ROSCOMMON COUNTY COUNCIL

PLANNING AND DEVELOPMENT ACT, 2000 (as amended)

SECTION 5 - DECLARATION ON DEVELOPMENT AND EXEMPTED DEVELOPMENT

NOTIFICATION OF DECISION

REGISTERED POST
Elgin Energy Services Ltd.,
[redacted]

Reference Number: **DED 514**

Application Received: **21st March, 2022**

WHEREAS a question has arisen as to whether works consisting of proposed underground 10Kv grid connection to connect a permitted onsite solar farm substation to the existing 38Kv Castlerea substation – the total length of the route is 1.14km at Rathleg, Castlerea, Co. Roscommon is or is not development or is or is not exempted development.

AND WHEREAS Roscommon County Council, in considering this application, had regard particularly to:

(a) Sections 2, 3, 4 and 5 of the Planning and Development Act 2000, (as amended).
(b) Articles 6 and 9 of the Planning and Development Regulations 2001, (as amended).
(c) Class 26 of the Planning and Development Regulations 2001, (as amended).

AND WHEREAS Roscommon County Council has concluded that:

(a) The proposed development constitutes development as defined in the Planning & Development Act 2000, (as amended) and associated Regulations.
(b) The proposed development is not exempted development as defined in the Planning & Development Act 2000 (as amended) and associated Regulations.
(c) The proposed development individually and in combination with other plans or projects would not be likely to have a significant effect on any European site and that the requirement for AA or EIAR does not apply with respect to the current case.

NOW THEREFORE:

By virtue of the powers vested in me by the Local Government Acts 1925 – 2019 and Section 5(2)(a) of the Planning and Development Act 2000 (as amended) and, having considered the various submissions and reports in connection with the application described above, it is hereby declared that the said **works consisting of proposed underground 10Kv grid connection to connect a permitted onsite solar farm substation to the existing 38Kv Castlerea substation – the total length of the route is 1.14km at Rathleg, Castlerea, Co. Roscommon constitutes development that is not exempted development** as defined within the Planning and Development Act 2000 (as amended) and associated Regulations.

Any person issued with a Declaration under Section 5 of the Planning and Development Act, 2000 (as amended) may, on payment to An Bord Pleanála of the prescribed fee, refer a Declaration for review within 4 weeks of the date of the issuing of the Declaration.

Signed on behalf of the Council:

Administrative Officer,
Planning.

Date: 14th April, 2022

c.c. **Tobin Consulting Engineers,**
Block 10-4, Blanchardstown Corporate Park,
Dublin 15.

Planner's Report on application under
Section 5 of the Planning and Development Act 2000 (as amended)

Reference Number: **DED 514**

Name of Applicant: **Elgin Energy Services Ltd.**

AGENT: **Tobin Consulting Engineers**

WHEREAS a question has arisen as to whether works consisting a proposed underground 10kv grid connection to connect a permitted onsite solar farm substation to the existing 38kv Castlerea substation is or is not development, constitutes a material change of use, and is or is not exempted development:

I have considered this question, and I have had regard particularly to –

(a) Sections 2, 3, 4 and 5 of the Planning and Development Act 2000 (as amended)
(b) Articles 6 and 9 of the Planning and Development Regulations 2001 (as amended)
(c) Class 26 of the Planning and Development Regulations 2001 (as amended)

AND WHEREAS the Planning Authority has concluded that works consisting a proposed underground 10kv grid connection to connect a permitted onsite solar farm substation to the existing 38kv Castlerea substation, constitute works which do not constitute exempted development, insofar as said works contravene the specified Article 9 (iii) of the Planning and Development Regulations 2001 (as amended), as they involve substantial works which will impact upon the public road network and potential future works to same and also have the potential to endanger public safety by reason of traffic hazard or obstruction of road users, and thus, it is the opinion of the Planning Authority of Roscommon County Council that the proposal does not constitute exempted development.

NOW THEREFORE The Planning Authority, in exercise of the powers conferred on it by Section 5 of the 2000 Act, hereby decides that the proposed underground 10kv grid connection to connect a permitted onsite solar farm substation to the existing 38kv Castlerea substation is development and is not exempted development.

