

TYPE 15
Y - JUNCTION

TYPE 16
NO OVERTAKING

ROAD SIGN -TYPE NO. 11,12,13,14,15 & 16

CORRIB FIELD DEVELOPMENT PROJECT / ONSHORE GAS RECEPTION TERMINAL

Master Traffic Movements Plan (Envisaged)

Responsible Party	Location	Activity	Duration Months	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12	Month 13	Month 14
				Q3	Q4	Q4	Q4	Q1	Q1	Q1	Q2	Q2	Q2	Q3	Q3	Q3	Q4
				Sep-04	Oct-04	Nov-04	Dec-04	Jan-05	Feb-05	Mar-05	Apr-05	May-05	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05
Mayo County Council	Local Roads	Construction Upgrade Roads															
		Construction Equipment		18		18											
		Materials Rock and Surfacing Materials		1133	1133	1133											
		Structural Elements		6	6	6											
		Services		8	8	8											
		Miscellaneous Items Cabins etc		5		5											
		Personnel		300	300	300											
Bord na Mona	Srahmore Deposition Site	Construction Reception Area Deposition Maintenance															
		Construction Equipment		18	6		24		36	36			12		52		
		Materials Concrete, Rock and Surfacing		353	319	204	82			303	303	303					
		Structural Elements			28	58	48										
		Services		8	8	8	8				39	39	39	39	39	28	28
		Miscellaneous Items Cabins etc		5													
		Personnel		270	361	441	91		26	378	720	853	671	671	410	137	137
Shell	Onshore Terminal	Construction Enabling works Peat Haulage Civils Structural Piping & Vessels Commissioning															
		Construction Equipment		25	12	10				15	22	10	10	10	10	10	10
		Miscellaneous Items Cabins etc		10	5	5	5	5	5	5	5	5	10	10	10	5	5
		Services		45	45	45	45	45	45	45	50	50	45	50	50	50	45
		Rock		600	600	600	600	600	600	300	400	300	300	300	300	200	200
		Cement / Binders		280	280	280	280	280	280								
		Precast Piles				60	60	60	60								
		Sheet Piling		35	35	35	35										
		Drainage & U/G Pipes etc		5	5	5	5	5	5	5			5		5		5
		Peat Haulage									5000	8000	8000	8000	8000	8000	
		Unsuitable Materials Haulage												825	825	825	825
		Black Top								100							
		Concrete						170	170					200	200	200	200
		Structural Steel														10	10
		Pipe Spools															15
		Tanks & Vessels															
		Gas Equipment															
		Personnel		473	473	473	473	473	473	473	1182	1182	1182	2365	2365	2365	2365
Shell	Onshore Pipelines	Construction Pipe Haulage Umbilical Conduit Pipeline Spread Construction Equipment															
		Construction Equipment							10	20	10	20	10	20	10	10	10
		Miscellaneous Items Cabins etc							16								
		Services							10	10	10	10	10	10	10	10	10
		Rock to Way Leaves							1200	1200				70	70	70	
		Pipe								30	100	70					
		Umbilical / Conduit								6		20			12	14	
		Personnel							250	375	625	1250	1250	1250	1250	1250	625
Bord Gas Eireann	Link Line Bellanaboy Bridge to East of Bangor Erris	Construction Pipe Haulage Communication Conduit Pipeline Spread Construction Equipment															
		Construction Equipment															10
		Miscellaneous Items Cabins etc															8
		Services															10
		Rock to Way Leaves															500
		Pipe															
		Communication Conduit															
		Personnel															625
Commercial Vehicles Monthly Total				2554	2490	2478	1392	1365	2437	2078	5939	8827	8441	8709	8763	8605	1592
Average Daily Total				114	111	110	62	61	108	92	264	392	375	387	389	382	71
Personnel Vehicles Average Monthly Total				1043	1124	1214	564	473	749	1224	2527	3265	3103	4286	4025	3752	3752
Average Daily Total				46	50	54	25	21	33	54	112	146	138	190	179	167	167

Responsible Party	Location	Activity	Month 15	Month 16	Month 17	Month 18	Month 19	Month 20	Month 21	Month 22	Month 23	Month 24	Month 25	Month 26	Month 27
			Q4	Q4	Q1	Q1	Q1	Q2	Q2	Q2	Q3	Q2	Q3	Q4	Q4
			Nov-05	Dec-05	Jan-06	Feb-06	Mar-06	Apr-06	May-06	Jun-06	Jul-06	Aug-06	Sep-06	Oct-06	Nov-06
Mayo County Council	Local Roads	Construction Upgrade Roads													
		Construction Equipment													
		Materials Rock and Surfacing Materials													
		Structural Elements													
		Services													
		Miscellaneous Items Cabins etc													
		Personnel													
Bord na Mona	Srahmore Deposition Site	Construction Reception Area Deposition Maintenance													
		Construction Equipment	11										12		12
		Materials Concrete, Rock and Surfacing											1110	1110	1110
		Structural Elements													
		Services	28										28	28	28
		Miscellaneous Items Cabins etc													
		Personnel	137	13	13	13	13	13	13	13	13	13	208	208	208
Shell	Onshore Terminal	Construction Enabling works Peat Haulage Civils Structural Piping & Vessels Commissioning													
		Construction Equipment	70	10	10	10	10	10	10	10	10	40	10	10	40
		Miscellaneous Items Cabins etc	5	5	5	5	5	5	5	5	5	5	5	5	5
		Services	50	45	50	48	50	48	50	48	50	48	50	50	50
		Rock	200	200	200	200	200	200	300						
		Cement / Binders													
		Precast Piles													
		Sheet Piling													
		Drainage & U/G Pipes etc		5		2		2		2		2			
		Peat Haulage													
		Unsuitable Materials Haulage													
		Black Top									150	150	150		
		Concrete	200	200	200	200	200	100	100						
		Structural Steel	10	10	10	10	10								
		Pipe Spools	15	20	20	25	20	5	5	5	5				
		Tanks & Vessels	3		3	3	3								
		Gas Equipment			3	3	3	3	3	3					
		Personnel	2365	2365	3547	3547	3547	3547	4730	4730	4730	5912	5912	2958	2958
Shell	Onshore Pipelines	Construction Pipe Haulage Umbilical Conduit Pipeline Spread Construction Equipment													
		Construction Equipment	20												
		Miscellaneous Items Cabins etc	16												
		Services	10												
		Rock to Way Leaves													
		Pipe													
		Umbilical / Conduit													
		Personnel	625												
Bord Gas Eireann	Link Line Bellanaboy Bridge to East of Bangor Erris	Construction Pipe Haulage Communication Conduit Pipeline Spread Construction Equipment													
		Construction Equipment	10	10	10	10	10	10	20	20	20	20	40	10	10
		Miscellaneous Items Cabins etc											8		
		Services	10	10	10	10	10	10	10	10	10	10	10		
		Rock to Way Leaves	500	500				100	100	100	100				
		Pipe			100	100	100	100							
		Communication Conduit													
		Personnel	625	375	375	375	625	1250	1250	1250	1250	625	250	250	250
Commercial Vehicles Monthly Total			1676	1536	741	746	741	813	733	333	480	305	1479	1221	1263
Average Daily Total			74	68	33	33	33	36	33	15	21	14	66	54	56
Personnel Vehicles Average Monthly Total			3752	2753	3935	3935	4185	4810	5993	5993	5993	6550	6370	3414	3414
Average Daily Total			167	122	175	175	186	214	266	266	266	291	283	152	152

Notes

Notes	
	Assumes a month is made up as follows 5.5 days in a week and 4.3 weeks in a month
	All Personnel will car share, at least 2 persons per car
	Rock & Unsuitable Materials will generally be hauled when peat operation is weathered off, unless partial peat haulage is in operation and capacity is available. For the purpose of this document, Unsuitable Material Haulage movments off site have been illustrated but have not been carried forward as cumilatives in the table summaries
	No allowance / credit is taken for back loading empty peat trucks with rock nor back loading rock imports with unsuitable materials to go off site
	All figures are averaged
	All figures relating to the BGE Pipeline activities are indicative and based on Shell's comprehension of Pipeline construction activities

Appendix No. 4 - Materials Flow (Loads per month)

LEGEND

1. ROAD SIGN TYPE 1 (REF. APPENDIX NO. 3)

R313 ROAD REFERENCE NUMBER

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Rev.	Date	Description	By	Chkd

Client

Project
BELLANABOY BRIDGE TERMINAL TRANSPORT MANAGEMENT PLAN

Title
LAYOUT PLAN SHOWING ROAD NETWORK AND DISTANCE SIGNAGE

Scale	1 : 50,000		
Prepared by: P.G.	Checked	Date OCT '03	
Project Director	M.F.GARRICK - CASTLEBAR		

TOBIN
Consulting, Civil and Structural Engineers,
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tel: +353-(0)91-565211
fax:+353-(0)91-565398
e-mail: info@ptobin.ie
www.ptobin.ie

Drawing No. 2044-1000

Revision -

T:\Projects\EIL\Report Drawings\2044-1000.dwg PG

GLENAMOY
Glenamoy
Gleann na Muaidhe

Terminal Site

R314
R313
L5244
L5284
L1204
L1205
N59

Carrowmore Lake
Loch na Ceathrú Móire

Peat Deposition & Recovery Area

BANGOR

FOR DETAILS OF ROAD SIGNAGE FOR L1204 REFER DRG. NO. 2044-1003

LEGEND

1. ROAD SIGN TYPE 1 (REF. APPENDIX NO.3)
PROPOSED HAUL ROUTE (L1204)
KILOMETRE CHAINAGE POINTS
R313 ROAD REFERENCE NUMBER

FOR DETAILS OF ROAD SIGNAGE TO L1204 REFER DRG. NO. 2044-1003

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Rev.	Date	Description	By	Chkd.

Client

Project
BELLANABOY BRIDGE TERMINAL TRANSPORT MANAGEMENT PLAN

Title
LAYOUT PLAN SHOWING TERMINAL SITE, HAUL ROUTE AND PEAT DEPOSITION SITE

Scale 1 : 25,000

Prepared by:	Checked	Date
P.G.		OCT. '03

Project Director M.F.GARRICK - CASTLEBAR

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Drawing No. 2044-1001

Revision -

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CANDIDATE SPECIAL AREA OF CONSERVATION

2044-1005
2044-1006
2044-1007
2044-1008
2044-1009
2044-1010
2044-1011
2044-1012

ROAD WIDENING TO THE EAST SIDE OF THE ROAD IN THIS AREA

SAC STOPS EAST SIDE OF FENCE ALONG ROAD

ROAD WIDENING TO THE EAST SIDE OF THE ROAD IN THIS AREA

AVOID WEST OF DRAIN ON WEST SIDE OF ROAD

PREFERRED SIDE FOR ROAD WIDENING TO THE EAST SIDE OF THE ROAD IN THIS AREA

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
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Rev.	Date	Description	By	Chkd.

Client: Corrib

Project: **BELLANABOY BRIDGE TERNINAL TRANSPORT MANAGEMENT PLAN**

Title: **KEY PLAN TO LAYOUT PLANS**

Scale	1 : 15,000	
Prepared by: P.G.	Checked	Date OCT. '03
Project Director	M.F.GARRICK - CASTLEBAR	

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Revision -

Drawing No. 2044-1002

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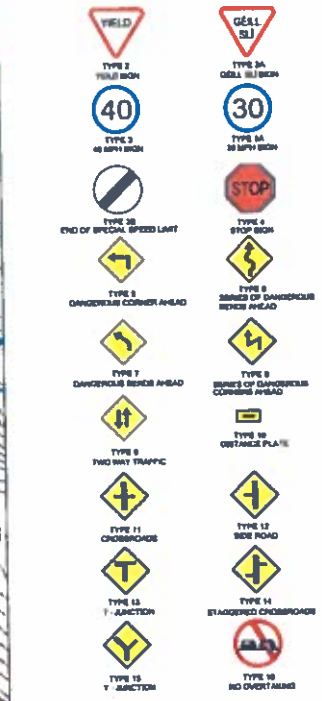

NOTES

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Rev.	Date	Description	By	Chkd.

