EirGrid
Enforcement Notice
LAOIS KILKENNY
REINFORCEMENT PROJECT -
COOLNABACKY 400 kV SUBSTATION

September 2017

TOBIN CONSULTING ENGINEERS

TOBIN
Patrick J. Tobin & Co. Ltd.

Report to assess the impact of the unauthorized development on the Aquifer at Coolnabacky Construction site

PROJECT: **LAOIS KILKENNY REINFORCEMENT PROJECT - COOLNABACKY 400kV SUBSTATION**

CLIENT: **EirGrid Plc**

COMPANY: **TOBIN Consulting Engineers**
Block 10-4
Blanchardstown Corporate Park
Dublin 15

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DOCUMENT AMENDMENT RECORD

PROJECT NUMBER:10310				DOCUMENT REF: 10310-01			
A	Report	JD	220917	ST	220917	DG	220917
Revision	**Description & Rationale**	**Originated**	**Date**	**Checked**	**Date**	**Authorised**	**Date**
TOBIN Consulting Engineers							

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APPENDICIES

1 INTRODUCTION

EirGrid plc received an Enforcement notice dated the 31st July 2017 (Appendix A) in relation to unauthorized works carried out at the townland of Coolnabacky. The notice requirements are:

- *Cease the said development on receipt of this notice;*
- *Carry out the restoration works on site in accordance with the restoration plan dated 4th July 2017, which was received by the planning authority on the 4th July 2017, by 4pm on 8th September 2017; and*
- *Carry out a hydrological / hydrogeological report to assess the impact of the unauthorized development on the aquifer by a suitably qualified person and submit this report to the Planning authority by 4pm on 22nd September 2017.*

TOBIN Consulting Engineers have been engaged by EirGrid as experts in Hydrology and Hydrogeology to carry out the Hydrological / Hydrogeological study - the third requirement of the enforcement notice.

In advance of any restoration works taking place TOBIN Consulting Engineers reviewed the Environmental Impact Assessment (EIA) for the Laois Kilkenny Reinforcement Project submitted in August 2013, specifically Chapter 7 and 8. The restoration plan, dated 4th July, is included in Appendix B.

The report looks at the impact of the unauthorized works along with the impact of the restoration works on the aquifer. The objectives of this report are to provide an independent assessment of the impact of the unauthorized works on the aquifer.

2 PROJECT BACKGROUND

The substation site lies approximately 4 km south-southwest of the town of Stradbally and 2.5 km northeast of Timahoe village. The location of the substation is within an agricultural field. The access route is via an existing farm access lane. The field boundaries are separated by dry ditches and mature tree lines. The site is bordered by agricultural land in all other directions.

In February 2012, in advance of the planning submission for this site, detailed geotechnical and geo-environmental data was collected for this site as part of the Environmental Impact Assessment (EIA) process. Soil Mechanics (SM) was commissioned by ESB International (ESBI), on behalf of EirGrid, to carry out a ground investigation at Coolnabacky, County Laois.

The investigation was carried out to obtain geotechnical and geoenvironmental information for the proposed 400kV substation development. This information was used to complete the environmental assessment.

The planning application included an Environmental Report which was submitted in January 2013. Following a request for further information from An Bord Pleanála (ABP) an Environmental Impact Assessment was submitted in August 2013 and a subsequent oral hearing on the scheme was held in November 2013.

An Bord Pleanála granted permission for the scheme in April 2014 reference: PL11.VA0015.

The following statement was taken from page 7 of the ABP planning approval which highlights the assessment of the application.

Taking all of the above into account, and having regard to the nature, scale and location of the proposed development, and to the demonstrated need for the development, it is considered that, subject to compliance with the conditions set out below, the proposed development:

- *would be in accordance with national policies and guidance, and with regional and local development policies,*
- *would represent a benefit for this region by virtue of the enhancement of electricity supply,*
- *would not seriously injure the amenities of the area or of property of the area,*
- *would not seriously injure the ecology of the area, including bird life, protected species and habitats, and areas designated for environmental protection,*
- ***would not give rise to water pollution, and would not affect drinking water supplies,***
- ***would not adversely affect the hydrology or hydrogeology of the area,***
- ***would not give rise to risk of or exacerbation of flooding,***
- *would not be prejudicial to public health,*
- *would not detract from the character or setting of features of architectural or archaeological heritage, and would not seriously detract from the cultural heritage of the area,*
- *would be acceptable in terms of traffic safety and convenience, and*
- *would, therefore, be in accordance with the proper planning and sustainable development of the area.*

The elements relative to this assessment are highlighted in bold.

The unauthorized works commenced on the Coolnabacky site, in April 2017, prior to the discharging of planning conditions. When the situation came to the attention of EirGrid, all works were ceased and no further works would take place until the planning conditions have been discharged.

Following consultation with Laois County Council at a meeting held on the 30th June 2017 it was agreed to remove the works already undertaken at the drain crossing and tower location shown on Figure 2-1 and the enforcement notice dated 31st July 2017 was issued based on that understanding.

2.1 WHAT IS AN AQUIFER?

Aquifers are quaternary deposits or rocks that contain sufficient void spaces and which are permeable enough to allow water to flow through them in significant quantities. The potential of rock to store and transport water is governed by permeability of which there are two types, intergranular and fissure permeability.

Intergranular permeability is found in sediments, sands, gravels and clays and fissure permeability is found in bedrock, where water moves through (and is stored in) cracks, fissures, planes and solution openings.

Based on the desk study information a Regionally Important Karstified (diffuse) bedrock Aquifer and a Locally Important Sand/Gravel Aquifer underlie the proposed substation. The bedrock aquifer is classified as a Regionally Important Aquifer (Rkd); referring to the Ballyadams Formation.

Gravel deposits are also present in the area which will also act as an aquifer when sufficiently thick, permeable, saturated and extensive. The proposed substation is mapped on the boundary of Timahoe-Stradbally Locally Important Gravel Aquifer however as detailed below in section 2.6 of this report and the EIA, no significant saturated sand and gravel deposit was encountered in the vicinity of the substation site.

2.2 HOW DOES AN AQUIFER WORK?

In general terms it would be expected that the groundwater gradient would follow the topographic variation in an area. Flow paths and distance is dependent on the characteristics of the aquifer type. Most groundwater flow is confined to the upper 10m of weathered bedrock (if present) and gravel aquifers and will discharge to the nearest watercourse. The nearest large river is the Timahoe river, approximately 600m to the south east of the site shown on Figure 2-1. The groundwater flow direction is assumed to also be to the south east.

2.3 SITE TOPOGRAPHY AND SURFACE HYDROLOGY

The substation footprint lies between 100 and 120 metres above ordnance datum (AOD) on gently undulating land as shown on Figure 2-1. Low esker ridges (sand & gravel) form the higher ground. One such esker runs north-south, 250m southeast of the granted Coolnabacky

Substation. Further to the east lies an extensive alluvial flat, drained by a number of deep drains. A dry drain is located to the west of the substation location.

To the south, a number of deep drainage ditches drain to the Timahoe River. While these drains were dry during the site visit in July 2017, a high water table is likely due to the presence of Reed Canary Grass and other semi aquatic vegetation at the base of the drain.