AND WHEREAS I have concluded that the said development does constitute development and is not exempted development as defined within the Planning & Development Act, 2000 as amended and associated regulations and it is recommended that a declaration to that effect should be issued to the applicant.

Site Location: Rathleg, Castlerea, Co. Roscommon.

Development: WHEREAS a question has arisen as to whether works consisting a proposed underground 10kv grid connection to connect a permitted onsite solar farm substation to the existing 38kv Castlerea substation is or is not development, constitutes a material change of use, and is or is not exempted development:

Recent Relevant Planning History:

File number	Development description	Development address	Applicant name	App Type	App Decision
17-295	Development at a site within the townland of Rathleg, Castlerea, Co. Roscommon. The application is for a 10 year planning permission. The development will consist of A Solar Farm with an export capacity of approximately 4.2 MVA comprising Photovoltaic Panels on ground mounted frames, an enclosed single storey ESB Terminal Station, a single storey switchgear enclosure with storage contained, 4 No. single storey inverter stations, ducting & underground electrical cabling, perimeter fencing mounted CCTV cameras, provision of new access to public road as well as internal access track, and all associated site development and landscaping works	Rathleg, Castlerea, Co. Roscommon	Elgin Energy Services Ltd	Permission	Granted

Site Location and Description:

The subject site is located just outside Castlerea and comprises existing lands, which has the benefit of planning permission for a solar farm as outlined above. This in turn leads to the motivation for the DED affected lands, namely the public road network, which runs to an existing substation via the R377 regional route.

Relevant Legislation:

Planning and Development Act, 2000

Section 2 (1)

> "works" includes any act or operation of construction, excavation, demolition, extension, alteration, repair or renewal and, in relation to a protected structure or proposed protected structure, includes any act or operation involving the application or removal of plaster, paint, wallpaper, tiles or other material to or from the surfaces of the interior or exterior of a structure.

Section 3 (1)

> In this Act, "development" means, except where the context otherwise requires, the carrying out of any works on, in, over or under land or the making of any material change in the use of any structures or other land.

Section 4 (1) (h)

> This section states that the following (in this instance – subsection h) shall be exempted developments for the purposes of this Act—
>
> *development consisting of the carrying out of works for the maintenance, improvement or other alteration of any structure, being works which affect only the interior of the structure or which do not materially affect the external appearance of the structure so as to render the appearance inconsistent with the character of the structure or of neighbouring structures;*

Planning and Development Regulations, 2001

Article 6 (3)

> Subject to article 9, in areas other than a city, a town or an area specified in section 19(1)(b) of the Act or the excluded areas as defined in section 9 of the Local Government (Reorganisation) Act, 1985 (No. 7 of 1985), development of a class specified in column 1 of Part 3 of Schedule 2 shall be exempted development for the purposes of the Act, provided that such development complies with the conditions and limitations specified in column 2 of the said Part 3 opposite the mention of that class in the said column 1.

Article 9 (1)

Development to which article 6 relates shall not be exempted development for the purposes of the Act—

(a) if the carrying out of such development would, (inter alia) —

> (i) Contravene a condition attached to a permission under the Act or be inconsistent with any use specified in a permission under the Act,
>
> (iii) endanger public safety by reason of traffic hazard or obstruction of road users,
>
> (viiB) comprise development in relation to which a planning authority or An Bord Pleanála is the competent authority in relation to appropriate assessment and the development would require an appropriate assessment because it would be likely to have a significant effect on the integrity of a European site.

Class 26 of the Planning and Development Regulations 2001 (as amended)

Class 26 states the following: -

Development consisting of: -

The carrying out by any undertaker authorised to provide an electricity service of development consisting of the laying underground of mains, pipes, cables or other apparatus for the purposes of the undertaking.

The above is deemed to be exempt without any attached conditions or limitations stated in the adjoining column of the Regulations.

Assessment:

The question to be determined in this Section 5 referral relates to the determination of whether works consisting of a proposed underground 10kv grid connection to connect a permitted onsite solar farm substation to the existing 38kv Castlerea substation is or is not development, constitutes a material change of use, and is or is not exempted development. Having considered the definition of both "works" and "development" outlined above, it is deemed that proposal clearly constitutes works and is therefore, clearly development.