Client

Project
BELLANABOY BRIDGE TERMINAL TRANSPORT MANAGEMENT PLAN

Title
LAYOUT PLAN SHOWING ROAD SIGNAGE DETAILS FOR L1204

Scale	1 : 10,000		
Prepared by: P.G.	Checked	Date OCT. '03	
Project Director	M.F.GARRICK - CASTLEBAR		

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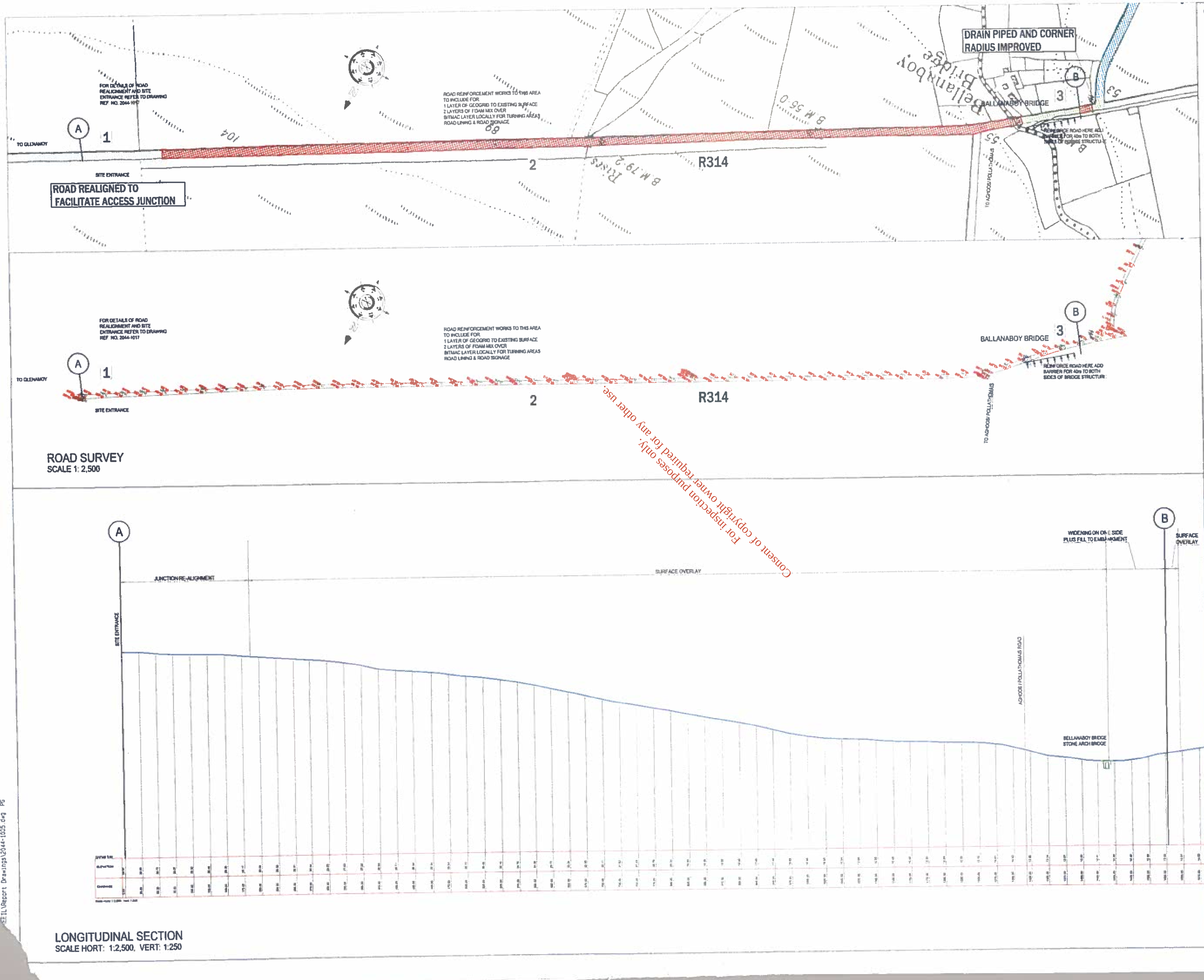
Drawing No. **2044-1003**

Revision -



KEY TO LAYOUT PLANS

1. JUNCTION REALIGNMENT
2. OVERLAY ONLY
3. WIDENING ON ONE SIDE PLUS FILL TO EMBANKMENT
4. WIDENING ON ONE SIDE BY GRADING BACK EXISTING EDGE
5. SIGNIFICANT WIDENING WITHIN ROAD BOUNDARY
6. WIDENING ON ONE SIDE WITH DITCH REGRADING
7. WIDENING ON BOTH SIDES BY GRADING BACK EXISTING EDGE
8. ROAD REALIGNMENT
9. CANDIDATE SPECIAL AREA OF CONSERVATION

SIDE OF ROAD FOR PROPOSED WIDENING

NOTES

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Rev.	Date	Description	By	Chkd.

Client

Project

BELLANABOY BRIDGE TERMINAL TRANSPORT MANAGEMENT PLAN

Title

LAYOUT PLAN & LONGITUDINAL SECTION OF HAUL ROAD SHEET 1 OF 7

Scale	1 : 2,500	HORIZ: 1 : 2,500 VERT: 1 : 250
Prepared by: P.G.	Checked	Date OCT. '03
Project Director	M.F.GARRICK - CASTLEBAR	

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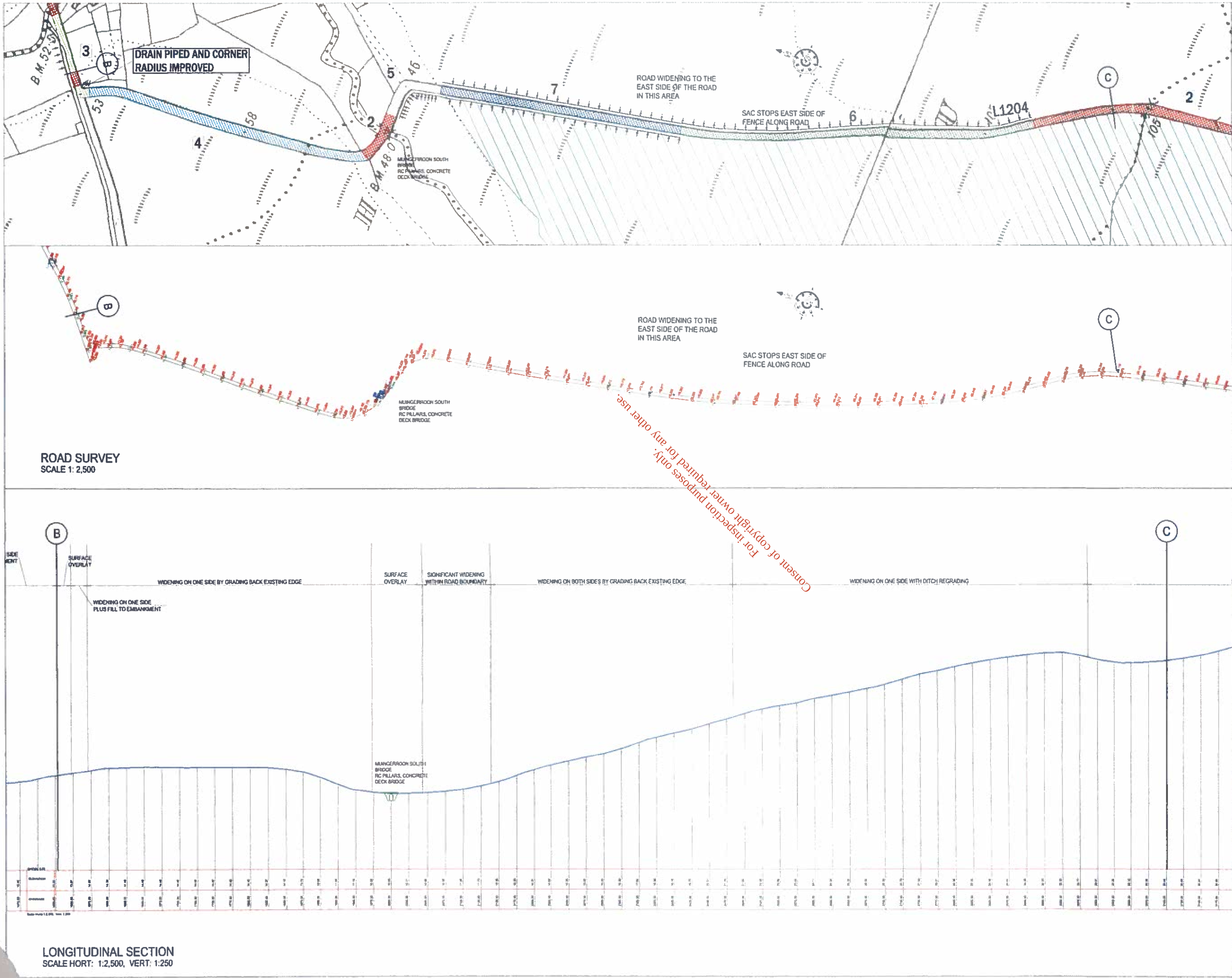
Drawing No. **2044-1005** Revision -



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KEY

1. JUNCTION REALIGNMENT
2. OVERLAY ONLY
3. WIDENING ON ONE SIDE PLUS FILL TO EMBANKMENT
4. WIDENING ON ONE SIDE BY GRADING BACK EXISTING EDGE
5. SIGNIFICANT WIDENING WITHIN ROAD BOUNDARY
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8. ROAD REALIGNMENT
9. CANDIDATE SPECIAL AREA OF CONSERVATION

SIDE OF ROAD FOR PROPOSED WIDENING

NOTES

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Rev.	Date	Description	By	Chkd.

Client

Project
BELLANABOY BRIDGE TERMINAL TRANSPORT MANAGEMENT PLAN

Title
LAYOUT PLAN & LONGITUDINAL SECTION OF HAUL ROAD SHEET 2 OF 7

Scale	1 : 2,500	HORIZ: 1 : 2,500 VERT: 1 : 250
Prepared by: P.G.	Checked	Date OCT. '03
Project Director	M.F.GARRICK - CASTLEBAR	

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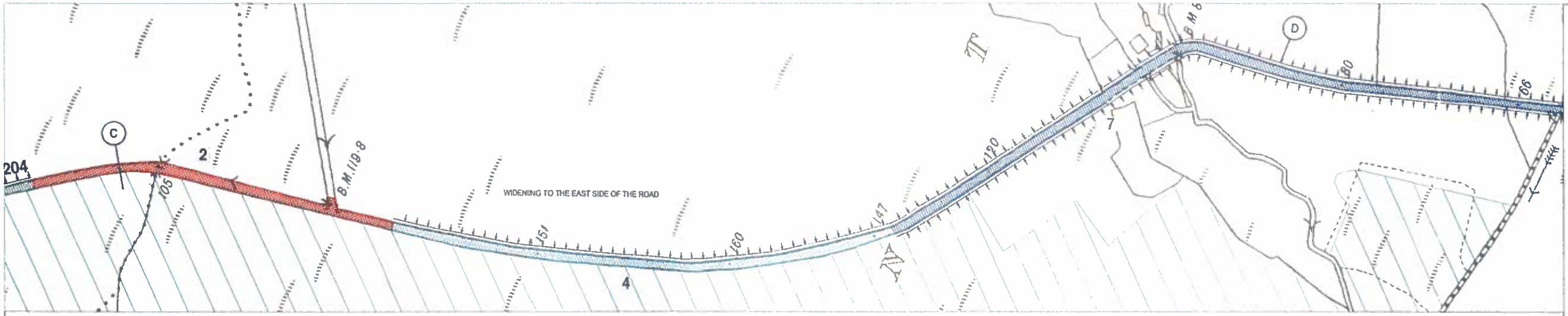
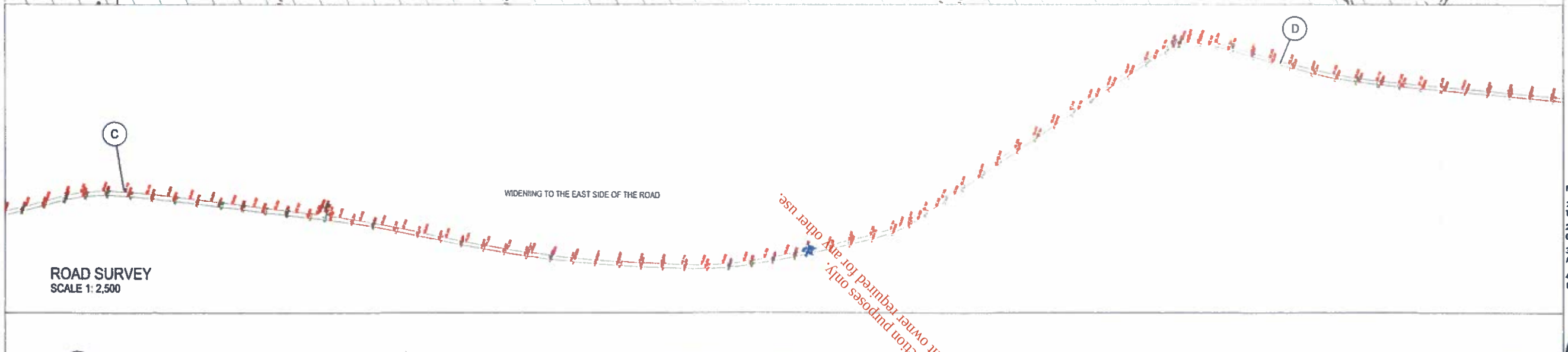
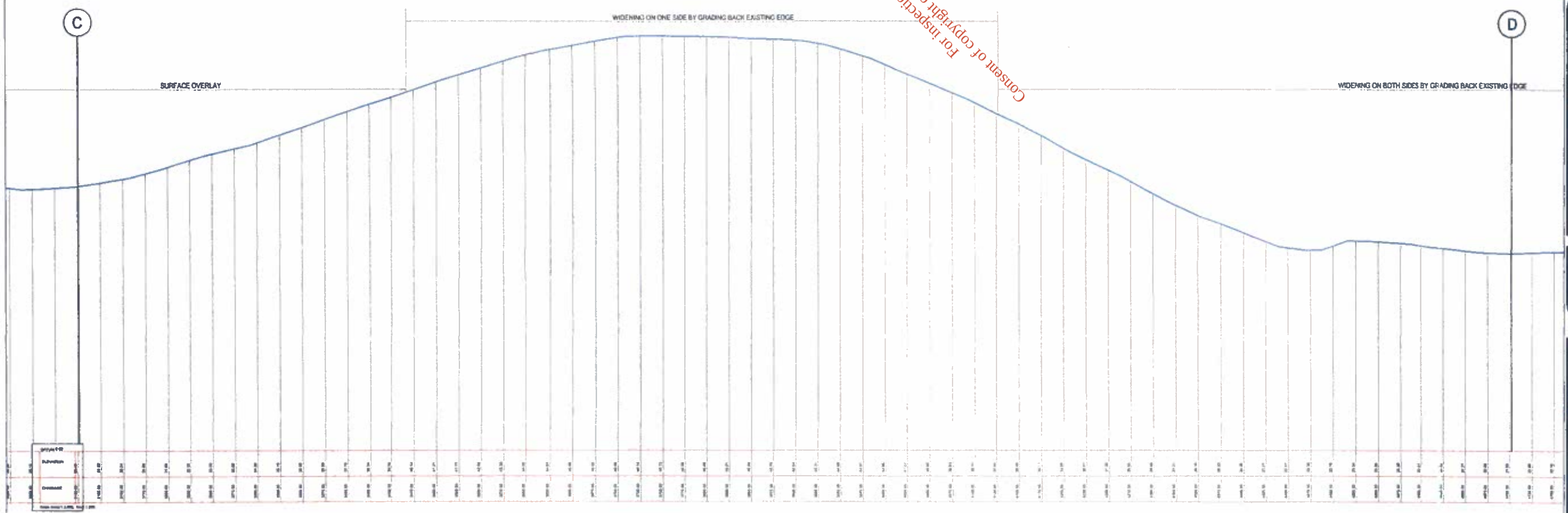
Drawing No. 2044-1006
Revision -