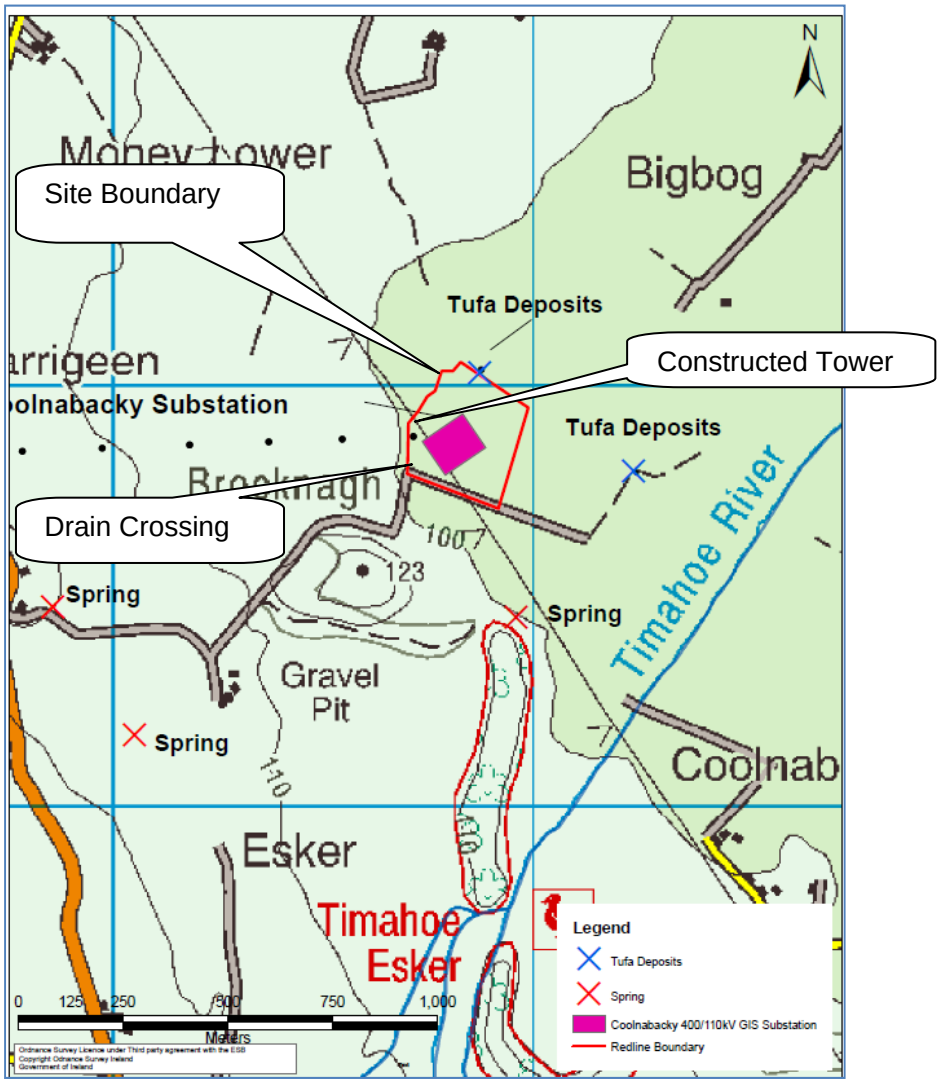


Figure 2-1 Site Outline with nearest surface water features

The area lies at the headwaters of the Timahoe River as shown on Figure 2-1. The topographical gradient at the substation site is relatively flat with a slope ratio of less than 1/50. The area is underlain by a variety of soils. The alluvial flat is underlain by alluvial soil, much of which is characterised by a high water table. The land above and alongside the Timahoe Esker has very well-drained soils. To the south of the substation a former quarry has been reinstated and is currently in agricultural use. The glacial tills at the foot of the Castlecomer Plateau have given rise to well-drained soils. Tufa deposits are present on the site boundary but these are over 100m from the substation footprint, a significant distance outside the recommended 25m buffer stated in the EIA.

2.4 SITE GEOLOGY

The bedrock geology of the area comprises Upper Carboniferous limestone bedrock. The bedrock is summarised below (from McConnell, 1994).

Ballyadams Limestone Formation

This formation consists mainly of medium to dark-grey thick-bedded to massive shelf limestones. The upper part of the formation tends to be cyclic, dark, rather argillaceous thin bedded limestones passing up into massive pale grey limestones which are capped by small scale karstic features (McConnell, 1994). The area lies at the northern end of the Castlecomer Plateau, an elevated syncline (v-shaped fold). The bedrock succession dips southwards at low to moderate angles.

2.5 SITE SUBSOIL GEOLOGY

The subsoils of the area consist of esker sands and gravels, limestone sands and gravels, tills and alluvium.

At the substation, excavated material was stored along the western boundary. The material is consistent with the borehole logs previously completed at the site. The subsoil material comprises limestone till with occasional lenses of sand. The till is predominantly comprised of firm to stiff, grey slightly sandy slightly gravelly clay. No bedrock was encountered in any boreholes completed on site. The deepest borehole at that time extended to 8.5 metres below ground level (see BH 4 in Fig 2-2). No bedrock outcrop is recorded at the site and no exposures were encountered in trial pits, borehole or in adjacent drainage ditches.

Timahoe Sands and Gravels

The Timahoe esker is a prominent feature in the area, traversing a sinuous course from east to west. Much of the deposit has been removed by gravel working. The deposits consist of clean, well sorted sands and gravels. To the south of the substation is a former sand and gravel quarry that has been reinstated and is currently in agricultural use. The site is mapped as lying within the Timahoe gravel – a Locally Important Gravel Aquifer.

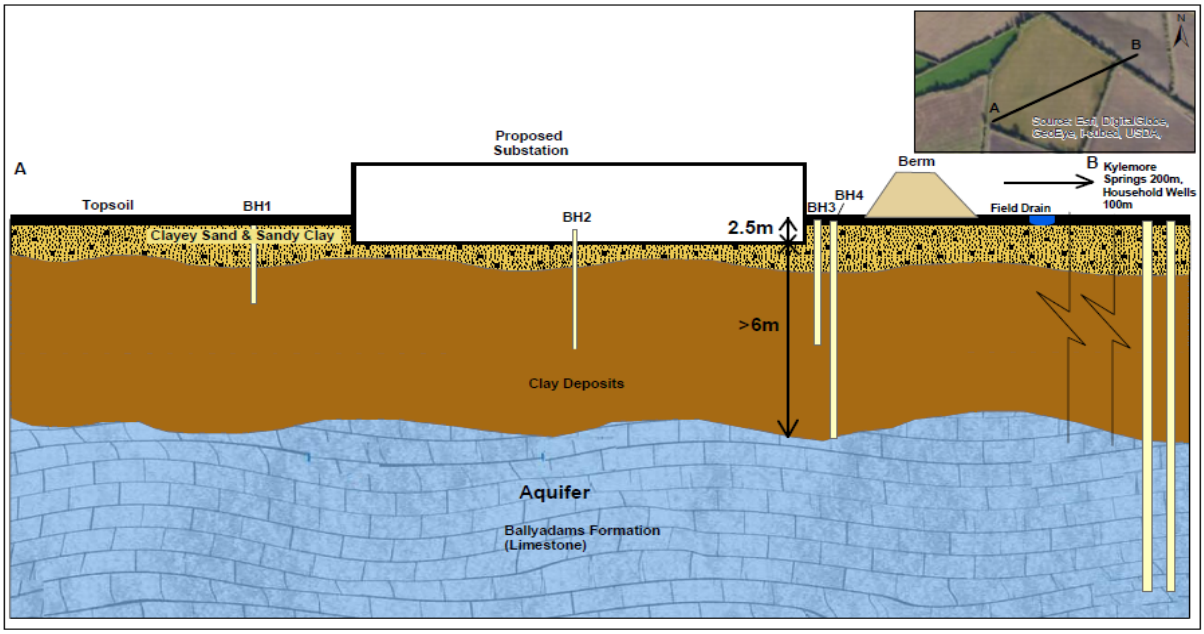


Figure 2-2 Proposed Layout - Conceptual Site Model

2.6 HYDROGEOLOGY

Groundwater can be defined as water that is stored in, or moves through, pores and cracks in sub-soils or bedrock. Aquifers are quaternary deposits or rocks that contain sufficient void spaces and which are permeable enough to allow water to flow through them in significant quantities. The potential of rock to store and transport water is governed by permeability of which there are two types, intergranular and fissure permeability. Intergranular permeability is found in sediments, sands, gravels and clays and fissure permeability is found in bedrock, where water moves through (and is stored in) cracks, fissures, planes and solution openings.

TOBIN Consulting Engineers note the edge of the Timahoe-Stradbally Gravel Aquifer is mapped as underlying the site based on desk study information provided. During 2012 site specific ground investigation works stiff to very stiff clay was encountered at all locations between 2.8 m and 7.6 m below ground level. This stiff clay will impede any vertical groundwater flow to the bedrock aquifer.

2.7 GROUNDWATER PROTECTION ZONES

There is no groundwater source protection zone (SPZ) at the site. The nearest mapped source protection zone is >2km to east, i.e. Kyle Spring SPZ. There is no connectivity between the site and Kyle Spring as delineated by the Kyle Spring SPZ.

3 WORKS COMPLETED

3.1 UNAUTHORIZED WORKS

Following a desktop review of the EIA documentation and the planning report a site visit took place in July 2017. A partially constructed tower and completed foundation pads were in place at one tower location as shown in Photograph 1. Along with this a number of tower sections and pole sets were stored in the field and there was no ground foundation works associated with these tower sections (Photograph 2). A dry drain crossing was created to facilitate the access to site (Photograph 3). No further works were visible within the site.

Photograph 1 Tower foundation following unauthorized works.

Photograph 2 Materials retained on site following unauthorized works.

Photograph 3 Dry drain crossing following unauthorized works.

