
ESB NETWORKS

**20KV GRID CONNECTION TO CONNECT
DERREENACRINNIG WEST WIND FARM,
DRIMOLEAGUE, COUNTY CORK
TO THE NATIONAL GRID**

CONSTRUCTION METHOD STATEMENT (CMS)

OCTOBER 2021

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FARM, DRIMOLEAGUE, COUNTY CORK
TO THE NATIONAL GRID**

CONSTRUCTION METHOD STATEMENT

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1.0 INTRODUCTION

ESB is embarking on a development to remove the partially built Grid Connection and construction of a full length of a new grid connection to connect the consented Derreenacrinnig West Wind Farm (DWWF) to the existing Ballylickey substation in Co. Cork. The total length of the proposed grid connection is approximately 14.05km. The partially built grid connection (c.9.5km) (to be removed) is entirely of overhead line construction. The new grid connection will comprise 10.75km of new overhead line and c.3.3km of underground cable.

This CMS provides details of the intended construction practice for the development including hours of working, noise management measures and off-site disposal of construction/demolition waste – see Waste Management Plan attached as an Annex to this CMS.

ESB Networks (part of the ESB Group and referred to as ESNB) will be responsible for the construction, and subsequent operation of the grid connection. ESNB may use a contractor(s) from their approved framework to construct all or part(s) of the works.

The term “Contractor” in this document refers to ESB Networks as well as any contractor whom they may engage to carry out the works.

It should be noted that this plan is not exhaustive, and allowance will be made for the appointed Contractor to add additional measures that may be deemed necessary to develop the plan specific to their own working procedures. However, the key deliverables and requirements of this plan will be adhered to regardless of the selected contractor. Should the selected contractor wish to deviate from this plan, additional consultations with Cork County Council will be required.

This CMS should be read in conjunction with the Construction Environmental Management Plan (October 2021) and the four Management Plans attached to it.

1.1 OVERVIEW

This Construction Method Statement (CMS) report is structured to set out the construction procedures and methods required to allow the project to be developed in an environmentally sustainable manner. This CMS must be read as the requirements of the expected standard, without prejudice to the compliance with both legislation and other contractual obligations. It is also understood that all design and construction works are undertaken in accordance with their obligations outlined within the Safety, Health and Welfare at Work (Construction) Regulations 2013, as amended.

2.0 CONSTRUCTION METHODOLOGY AND PROGRAMME

2.1 OVERVIEW

The outline construction methodology is discussed under the following headings:

- Construction Method – Removal of Existing Overhead Cable
- Construction Method
- Cable Ducting / Grid Connection
- Expected Duration of the Works
- Working Hours
- Noise Management
- Ecological Management
- Handling and Disposal of Waste Material

2.2 CONSTRUCTION METHOD

This section details the specific construction methodologies to be employed during the construction of each infrastructure element. This CMS must be read as the requirements of the expected standard, without prejudice to the compliance with both legislation and other contractual obligations. It is also understood that all design and construction works are undertaken in accordance with their obligations outlined within the Safety, Health and Welfare at Work (Construction) Regulations, 2013, as amended.

The provisions made in this CMS relating to design elements of individual work items will vary subject to the detailed design, work methods employed, scheduling and available plant/resources of appointed contractor. The CMS will form part of the package of additional information included with contract documents and the contractor must adhere to the provisions made within this outline CMS.

Prior to construction works commencing on site, the Construction Method Statement will be updated to take into consideration any specific planning conditions. The Contractor's detailed plan will conform to the requirements of this plan and be reviewed by the Employer and the Employer's Representative.

Any deviation from the methodologies outlined in this CMS will first be highlighted to Cork County Council and approval will be sought for each deviation.

2.3 CONSTRUCTION SEQUENCE

The outline construction period and the Contractor's proposed sequence of works will take due cognisance of the requirements of the stipulated Planning Conditions and by the Contractors Contractual obligations.