ROAD SURVEY
SCALE 1: 2,500



LONGITUDINAL SECTION
SCALE HORT: 1:2,500, VERT: 1:250

KEY

1. JUNCTION REALIGNMENT
2. OVERLAY ONLY
3. WIDENING ON ONE SIDE PLUS FILL TO EMBANKMENT
4. WIDENING ON ONE SIDE BY GRADING BACK EXISTING EDGE
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7. WIDENING ON BOTH SIDES BY GRADING BACK EXISTING EDGE
8. ROAD REALIGNMENT
9. CANDIDATE SPECIAL AREA OF CONSERVATION

SIDE OF ROAD FOR PROPOSED WIDENING

NOTES

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4. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Rev.	Date	Description	By	Chkd.

Client: Corrib

Project: BELLANABOY BRIDGE TERMINAL TRANSPORT MANAGEMENT PLAN

Title: LAYOUT PLAN & LONGITUDINAL SECTION OF HAUL ROAD SHEET 3 OF 7

Scale	1 : 2,500	HORIZ: 1 : 2,500 VERT: 1 : 250
Prepared by: P.G.	Checked	Date OCT. '03
Project Director	M.F.GARRICK - CASTLEBAR	

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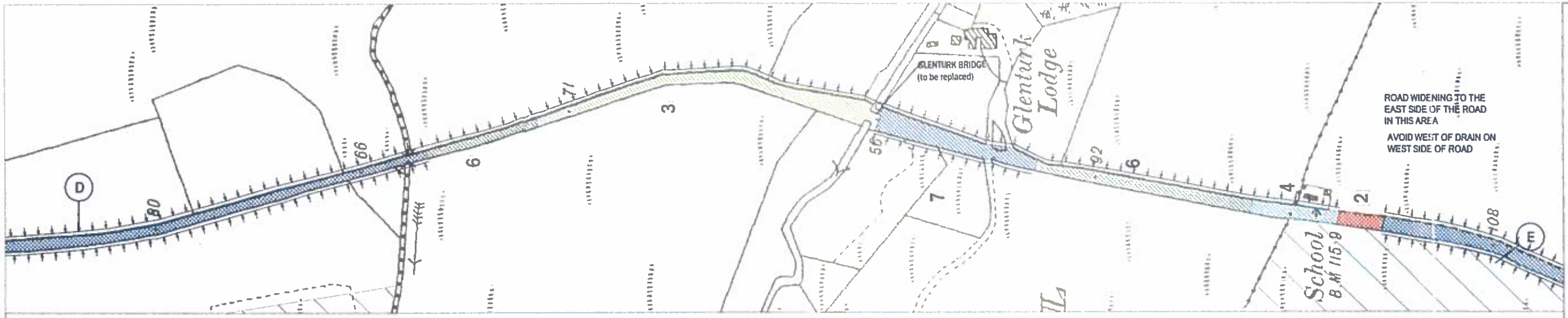
Drawing No. 2044-1007 | Revision -



KEY

1. JUNCTION REALIGNMENT
2. OVERLAY ONLY
3. WIDENING ON ONE SIDE PLUS FILL TO EMBANKMENT
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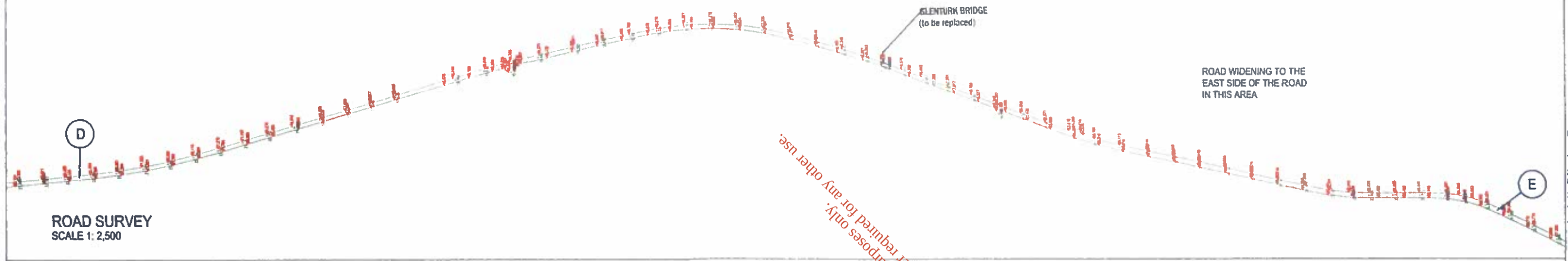
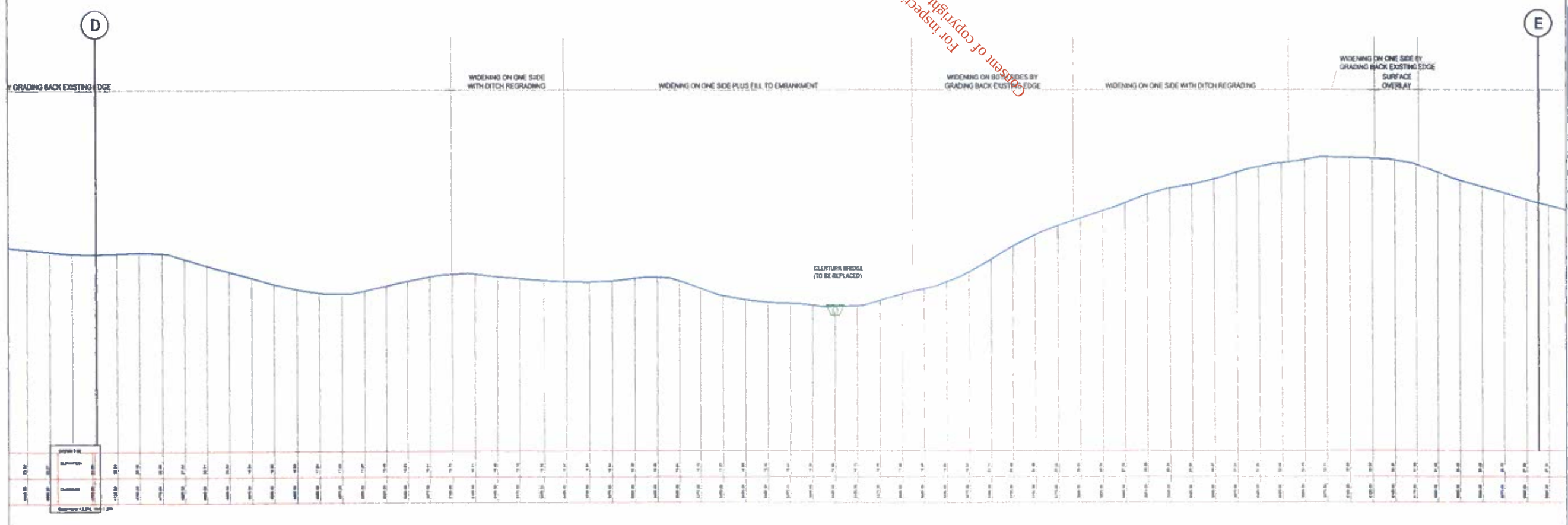
7. WIDENING ON BOTH SIDES BY GRADING BACK EXISTING EDGE
8. ROAD REALIGNMENT
9. CANDIDATE SPECIAL AREA OF CONSERVATION

SIDE OF ROAD FOR PROPOSED WIDENING



ROAD SURVEY
SCALE 1: 2,500



LONGITUDINAL SECTION
SCALE HORT: 1:2,500, VERT: 1:250

NOTES

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Rev.	Date	Description	By	Chkd.

Client: Corrib

Project: **BELLANABOY BRIDGE TERMINAL TRANSPORT MANAGEMENT PLAN**

Title: **LAYOUT PLAN & LONGITUDINAL SECTION OF HAUL ROAD SHEET 4 OF 7**

Scale	1 : 2,500	HORIZ: 1 : 2,500 VERT: 1 : 250
Prepared by: P.G.	Checked	Date OCT. '03
Project Director	M.F.GARRICK - CASTLEBAR	

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Drawing No. **2044-1008** Revision -

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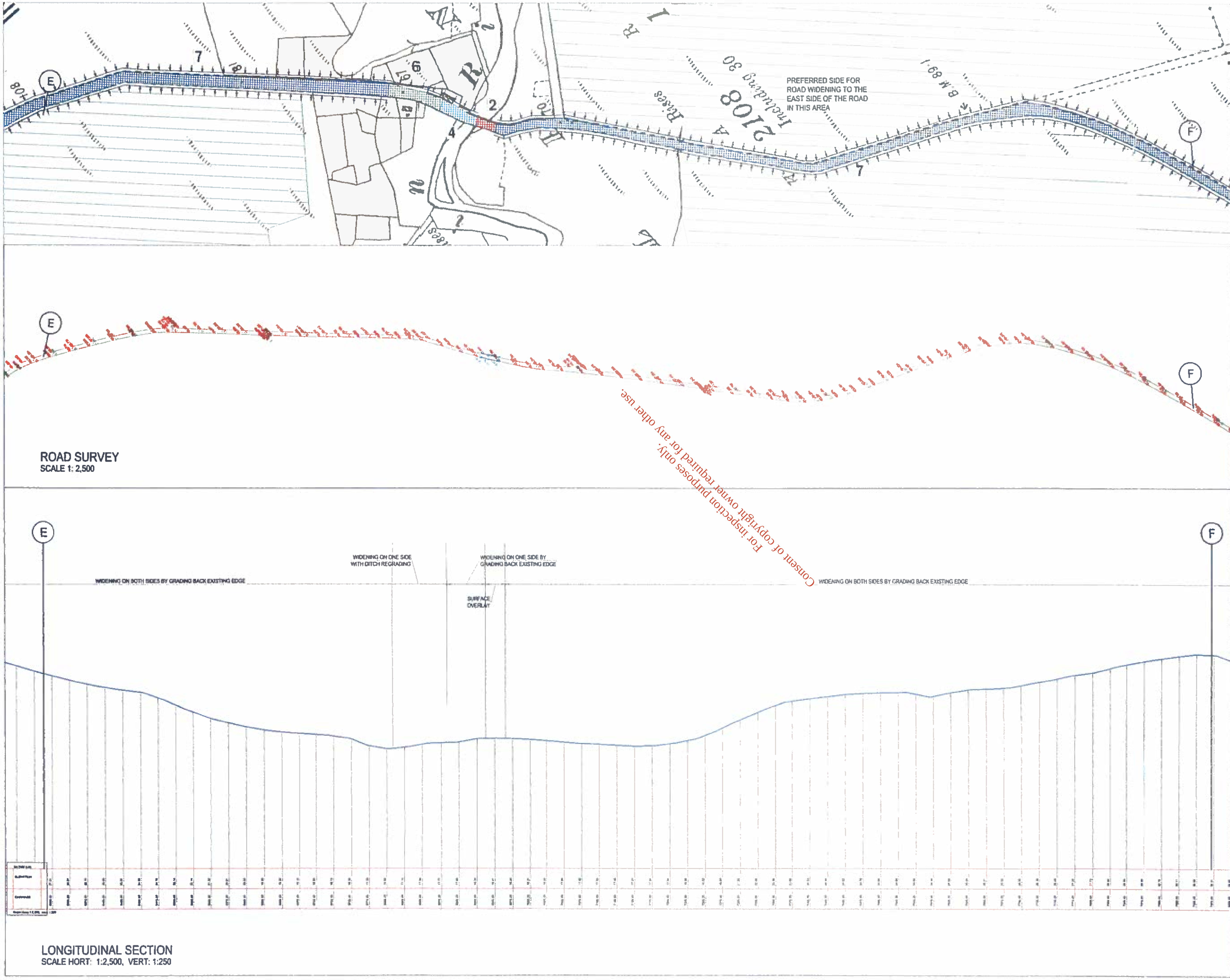

KEY

1 JUNCTION REALIGNMENT
2 OVERLAY ONLY
3 WIDENING ON ONE SIDE PLUS FILL TO EMBANKMENT
4 WIDENING ON ONE SIDE BY GRADING BACK EXISTING EDGE
5 SIGNIFICANT WIDENING WITHIN ROAD BOUNDARY
6 WIDENING ON ONE SIDE WITH DITCH REGRADING
7 WIDENING ON BOTH SIDES BY GRADING BACK EXISTING EDGE
8 ROAD REALIGNMENT
9 CANDIDATE SPECIAL AREA OF CONSERVATION

SIDE OF ROAD FOR PROPOSED WIDENING

NOTES

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4. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

Rev.	Date	Description	By	Chkd.