Article 9 (i) - Planning and Development Regulations, 2001 (as amended)

This section addresses development to which article 6 relates and states that development *shall not be exempted development for the purposes of the Act—*

(a) if the carrying out of such development would—

(iii) endanger public safety by reason of traffic hazard or obstruction of road users,

Having assessed the merits of the DED put forward and engaged with the Roads Section of RCC in order to inform this determination, the Planning Authority has concluded that the proposal as outlined has the potential to endanger public safety by reason of a traffic hazard or obstruction of road users, and thus its comprises works which do not constitute exempted development. Accordingly, such works as that put forward as part of this DED cannot be considered exempt

In respect of whether an Appropriate Assessment (including screening for AA), is required, it is considered that given the nature and scale of the activity and the distance from the closest site i.e. Ballinagare Bog SPA/SAC (C.4.9km), it is considered unlikely that the proposed development would have significant effects on the achievement of the conservation objectives for the site and it is also considered unlikely that the proposed development would have a significant effect on the integrity of this European site.

Recommendation

I have considered this question, and I have had regard the above referenced Planning and Development Act and Regulations and particularly to –

Article 9 (iii) - Planning and Development Regulations, 2001 (as amended)

AND WHEREAS I have concluded that:

a) The works are development

b) The works contravene the specified Article 9 (iii) of the Planning and Development Regulations 2001 (as amended), insofar as they involve substantial works which will impact upon the public road network and potential future works to same and also have the potential to endanger public safety by reason of traffic hazard or obstruction of road users, and thus, it is the opinion of the Planning Authority of Roscommon County Council that the proposal does not constitute exempted development.

Accordingly, such works as that put forward as part of this DED are not considered to be exempt.

I recommend that a declaration to this effect should be issued to the applicant.

Signed: _____ **Date: 14th April 2022**

Brian Farragher A/SEP

Roscommon County Council
Aras an Chontae
Roscommon
09066 37100

21/03/2022 11:53:13

Receipt No. : L01/0/216059

ELGIN ENERGY SERVICES LTD
[redacted]

EXEMPTED DEVELOPMENT

PLANNING APPLICATION FEES		80.00
GOODS	80.00	
VAT Exempt/Non-vatable		
DED 514		

Total : 80.00 EUR

Tendered :
Cheque 80.00
718

Change : 0.00

DEDS14

ROSCOMMON COUNTY COUNCIL
21 MAR 2022
PLANNING SECTION

Comhairle Contae Ros Comáin
Roscommon County Council

Áras an Chontae,
Roscommon,
Co. Roscommon
Phone: (090) 66 37100
Email: planning@roscommoncoco.ie

Roscommon County Council

Application for a Declaration under Section 5 of the Planning & Development Act 2000, regarding Exempted Development

Name:	Elgin Energy Services Ltd.
Address:	[redacted]
Name & Address of Agent:	TOBIN Consulting Engineers Block 10-4, Blanchardstown Corporate Park, Dublin 15, D15 X98N Ireland
Nature of Proposed Works	Proposed underground 10kV grid connection to connect a permitted onsite solar farm substation to the existing 38kV Castlerea substation. The total length of the route is 1.14km.
Location (Townland & O.S No.)	Rathleg, Castlerea, Co. Roscommon
Floor Area	n/a
Height above ground level	n/a
Total area of private open space remaining after completion of this development	n/a
Roofing Material (Slates, Tiles, other) (Specify)	n/a
Proposed external walling (plaster, stonework, brick or other finish, giving colour)	n/a
Is proposed works located at front/rear/side of existing house.	n/a

Roscommon County Council

Application for a Declaration under Section 5 of the Planning & Development Act 2000, regarding Exempted Development

Has an application been made previously for this site	Yes
If yes give ref. number (include full details of existing extension, if any)	Planning Ref. PD/17/295 for a solar energy development and associated works was granted permission on the site.
Existing use of land or structure	n/a
Proposed use of land or structure	n/a
Distance of proposed building line from edge of roadway	n/a
Does the proposed development involve the provision of a piped water supply	n/a
Does the proposed development involve the provision of sanitary facilities	n/a