2.3.1 Phasing of Works

Prior to the commencement of construction, the contractor will prepare day to day method statements and work programmes that outline a detailed phasing of works. Due to the nature of the development, it is likely that a number of construction crews will be working along the route at any one time. These crews will be suitably spread across the route to ensure that cumulative traffic related impacts are not experienced by local residents, landowners or businesses. ESB Network's Project Manager will ensure that the phasing of work is undertaken in accordance with the prepared method statements and in accordance with a detailed works programme.

2.3.2 Working Hours

The working hours for the construction and installation of the transmission will typically be between 08.00 and 20.00 Monday to Friday and 08.00 and 13.00 on Saturdays. No works will be undertaken on Sundays or Bank Holidays, except where emergency environmental or safety remedial works are required. Any works which may be required outside of these hours will require the prior approval of the Local Authority.

2.3.3 Site Management Procedures and Methodologies

The contractor will be required to prepare targeted method statements for proposed activities on site which demonstrate how the management requirements set out in this CEMP are to be achieved on site. The following sections outline the construction activities which are proposed during the construction of the proposed grid connection.

2.3.4 Removal of As Constructed 20kV Line

The removal of the as constructed sections of the 20kV overhead line will be carried out in accordance with ESB Networks Overhead Line Poling Standards. This will require the overhead line electrical conductor to be removed in advance of all wood pole structures and associated equipment being removed.

Removal of overhead line electrical conductor

In advance of the removal of the wood poles, the strung sections of electrical conductor will be removed along the entire as-constructed overhead line route. This work will involve

- Disconnection of conductor from all wood pole structures, This is carried out in sections, typically between angle/strain points of the overhead line.
- The conductor is mechanically coiled/rolled onto drums and removed from site for appropriate reuse or disposal. This equipment will be brought to site on vehicle drawn trailer.

Additionally, all cables, earth wires, stay wires shall be completely removed from all poles to be removed. This equipment will be either removed from site by ESBN for appropriate disposal or reused as part of the proposed new grid connection.

Removal of Wooden Poles along entire as constructed line route

The age and condition of the pole will influence the method chosen to retire it. Poles shall never be pulled directly out of the ground – prior excavation of the pole foundation shall always be carried out.

Prior to any works being undertaken, the following will be carried out:

- Arrangements in relation to access, temporary fencing, security of livestock etc. will be discussed with landowners are implemented in advance of works.
- Pollution control measures will be implemented.
- Traffic management measures to be implemented whenever any poling works are likely to interfere with traffic or pedestrians.
- A controlled entry zone will be established.

Approved Methods of Wood Pole retirement are as follows:

1. 360° Tracked Excavator with Approved Split Bucket or 180° Rubber Tyre Excavator with Approved Pole Erector Grab, loosening the soil and lifting the pole. This method is not suitable if the pole to be retired has been assessed as seriously defective by ESBN.
2. 360° or 180° Excavator; Controlled Push Down Method.

Excavator Controlled Push Down Method

- Dig a trench in the direction of the push down 150mm from pole and 1000mm deep, with a taper back towards digger.
- For the push-down: Set up excavator 90° degrees to trench a minimum of 4m back from pole. Under the guidance of the PICP the machine operator positions the back actor between 1m and 1.5m high beside the pole on the opposite side of the trench.
- With the machine in position: Switch off excavator, Person in Charge of Poling (PICP) to choke a 2m (2000kg) sling around pole, and Attach to the eye at the end of the excavator arm via a 2000kg shackle.
- All personnel to move outside of the extended Controlled Entry Zone (CEZ).
- On the instruction of the PICP when the area is clear: The machine operator will take slack in the sling, and Push against the pole in a slow and smooth action, until the pole is lowered safely to the ground.

When the pole is on the ground, it will be removed from site if required or reused as part of the proposed new grid connection.

ESBN will supervise and photograph/ record the removal of the entire overhead line and poles.

It is ESB standard policy to make good any ground damaged during poling activities in partnership with the associated landowners.