Client

Project

BELLANABOY BRIDGE TERMINAL TRANSPORT MANAGEMENT PLAN

Title

LAYOUT PLAN & LONGITUDINAL SECTION OF HAUL ROAD SHEET 5 OF 7

Scale	1 : 2,500	HORIZ: 1 : 2,500 VERT: 1 : 250
Prepared by: P.G.	Checked	Date OCT. '03
Project Director	M.F.GARRICK	- CASTLEBAR

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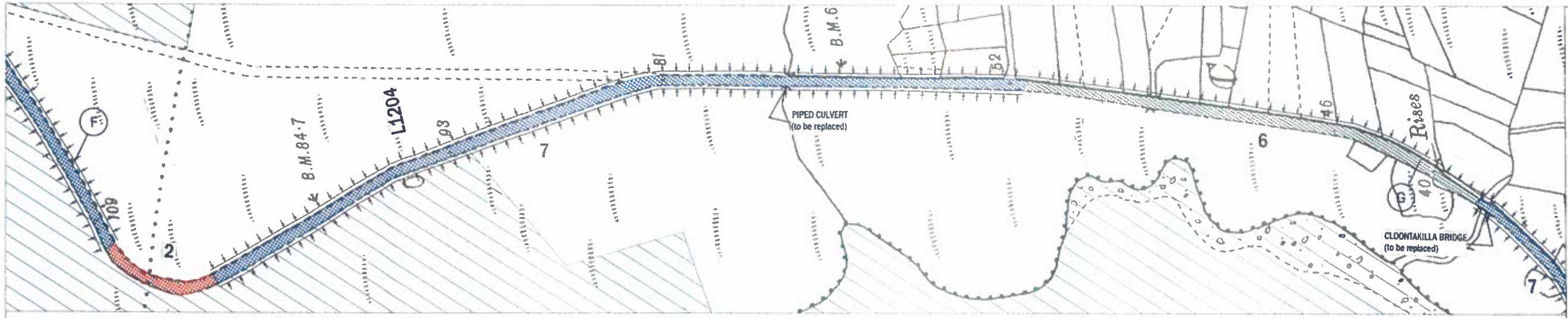
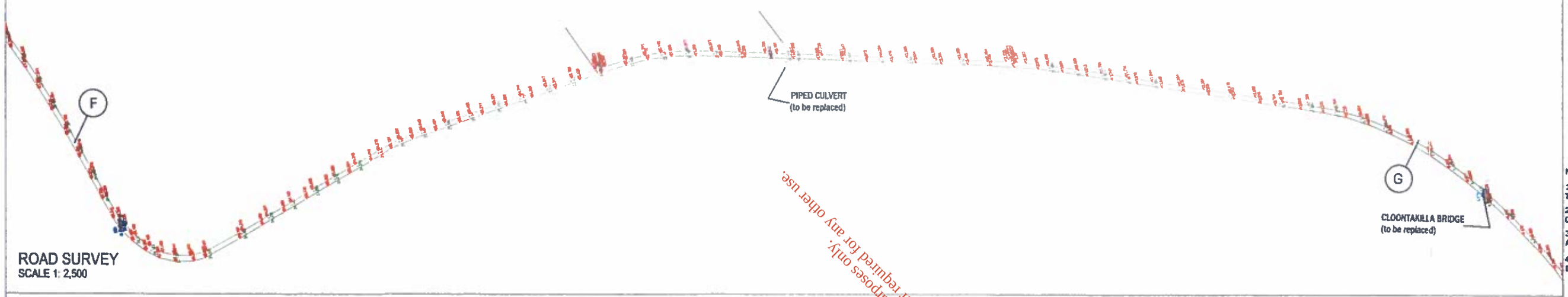
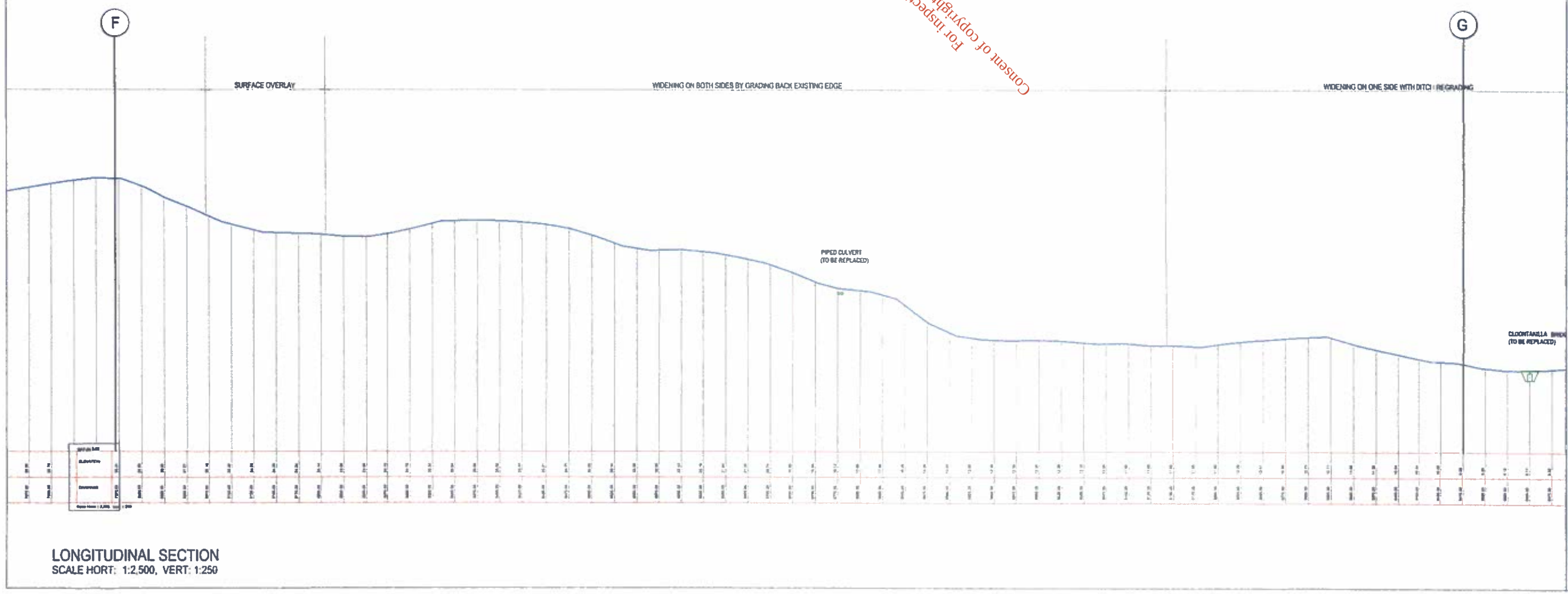
Drawing No. 2044-1009

Revision -





ROAD SURVEY
SCALE 1: 2,500



LONGITUDINAL SECTION
SCALE HORT: 1:2,500, VERT: 1:250

KEY

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SIDE OF ROAD FOR PROPOSED WIDENING

NOTES

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Rev.	Date	Description	By	Chkd

Client: Corrib

Project:
BELLANABOY BRIDGE TERMINAL TRANSPORT MANAGEMENT PLAN

Title:
LAYOUT PLAN & LONGITUDINAL SECTION OF HAUL ROAD SHEET 6 OF 7

Scale	1 : 2,500	HORIZ: 1 : 2,500 VERT: 1 : 250
Prepared by: P.G.	Checked	Date OCT. '03
Project Director	M.F.GARRICK - CASTLEBAR	

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Drawing No. 2044-1010

Revision -

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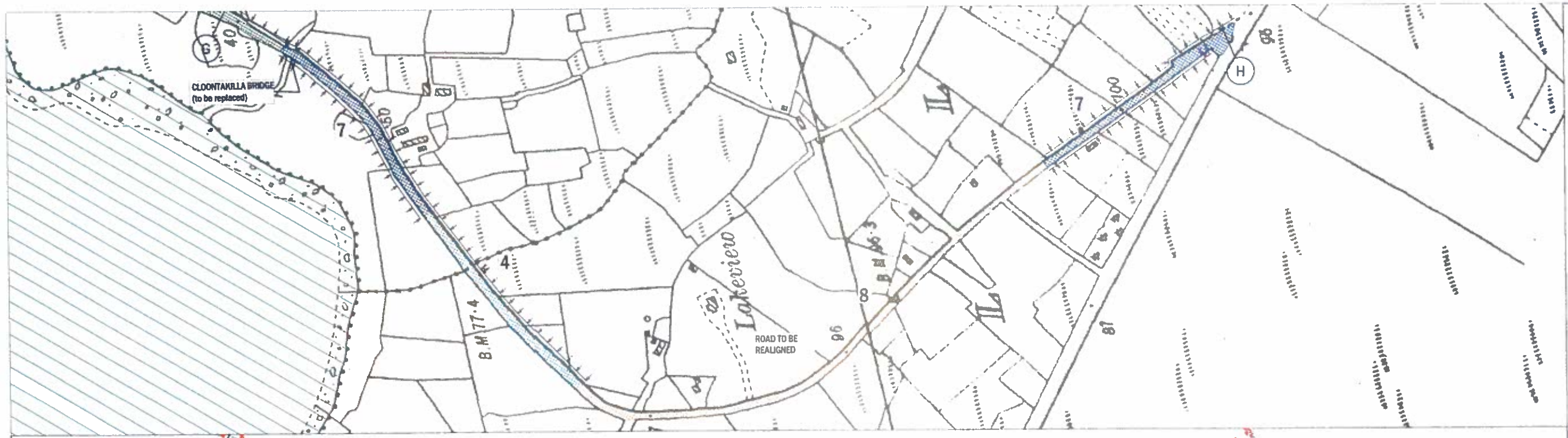