3.2 RESTORATION WORKS

Restoration works were undertaken between the 23rd August 2017 and the 5th September 2017. Restoration works included:

- Dismantling the partially erected tower and digging out of the associated bases
- Transportation of all materials from the site
- Removal of stoned access created over drain
- Make good all disturbed lands
- Allow local hedgerows removal to naturally regenerate

A pre mobilisation meeting on the 9th August 2017 was attended by TOBIN Consulting Engineers to discuss the proposed works. Following this meeting the contractor Reach Active provided a method statement (Appendix C) for review and subsequent approval by TOBIN Consulting Engineers prior to works starting.

This method statement was reviewed against the proposed mitigation within the EIA to ensure compliance with the EIA requirements.

The removal of a single tower required minimal disturbance to ground. The proposed restoration works posed little risk of sediment loss on a level site with no streams within 100m. TOBIN Consulting Engineers confirmed, based on ground conditions and the detailed mitigation measures outlined in the EIA, there was no requirement for the use of silt traps as a part of these restoration works. This was due to the large distance (>100m) to any stream, negligible gradient on site and limited excavation works.

The restoration works were undertaken in accordance with the Method Statements from Reach Active and were supervised by TOBIN Consulting Engineers staff, John Dillon PGeo and Monika Kabza PGeo.

John Dillon has 14 years' experience in providing project management, project co-ordination and specialist contribution to hydrogeology, hydrology and geology reports for planning applications, environmental impact statements and waste licence applications. His experience also includes groundwater resource exploration and development, groundwater vulnerability, groundwater protection assessment, design and management of site investigation/remediation programmes, contaminated land site investigation, water quality monitoring and hydrogeology.

Monika Kabza has 10 years' experience in hydrology and hydrogeology, her background includes the completing the National Vulnerability Mapping and delineating the Zone of Contribution for Group Water Schemes. Their CV's are attached (Appendix D).

A site welfare compound was located in the adjoining farmyard, away from the restoration works. Welfare facilities were provided and used by all site staff. Any effluent generated by temporary onsite sanitary facilities was taken off-site for appropriate treatment. Site vehicles and equipment were refuelled in a designated area at the site compound. All equipment was in good working order during the works. Spill kits and hydrocarbon absorbent packs were available for use. These measures were consistent with the mitigation measures detailed in section 8.5 of the EIA.

When the work started the foundation caps, as shown in Photograph 4, were removed. This allowed the tower steelwork to be disassembled. Once the steelwork sections were removed the topsoil and subsoil surrounding each tower leg was excavated to approximately 2 m depth. This enabled the concrete to be broken down using a rock breaker. This is shown in Photographs 5 - 7 where concrete is broken into manageable sized pieces for removal.

When all the concrete for that leg was removed using an excavator this was stored separately for removal. The stored subsoil and topsoil was used to reinstate the area where the foundation was removed. Photograph 8 shows the stored topsoil and Photograph 9 shows the subsoil being used for reinstatement. This process was completed for the remaining three tower legs and the area following restoration is shown in Photograph 10.

All the concrete was removed from site and environmentally disposed of using a licensed contractor, AES based in Kyletalesha, Portlaoise, County Laois.

All overhead line materials that were stored on the site were removed to the ESB Networks compound. Following the completion of the site works the drain crossing was removed and restored as shown in Photograph 11. A number of Photographs are included below of the restoration works undertaken by Reach Active.

Photograph 4 Tower legs pre-removal.

Photograph 5 Tower leg removal.

Photograph 6 Tower leg removal.

Photograph 7 Tower leg removal.

Photograph 8 Stored topsoil to be reinstated.

Photograph 9 Tower leg reinstatement with subsoil.

Photograph 10 Site location following restoration works.

Photograph 11 Reinstated Drain and Dry Bank following removal of drain crossing.

4 ASSESSMENT OF IMPACT ON AQUIFER

Below is a summary of the impact assessment of the unauthorised works and the restoration works undertaken to comply with enforcement notice from Laois County Council.

4.1 ASSESSMENT OF UNAUTHORISED WORKS

A partially constructed tower and completed foundation pads were in place at one tower location (See Photograph 1). Material stored on site comprised raw materials including steelwork is shown in Photograph 2. The dry drainage ditch crossing and site access are shown in Photograph 3. Based on site walkover no changes to the overall site topography or runoff patterns occur as a result of the dry drain installation. No impermeable surfaces were constructed for the site access. There was no evidence of siltation of the nearby drains occurring as a result of the unauthorized works. Natural stones and soil were stored in a neat stockpile on site and partially revegetated. Areas identified as tower bases for the remaining towers on site were left indistinguishable from the adjoining areas.

Based on the initial site walkover in July 2017 and an inspection of the nearest potential receptors there was no identifiable hydrological or hydrogeological impact as a result the works completed up to that point.

4.2 ASSESSMENT OF RESTORATION WORKS

Restoration works were initiated by Reach Active following completion of the relevant Health and Safety requirements for the site. The excavation works were supervised by TOBIN Consulting Engineers staff as detailed in Section 3.2 above. The Photographs 5 to 8 illustrate the dry conditions encountered on site and also highlight the presence of glacial till material encountered underlying the site. As can be seen in Figures 5 to 8 the dry conditions on site did not require any additional measures such as groundwater pumping.

No significant sand and gravel deposits were encountered. Minor groundwater seeps were encountered in two of four tower leg excavations, however no accumulation of groundwater occurred in the excavations. The minor seep is consistent with ground conditions detailed in the EIA provided to TOBIN Consulting Engineers. The material encountered, as shown in Photographs 5 to 9, was consistent with the descriptions provided to TOBIN Consulting Engineers from the original ground investigation data by Soil Mechanics. Photographs 10 and 11 demonstrate the site condition of the tower base and drainage ditch following completion of the works.

The Contractor Reach Active fully adhered to the method statement and completed daily risk assessments on the site. These restoration works were completed by the same contractor as the unauthorized works. The contractor showed a high level expertise and professionalism during the restoration works.

No contamination of the existing drains occurred. All the materials that have previously been stored on site were removed with no impact on the Hydrology / Hydrogeology of the site. All mitigation measures detailed in section 8.5 of the EIA and relevant to the restoration works were implemented including the provision of welfare facilities, provision of spill kits etc.

Following the completion of the restoration works TOBIN Consulting Engineers can confirm that given the absence of a source of contamination and the depth of low permeability subsoil, no feasible source-pathway-receptor exists on site to the Regionally Important Aquifer (Rkd); referring to the Ballyadams Formation. All three elements (source, pathway and receptor) are required to present a potential impact to the receptor(s).

No saturated gravels were encountered on site and therefore there was no impact on the Timahoe - Stradbally Locally Important Gravel Aquifer, a result of this development.

5 CONCLUSION

All restoration works were completed by the 5th September 2017. TOBIN Consulting Engineers supervised the restoration works and the contractor fully adhered to the method statement in terms of Hydrology and Hydrogeology.

The unauthorized development and restoration works were assessed by the Hydrologist / Hydrogeologist and the conclusion is that the works:

- Did not adversely affect the hydrology or hydrogeology of the area;
- Did not give rise to water pollution, and did not affect drinking water supplies; and
- Did not give rise to risk of or exacerbation of flooding.

The original assessment approved by An Bord Pleanála considered the overall scheme with a more significant impact and concluded there would be no adverse impact on the Hydrology / Hydrogeology of the area. The above conclusion on a smaller area is consistent with the assessment made within the Environmental Impact Assessment that formed part of the planning approval for the overall substation proposal.

It is concluded the unauthorized works and subsequent restoration works did not have an adverse impact on the aquifers.

Appendix A

Rcv'd 0 1 AUG 2017

→ RM°C / TF / JF

REGISTERED POST

PLANNING AND DEVELOPMENT ACTS 2000 - 2016
(SECTION 154)
ENFORCEMENT NOTICE
(UNAUTHORISED DEVELOPMENT)

Enforcement notice served on: **UD17/33**

Fintan Slye, Director, EirGrid Public Limited Company, The Oval, 160 Shelbourne Road, Ballsbridge, Dublin 4, D04 Y2Y4

Notice

Laois County Council, as local authority with responsibility for enforcement of the Planning and Development Act 2000 – 2016 in the County of Laois, hereby issues this Enforcement Notice to you pursuant to Section 153 and Section 154 of the Planning and Development Act 2000,as amended, in respect of unauthorised development carried on by you at the townland of Coolnabacky, in the barony of Cullenagh, and County of Laois and postal address of Coolnabacky, Timahoe, Co. Laois, more particularly identified in the map annexed to this notice and outlined with a red line. The lands in question are referred to below as "the lands".

or

You are a director of the body corporate responsible for carrying out unauthorised development on them.