ROSCOMMON COUNTY COUNCIL
21 MAR 2022
PLANNING SECTION

Signature: _____

Date: 14/03/2022

Note: This application **must** be accompanied by:-

(a) €80 fee
(b) Site Location map to a scale of 1:2500 clearly identifying the location
(c) Site Layout plan to the scale of 1:500 indicating exact location of proposed development
(d) Details specification of development proposed

TOBIN
CONSULTING ENGINEERS

www.tobin.ie

Fairgreen House
Fairgreen Road
Galway
H91 AXK8
Tel: + 353 (0)91 565211
Email: info@tobin.ie

Block 10-4,
Blanchardstown Corporate Park
Dublin
D15 X98N
Tel: + 353 (0)1 8030401
Email: info@tobin.ie

Market Square
Castlebar
Co Mayo
F23 Y427
Tel: +353 (0)94 9021401
Email: info@tobin.ie

ROSCOMMON COUNTY COUNCIL
21 MAR 2022
PLANNING SECTION

Our Ref: 7879

14 March 2022

Planning Department
Roscommon County Council
County Hall,
County Roscommon,
F42 VR98

Re: Section 5 Exemption Application for Underground Electrical Cable to Roscommon County Council

Dear Sir or Madam,

On behalf our client Elgin Energy Services Limited, TOBIN Consulting Engineers is pleased to submit this application to Roscommon County Council to confirm that the proposed development of an underground 10kV cable is exempted development.

The underground 10kV cable (hereafter referred to as the "proposed development") is associated with the proposed 4.2MVA Solar Farm at Castlerea in County Roscommon which secured planning permission from Roscommon County Council on the 29th September 2017 (Planning Register Reference: PD/17/295). The planning application for the solar project included the proposed development within the scope of the various environmental assessments (ecology, cultural heritage and archaeology, Screening for Appropriate Assessment, Landscape etc.) undertaken in support of that application however did not seek planning permission for the cabling works.

Description of Development

The route of the proposed underground cable will connect the permitted onsite substation to the existing ESB substation in Castlerea, Co. Roscommon. Approximately 0.95km of the proposed 1.14km route is within the public road corridor. The remaining 0.19km is within lands under the ownership of the solar farm landowner. It exits the permitted solar farm site onto a local road in Rathleg, running in a southwest direction for approximately 800m before turning west to enter the existing ESB substation in Rathleg.

Works shall be carried out to the appropriate ESB specifications and will include any required site clearing, excavations, laying ducts and joint bays, backfilling and reinstatement. The area will be checked for existing underground services, particularly near the public road, and the area around any services will be carefully dug to avoid impacts to the service. The duct will be placed in the trench and the appropriate aggregate material will be backfilled and compacted in layers. The reinstatement and surface finish shall be agreed in advance with the local authority, ESB and the solar farm landowner. All reinstatement within public roads will be equal to or better than the original surface.

Justification for Exemption

Under the Planning Act, planning permission shall be required in respect of any development not being exempted development. The following definitions as per the Planning and Development Act 2000 (as amended) are relevant:

Section 2(1): "In this Act, except where the context otherwise requires

> *"Works" includes any act or operation of construction, excavation, demolition, extension, alteration, repair or renewal and in relation to a protected structure or proposed protected structure, includes any act or operation involving the application or removal of plaster, paint, wallpaper, tiles or other material to or from the surfaces of the interior or exterior of a structure."*
>
> *"Structure" means any building, structure, excavation, or other thing constructed or made on, in or under any land, or any part of a structure so defined, and (a) where the context so admits, includes the land on, in or under which the structure is situate,"*

Section 3(1) "In this Act

> *"Development" means, except where the context otherwise requires, the carrying out of any works on, in, over or under land or the making of any material change in the use of any structure or other land.*

Section 4(1) sets out developments that shall be exempted development for the purposes of the Act.

Article 6(1) of the Planning and Development Regulations, 2001 states that:

> *"Subject to Article 9 development of a class specified in Column 1 and part 1 of Schedule 2 shall be exempted development for the purpose of the Act."*

Schedule 2 of the Planning and Development Regulations 2001, (as amended) includes classes of development which are considered exempted development. Class 26 is directly relevant to this proposed development and refers to:

"the carrying out by any statutory undertaker authorised to provide an electricity service of development consisting of the laying of underground mains, pipes, cables or other apparatus for the purposes of the undertaking".