KEY

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2. OVERLAY ONLY
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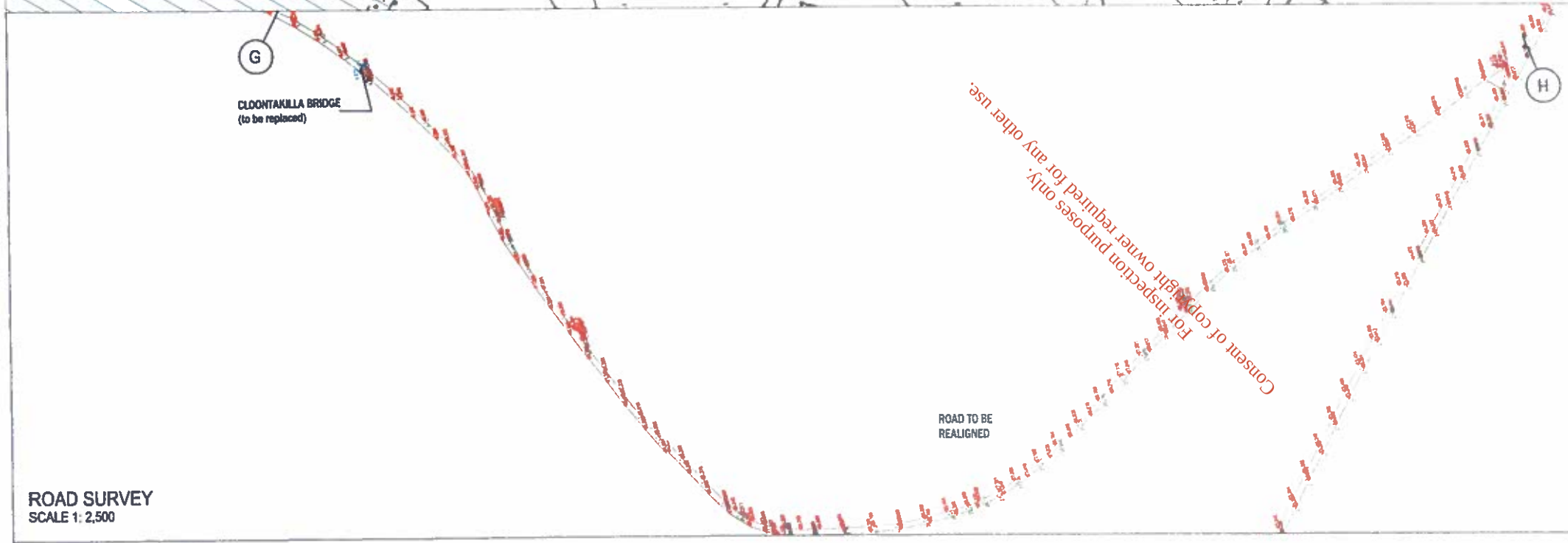
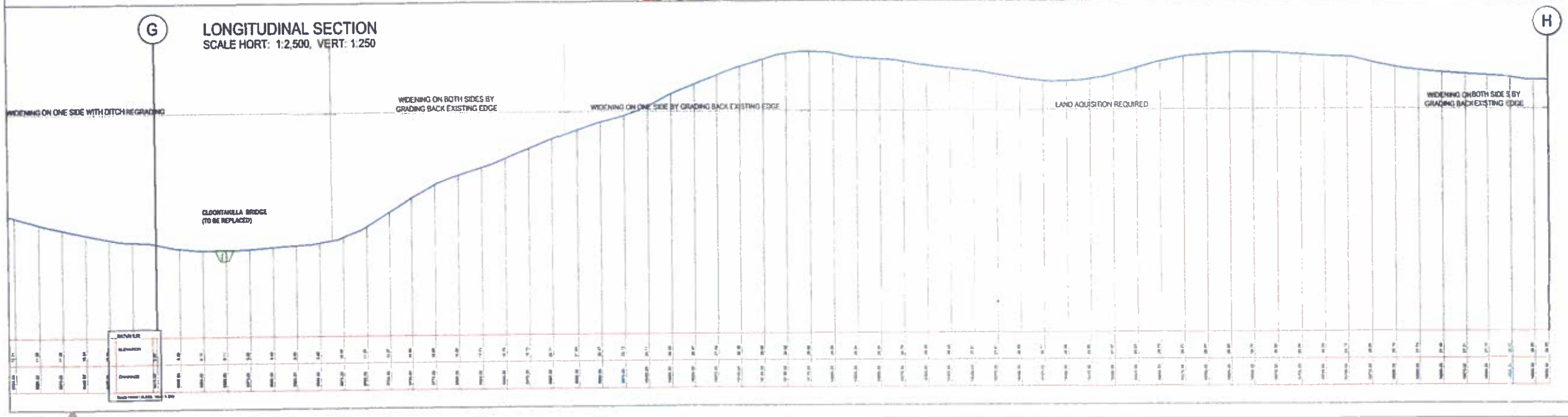
8. ROAD REALIGNMENT
9. CANDIDATE SPECIAL AREA OF CONSERVATION

SIDE OF ROAD FOR PROPOSED WIDENING



ROAD SURVEY
SCALE 1: 2,500



NOTES

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Rev.	Date	Description	By	Chkd

Client: Clare County Council

Project: **BELLANABOY BRIDGE TERMINAL TRANSPORT MANAGEMENT PLAN**

Title: **LAYOUT PLAN & LONGITUDINAL SECTION OF HAUL ROAD SHEET 7 OF 7**

Scale 1 : 2,500		HORZ: 1 : 2,500 VERT: 1 : 250
Prepared by: P.G.	Checked	Date OCT. '03
Project Director M.F.GARRICK - CASTLEBAR		

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Drawing No. 2044-1011 | Revision -

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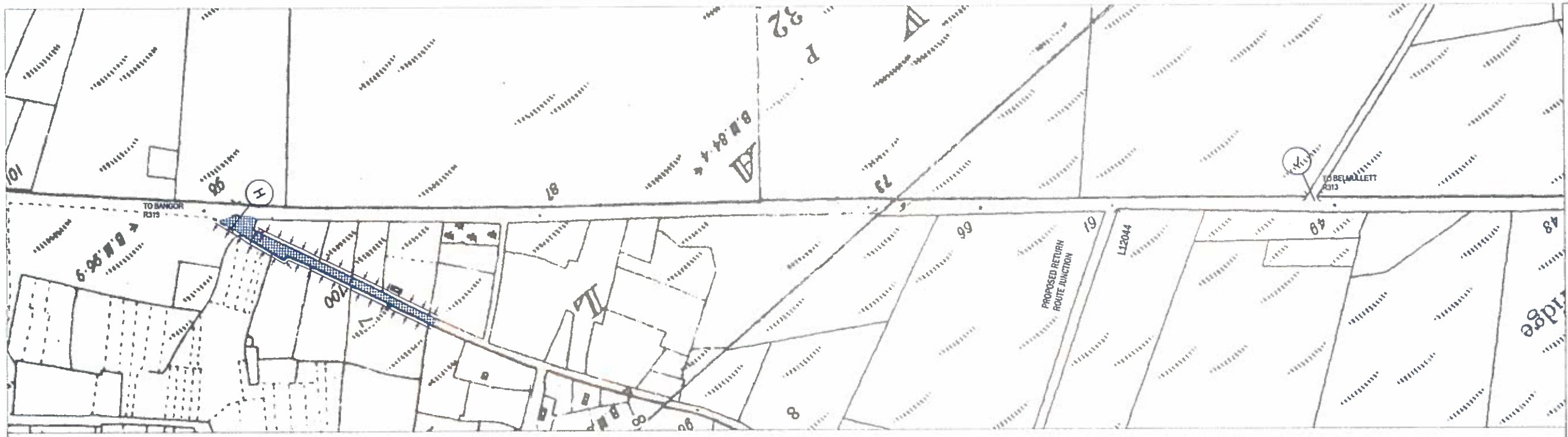
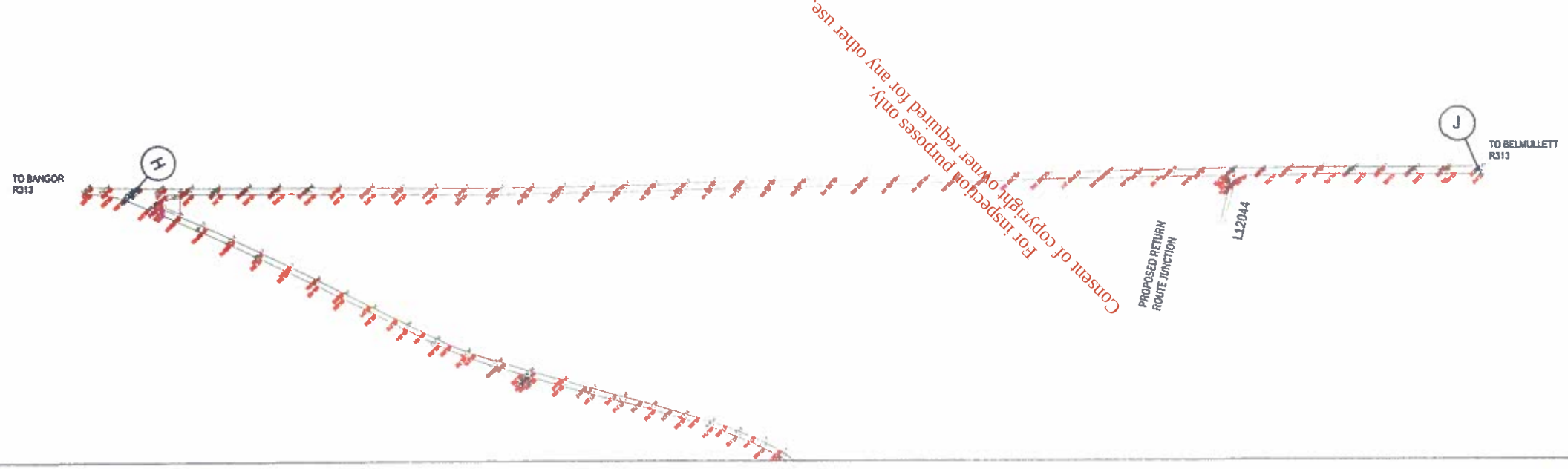
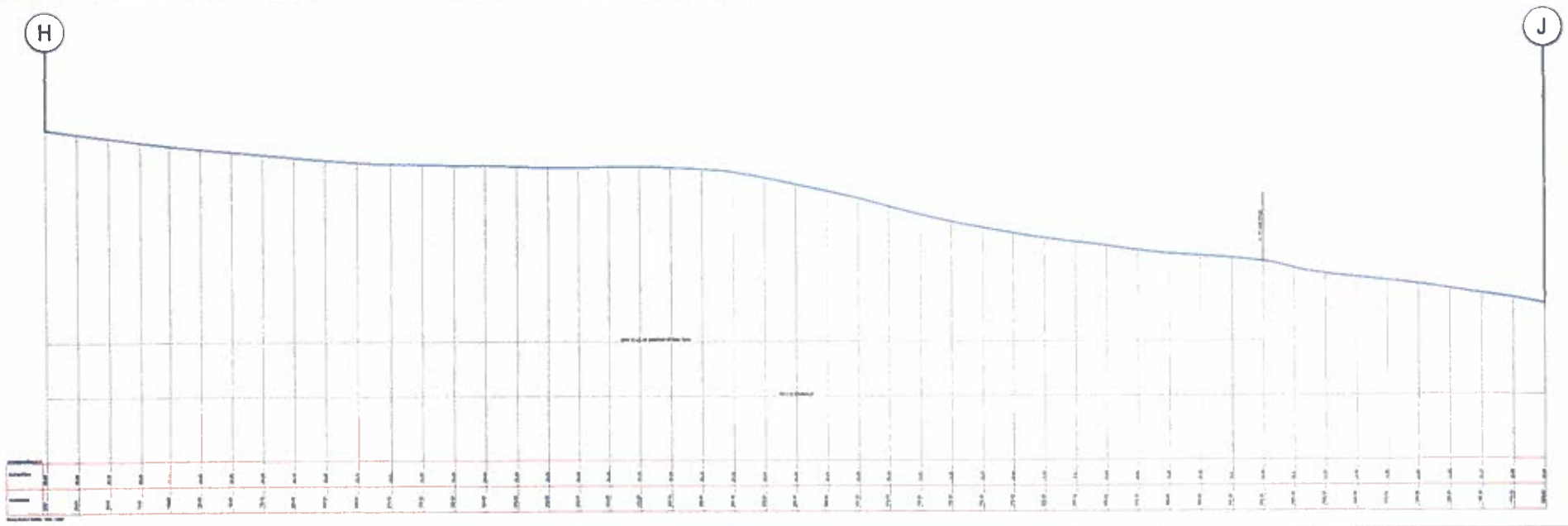


ROAD SURVEY
SCALE 1: 2,500



LONGITUDINAL SECTION
SCALE HORT: 1:2,500, VERT: 1:250



KEY

1. JUNCTION REALIGNMENT
2. OVERLAY ONLY
3. WIDENING ON ONE SIDE PLUS FILL TO EMBANKMENT
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7. WIDENING ON BOTH SIDES BY GRADING BACK EXISTING EDGE
8. ROAD REALIGNMENT
9. CANDIDATE SPECIAL AREA OF CONSERVATION

SIDE OF ROAD FOR PROPOSED WIDENING

NOTES

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Rev.	Date	Description	By	Chkd.

