

TII ESB EirGrid **Protocol** October 2020





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1.0 Introduction

The provision of major national road infrastructure, both new build and upgrade projects, can have significant impacts on existing and planned networks of utility service providers. It is, therefore, imperative that there is adequate communication and co-ordination between state agencies and Local Authorities during the planning, design and implementation phases of major national road schemes.

This document outlines a protocol for interaction between Transport Infrastructure Ireland (TII) and Local Authorities with the Electricity Supply Board (ESB) and EirGrid during the development phases of major national road schemes. The protocol will ensure the early identification of potential conflicts and the timely design and approval of all necessary alterations to existing transmission circuits. The protocol will also ensure the early identification of opportunities that may arise between national road development schemes and new transmission circuits that are at route selection stage.

With the exception of quarterly meetings which will be attended by representatives of TII, ESB and EirGrid, all contact between the road design team and the ESB on national road schemes is to be co-ordinated through and prioritised by TII. Both TII and ESB will nominate a contact person in their respective organisations who will meet regularly and coordinate the implementation of this protocol. This document also includes information and guidance on;

- the identification and classification of the ESB transmission network
- design phase considerations
- construction phase considerations
- interactions between the road design team and the ESB
- the role of EirGrid as the Transmission System Operator

Note that this protocol covers interactions for major national road schemes with transmission circuits only. A separate protocol will be developed for lower voltage distribution networks.

2.0 Statement of Principle

Proposals for circuit alteration requests should comprise of the same technology where feasible, i.e. overhead line or underground cable. As per EirGrid policy, the circuit alteration will achieve the maximum standard rating for that technology type and voltage level.

3.0 Roles and Responsibilities

Transport Infrastructure Ireland (TII)

Transport Infrastructure Ireland, formerly known as the National Roads Authority (NRA), was established under the Roads Act 1993 and is responsible for improving and managing the national road and light rail (Luas and proposed Metro) networks. In the delivery of major national road schemes, TII may act as client or may work in partnership with Local Authorities, who will act as client.

Local Authorities

Local Authorities (County and City Councils) are the road authorities for all roads, national and non-national, within their respective functional areas. They have powers, duties and functions under various legislation to maintain and construct roads in their administrative areas, including national roads. Funding for major national road schemes in a Local Authority functional area is provided by way of grants that are allocated annually by TII, who fulfils the role of approving / sanctioning authority.

Road Design Office

As part of the overall strategy for the management and implementation of the national roads programme, Road Design Offices have been established in a number of Local Authorities to ensure the efficient and effective delivery of the programme. These offices are the responsibility of Local Authority in which they are located and are staffed by Local Authority personnel. However, they work exclusively on national road schemes and programmes.

Electricity Supply Board (ESB)

The ESB is a statutory corporation of Ireland with its principal offices at 27 Lower Fitzwilliam Street, Dublin 2, in its capacity as Transmission Asset Owner (TAO). The ESB was established in 1927 as a statutory corporation in the Republic of Ireland under the Electricity (Supply) Act 1927.

ESB operates right across the electricity market, from generation, through transmission and distribution to supply. ESB supplies electricity throughout the country via its distribution network.

ESB Networks

ESB Networks is a subsidiary of ESB. On behalf of ESB, ESB Networks, amongst other roles, constructs and maintains the electricity transmission system.

ESB Networks Assets

ESB Networks Assets is a subsection of ESB Networks which focuses on strategy and investment, the development of the distribution system, the operation of networks assets and retail market systems, the regulatory price reviews and programmes, and the management, but not development, of transmission assets.

ESB Networks Customer Delivery

ESB Networks Customer Delivery is a subsection of ESB Networks which delivers core networks services safely and in a consistent way and focuses on works delivery.

EirGrid

As Transmission System Operator (TSO), EirGrid operates and ensures the maintenance and development of a safe, secure, reliable, economical and efficient transmission system. EirGrid is a state-owned company and aims to provide quality, efficient, independent transmission and market services for the benefit of all stakeholders. EirGrid moves wholesale power around the country, bringing energy from generation stations to heavy industry and hightech users. EirGrid also supplies the distribution network.