Under Article 3(3) of the Electricity Regulation Act 1999, electricity undertaking is defined as:

"any person engaged in generation, transmission, distribution or supply of electricity, including any holder of a license or authorisation under this Act, or any person who has been granted a permit under Section 37 of the Principle Act"

The applicants have been granted permission for an electricity generating development and as such are *"authorised to provide an electricity service"* through the *"generation, transmission and distribution of supply of electricity."*

In order to demonstrate that a development is exempt, it is also necessary to demonstrate that certain restrictions on exempted development do not apply. These restrictions are set out in various Articles/Sections set out in the Planning Regulations/Acts and are reproduced in Table 1 which includes an analysis as to the applicability of the restriction to the proposed development.

Table 1: Planning Regulations/Acts- Exemption Criteria Analysis

Article / Section	Article Description	Commentary
9(1)(a)(i)	Contravene a condition attached to a permission under the Act or be inconsistent with any use specified in a permission under the Act	The proposed development will not contravene any related planning conditions.
9(1)(a)(iii)	Endanger public safety by reason of traffic hazard or obstruction of road users,	The proposed development will be subject to a road opening licence from Roscommon County Council and will be subject to a Traffic Management Plan to be agreed in advance of any works with Roscommon County Council.
9(1)(a)(vi)	Interfere with the character of a landscape, or a view or prospect of special amenity value or special interest, the preservation of which is an objective of a development plan for the area in which the development is proposed or, pending the variation of a development plan or the making of a new development plan, in the draft variation of the development plan or the draft development plan,	The proposed development will be an underground cable and will be installed in accordance with ESBs cable specification requirements. There will be no impact in the context of the landscape sensitivities identified over.
9(1)(a)(vii)	Consist of or comprise the excavation, alteration or demolition of places, caves, sites, features or other objects of archaeological, geological, historical, scientific or ecological interest, the preservation, conservation or protection of which is an objective of a development plan or local area plan (LAP) for the area in which the development is proposed or, pending the variation of a development	The proposed development will be an underground cable and will be installed in accordance with ESBs cable specification requirements. There will be no impact in the context of the geological, archaeological and other sensitivities identified over.

Section	Article Description	Commentary
	plan or LAP, or the making of a new development plan or LAP, in the draft variation of the development plan or LAP, or the draft development plan or draft LAP.	
9(1)(a)(viiA)	Consist of or comprise the excavation, alteration or demolition of any archaeological monument included in the Record of Monuments and Places.	The proposed development was considered as part of the wider solar project in a Cultural Heritage Assessment prepared by John Cronin & Associates. This assessment was submitted to Roscommon County Council in support of the planning application for the solar project. This assessment concluded that the development poses a slight indirect impact on the setting of a ringfort located to the southwest of the proposed development.
9(1)(a)(viiB)	Where the planning authority or the Board is competent authority for the purposes of Appropriate Assessment (AA) and the development would require an AA because it would be likely to have a significant effect on the integrity of a European Site;	The proposed development was considered as part of the wider solar project in a Screening for Appropriate Assessment prepared by RPS Group. This assessment was submitted to Roscommon County Council in support of the planning application for the solar project. This assessment concluded that the solar project (including the underground cable) will not delay or hinder the maintenance or restoration to favourable conservation conditions, the qualifying interests for which the SACs has been designated or the special conservation interests for which the SPA have been designated. The project will not result in a significant adverse effect on NATURA 2000 sites either alone or in combination with other projects.
9(1)(a)(viiC)	Where the development would be likely to have an adverse impact on an area designated as a Natural Heritage Area (NHA) under the Wildlife Act;	The proposed development was considered as part of the wider solar project in an Ecological Impact Assessment prepared by RPS Group. This assessment was submitted to Roscommon County Council in support of the planning application for the solar project. This assessment concluded that the solar project (including the underground cable) will not result in any adverse impact on an area designated as a Natural Heritage Area (NHA) under the Wildlife Act.
9(1)(a)(x)	Consist of the fencing or enclosure of any land habitually open to or used by the public during the 10 years preceding such fencing or enclosure for recreational purposes or as a means of access to any seashore, mountain, lakeshore, riverbank or other place of natural beauty or recreational utility	The proposed development will not result in the fencing or enclosing or obstructing access as described over.
9(1)(a)(xi)	Obstruct any public right of way	The proposed development will not result in any obstruction of public right of way.
9(1)(a)(xii)	Consist of or comprise the carrying out of works to the exterior of a structure, where the structure concerned is located within an architectural conservation area or an area specified as an architectural conservation area	The proposed development is not located within an architectural conservation area or an area specified as an architectural conservation area.
9(1)(c)	Where the development is subject to the Environmental Impact Assessment Directive (i.e. is of a class of project listed in Annexes I or II of the Directive);	Solar projects and electrical grid infrastructure comprising underground cables are not project types requiring EIA as set out in Schedule 5 of the Planning and Development Regulations 2001, as amended. This has been established most recently by the High Court in *Sweetman V An Bord Pleanála and others (2019 No. 33 JR).*
Section 57 of Planning Act	The carrying out of works to a protected structure, or a proposed protected structure, shall be exempted development only if those works would not materially affect the character of— (a) the structure, or (b) any element of the structure which contributes to its special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest.	The proposed development will not materially affect the character of any protected structure.