Nature of Unauthorised Development

The unauthorised development consists of

Unauthorised site development works in non compliance with conditions of Strategic Infrastructure Development Ref 11.VA0015.

This development is unauthorised because:

* The carrying on of this development on the lands is not exempted development and is unauthorised development comprising unauthorised works.
* The carrying out of development which is the subject of a permission granted under either under Section 34 or 37 of the Planning and Development Act 2000, as amended, or under Part IV of the Local Government (Planning and Development) Act 1963 in non-compliance with a condition to which that permission is subject is unauthorised works and amounts to unauthorised development as defined in section 2 of the Planning and Development Act 2000, as amended.
* The development commenced on or after 1 October 1964.

Requirements

Pursuant to Section 154(5)(a) and (b) of the Planning and Development Act 2000, as amended:

You are hereby required to:

- Cease the said development on receipt of this notice.
- Carry out the restoration works on site in accordance with the restoration plan dated 4th July 2017, which was received by the Planning Authority on 4th July 2017, by 4pm on 8th September 2017.
- Carry out a hydrological/hydrogeoloical report to assess the impact of the unauthorized development on the aquifer by a suitably qualified person and submit this report to the Planning authority by 4pm on 22nd September 2017.

Warning

Pursuant to Section 154(5)(c) and (e) of the Planning and Development Act 2000, as amended:

Please note that, unless you take the steps specified above within the time stated (or such extended period not exceeding six months as the Council may expressly allow):

1. You may be guilty of an offence; and
2. The Council may enter on the land and take such steps, including the removal, demolition, or alteration of any structure, and may recover any expenses reasonably incurred by it in that behalf.

Costs

Pursuant to Section 154(5)(d) of the Planning and Development Act 2000, as amended:

You are hereby required to refund to the Council the sum of €1,200, being the costs and expenses reasonably incurred by it in relation to the detection and issue of this Enforcement Notice and Warning Letter dated 30/05/2017. This sum includes costs incurred in respect of the remuneration and other expenses of employees, consultants and advisers.

Signed on behalf of Laois County Council:

ANGELA MCEVOY
SENIOR PLANNER
PLANNING

Dated: 31st **JULY 2017**

Note: Extract from OS Sheet 4001 & 4060

Location of UD 17/33
within the area outlined in red

N

FF

SS

CE

UND

Brocknagh

Quarry

Timahoe River

Laois County Council
Comhairle Chontae Laoise

Kieran Kehoe,
Director of Services, Planning

County Hall
Portlaoise,
Phone (057) 8664000

Planning Enforcement

Unauthorised Development

Location:
Unauthorised development at
Coolnaback, Timahoe, Co. Laois.

Drawn: Y.O'Reilly., Exe. Tech.	Original scale: 1:5000	Drawing No: 17/33-01
Checked:	Date: 26/07/2017	UD 17/33

Appendix B

FAO: Michael Callan,

Assistant Staff Officer,
Planning Enforcement,
Laois County Council,
Áras an Chontae,
Portlaoise,
Co. Laois.

www.eirgrid.com
The Oval, 160 Shelbourne Road
Ballsbridge, Dublin D04 FW28, Ireland
Telephone +353 1 677 1700
Email info@eirgrid.com

4th July 2017.

Re: Unauthorised Development at Coolnabacca, Co. Laois.

Ref. U.D. 17/33

Proposal to restore the lands at Coolnabacca to their original condition.

Dear Michael,

EirGrid acknowledges receipt of the Letter from Laois County Council, dated 21st June 2017 requesting a proposal to restore the lands to their original condition.

Our proposal in respect of same is set out below. In order to restore the lands EirGrid propose to undertake the following works:

- Dismantling the partially erected tower and digging out of the associated bases
- Transportation of all materials from the site
- Removal of stoned access created over drain
- Make good all disturbed lands
- Allow local hedgerows removal to naturally regenerate

The following plant would be required to undertake these works:

- Lorries
- Excavators
- Rock breaker
- Dumper
- Associated site facilities

The timeframe to undertake these works would be five weeks, which includes the time for mobilization of contractors.

We also note that such works set out in this proposal comprises development as defined under the Planning and Development Act, 2000 (as amended).

Yours sincerely,

Des Cox
Senior Planning Consultant,
EirGrid PLC.

Appendix C

Method Statement

Removal of 110kV Tower Foundations
Athy-Portlaoise Diversion

1. CONTENTS

Revision history

Rev	Date	By	Approval (ERA)	Reviewed (ESB)	Description of Modification
5	30.11.16	DF			Table of Contents Revision History Method for Placing Tower Base Tower Placement Check Sheet
6	23.03.17	MF			Risk Assessment review
7	30/03/17	DC			Update for Athy-Portlaoise 110kV Diversion.
8	04/08/17	JC			Update for Athy Portlaoise Remedial Works
9	19/ 08/2017	JC			Revised as per Eirgrid Request

2. PURPOSE

Health & safety method statements have proved to be an effective & practical management tool, especially for higher risk work. A health & safety method statement draws together the information compiled about the various hazards and the ways in which they are to be controlled for any particular job.

The health, safety, Environmental & welfare method statements takes into account the conclusions of assessments made under all the Safety, Health, Environmental and welfare legal obligations of the country ERA are operating in. Additional, site specific, personal risk assessments will be necessary. Account has been taken of the Company's health & safety organization, current legislation, codes of practice, training procedures & staff selection processes.

This is a generic document and the details described will apply under most circumstances, however conditions vary from site to site. Design & work planning and personal risk assessment should be used to identify and control the hazards at all stages during the job.

3. SCOPE

This Method Statement is prepared for the:

- Set up site (enclosure).
- Access Road.
- Scan dig area and prepare Permit to dig for crew.
- Break concrete and Excavate out the existing foundations to depth as required.
- Reinstate hole with existing backfill and topsoil
- Removal of drain crossing reinstatement of site

following completion of works

4. RISK ASSESSMENT

Excavations:

- All excavation work will be carried out in accordance with this method statement, ESBN procedures and in accordance with COP Avoiding Danger from Underground Services and A Guide to Safety in Excavations.
- ERA will issue excavation permits to the machine operators and copies of these permits will be kept in the cab of the machine carrying out the excavation.
- Prior to excavation work commencing, each area will be scanned for services along with consultation with ESB (Central Site), relevant Station personnel, Bord Gais, Eir and the local council.
- Excavations will be fenced off, signposted and protected if they are left unattended irrespective if the depth of the excavations.
- All areas must be scanned prior to excavation / clearance works and the scan log sheet will be filled out. All known services will be clearly marked and identified on site. Trial holes may need to be dug to determine exact location and depths of services.
- All services should be assumed live at all times.
- When working near live sewage gloves must be worn at all times and good hygiene practices to be carried out by all personnel.
- Pumps will be available, if required to keep the excavations free of water.
- Flooded trenches are to be drained as soon as possible and are to be fully inspected by a competent person, prior to work re-commencing.
- Areas that have been scanned and have a permit will be identified in the scan log sheet, and where there may be continuous excavation works required the area where the permit and scan has been carried out will be marked with a physical barrier.

- Properly secured stop blocks or a suitable alternative shall be used (when possible) where trucks or other plant are tipping into the excavation or when they are in close proximity to the excavation.
- Only hand digging is permitted within 0.5 m of known services.
- For all excavations, excavated spoil will be placed at a safe distance away from the open excavations, to avoid risk of danger to persons at ground level or at work below, and also to facilitate safeguarding of excavations if they remain open overnight. All unwanted spoil will be removed from the site to a licensed tip by a licensed hauler. Relevant permits will be stored in the health and safety file. Safe distances will be determined on site taking account of live apparatus, ground conditions, weather, soil types, and evidence of collapse or weakening of the side walls of the excavations, etc.
- If it will be required to leave any excavation open overnight, the excavation will be protected by the erection of suitable fencing and Danger/ Warning notices. Where excavation is taking place, the safety of ERA staff and all others must be fully catered for, including the provision of fencing and signage.
- Where excavation is taking place near, or in the vicinity of, existing structures, care will be taken to avoid damage to or subsidence of these foundations etc.
- There will be suitable access provided to all excavations.
- All excavations greater than 2 meters' depth that require personnel to access will be inspected with the results recorded on the AF3.
- Slinger/Signaler will assist with the directing and loading/offloading at all times.

Vehicular and Pedestrian Traffic:

- Access/ egress to the work sites will be signposted and all personnel coming on to site must sign in on the J.S.S.P daily. Signage will also be erected on the public road to warn the public of the presence of construction traffic in the area. Controls will be put in place on access/ egress routes within the work area to ensure pedestrian safety.
- Extreme care is required when exiting/ entering the sites at all times.