ESB Engineering Major Projects

ESB Engineering Major Projects is a global engineering consultancy specialising in the utility sector, focusing on the delivery of large scale, capital infrastructure projects for international clients and for its parent company, ESB.



4.0 Definitions and Glossary

Tail-fed stations - stations that have not been looped into the overall Transmission system e.g. a 110kV station that is not connected to another ESB / EirGrid 110kV Station via a 110kV feeder.

Environmental Impact Assessment

Report (EIAR) - is a report or statement of the effects, if any, which the proposed scheme would have on the environment. It is prepared by the developer of the scheme as part of the Environmental Impact Assessment process.

Compulsory Purchase Order (CPO)

- is a legal process that allows a state agency to acquire land compulsorily for new road developments.

Motorway Order (MWO) - is a legal process that allows a state agency to acquire land compulsorily for new motorway developments.

Circuit Alteration Request (CAR) -

Formal agreement between the system operator (EirGrid) and the asset owner (ESB) as to how the circuit alteration will progress.

ESB / EirGrid Minor Capital Project

- Project requires a lower level approval and is not required to follow the full project development process. Timeline for approval will likely be shorter than a major capital project.

ESB / EirGrid Major Capital Project

- As major projects tends to be higher cost, the project requires full project development process.

Ground Investigations - investigations to establish ground conditions prior to construction work which inform design parameters and reduce any hidden risks that may cause delay or impact on costs.

Memorandum of Understanding

(MOU) - sets out the design assumptions and proposed transmission network diversions to assist the approval of Circuit Alteration Request (CAR).

5.0 Phases of Road Scheme Development

The TII Project Management Guidelines (PMG) provide a framework for a phased approach to the management and delivery of proposed national road improvement schemes. The guidelines divide the progression of the road scheme through 8 discrete phases, as shown below. These phases cover the planning, design, development, construction and closeout of the scheme.

| Planning and Design | Phase 0 | Scope and Pre-Appraisal |
|------------------------|---------|-------------------------------------|
| | Phase 1 | Concept and Feasibility |
| | Phase 2 | Options Selection |
| | Phase 3 | Design and Environmental Evaluation |
| | Phase 4 | Statutory Processes |
| ct / | Phase 5 | Enabling and Procurement |
| Constru Impleme | Phase 6 | Construction and Implementation |
| | Phase 7 | Close out and Review |

This protocol identifies a series of ten interactions between the road design team and ESB during the design, construction and handover phases of the road scheme development.

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6.0 Electricity Supply Network

The electricity supply network is made up of the following;

- Transmission Network
- Distribution Network

The Transmission Network covers 400KV, 275KV, 220KV and the majority of 110KV lines and is operated by EirGrid.

The Distribution Network covers 110KV in the Dublin area, 110kV tail-fed stations and nationwide 38KV, 20KV, 10KV and low voltage (LV) and is operated by ESB.

Photographs and illustrations of the various networks are shown in Appendix 1.

The following details outline the current practice for any works near the existing ESB infrastructure.

How to get a map

- email your request including your site map to dig@esb.ie.
- call 1850 928 960 or +353 01 858 2060 or
- alternatively, make a postal request to:

Central Network Mapping ESB Networks St Margaret's Road Finglas Dublin 11 D11X3W7

A map will be issued within ten days.

Note in emergency cases, ESB Networks' Central Network Mapping can provide maps for collection. Please call 1850 928 960 or +353 1 858 2060 for more details. This service operates Monday to Friday only.