2.3.5 Overhead line

The proposed OHL will traverse private lands for c. 10.8km with the OHL crossing over predominantly agricultural lands but also a number of public roads, watercourses and rivers. The OHL will require the erection of 157 no. wooden pole-sets (12-16m) along the proposed route from which the electricity line will be suspended. The proposed OHL will require 3 No. separate cables being suspended from the poles.

Pole and line installation works will be standard for a 20kV ESB overhead line:

- Arrangements in relation to access, temporary fencing, security of livestock etc. will be discussed with landowners are implemented in advance of works.
- Pollution control measures will be implemented.
- Traffic management measures to be implemented whenever any poling works are likely to interfere with traffic or pedestrians.
- A controlled entry zone will be established.
- Where possible, existing poles that have been removed previously will be utilised in the construction and erection of the proposed new grid connection provided their conditions enable their reuse from a technical/structural aspect.
- If required, Poles are carried from adjacent roadways to each erection site and placed into an excavated hole using a wheeled or tracked excavator fitted with a pole grab attachment.
- The pole hole is manually backfilled and tamped down to a minimum depth of 1.0m until the backfill is capable of supporting the pole; the excavator then continues the backfilling and tamping
- Where rock is encountered, the pole hole is formed using a hydraulic rock-breaker attachment mounted on the excavator.
- Where the line changes direction and at pole set locations with poor ground conditions, stay wires will be required. These wires are supported by means of stay blocks, which are made of wooden sleepers and are buried underground.
- Stringing of the conductor involves pulling out polypropylene rope along the route by hand, attaching the conductors and then pulling into position with stringing machine.

2.3.6 Underground Line

Six discrete sections of underground ducted line occur (total length 3.297km) along the proposed grid connection route including:

- Approximately 116 metres of Grid Connection at Derreenacrinnig West within the wind farm site
- 1,156 metres within the carriageway of the road at Glanareagh and Barnagowlane West Townlands
- 111 metres in Ards Beg and Gortnacowly Townlands.
- Approximately 629 metres of underground cable in Ballylickey and Dromloughlin townlands
- Approximately 1,081 metres of the grid connection route will be ducted along the verge of the existing local road at Shandrum More and Shandrum Beg Townlands
- 204 metres of underground cables from Ballylicky Substation

The 20kV underground power cable construction type is 20kV XLPe cable to be ducted according to ESB Networks 'Specification for the Installation of Ducts & Structures for Underground 10-20kV Power Cables & Communication Cable'. The 20kV power cable will be laid in a single 125mm diameter uPVC duct in a cable trench.

Cable ducts will be placed within a trench approximately 0.95m deep and 0.325m wide. All trenching works will be undertaken to ensure that only short sections of trench are open at any one time. Excavated materials (topsoil, subsoil) will be stored separately for use during the reinstatement of the trench or disposal to an appropriate licensed facility as necessary. The trench will then be reinstated with excavated materials. The proposed sequence of works is as follows:

- All trenching works shall be undertaken to ensure that only short sections (approximately 100m) are open at any one time.
- The locations of any existing services will be established.
- Traffic control measures will be implemented.
- Pollution control measures will be implemented in advance of any excavation works being undertaken.
- Excavate the trench to the required dimensions, approximately 0.95m deep and 0.325m wide.
- Lay in and compact a 250mm layer of leanmix concrete CBM4 around and above ducts; and place red marker strip above.
- Lay in and compact an additional 375mm of CBM4 lean mix concrete (in roads) or selected excavated material (in fields) and place a yellow marker warning tape above.
- Yellow warning tape to be 300mm below the finished surface. Place Clause 804 material (in roads) or selected excavated material (fields) to within 100mm of surface.
- Final surface reinstatement, dense bitumen macadam (in roads) or topsoil (in fields/verges)

Joint bays and communication bays will be provided approximately every 500 to 700m along the UGC route to facilitate the joining of electrical cables and fibre optic communications cables. These bays/chambers consist of precast concrete structures which will be set into an excavated area and surrounded by appropriate fill. The bays will be finished to below road level and reinstated in accordance with the Local Authority requirements. The communications bay will also include an access cover to facilitate access should it be required.