Additional Controls:

- GA1 Cert available for Excavators, Site Dumpers
- GA2 forms to be completed for all of the above.
- CSCS trained staff for Slinger/Signaler, Excavator / Dumper drivers and for locating Underground Services.
- Clean as you go system in place. Regular housekeeping will be conducted to reduce trip hazards. The works area will be maintained at all times to achieve a safe place of work.
- Workers must be aware at all times of site restrictions and close proximity of Overhead lines and the presence of a large number of heavy plant working on site.
- Note in this case Height Restrictor at 4.7m will be required on the excavator for works below the 110kv line
- All vehicles, plant and machinery to have flashing beacons and rear mounted cameras as required.
- When operating machinery mobile phones are not to be used.
- On site speed limit of 10 Km/h to be obeyed at all times.
- Manual handling of items should be kept to a minimum.
- All employees will have manual handling training
- Mechanical handling equipment shall be used, where possible
- Slinger/Signaler will assist with the directing and loading/offloading at all times.
- Barriers and signage will be checked regularly by the site supervisor
- Drains should be inspected on a daily basis

Personal Protective Equipment Required

- Safety Boots with ankle protection
- Safety Helmets and chin straps.
- High Visibility Vests.
- Gloves.
- Safety Glasses
- Ear defenders for Sheet Piling/Rock Breaking

5. Health and Safety Instructions for Persons involved with the Work

- Conduct work in compliance with this work method statement.
- Comply with site safety rules as indicated during induction
- Comply with requirements of permit system
- Obey all instructions from PSCS and ESB Staff

6. Inspection and Maintenance

All safety critical equipment will be inspected immediately prior to use. Complex equipment is allocated a unique number and is maintained by qualified technicians at least in line with manufacturers' recommendations.

Lifting equipment is formally inspected and marked every six months, and weekly by the user GA2. Electrical equipment is formally inspected marked every twelve months. Formal defect reporting systems are in place. Maintenance and inspection details are recorded and kept.

7. Training

- Induction Training by PSCS
- Tool Box Talk on contents of Method Statement by ERA management
- Manual Handling Training
- FAS Safe Pass Training
- CSCS Slinger / Signaler
- CSCS Track Machine Operator
- CSCS Dumper Operator
- Certification for all slings, chains and lifting appliances within site safety file
- Abrasive wheel training as required
- First Aid Training

8. Communication and Information

Before planned work takes place, a briefing pack of information will be collated. The contents of this pack will be discussed with those carrying out the work. The briefing pack will be available at the point of work and may contain;

Completed JSSP	Appropriate plans, drawings and sketches
Manufacturers operating instructions	The work instruction
Information relating to any safety documents relevant to the job (i.e. PTW etc.)	Other information which may assist in reducing on site risks (i.e. Jumper configuration sheet & Polarity check sheet)

Certain tasks require that all those doing the work agree clear communication systems before work starts. Special consideration should be given to the nature of the work and the environment (e.g. noise, poor visibility, intricacy of the work etc.). Mobile phones or 2 way radios are supplied.

9. STEP BY STEP SEQUENCE INVOLVED IN DOING WORK

Site Set-up (enclosure):

- All persons will have attended an onsite induction prior to entering the site and this method statement(s) will be communicated to and signed off by all personnel engaged in the works.
- A daily JSSP will be completed and signed by all site visitors
- A suitable site entrance will be established with cones and signage erected on the roadside.
- Parking areas will be identified close to the work zone to allow safe loading and unloading of plant, materials and employee movement.
- Site welfare facilities will be identified and arrangements made for their use by ERA staff.
- A site exclusion zone will be established. This zone should be large enough to accommodate all activities associated with the civil works to be undertaken. This area will be delineated using white fencing post and 6mm blue nylon rope.
- A site multi board will be erected at the site entrance and will contain details of the site rules and PPE requirements.
- Addition signage such as 'Deep Excavation' and 'No Entry' will be erected along the perimeter line.
- Barriers using timber handrails will be erected around the excavation area.
- An area on site will be designated for the temporary stockpiling of excavated material.
- The entire site will be scanned for underground services with a Cable Avoidance Tool.
- A scan log sheet will be completed by a competent person.
- An excavation permit will then be completed before the works can commence.
- Ensure appropriate training records and certifications are included in the site safety folder.

Access Road / Site Area

- Route and direction of access road will be pre-agreed with Reach Active 360 Excavator and Site Dumper will be used.
- All soft material, including topsoil will be excavated and side casted with the Excavator.
- Where required, a sub base layer of aggregate will be placed
- Terram will be rolled out the full length of the access road footprint with a top/ finish layer of aggregate if required.
- Area will be rolled with Excavator to provide compaction of aggregate

- Where works are taking place underneath Overhead Lines – a Height Restrictor will be fitted to the Excavator and adjusted to ensure Close Proximity is not breached.

Excavate out the existing bases to the depth as required.

- With the excavation permit in place, the excavator can set up over the first existing leg base[A], as is on site.
- Typically, a 13-ton excavator with a selection of rock breaker, trenching, digging and grading buckets will excavate to the required depth (3.2 m below original GL)
- The excavator driver will endeavor to maintain clean vertical faces to the excavation. Over-break and loose debris will be removed as the excavation proceeds.
- Spoil will be side cast and stockpiled not less than 3.5 m from the closest edge of the excavation.
- Where necessary spoil may be loaded directly into a site dumper or other transport provided that the operator of such transport is clear of the vehicle. This particularly applies to Dumper drivers.
- Once the excavation is complete, an AF3 form will be completed every day that the excavation remains open.
- All excavated material will be removed off site to a licensed waste disposal company.
- Once the excavation is complete, Hole [A] will be photographed for future reference and will be checked on site by a competent person.
- Hole A will then be back filled and compacted every 300mm with the existing spoil previously removed from the hole.
- This process will be repeated for legs B, C AND D
  Once backed and top 300mm top soiled, the area will be grass seeded as per existing grass specification.

Breaking out Rock

- Rock, when encountered shall be removed, to complete the excavation to required dimensions as per the design.
- A hydraulic rock breaker attachment shall be fitted to the excavator quick hitch and will be used to transfer impact forces, and to fracture the rock and reduce it to a size that will allow it to be removed using a standard bucket.
- A second excavator may be made available depending on the extent of the rock removal required.
- In addition to the standard PPE, ear defenders and eye protection shall be worn in the vicinity of the rock breaking activity.

10. SUPERVISION

- Project Manager
- Site Manager
- Civils Supervisor
- PICW

11. SPECIFICATION

All work must be carried out and completed in accordance with current method statements and client's O/H Line Construction Standards

12. EMERGENCY ARRANGEMENTS

Site first aider	Diarmuid Crowley (086) 0492744	Nearest Hospital	Hospital Tel.: 00353 57 862 1364 or 112
First aid located at	Site office/Vans	Fire point located at	Site office
Assembly point	Site compound	Spill kit located at	Site stores

13. AMENDMENTS – SIGNING SHEET

I herby verify that I have read and understand this document and have been given the appropriate training to carry out the work safely. My duties as an employee have been explained to me, with regards to Health & Safety		
Print Name (Block Capitals)	**Signature**	**Date**

Risk Assessment											
Ref	**Description**	**Hazards**	**Actual Risks**	**Without Controls**			**Control Measures**	**With Controls**		
1	**Vehicle / Mobile Plant and Pedestrian Movement on Site**	**Slips, Trips & Falls Impact with Vehicles Blocked escape routes**	**Death Major Injuries Personal/public injury**	**L 5**	**S/C 5**	**RR 25**	**Traffic Management Plan agreed with all parties available and briefed to all staff Pedestrians separated from vehicle movement by use of barriers and delineation. Reversing minimized to restricted area and controlled by use of banksman. Vehicles equipped with safety and warning devices. Driver monitoring systems. All vehicles maintained and records kept. All operators competent and certificated. High visibility clothing worn at all times. Ensure a traffic management plan is available where necessary.**	**S/C 5**	**L 1**	**RR 5**
2	**Access and egress**	**Slips, trips, falls. Animals**	**Personal/public injury**	**3**	**3**	**9**	**Choose the correct point to gain access and egress to and from your work. Examine each site for the presence of animals that could cause you harm. At all times use the correct PPE for the task being performed and use in the correct manner. Be mindful of changes in site conditions as your work progresses e.g. change in weather conditions Always ask the owner about animals and livestock, be cautious around dogs,**	**3**	**1**	**3**