Client

Project
BELLANABOY BRIDGE TERMINAL TRANSPORT MANAGEMENT PLAN

Title
LAYOUT PLAN & LONGITUDINAL SECTION OF RETURN ROUTE R313 & L12044

Scale	1 : 2,500	HORIZ: 1 : 2,500 VERT: 1 : 250
Prepared by: P.G.	Checked	Date JAN. '04
Project Director	M.F.GARRICK - CASTLEBAR	

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Drawing No. **2044-1012**

Revision -

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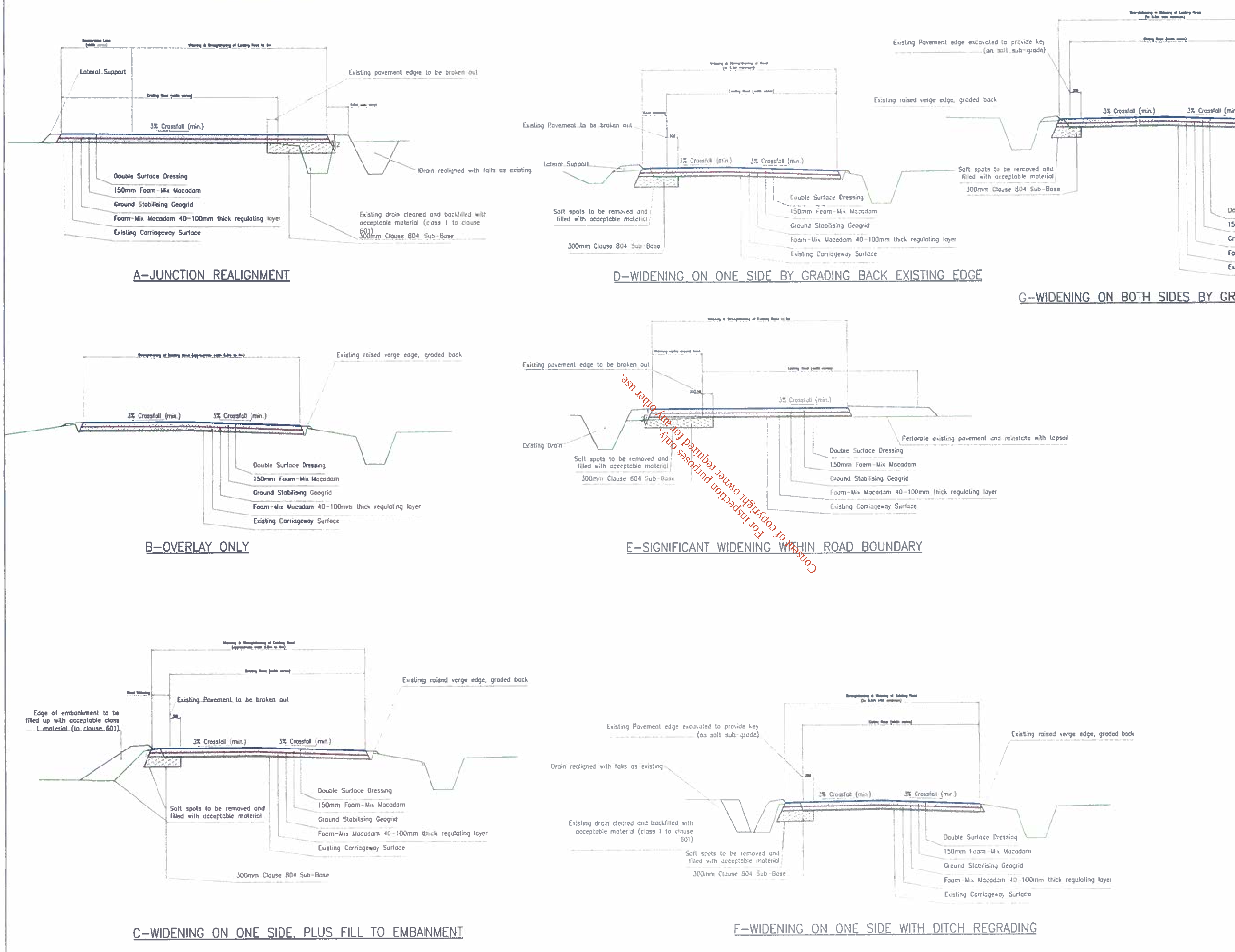

NOTES

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Rev.	Date	Description	By	Chkd.

Client: Corrib

Project: **BELLANABOY BRIDGE TERMINAL TRANSPORT MANAGEMENT PLAN**

Title: **TYPICAL CROSS SECTIONS OF ROAD, TYPES A - H**

Scale	1:50	
Prepared by: TC	Checked	Date NOV. '03
Project Director	M.F.GARRICK - CASTLEBAR	

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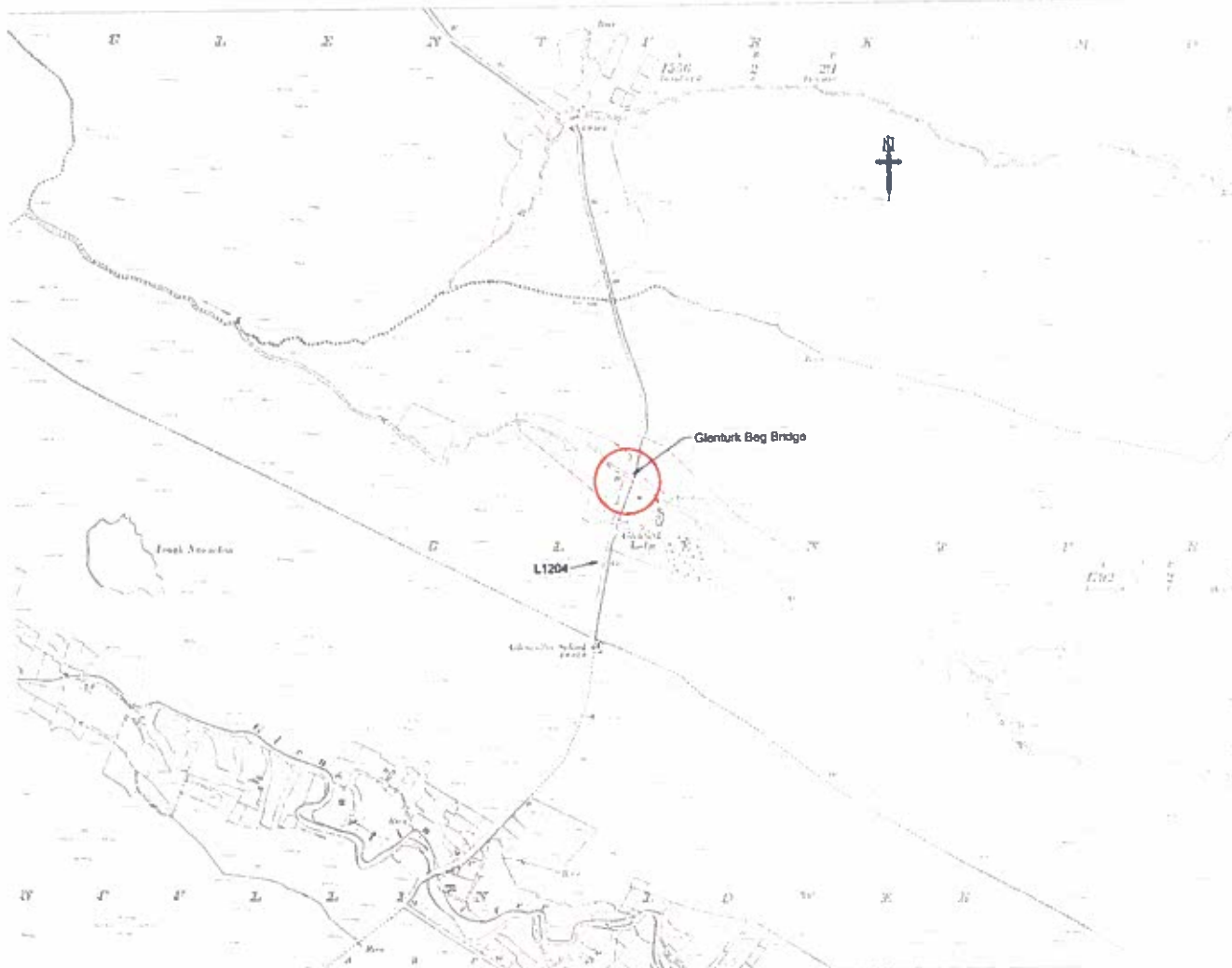
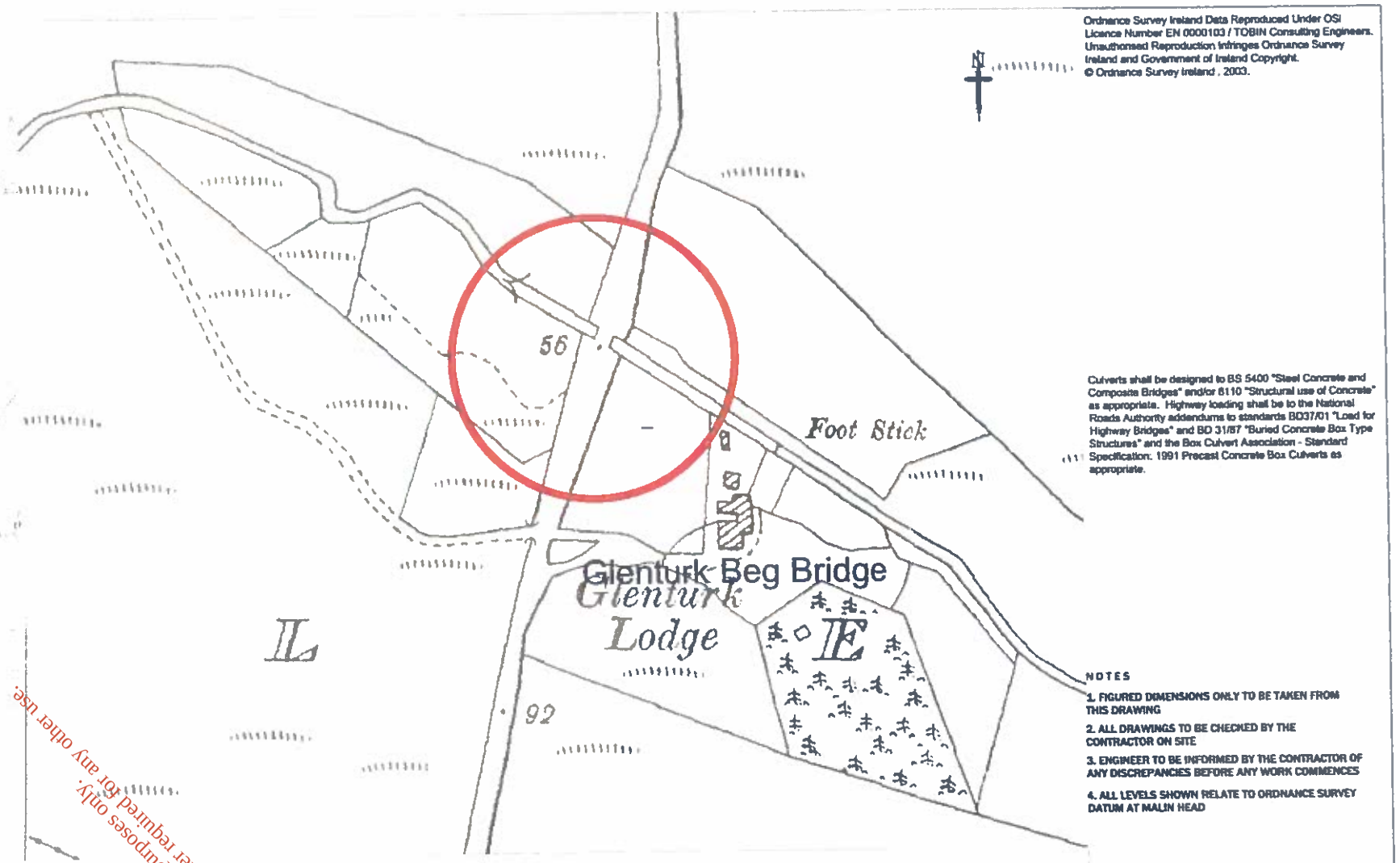
Drawing No. **2044-1013** Revision -





Culverts shall be designed to BS 5400 "Steel Concrete and Composite Bridges" and/or 8110 "Structural use of Concrete" as appropriate. Highway loading shall be to the National Roads Authority addendums to standards BD37/01 "Load for Highway Bridges" and BD 31/87 "Buried Concrete Box Type Structures" and the Box Culvert Association - Standard Specification. 1991 Precast Concrete Box Culverts as appropriate.