7.0 TII / LA / RDO / ESB / EirGrid Interactions

To facilitate the timely and efficient interaction with EirGrid and ESB on TII funded schemes, the following protocol will apply;

- EirGrid, TII and ESB will each nominate a contact person to co-ordinate and prioritise interactions with ESB on TII funded schemes.
- (2) A scheme tracking spreadsheet will be developed and managed by TII. Each TII funded scheme that requires interaction with ESB will be given a Road Scheme Tracking Number (RSTN).
- (3) This RSTN will be used on all correspondence and communication between TII, ESB and the road design team.
- (4) The TII, EirGrid and ESB nominees shall meet every three months to review progress, issues and priorities. However, urgent issues or changes to the priority list on the tracker should be brought to the attention of the nominated persons immediately.
- (5) There are ten formally identified interactions with ESB during the development of a major national road scheme. Six of these occur during the Planning and Design Phase and four during the Construction Phase. See Table 1 overleaf.

- (6) Once priorities and workloads are agreed, TII will communicate with the relevant road design team to progress the scheme directly with the ESB through the relevant interaction.
- (7) A brief overview and the minimum requirements for each interaction and indicative timelines are given in Table 2.
- (8) A formal sign-off is required between the Local Authority and ESB at two distinct phases in this protocol, as follows:
 - (i) At Interaction 4 prior to the publication of the statutory consent application (including EIAR) for the scheme. See the Memorandum of Understanding template at Appendix 6. (For the avoidance of doubt, this will be the agreed position at that point in time. It is noted however, that this may change due to updates in ESB or TII standards or conditions imposed during the planning process).
 - (ii) At Interaction 7 prior to ordering any new towers / poles or other significant part of the ESB transmission infrastructure.
- (9) While the approved CAR / MOU will be treated as a final agreement at the date of signing and included in the scheme tracking schedule, it is noted that CAR / MOU commitments can change. All projects will be reviewed at quarterly interface meetings between EirGrid / ESB / TII.

Table 1

| Phase | Road Design Activities | Interaction | |
|--------------------------|------------------------------------|----------------|---|
| Phase 0 | | | |
| Scope and Pre-Appraisal | Prepare Project Appraisal Plan | None | |
| Phase 1 | Procure Technical Advisors | None | |
| Concept and Feasibility | Feasibility Reports (if necessary) | | |
| Phase 2 | | | |
| Option Selection | Constraints Gathering | Interaction 1 | |
| | Route Corridor Option Generation | | |
| | Route Corridor Option Refinement | | |
| | Route Corridor Selection | Interaction 2 | |
| Phase 3 | | | |
| Design and Environmental | Topo - GI and Other surveys | | |
| Evaluation | Landowner Engagement | | |
| | Design Refinement | Interaction 3 | 4 |
| | EIAR / CPO / MWO Finalisation | Interaction 4 | 1 |
| Phase 4 | | | |
| Statutory Process | Publish Statutory Orders | Interaction 5 | |
| | Oral Hearing | | |
| | Planning Decision | Interaction 6 | |
| Phase 5 | | | |
| Enabling and Procurement | Review Planning Conditions | | |
| | Take Possession of Land | | |
| | Undertake Advance Works | Interaction 7 | 4 |
| | Procure Main Works Contracts | Interaction 8 | 4 |
| Phase 6 | | | |
| Construction and | Construct Scheme | Interaction 9 | |
| | | | |
| Phase / | | | |
| Closeout and Review | Scheme Closeout | Interaction 10 | |

Table 2

Interaction 1

- Introduction of the road scheme by the project team, with an indicative timeline to the identification of the Preferred Route Corridor.
- Mapping for existing ESB infrastructure can be obtained by sending an email request to dig@esb.ie, as described in Section 4 above.
- If deemed to be required, the scheme is assigned an ESB / TII Road Scheme Tracking Number (RSTN) and added to the Tracking List and ESB conflicts team notified via dig@esb.ie.

Interaction 2

- Local Authority updates ESB of the selected corridor and indicative timeline to publication of the Statutory Orders (MWO / CPO / EIAR etc).
- Local Authority to advise of indicative timeline to development of design for the subsequent interaction.
- ESB to advise of any changes to existing / planned infrastructure in the vicinity of the preferred route corridor within 4 weeks.
- The Local Authority design team and ESB are to discuss the good practice guidance contained in this document and identify any particular areas of concern.