							even if they are friendly, and always keep gates locked after entry / exit to prevent livestock escaping. document on the JSSP			
3	**Manual handling**	**Pulling Pushing Lifting Lowering**	**Personal/public injury**	**3**	**4**	**12**	**Ensure the public is kept away from operations. Assess the task and use mechanical means if possible. Gloves must be used. Operative must be trained in manual handling procedure. Correct manual handling procedure must be adopted. Assess the item, which requires lifting. If it is too heavy to manually lift use mechanical means. If possible to lift manually use kinetic lifting technique as shown during your Manual handling Awareness Training. Seek assistance to make the lift.**	**4**	**1**	**4**
4	**Ground Work**	**Falling Objects/ Strain/ Trips**	**Soft tissue damage. Fracture, Cuts, Bruises/ Lacerations/ Fractures**	**4**	**5**	**20**	**Remain outside the exclusion zone. Use sash line to raise and lower equipment. Do not throw materials up. Request permission to enter the exclusion zone. Use correct manual handling procedures. Keep the site clear of materials, which could cause trips. Practice good housekeeping.**	**5**	**1**	**5**
5	**Visibility. Inadequate lighting**	**Poor visibility due to weather conditions. Slips, Trips and Falls**	**Ranging from minor bruising to fractures and possible fatality**	**4**	**5**	**20**	**Cease operations when visibility makes works area hazardous. Improve site visibility by using appropriate lighting where possible. Keep signage clean to maintain reflectivity. Ensure sufficient temporary lighting is available, stationary or mobile and regular checks**	**5**	**2**	**10**

							to ensure suitability by a competent operative In case of lights failing, ensure they are supplied from two independent power sources. Hang lights to suitable points above head height wherever possible to avoid tripping hazards. Check the PAT test date is in compliance.			
6	Signage	Geography of work pace, junctions & slip roads,	Injury through vehicular accident, struck by vehicle. Ranging from minor bruising to fractures and possible fatality	5	5	25	Extend start of coning/ signage to provide better advanced warning to approaching traffic. Make sure traffic flows from junctions'/slip roads are incorporated into traffic management plan, consider additional control by traffic signals. Always ensure signs and cones are clean. Always have sand bags in the vehicle to secure signage on windy days. Place a courtesy sign at the entrance to the job site.	5	2	10
7	Controlling traffic	Collision or struck by vehicle	Injury through vehicular accident, struck by vehicle. Ranging from minor bruising to fractures and possible fatality	5	5	25	Position signs/lights for maximum warning and allow sufficient space for passing/waiting traffic. Make sure control method reflects traffic flow. Have manual control means available for emergency use. Complete a traffic management plan where necessary, only trained TM personnel can alter the flow of traffic	5	2	10
8	Pedestrian access	Struck by vehicles Uneven ground	Ranging from minor bruising	5	5	25	Install suitable safe pedestrian access points. Install diversions using pedestrian barriers as required.	5	2	10

			to fractures and possible fatality				Consider escort person for extreme situations. Keep pedestrian access routes clear and free from obstacles.			
9	Weather Conditions	Road accidents Accidents on site Lightning High Winds	Soft tissue damage. Fracture, Cuts, Bruises/ Lacerations/ Fractures	4	5	20	Remain outside the exclusion zone Endless sash lines to be attached to all loads being dismantled and erected. Co-ordinate with spotter/observer on a regular basis for sudden changes in weather conditions. Vehicle lights must be on at all times during adverse weather where visibility is limited. The site engineer will determine if work should stop on site due to the dangers of adverse weather. Suitable PPE to be provided for inclement weather. No work to take place near electrical structures when the lightning risk is high. Staff to remain a minimum of 10m away from structure. Follow the guidelines when operating vehicles always document changes in the weather in the JSSP i.e. wind, rain, ice, sun	5	2	10
10	Working at Heights	Falls from heights. Falling Objects.	Cuts & Bruises, Sprains, fractures & Fatalities.	5	5	25	A Harness must be worn at all times where there is a danger of a fall; it must also be attached to a suitable anchor point. Programmed inspection of harness belt and climb safe/ Daily inspection of climbing irons harness and climb safe. Recorded on the GA3 forms. Training, Experience and Knowledge required for task. Exclusion zone to be put in place and an observer to control the area when others work at height.	5	2	10

11	**Pole climbing**	**Pole rot, Conductor damage, Animals, Creosote, Falls, Pole breaking**	**Death, Serious Injury, Fracture, Lacerations, Soft tissue damage.**	**5**	**5**	**25**	**Carry out pre-climb checks on poles to be climbed. Carry out checks on all adjacent poles. Carry out condition assessment on conductor in the span to be worked on and in the adjacent spans. Check all climbing equipment and ensure that all equipment is to the correct specification and is in a serviceable state for the purpose intended. Correct PPE to be worn. A physical exclusion zone must be in place around the pole before work commences. Hands must be covered to protect against contact with creosote. Hammer test the pole before climbing. Hammer test the pole while climbing. Climb safe must be used correctly Programmed inspection of harness belt and clickers (GA1). Weekly Inspection GA2. Daily inspection of harness and lanyards (ERA form). All correct PPE to be worn. Only trained personnel must work aloft. Adequate light must be used in darkness. The auxiliary belt must be used when drilling and climbing over objects. Climbing operations must cease for 0.5Hrs after thunder or lightning is heard or observed. Climbing must cease in excessive winds.**	**5**	**2**	**10**

12	**Poor housekeeping**	**Slips, trips and falls.**	**Sprains, sprains, back injury , cuts**	**3**	**3**	**9**	**Maintain a good standard of housekeeping at all times, route cables and hoses so they do not obstruct the work area or walkways. Do not let bolts or tools accumulate at the feet of the operator. Remove waste material and transport it regularly to the disposal point and place it in an appropriate skip. Place all general and special waste in the bins provided.**	**3**	**1**	**3**
13	**Sharp edges and pinch points**	**Cuts and crush injuries.**	**Cuts , pinching , trapped fingers**	**3**	**3**	**9**	**All operatives must wear suitable gloves at all times. Care must be taken to avoid trapping your hands and/or fingers beneath objects being handled and during handling or lifting operation (pinch points), avoid and document pinch points in your JSSP. Dress all sharp edges when possible.**	**3**	**1**	**3**
14	**Ascending and descending from ladders**	**Falls from heights. Proximity to live overhead services, Falling objects**	**Death, Major injury, Fractures, Minor injury**	**5**	**5**	**25**	**Inspect the ladder before each use ensuring tag is affixed and in date, do not use if there is any damage to the ladder, report it immediately to your supervisor and quarantine ASAP. The ladder must be footed at all times. Keep ladder free of dirt grease or oil. Use correctly. Do not carry items up or down the ladder. The three points of contact must be maintained at all times. Watch out for live overhead services. Look for loose items where the ladder is resting**	**5**	**2**	**10**

							(roofing materials, fascia, soffit) handling of material at ladder top and working to be limited to 30minutes per activity.			
15	Use of All Terrain Vehicle	Speeding, loss of control, Overturning, carrying of passengers, carrying of materials	Death, Major injury, Fractures, Minor injury	5	5	25	Trained operatives only, no passengers, no operatives under 16 years. Correct PPE to be worn, Helmet, High visibility clothing, glove's. Reduced speed. No abnormal loading of the ATV. Use of cargo boxes to hold equipment. Limited use on roads. Switch on lights for better visibility of ATV.	5	2	10
16	Working from an MEWP	Over turning, Objects falling from heights, Incorrect use for lifting objects. Poor assessment of ground condition (soft, slope or level).	Injury to personnel, due to overturning, unstable load, falling out of the basket. Objects falling from the basket.	5	5	25	Only trained certificated MEWP operative to use. GA1 available in date and free of defects. Weekly GA2 to be carried out on MEWP and daily ERA inspection. Correct PPE to be worn. Harness to be worn at all times and attached to the designated anchor point in the MEWP with short 1 meter lanyard. Programmed inspection of harness and lanyards. Daily inspection. Recorded on the GA3 forms. The SWL load is not to be exceeded. The permitted amount of personnel is not exceeded. An assessment of the ground condition, slope and level for the position of the MEWP. Use of spreader plates underneath all outrigger plates when deployed. Ensure the Vehicle is fitted with lights	5	2	10

							and rotating beacon. Only operate when safe to do so. Never operate a MEWP in high winds as per manufacturer's guidelines. During erection works, area below MEWP to be have an exclusion zone erected and warning signs erected. Storage of material on the body of MEWP to be restricted due to hindrance of operation and risk of structural damage.			
17	Electrical Hand/Tools,	Hand injury , impact , fire	Electric Shock, Wrist Sprain, Entrapment	5	5	25	All Electrical tools and extension cables must have a valid PAT Test Certificate. Inspect before use, report any defects. Care must be taken during the drilling operation to avoid the drill from jamming causing it to make sudden twisting movements. Correct PPE to be worn. Tools should only be used for design purpose.	5	2	10
18	Hazardous substances	Respiratory problems, Chemical burns, Allergic reactions	Asphyxiation & respiratory damage, burns, Scarring	5	5	25	Carry out a risk assessment based on the material present. Wear the correct PPE, as stipulated in the assessment. Ensure all operatives have knowledge, training and experience. Have the material Safety Data sheet for the substance for reference. Smoke, fume and dust suppression if required. Emergency equipment present if necessary. Always ensure a trained first aider is on site.	5	3	15