NOTES

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
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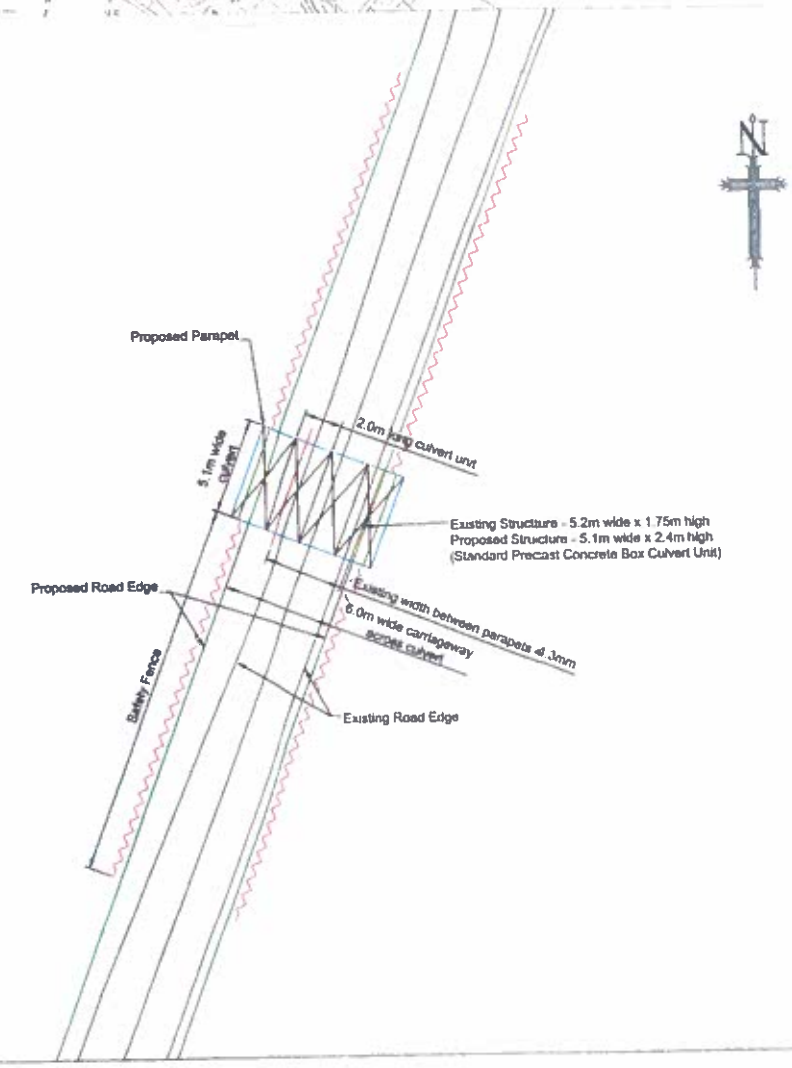
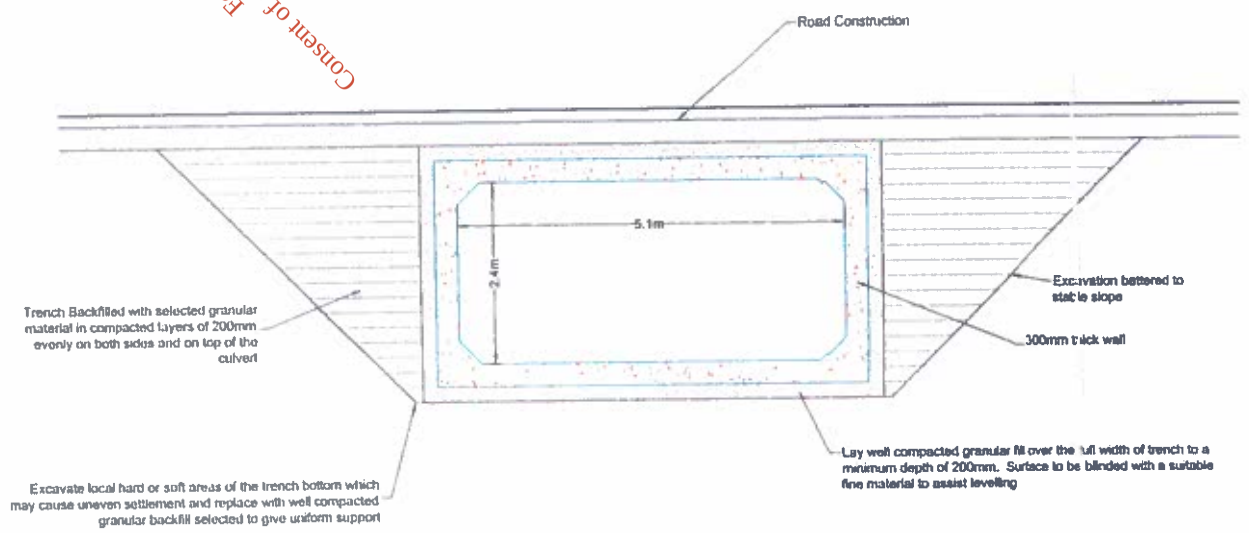


PLAN
(Scale 1:200)



TYPICAL SECTION THROUGH CULVERT
(Scale 1:50)

Rev.	Date	Description	By	Chkd.

Client: Corrib

Project: **BELLANABOY BRIDGE TERMINAL TRANSPORT MANAGEMENT PLAN**

Title: **EXISTING AND PROPOSED DETAILS OF GLENTURK BEG BRIDGE**

Scale	As Shown	
Prepared by: TC	Checked	Date NOV. '03
Project Director	M.F.GARRICK - CASTLEBAR	

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Drawing No. **2044-1014** Revision

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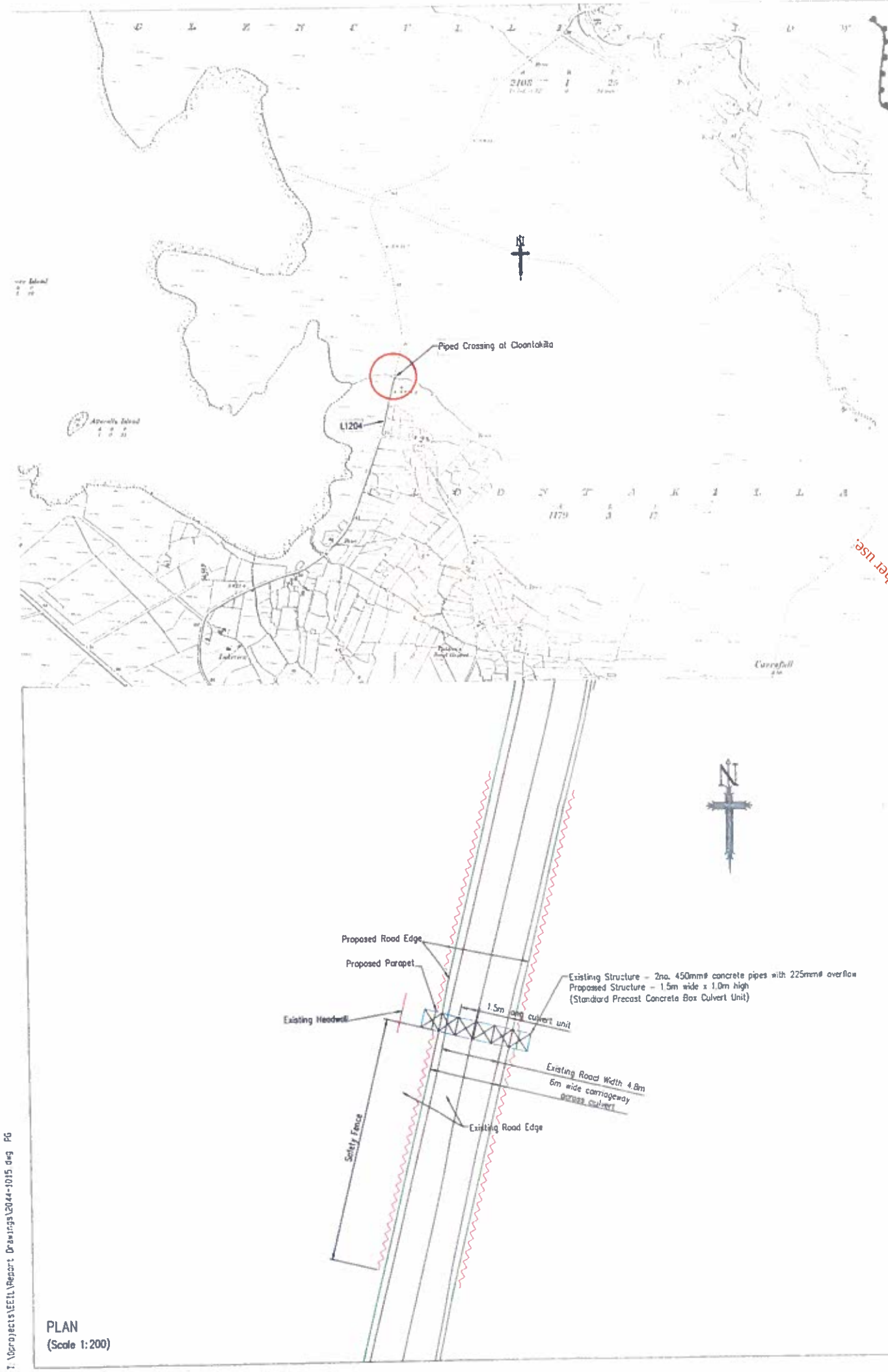
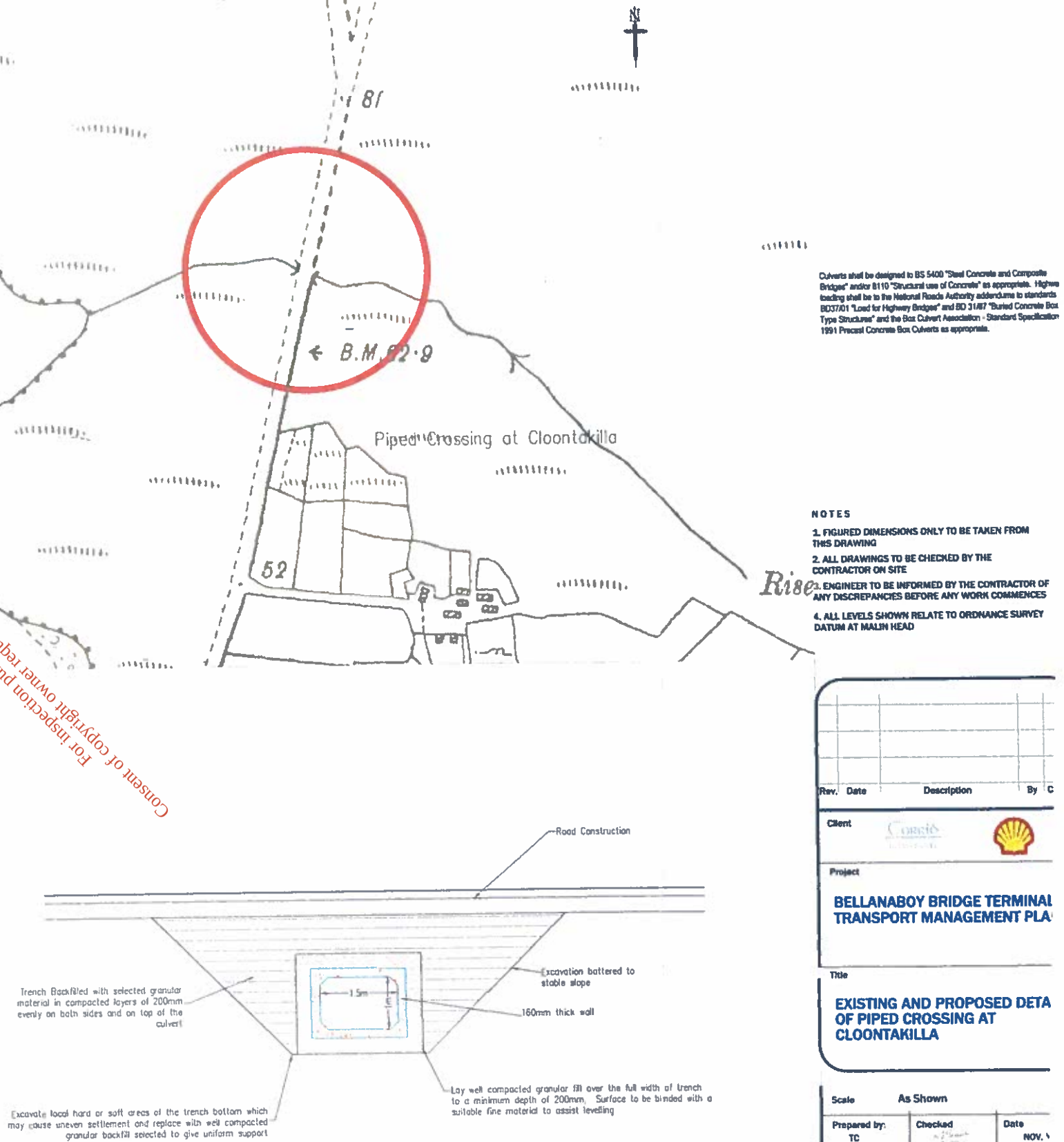


PLAN
(Scale 1:200)



TYPICAL SECTION THROUGH CULVERT
(Scale 1:50)

Culverts shall be designed to BS 5400 "Steel Concrete and Composite Bridges" and/or B110 "Structural use of Concrete" as appropriate. Highway loading shall be to the National Roads Authority addendums to standards BD37/01 "Load for Highway Bridges" and BD 31/87 "Buried Concrete Box Type Structures" and the Box Culvert Association - Standard Specification 1991 Precast Concrete Box Culverts as appropriate.