Interaction 3 🔸

- This interaction occurs when the Horizontal and Vertical alignments are well advanced and the sections and extent of cut / fill are broadly defined.
- During this phase, the design team shall be conscious of overall good design guidance and aim to eliminate / minimise impacts on ESB Transmission infrastructure including outages where feasible. Good Design Principles are given in Appendix 2 of this document.
- The Local Authority prepares and submits a "Design Pack" for each proposed interface with ESB infrastructure. This will contain, as a minimum for each interface, (a) 3D Model, (b) Topographical Survey (c) Horizontal and Vertical Alignment (d) Constructing Phase access arrangements (e) Operation phase arrangements.
- ESB to review the design and revert with any comments / observations for consideration and amendment within 4 weeks.
- ESB to advise of any specific GI requirements that may be necessary to accommodate transmission line alterations or diversions. Depending on the road scheme GI contracts, this ground investigation requirement may be undertaken either at this phase or at a later phase.
- The ESB / TII Road Scheme Tracking List is updated accordingly.

Interaction 4 🔸

- The design team shall consider the comments and observations received from ESB following interaction 3.
- The design team and ESB shall review the GI undertaken to date and identify any future GI requirements necessary post confirmation of the scheme.
- All lands required for ESB Transmission Line Diversions / Alterations and post scheme access shall be permanently CPOd and an easement granted to ESB on completion of the land acquisition phase.
- A Memorandum of Understanding is prepared by the Local Authority and submitted to ESB for review and comment. This MOU will contain an outline of each conflict / interaction and the proposed diversions. It shall also address land acquisition, access arrangements both for the construction and operational phases and an indicative programme. A template of this MOU is contained at Appendix 6.
- The Local Authority shall forward the final draft of EIAR / CPO / MWO to ESB for review and to ensure that all ESB requirements are contained and adequately described in the statutory documentation.
- Once all necessary diversions and civil works are agreed, ESB shall prepare and submit the "Circuit Alteration Request" Form (CAR) and MOU to EirGrid.
- On submission of the documents EirGrid will review the CAR for approval.
- An indicative timeline of 4 to 6 weeks is required to allow EirGrid to confirm whether the project is major or minor. Approval of the CAR for major projects is expected 2 months later
- On approval of the CAR by EirGrid, the Local Authority shall collate the pertinent document and forward to ESB for acknowledgement as the agreed position for the planning phase of the scheme's development. This is to ensure that the approved diversions and civil works are brought forward to the statutory procedures and construction phases.
- ESB to confirm whether the diversion works necessary are to be progressed as a "Major" or "Minor" work.
- The ESB / TII Road Scheme Tracking Sheet shall be updated accordingly.

Interaction 5

- Local Authority shall advise ESB of the publication of the Statutory Orders.
- ESB / TII Road Scheme Tracking Sheet Updated.

Interaction 6

- Local Authority shall advise ESB of the decision of An Bord Pleanála and any planning conditions imposed, in so far as they relate to ESB Transmission infrastructure.
- As the timeline between Interaction 5 and interaction 6 may be quite substantial, ESB to review the Memorandum of Understanding to ensure that there have been no changes to standards and that no works that have been proposed or constructed in the meantime that will affect the proposed solution for the road scheme.
- ESB / TII Road Scheme Tracking Sheet Updated.

Interaction 7 🚼

- Local Authority shall meet ESB to agree the programme to secure all necessary service diversions / alterations, either as an advance work or as part of the overall construction contract.
- The design team and ESB shall agree any further GI requirements necessary to accommodate the service diversions.
- The design team and ESB shall review the access arrangements for construction of diversions / alterations and any difficulties in obtaining possession of the lands shall be discussed.
- Any temporary access roads or other infrastructure requirements to permit the ESB diversion / alteration works to be constructed shall be identified, programmed and noted for archaeological investigation and resolution.
- Roles and responsibilities discussion to take place on PSCS and PSDP.
- ESB shall proceed with detailed design of the necessary infrastructure and secure sign off approval from ESB Networks and EirGrid.
- ESB to provide the design pack to EirGrid client engineer for review.
- ESB / TII Road Scheme Tracking Sheet Updated.