Figure 1 – Typical Trench Construction within roads

2.4 TRENCHING WORKS

2.4.1 Storage of materials

Equipment

None.

Materials:

Sand for duct bedding.

Clause 804 Material.

Coils of 125mm diameter polyethylene cable duct.

1 no. tracked dumper or tractor and trailer.

Method:

All equipment will be stored on or immediately adjacent to the trench location on the existing roadway.

2.4.2 Trench Operations

Equipment:

2-3 General Operatives.

1 Excavator Operator.

1 no. tracked excavator.

1 no. tracked dumper or tractor and trailer.

Materials:

Lean Mix Concrete for duct bedding/surround

Clause 804 Material.

Coils of 125mm diameter polyethylene ducting.

Dense bitumen macadam road surfacing

Method:

All existing underground services shall be identified on site prior to works advancing with the underground trenching.

A 100m section of trench will be opened at any one time. The second 100m will only be excavated once the majority of reinstatement has been completed on the first. The excavated trench will be approximately 325mm in width and approximately 950mm deep along the public roadway.

Trackway material within the temporary working area will be stripped and stockpiled adjacent to the excavation. Subsoil will be stockpiled separately.

Any earthen (sod) banks to be impacted will be carefully opened with the surface sods being stored separately and maintained during construction. Those earthen (sod) banks which do not require to be dismantled will be fenced off to protect them from construction traffic.

All ducting will be strung out, welded and tested prior to excavating the trench.

The pipeline trench will be excavated, and the material stockpiled onsite.

The excavated trench will be dewatered if required, from a sump installed within the low section of the opened trench.

The base of the excavated trench will be lined with lean mix concrete bedding.

The cable ducting will be placed into the prepared trench and inspected and backfilled with lean mix concrete gravel (Clause 804) and the excavated material.

Excavated material shall be employed to backfill the trench and any surplus material recovered and exported off site to a licenced tip.

Dense bitumen macadam will be applied to the top of the trench for ducts within public roads in line with Guidelines for Managing Openings in Public Roads, Department of Transport, Tourism and Sport, April 2017 (Purple Book).

2.4.3 Managing excess material from trench

Equipment:

2-3 General Operatives.

1 Excavator Operator.

1 no. excavator / JCB.

1 no. tracked dumper or tractor and trailer.

3 x Tipper trucks on rotation

Materials:

None.

Method:

It is anticipated that 31m³ of spoil will be excavated for each 100 metre section of duct in roadways. This spoil will be largely existing access road construction material and competent subsoil material. This material will be removed from site as it is being excavated and will be transported to a fully licensed landfill for disposal.

Stockpiles of backfill material will be restricted to less than 2m in height. Stockpiles will be located as far as possible from drainage ditches, mature trees, hedgerows, surface water drains and watercourses. Stockpiles will be used during the same day.

2.5 OVERHEAD POWER LINES

The proposed 20kV power line will be constructed using standard timber poles erected to ESB Specification. This style of construction is the standard type of construction used for 20kV single circuit line/cable in Ireland. **Figure 2** below shows the typical structure type to be used on this project.