NOTES

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Rev.	Date	Description	By	C

Client

Project
BELLANABOY BRIDGE TERMINAL
TRANSPORT MANAGEMENT PLA

Title
EXISTING AND PROPOSED DETA
OF PIPED CROSSING AT
CLOONTAKILLA

Scale	As Shown	
Prepared by: TC	Checked	Date NOV.
Project Director	M.F.GARRICK - CASTLEBAR	

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Drawing No. 2044-1015

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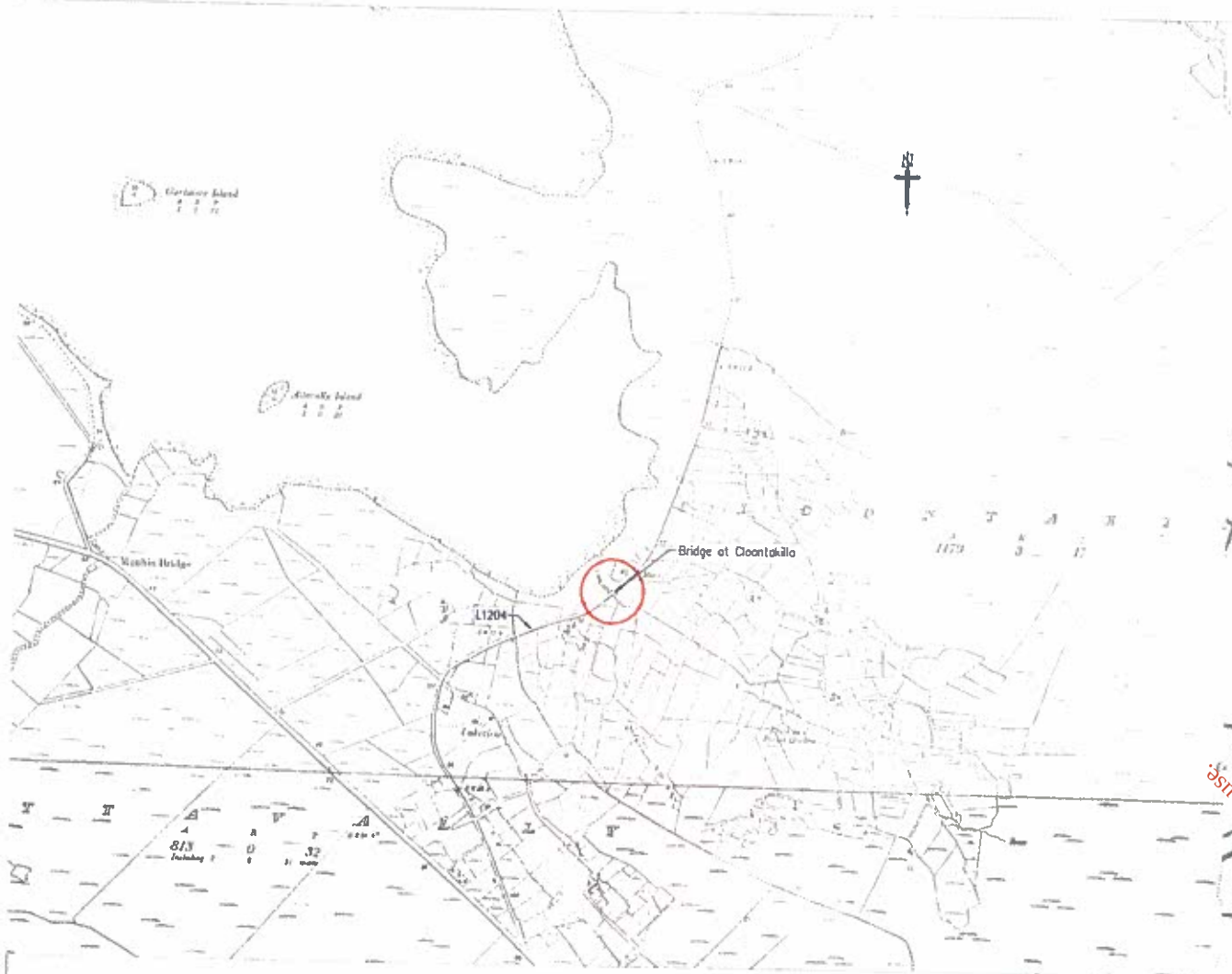

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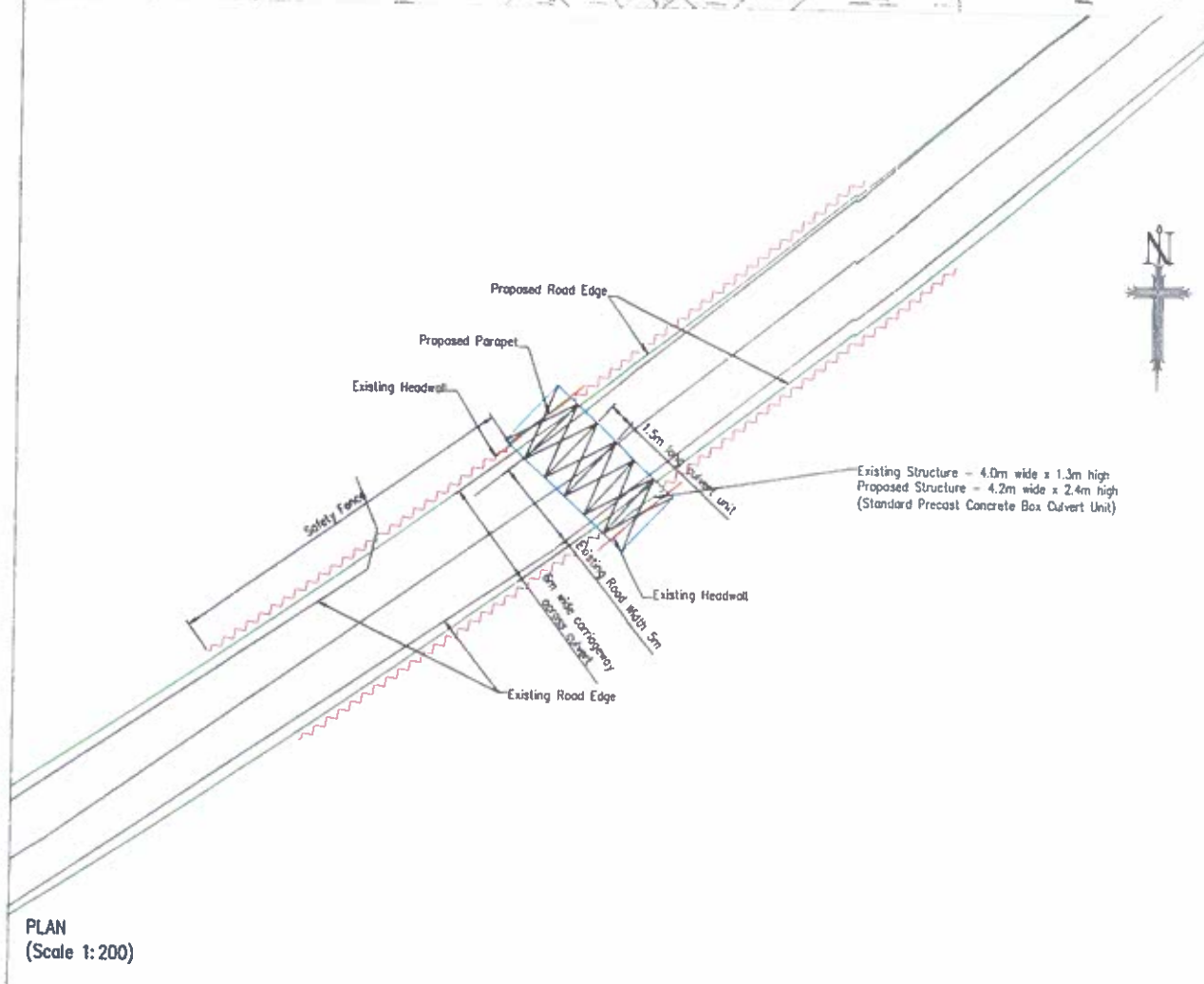
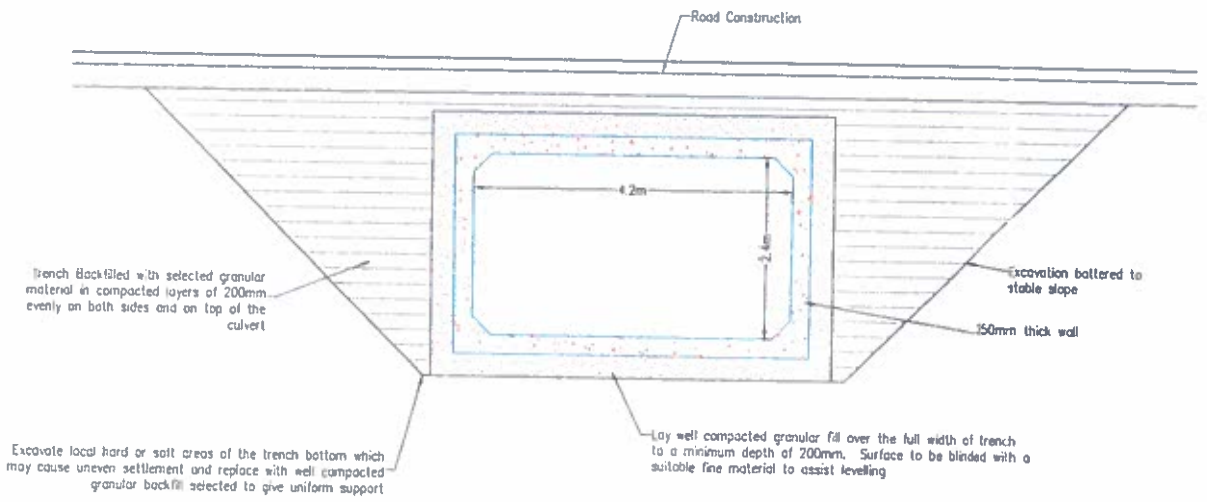


PLAN
(Scale 1:200)



TYPICAL SECTION THROUGH CULVERT
(scale 1:50)

Rev.	Date	Description	By	Chkd.

Client

Project

BELLANABOY BRIDGE TERMINAL TRANSPORT MANAGEMENT PLAN

Title

EXISTING AND PROPOSED DETAILS OF BRIDGE AT CLOONTAKILLA

Scale	As Shown	
Prepared by: TC	Checked	Date NOV. '03
Project Director	M.F.GARRICK - CASTLEBAR	

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Drawing No. **2044-1016**

Revision -

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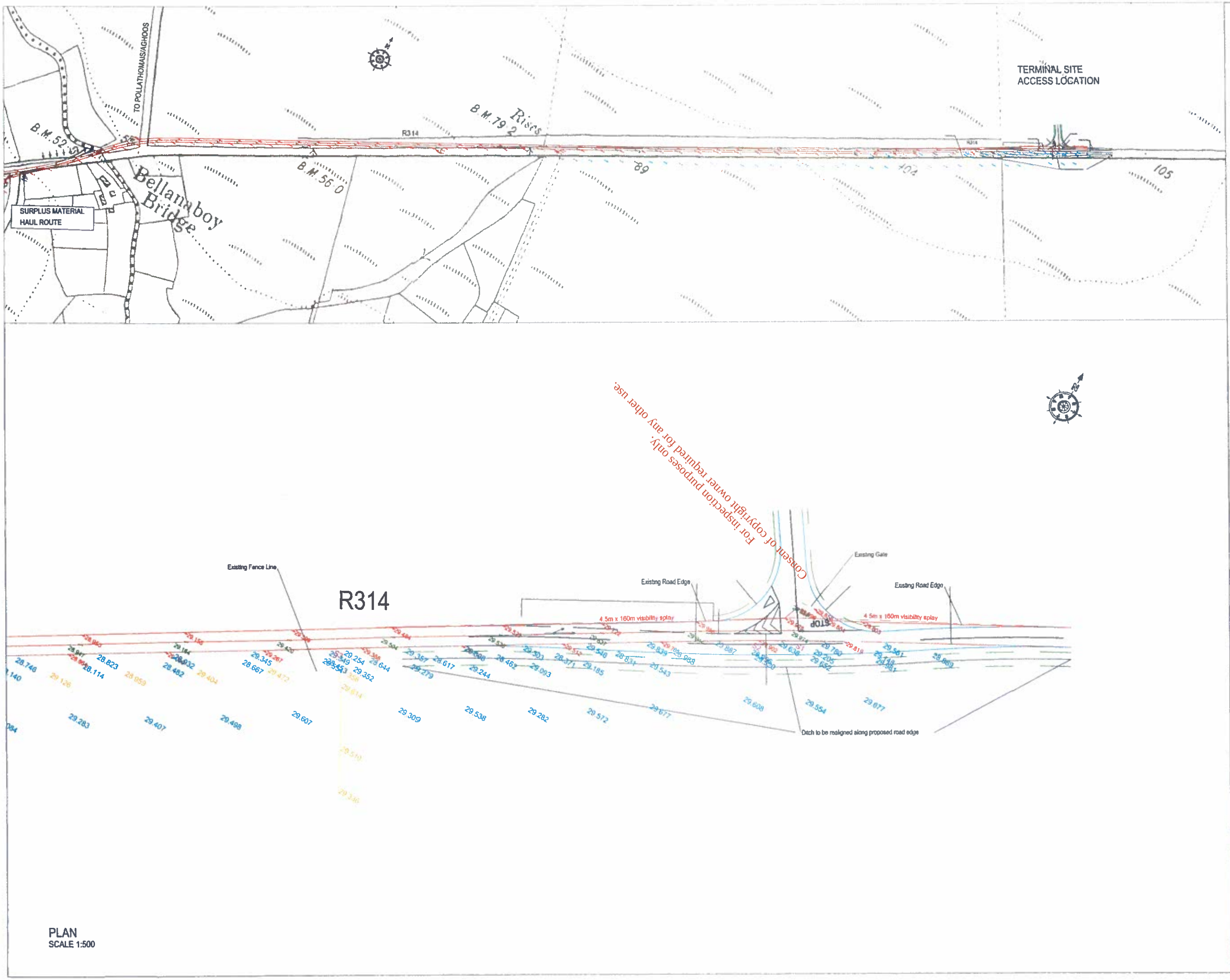

PLAN
SCALE 1:500

SIDE OF ROAD FOR PROPOSED WIDENING

NOTES

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Rev.	Date	Description	By	Chkd.

Client

Project
BELLANABOY BRIDGE TERMINAL TRANSPORT MANAGEMENT PLAN

Title
DETAILS OF PROPOSED TERMINAL ACCESS JUNCTION

Scale	As Shown	
Prepared by: TC	Checked	Date NOV. '03
Project Director	M.F.GARRICK - CASTLEBAR	

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Drawing No. **2044-1017**

Revision -

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