Interaction 8 \star

- Local Authority shall meet ESB to review the programme and progress on constructing all necessary service diversions / alterations.
- Any areas of the lands to be made available to the main works contractor, that still need to be kept in the possession of ESB, shall be identified and quarantined under the main works contract documents for as long as required.
- The design team and ESB shall review the contract documents to ensure that the permanent access arrangements, as contained in the CAR, are adequately specified in the Main Works Contract Documentation.
- ESB / TII Road Scheme Tracking Sheet Updated.

Interaction 9

- Local Authority shall advise the Conflicts section of ESB of the outcome of the Main Works procurement process, the name of the successful candidate and the contract commencement date.
- ESB / TII Road Scheme Tracking Sheet Updated.

Interaction 10

- Local Authority shall liaise with ESB to ensure that;
 - all financial obligations between the two parties have been processed
 - all necessary access arrangements as contained in the Memorandum of Understanding have been implemented, or where alternatives have been requested or provided that they are signed off on by both parties
 - all necessary consents / rights are included in the folios of the lands acquired for the scheme

Appendix 1: Electricity Networks

The following is provided for information purposes only and as a general guide to the various Transmission Lines. The Engineering and Major Projects Conflicts Team will still need to be engaged on any work in the proximity to electrical infrastructure.

The following images are typical examples, as structure types and arrangements will vary depending on the design requirements for the site-specific case.

All line, structure voltages and design standards will be confirmed during the interactions with ESB as part of this Protocol.

400KV Transmission Lines

■ 400 kV Angle Tower (Strain position)



400 kV Intermediate Tower



220 kV Transmission Lines

 220 Kv Angle Tower (Strain Position)



- 110 kV Lines examples
- 110 kV Intermediate Poleset (Suspension position)



220 kV Intermediate Tower design



110 kV Angle Mast (Strain position)



Double Circuit Line example

Line Identification Plates





Appendix 2: Design Phase Guidance

- In general, the following is the preferred hierarchy:
 - No impact on existing infrastructure
 - No alteration to horizontal routing of transmission lines. However, higher clearances may be required
 - Diversion and new alignment for routing transmission lines

All lands necessary for transmission line diversions, pylons, foundations, cranes, temporary works, etc need to be included in the scheme. This should include details in relation to land owner status and the proposed Land take requirements. Under our statutory requirements we will be issuing a Wayleave to secure our rights to the diverted or altered alignment. Please make particular reference to Section 20 of the Electricity (Supply) (Amendment) (No.2) Act, 1934 for further clarification on the statutory requirements relative to Transmission Lines in particular.

- The design and construction will minimise outages on the Transmission System.
- Access for the construction phase and operation phase need to be considered and identified. Note that these diversions may be constructed in advance of the main works contract, given the specialist nature of the works and the need to construct the diversions as part of a planned outage.

- Impacts of new ESB infrastructure need to be considered and included in the EIAR, including the construction of any significant towers or diversions.
- As a general rule of thumb, the point of least clearence to existing ground level generally occurs at the point of maximum sag. This is usually at the mid point between two sequential towers. If the vertical alignment at a proposed crossing is in fill, it may prove more beneficial to place the horizontal alignment closer to one pylon than the other.
- Design and Build contracts have the potential to be problematic in the vicinity of ESB / Road interfaces, where the vertical alignment changes and reduces the agreed clearances. This may also impact on the order placement and delivery time of towers. Increases in the vertical clearence, as a result of the Design and Build process, is generally not problematic.