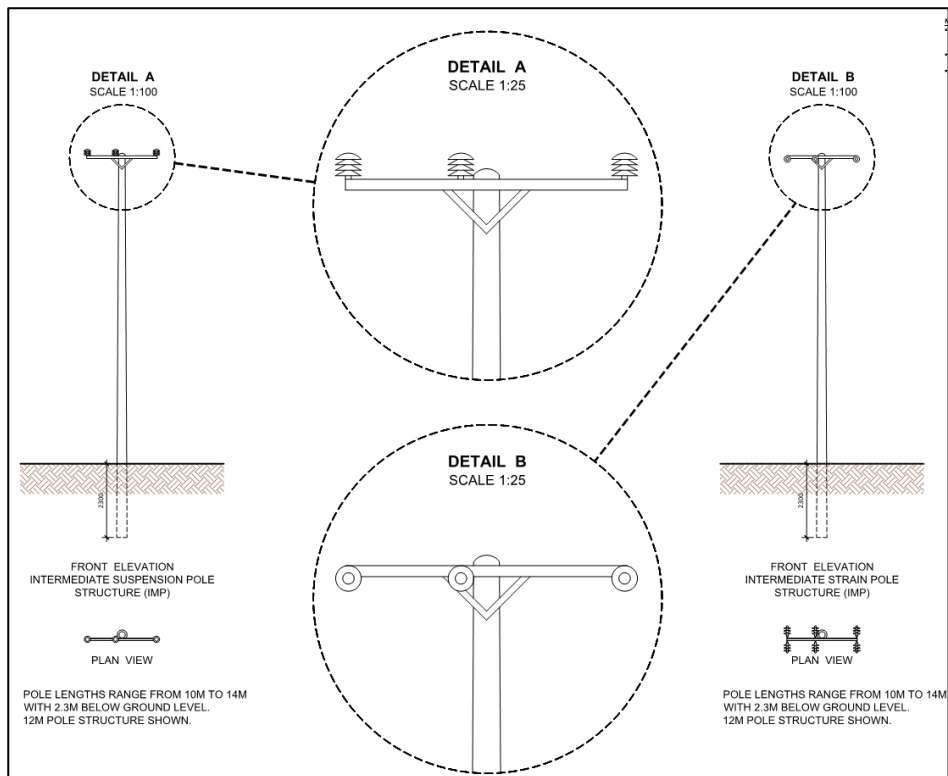


Figure 2 – Typical 20kV single circuit overhead power line



Figure 3 – Photograph of a Typical 20 kV Pole with Excavation

2.5.1 Access to start point and setting out

Equipment/Manpower:

2-3 General Operatives.

1 Excavator Operator.

1 no. tracked excavator.

Bog mats.

Materials

Timber Pegs for setting out.

Timber Poles / Stay Wires.

Method:

Access to the route of the overhead power line / site will employ the existing access gateways without the need to form new openings in boundary fence lines.

2.5.2 Installation of Poles.

Equipment/Manpower:

2-3 General Operatives.

2 Operators.

1 no. tracked excavator.

Bog mats.

1 no. telescopic wheel loader.

Materials

Timber Poles / Stay Wires.

Method:

Excavations are set out specifically for the type of pole and wire stay required for each specific site. It is anticipated that 2m³ of spoil will be excavated for each pole.

All excavated material shall be placed adjacent to the foundation with top soil stored separately for re-use. The backfill will be placed and compacted in layers. Following erection and backfill around the pole the site shall be reinstated to its original condition.

All poles shall be transported to site by the wheel loader / tracked excavator and set down adjacent to the point of erection, where the erection crew will fix the necessary overhead wire brackets, prior to erection of the pole.

Single pole erection will require minimum of 2 hours for erection and fixing of brackets.

2.5.3 Stringing of Overhead Wires.

Equipment/Manpower:

2-3 General Operatives.

2 Operators.

1 no. tracked excavator.

Bog mats.

2 no. teleporter.

4 x 4 vehicle.

2 no. drum stands.

2 no. Drum carriers.

Mobile aerial platform.

Materials

Stringing wheels.

Conductor drums.

Method

Stringing of overhead lines refers to the installation of phase conductors (lines) and earthwires on the supporting polesets. The conductor is kept clear of all obstacles along the straight by applying sufficient tension. This method requires the pulling of a pilot line (nylon rope) which is normally carried by hand into the stringing wheels. This in turn is used to pull a heavier pilot line (Steel rope) which is subsequently used to pull in the conductors from the drum stands using specifically designed “puller – tensioner” machines, see photograph below. The main advantages with this method are (a) the conductor is protected from surface damage and (b) major obstacles such as stream, road and rail crossings can be completed without the need for major disruption.