20	**Environmental Considerations**	**Pollution of the environment from work activities**	**Spillage of oils or fuels , waste left behind**	**3**	**4**	**12**	**Good housekeeping. Spillage containment and disposal. Smoke, fume and dust suppression. Emergency procedures. Ensure all operatives have knowledge, training and experience. Have the material Safety Data sheet for the substance for reference Ensure all operatives are trained in the use of spill kit awareness and deployment.**	**3**	**2**	**6**
21	**Lifting Equipment Teleporter.**	**Failing of equipment Striking of operatives Striking and overhead utility services Noise Overturning**	**Death Major injury Occupational Health injuries**	**5**	**5**	**25**	**Machine driver and Banksman to be trained and certified CSCS. All equipment to be inspected and colour coded, never use a piece of equipment that is not tagged (inspected). Lifting plan to be used if required. Ensure correct use of ground pads at all times. Check for overhead service if live and in local works area stop work. Relocate machinery away from hazard. Ensure Lifting equipment is certificated, maintained and checked daily by operator. Record of inspection to be filled out weekly (GA2) and daily ERA check sheet. Use correct safety pins, shackles etc. at all times**	**5**	**2**	**10**
22	**Use of Mobile Phone on Site**	**Lack of concentration and control of equipment**	**Serious, Fatal Injury**	**4**	**5**	**20**	**While plant is in use, operators must not use mobile phones on site. All others only use phone when safe to do so. Drivers of vehicles must not use mobile phones when driving**	**5**	**1**	**5**

23	**Excavations**	**Overhead and Underground cables. Striking Underground services, eg. Gas, electricity, water, etc. Trench Collapse Impact with persons & structures from moving vehicles. Manual handling materials.**	**Electrocution, Death, injury, Burns Explosion Drowning Crush injuries Asphyxiation Damage to plant and Equipment**	**5**	**5**	**25**	**Use of cable plans, location equipment and cables marked prior to work. Trial holes. Safe digging Procedures. Exclusion zones around excavations. Display warning signs. Correct PPE to be worn. Complete a location survey. Check for signs of manhole covers and trenches. Mark services on the ground. Avoid parking on any areas suspected of having underground services. Scan ground after excavating 300mm of ground in case services are too deep to be picked up in original survey. Use of Trained, knowledgeable and experienced staff. Permit to work and Permit to dig in place and signed prior to any work. Spoil to be stored as correct distance from edge of excavation. Depth = distance from edge. Goal posts and bunting to be used for highlighting presence of overhead cables.**	**5**	**2**	**10**
24	**Animals/Livestock**	**Injury / bites / loss of control**	**Personnel injury, members of public**	**5**	**5**	**25**	**Ask the owner about animals and livestock, be cautious around dogs, even if they are friendly, and always keep gates locked after entry/exit to prevent livestock escaping. Fields with cattle, bulls maybe included within the herd. Erect exclusion zone to keep cattle away from works. Document on the JSSP**	**5**	**2**	**10**

25	Fire	Burns, property damage, Soft tissue damage. Fracture, Cuts, Bruises, Lacerations, Fractures	Explosion, Death, injury, Burns, Property damage, vehicles / homes burns	3	5	15	Firefighting training provided. Provide suitable / sufficient firefighting equipment. Never use water extinguisher on an electrical fire Provide waste containers & remove rubbish on regular basis. Store flammable materials & substances correctly. No smoking/no naked flame notices erected. Ensure the first aid kit is fully stocked.	5	2	10
26	Working in a Noisy Environment	Noise	Damage to ears. Deafness Tinnitus. Stress.	4	3	12	PPE. Ear protection. Noise assessments. If noise levels exceed: (1) 80 dB(A) Notify employees, hearing protection advised. (2) 85dB(A) Notify employees, make hearing protection mandatory. Provide health surveillance Post warning signs. Silenced plant. Well-maintained & certified plant/equipment. Screen off area.	3	1	3
27	Contact with Electricity	Injury to Person Electrocution Burns Death	Injury to Person Electrocution Burns Death	5	5	25	Ensure adequate clearances are maintained from adjacent live equipment. Where necessary erect suitable barriers and use excavators fitted with height restrictors. Goal Posts or Controlled Gate System to be used for access under existing lines. Where clearances cannot be maintained lines to be made dead and earthed and permit to work issued. Protect against adjacent live parts.	5	2	10

28	**Plant & Equipment**	**Contact with persons on site Collision with other site traffic Poor working order Overturning**	**Electrocution, Death, injury, Burns Explosion Crush injuries Asphyxiation Damage to plant and Equipment Environmental Damage Occupational Health injuries**	**4**	**5**	**20**	**All operating staff trained in plant operation e.g. CPCS. Plant maintained and certificated. Lifting plan developed where necessary. Suitable and adequate plant for the operation. Specific risk assessment carried out. Do not leave keys in plant. Visually inspect plant to check it is in good order daily and complete inspection sheet. All plant should be properly certified Report and repair defects immediately – machine will be taken out of use until serious defects are repaired All personnel on site must wear correct PPE. High visibility clothing to ensure they can be seen on site by machine operators. All plant on site will be fitted with reversing alarms and flashing beacons. Site operatives attending plant should observe a safe distance from working plant, e.g. staying clear from the rear of a tipping lorry.**	**5**	**2**	**10**
29	**Refueling Plant**	**Explosion Slips / Trips Ground Contamination**	**Death Serious Injury Damage to plant and Equipment Environmental Damage Occupational Health injuries**	**3**	**5**	**15**	**Switch off engines, lights and mobile phones. No smoking. Use only approved containers. Diesel tanks, fuel cans, etc., should be stored and used so that leakages/spillages can be contained. Spill kits must be available on site. In the event of spillage during refueling – use spill kit & bag contaminated materials to dispose of as hazardous waste. Larger volumes of fuel to be stored in bunded fuel bowsers. No smoking Replace hoses after use Over 18 years old personnel to refuel.**	**5**	**1**	**5**
30	**Tower climbing**	**Fatigue of Steel,**	**Death, Serious Injury,**	**5**	**5**	**25**	**Carry out pre-climb checks on towers to be climbed. Carry out condition**	**5**	**2**	**10**

		Conductor damage, Failure of prefabricated components due to over stressed, Loose components Falls, Weather conditions (Ice on tower structure)	**Fracture, Lacerations, Soft tissue damage.**				**assessment on conductor in the span to be worked on and in the adjacent spans. Check all climbing equipment and ensure that all equipment is to the correct specification and is in a serviceable state for the purpose intended. Correct PPE to be worn. A physical exclusion zone must be in place around the tower before work commences. Operatives to be trained in use of clickers. Programmed inspection of harness belt and clickers (GA1). Weekly Inspection GA2. Daily inspection of harness and lanyards (ERA form). All correct PPE to be worn. Only trained personnel must work aloft. Adequate light must be used in darkness. Climbing operations must cease for 0.5Hrs after thunder or lightning is heard or observed. Climbing must cease in excessive winds. Excessive ice on the structure must be assessed and reported to supervisor.**			

RISK INDEX

The risk index is then simply defined by multiplying together the frequency index and severity index. With this ranking system this will yield a number between 1 and 25.