Appendix 3: ESB Project Development Phase Guidance

- Depending on the works required, there are two potential routes a project would have to follow:
 - Minor Conflict / Capital Project Project requires a lower level approval and is not required to follow the full project development process. Timeline for approval will likely be shorter than a major capital project.
 - Major Conflict / Capital Project As major projects tends to be higher cost, the project is required to follow the full project development process.

Examples of criteria that can determine which route is required would be:

- Planning and Environmental implications
- Transmission System impact
- Transmission Outage implications
- Project Costs (for the circuit diversion)
- Impact of cable vs. overhead line
- To be included in an outage programme, typically the outage request needs to be submitted to EirGrid by July of the previous year. If the outage request is not in by that time, the outage request is much less likely to be able to be facilitated.

- Prior to a capital contribution being paid, there is a limit to how far ESB can proactively engage on any specific project. Timing of payments and contractual arrangements to befurther considered by ESBN and EirGrid.
- Advice given in the Project Development process is by designers / delivery based on previous project experience. If / when ESB contractors are appointed, previous advice will have to be reviewed by the contractor and Risk Assessments / Method Statements may be required for approval to proceed. Examples of this would be distances of working in proximity to live apparatus which could affect outages, programme durations etc.
- Construction Timelines given at the Memorandum of Understanding stage are indicative. If / when contractors are appointed, these timelines may change.
- Policy changes and operation restrictions can change work methods. This can influence the approvals required to complete works (resourcing), work durations and feasibility to complete works.



Notes:

- 1) Assumes no iterations to CAR or MOU required.
- **2)** Fixed monthly approval meetings timeline dependant on when CPP issues.
- Dependant on project cost higher approval levels for higher costs.
- 4) Dependant on project cost higher approval levels for higher costs. Worst case scenario is 24 weeks, however this would not be common for a circuit alteration.

Appendix 4: Key Factors to consider during Construction Phase

- EirGrid Controls when transmission outages occur.
- There is a 4 months lead in time for delivery of pylons.
- The transmission outage season generally runs from March to October inclusive.
 Return to service is a major concern and constraint for ESB and EirGrid.
- It is important that the approved CAR scheme is brought forward for construction where possible. However, it is noted that changes may occur due to changes in Road or ESB standards or by conditions imposed during the planning approval process.
- There may be opportunities to construct road scheme required diversions during

outages planned for other requesters. Such opportunities need to be monitored at ESB / TII Interface meetings.

EirGrid undertakes network wide outage planning studies and produces a transmission outage plan for the outage season Y (year in question). Advance notice of outage requirements is critical as long duration transmission outages are difficult to re-plan and re-schedule and will have a significant impact on the transmission outage plan for the particular year, and by extension, on TII's plans to complete a road scheme. As above, opportunities to parallel works taking place within an outage are preferred.

Appendix 5: Operation Phase Guidance

New infrastructure needs to consider future maintenance requirements.

Maintenance will be carried out in accordance with EirGrid's maintenance and standards requirements as published on the EirGrid website.

Appendix 6: Memorandum of Understanding Requirements

TII Funded Major Project - Phase 3 – ESB / EirGrid Requirements to be included in the Scheme Statutory Process

| Scheme ID / PRS Code: | |
|--------------------------------------|--|
| Project Title: | |
| Local Authority / Sponsoring Agency: | |

ESB- Section

ESB and EirGrid have reviewed the Circuit Alteration Request documentation as received on *[insert date]* with subsequent modifications on *[insert date]*. Based on the identified modifications to electrical infrastructure as agreed on *[insert date]* being included in the scheme planning permission application, we are satisfied that no further consents would be required from the planning authority or An Bord Pleanála. Reference to the proposed modifications to electrical infrastructure should be included in the EIAR statutory notices, application forms and Natura Impact Statement (if applicable).

ESB Authorised Signatory:_____

Date:___

TII-LA Section

We confirm now that all proposed alterations to the electrical infrastructure identified have been included within the scheme EIAR, NIS and Statutory notices.

TII / LA Authorised Signatory:_____

Date:_____

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