Figure 4 – Tensioner Machine

Once the conductor has been pulled into position, one end of the straight is terminated on the appropriate tension fittings and insulator assemblies. The free end of the straight is then placed in temporary clamps called “come-alongs” which take the conductor tension. The conductor is then cut from the puller-tensioner and the conductor is sagged using a chain hoist.

The duration of stringing works is expected to be 1 week. This figure is approximately the same for all straights regardless of length as the most time consuming aspect is the movement and setup of stringing equipment. Stringing crews are typically quite large and could have as many as 10 workers.

In summary, the tension machines are located at the end of the line, they will not be tracking across the site. The nylon cable will be installed by hand.

3.0 EXPECTED DURATION OF WORKS

The Construction of the grid connection works yet to be built is estimated to take 3 to 4 months. In advance of that detail work planning and Road Opening Licence application/processing will take 1-2 months.

4.0 WORKING HOURS

The working hours for the construction and installation of the grid connection will typically be between 08.00 and 20.00 Monday to Friday and 08.00 and 13.00 on Saturdays. No works will be undertaken on Sundays or Bank Holidays, except where emergency environmental or safety remedial works are required. Any works which may be required outside of these hours will require the prior approval of the Local Authority.

5.0 NOISE MANAGEMENT

5.1 GENERAL NOISE OCCURRENCE

5.1.1 BS 5228:2009-1 Code of Practice for Noise and Vibration Control on Construction and Open Sites

Part 1 of BS5228 deals with noise prediction and control. It recommends procedures for noise control in respect of construction operations. The standard stresses the importance of community relations, and states that early establishment and maintenance of the relations throughout the carrying out of Site

operations will go some way towards allaying people's concerns. Some of the more relevant factors that are likely to affect the acceptability of construction noise are:

- The attitude of local receptors to the Development
- Site location relevant to noise sensitive receptors
- Duration of Site operations
- Hours of work
- The characteristics of the noise produced.

Recommendations are made regarding the supervision, planning, preparation and execution of works, emphasising the need to consider noise at every stage of the activity. Measures to control noise are described including:

- Control of noise at source by, e.g.
- Substitution of plant or activities by less noisy ones
- Modification of plant or equipment by less noisy ones
- Using noise control enclosures
- Siting of equipment and its method of use
- Maintenance of equipment
- Controlling the spread of noise by increasing distance between plant and receptors, or by the provision of acoustic screening

5.1.2 NRA Guidelines for Construction Noise

The NRA guidelines for construction noise which are considered typically acceptable are given in **Table 5.1**.

Table 5.1: Noise levels that are typically acceptable based on the NRA guidelines

Day / Times	Guideline Limits
Monday to Friday 07:00 – 19:00hrs 19:00 – 22:00hrs	70dB LAeq, (1h) and LAmax 80dB *60dB LAeq, (1h) and LAmax 65dB*
Saturday 08:00 – 16:30hrs	65dB LAeq,1h and LAmax75dB
Sunday and Bank Holidays 08:00 – 16:00hrs	*60dB LAeq,1h and LAmax 65dB*

*Construction at these times, other than required by an emergency works, will normally require explicit permission from the relevant local authority.

5.1.3 Overall Noise Limits

Part 1 of BS 5228 provides several example criteria for the assessment of the significance of noise effects from construction activities. Noise levels generated by construction activities are considered significant if:

- The LAeq, period level of construction noise exceeds lower threshold values of 65 dB during daytime, 55 dB during evenings and weekends or 45 dB at night.
- The total noise level (pre-construction ambient noise plus construction noise) exceeds the pre-construction noise level by 5 dB or more for a period of one month or more.

Construction noise from trenching or poling for the grid Connection is not considered an intensive activity. The main noise sources will be associated with the excavation for trenches, joint bags and poles.

There are no national Guidelines for construction noise. However, limits for construction noise are generally set below 65 dB LAeq 1h with no Sunday operations. The noise from the construction activities will be kept well below the aforementioned targets.