Refer to the following table and read off the priority rating:

LIKELIHOOD						
	1	1	2	3	4	5
	2	2	4	6	8	10
	3	3	6	9	12	15
	4	4	8	12	16	20
	5	5	10	15	20	25
		1	2	3	4	5
		SEVERITY/CONSEQUENCE				

The following shading indicates the level of risk:

Intolerable	16 - 25
Tolerable	6 - 15
Negligible	1 - 5

To evaluate risk: - Likelihood (L) * Severity (S) = Risk (R), Defined as High (16 - 25), Medium (6 - 15) or Low (1 - 5)

14. APPENDIX A: TOWER PLACEMENT CHECK SHEET

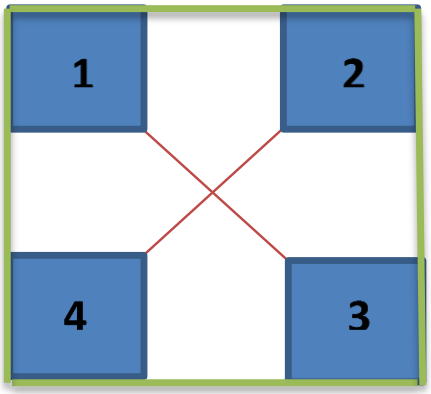
Project		Tower Type	
Foundation Type		Tower No.	
Relevant ESB Contact		Phone Number	
Relevant Drawings			

Aspect of tower orientation & placement	Y/N	Comments
Has the tower been correctly set-out by ESB? Including 4 corners of each foundation and the 2 center lines?		
Have those Pegs been recorded with GPS?		
Have they been extended to avoid hazard?		
Has the Z measurement on the Pegging Diagram been correctly marked?		
Are the Rings in the correct position over Z on the 804 subbase?		
Have the Screeds inside the rings been poured and the Steel plates Placed & leveled correctly?		
Have the 2 string lines and 4 plum-bobs been correctly positioned?		
Are the levels, diagonals, and faces all within the allowable tolerances using the method outlined in the method sheet?		
Are all measurements for each step recorded in the Engineers Level Book and available for inspection?		
Has the ESB contact been notified of any issues that may have arisen during the previous checks?		

Record the pre-pour measurements below

DIAGONALS	
1-3	
2-4	

LEVELS	
1	
2	
3	
4	



FACES	
1-2	
2-3	
3-4	
4-1	

Aspect of tower orientation & placement	Y/N	Comments
Has the finish level for pour 2 been marked on the legs of the tower and the banks of the trench?		
Have you ensured that the concrete has been brought up evenly around each leg and no force that could affect the positioning of the tower has been exerted on the base?		
How many hours passed before straps were removed?		
Have the post pour checks been completed and recorded on The foundation log sheet?		
Are the post pour checks all within tolerance? If not, has the ESB contact been notified?		

Checked By	Site Engineer/Manager Date:	Print: Signed:

Appendix D

Curriculum Vitae

TOBIN Consulting Engineers
Galway | Dublin | Castlebar | London

Building & Infrastructure | Water Services | Energy & Environment

Experience
John has over ten years experience in the areas of environmental management and assessment with particular reference to EIA, groundwater assessments and contamination assessment.

John provides specialist contribution to the project management of Environmental Impact Assessments as well as the preparation of individual sections (soil and water aspects of the environment); Groundwater resource exploration and development; Groundwater vulnerability and protection assessment; Design and management of site investigation/remediation programmes; Water quality monitoring and hydrogeology.

John oversaw the soils and geology baseline surveys, and completed the soil, geology and hydrogeology impact prediction and mitigation specification for the various commercial, industrial, waste facilities. John's previous experience includes:

- Preparation of Environmental Impact Statements
- Preparation of waste management permits/licenses
- Pumping well design and data analysis
- Report writing for contaminated land site investigations, including review of all chemical data produced from site investigation works, source-pathway-receptor based qualitative risk assessment and subsequent development of remediation strategies.
- Organising and conducting long term groundwater monitoring programmes at various sites. This also included analysis of the monitoring results and compilation of quarterly and annual reports.

EPA Source Protection Zones
Article 7 of the Water Framework Directive (WFD) requires member states to establish "safeguard zones" for those bodies of water, including groundwater, utilised in the production of drinking water. As part of a CDM/TOBIN/OCM team, John has produced over 14 safeguard zones/SPZs reports for various borehole and springs sources around Ireland.

Templemore Flood Relief Scheme
John assisted in the co-ordination, liaised with the client, statutory consultees & key stakeholders to determine key issues in relation to geology and hydrogeology for the application. John also provided geological and hydrogeological technical input which also involved leading a technical team undertaking assessments for the EIS. John also carried out contamination review for this project.

Clifden and Costello Regional Water Supply Scheme
John assisted in the management and co-ordination of geology and water chapters, liaised with the client, statutory consultees and key stakeholders to determine key issues in relation to geology and hydrogeology. John completed the soils, geology and water chapter of the EIS for Costello RWSS and Clifden RWSS.

Bilston Gasworks, Birmingham, UK
Supervision of site investigation, enabling works and resident engineer for the remediation of the former gasworks site on Ward Street, Bilston, West Midlands, with the intended end use for residential and open space development. Remediation included remediation of LNAPL and removal of spent oxide, ammonium tanks and Gas holders

Profile
John is a Hydrogeologist and holds the position of Senior Scientist with TOBIN Consulting Engineers.

His experience includes both fieldwork and report writing, including groundwater and surface water sampling and water quality monitoring, data interpretation and supervision of drilling for various residential and commercial developments

Qualifications
- M.Sc DIC Environmental Engineering
  Imperial College London, 2003
- B.Sc. Environmental Science
  National University of Ireland, Galway, 2000

Professional Membership
- IAHMember of the International Association of Hydrogeologists (Irish Group)
- Professional Geologist (PGeo)
- Member of the International Association of Hydrogeologists (Irish Group) (IAH)
- Member of the Irish Mining and Quarrying Society (IMQS)
- Chartered Waste manager (MCIWM)

Health & Safety Training
- Safe Pass Certificate
- Location of Underground Services (LUGS) Certificate
- Quarry Pass Training and Certification
- Landowner Survey Training
- First Aider

Key Skills
- Project Management
- Route & Site Selection
- Environmental Impact Assessment for soils, geology and water
- Environmental Monitoring
- Contaminated Land Investigation and Remediation
- Data Analysis and Interpretation
- Contaminated Land Investigation and Remediation
- Landowner Consultation
- Expert Witness

Curriculum Vitae

TOBIN Consulting Engineers
Galway | Dublin | Castlebar | London

Building & Infrastructure | Water Services | Energy & Environment

Monika Kabza

Geologist

Experience

Monika Kabza is a qualified Hydrogeologist and has extensive experience in sediment mapping, zone of contribution (ZOC) delineation, interpretation and 3D conceptualization, as well as the supervision and reporting of site and drilling operations. Her experience also includes research, analysis, and interpretation of site investigation results, GIS mapping and modelling, creating maps and report writing.

- Involved in defining the Zone of Contribution (ZOC) for groundwater abstraction points for the Geological Survey of Ireland (GSI) and National Federation of Group Water Schemes (NFGWS).
- Assists with biannual groundwater level monitoring and contributes to the periodic data reports and interpretive assessment reports.
- Assistant project manager for the Site Suitability course (SSA).
- Supervision of drilling for the Lisheen Wind Farm (Phase 2) site investigation (2014).
- Worked as an assistant hydrogeologist on data collation and data entry into a GSI database (2013-2015).
- Was involved in the Environmental Protection Agency (EPA) groundwater sampling project, collecting water samples from EPA monitoring sites.
- Assisted with karst land form mapping and identification as part of the Kilmaine and Swinford Source Protection Reports for the EPA.
- Worked on the National Vulnerability Mapping Project at the GSI (2007-2013).

Her background of completing National Vulnerability Mapping and delineating the Zone of Contribution for Group Water Schemes gave her excellent experience, particularly in the context of the Irish geological/hydrogeological environment.

Demonstrates and teaches participants of the “Site Suitability Assessment for On-site waste water treatment systems” how to classify log and record soil and subsoil classification according to GSI protocol BS5930 from 2007. Monika has presented the National Vulnerability Mapping to the monthly technical discussion meeting at the Geological Survey of Ireland, International Association of Hydrogeologist (IAH Irish Group) and local authorities.

Profile

Monika Kabza holds the position of Geologist and is based currently in the Geological Survey of Ireland.

Monika is a qualified Hydrogeologist and is an experienced geological field mapper and in the supervision of drilling operations.

Her experience also includes research, analysis and interpretation of site investigation results.

Qualifications

- M.Sc (Hon.)Groundwater Engineering, AGH University of Science and Technology in Krakow, Poland, 2003

Professional Membership

- Member of the International Association of Hydrogeologists (Irish Group) (IAH)
- Member of the Institute of Geologist of Ireland (IGI)
- Professional Geologist (P.Geo.)
- European Geologist (EurGeol.)

Health & Safety Training

- TOBIN Health & Safety Awareness

Key Skills

- Report Writing
- GIS Software
- Environmental Field Assessment
- Landowner liaison
- Subsoil Permeability Mapping
- Drilling Supervision and subsoil logging
- Word/Excel/PowerPoint