5.1.4 Evaluation of Potential Effects

The potential impacts of construction are evaluated by comparing the predicted noise levels against the guideline limits given in **Table 5.1** and sample criteria in Part 1 of BS 5228.

5.2 ASSESSMENT OF POTENTIAL EFFECTS

5.2.1 Construction Noise

It is not possible to specify the precise noise levels of emissions from construction equipment until such time as a contractor is chosen and construction plant has been selected, however **Table 5.2** indicates typical construction related noise levels for this type of activity (levels BS 5228 and from the JOD's database).

Table 5.2: Typical noise levels from construction works

Activity	L _{Aeq} at 10m
Rock breaker	82-89 dBA
Large vibrating rollers and trucks loading and tipping material	76-86 dBA
Grid Connection- Trenching, Tracked excavator 14t, Pneumatic breaker Vibratory roller 71t	70-74 dBA
Rig HPU* (diesel), mud pump, diesel generator /tractor/dumper	70-87 dBA

* Hydraulic power unit (for horizontal drilling)

The difference in noise levels between two locations can be calculated as:

$$\begin{aligned} L_{p2} - L_{p1} &= 10 \log (R_2 / R_1)^2 - (A_{\text{atm}} + A_{\text{gr}} + A_{\text{br}} + A_{\text{mis}}) \\ &= 20 \log (R_2 / R_1) - (A_{\text{atm}} + A_{\text{gr}} + A_{\text{br}} + A_{\text{mis}}) \end{aligned}$$

where:

L_{p1} = sound pressure level at location 1

L_{p2} = sound pressure level at location 2

R_1 = distance from source to location 1

R_2 = distance from source to location 2

and where:

A_{atm} = Attenuation due to air absorption

A_{gr} = Attenuation due to ground absorption

A_{br} = Attenuation provided by a barrier

A_{mis} = Attenuation provided by miscellaneous other effects

In the calculation attenuation by A_{atm} , A_{gr} is assumed as 3dBA and A_{mis} is assumed as 0.

The construction of the proposed development will result in some localised noise emissions from construction plant and machinery. Due to the generally transient nature of the construction works, noise will only be experienced on a temporary basis.

5.3 NOISE AND VIBRATION - MITIGATION MEASURES

Mitigation by Avoidance

- Trench width and depth will be constructed to the minimum required i.e. 0.325m wide, 0.95m deep.
- No blasting will be carried out during construction. Heavy construction works such as excavation, rock breaking (if required), use of heavy machinery etc. will be carried out between 08:00 and 18:00 Monday to Friday and on Saturday between 08:00 and 13:00. Construction will not take place on Sundays or Bank Holidays.

Mitigation by Reduction

- Noise levels will be controlled in accordance with the principles of BS 5228:1984 Noise Control on Construction and Open Sites. Construction equipment will be maintained in accordance with the EC (Construction Plant and Equipment) (Permissible Noise Levels) Regulations 1988, SI 320 of 1988. Heavy equipment will be, where possible, enclosed, located away from sensitive sites and shut down when not in use.

6.0 ECOLOGICAL MANAGEMENT

Method statements have been prepared for works that will take place in ecologically sensitive areas. This method statements are attached as Management Plan 3 of the CEMP. All measures outlined in this Management Plan must be strictly adhered to. Any deviation must be approved by the ECow and Cork County Council.

A Water Quality and Inspection Management Plan (WQIMP) has been prepared for the consented development. It is attached as Management plan 2 of the CEMP. The WQIMP details the water monitoring required to verify the efficacy of pollution prevention and mitigation measures. The monitoring will be undertaken by a suitably qualified Environmental Manager, prior to, during and post completion of construction works.

7.0 HANDLING / DISPOSAL OF WASTE MATERIAL

Where excavated material cannot be used on site it will be taken to an appropriately Licensed waste facility as outlined in the Waste Management Plan (CEMP- Management Plan 4) which is annexed to the CEMP. The Waste Management Plan includes an inventory of projected waste volumes as well as the likely facilities for disposal of same.