Having regard to the applicability of Class 26 to the proposed development and the absence of any restrictions as set out in the above table, it is the opinion of TOBIN Consulting Engineers that the proposed development is exempted development. This is in line with a decision from An Bord Pleanála (ABP-302895-18). We would request that Roscommon County Council consider these details and, in the event that the same conclusions are reached, issue an Exemption Declaration as per statutory timelines.

Content of Exemption Application

The exemption application submitted to Roscommon County Council comprises the following information:

- 2 no. copies of exempted development application form;
- 2 no. copies of exempted development application drawings:
  - Site Location Map;
  - Site Layout Map;
- 2 no. copies Ecological Assessment Report which includes an Appropriate Assessment Screening;
- 2 no. copies of ESB specifications
- 2 no copies of Final Grant Reg 17/295
- Cheque made payable to Roscommon County Council to the value of €80.00.

We trust you will find the enclosed information sufficient in order to determine the exempted development application and issue an Exemption Declaration. If you require any further information then please do not hesitate to contact the undersigned.

Yours sincerely,

Louise Byrne
Planner
For and on behalf of TOBIN Consulting Engineers and Elgin Energy Services Ltd
Block 10-4
Blanchardstown Corporate Park
Dublin
D15 X98N
Tel: + 353 (0)1 8030401
Louise.Byrne@tobin.ie

Comhairle Contae
Ros Comáin
Roscommon
County Council

Áras an Chontae,
Roscommon,
Co. Roscommon
Phone: (090) 66 37100
Email: planning@roscommoncoco.ie

ROSCOMMON COUNTY COUNCIL
24 MAR 2022
PLANNING SECTION

Roscommon County Council

Application for a Declaration under Section 5 of the Planning & Development Act 2000, regarding Exempted Development

Name:	Elgin Energy Services Ltd
Address:	[redacted]
[redacted] Address of Agent:	TOBIN Consulting Engineers Block 10-4, Blanchardstown Corporate Park, Dublin 15, D15 X98N Ireland
Nature of Proposed Works	Proposed underground 10kV grid connection to connect a permitted onsite solar farm substation to the existing 38kV Castlerea substation. The total length of the route is 1.14km.
Location (Townland & O.S No.)	Rathleg, Castlerea, Co. Roscommon
Floor Area	n/a
Height above ground level	n/a
Total area of private open space remaining after completion of this development	n/a
Roofing Material (Slates, Tiles, other) (Specify)	n/a
Proposed external walling (plaster, stonework, brick or other finish, giving colour)	n/a
Is proposed works located at front/rear/side of existing house.	n/a

Roscommon County Council

Application for a Declaration under Section 5 of the Planning & Development Act 2000, regarding Exempted Development

Has an application been made previously for this site	Yes
If yes give ref. number (include full details of existing extension, if any)	Planning Ref. PD/17/295 for a solar energy development and associated works was granted permission on the site.
Existing use of land or structure	n/a
Proposed use of land or structure	n/a
Distance of proposed building line from edge of roadway	n/a
Does the proposed development involve the provision of a piped water supply	n/a
Does the proposed development involve the provision of sanitary facilities	n/a

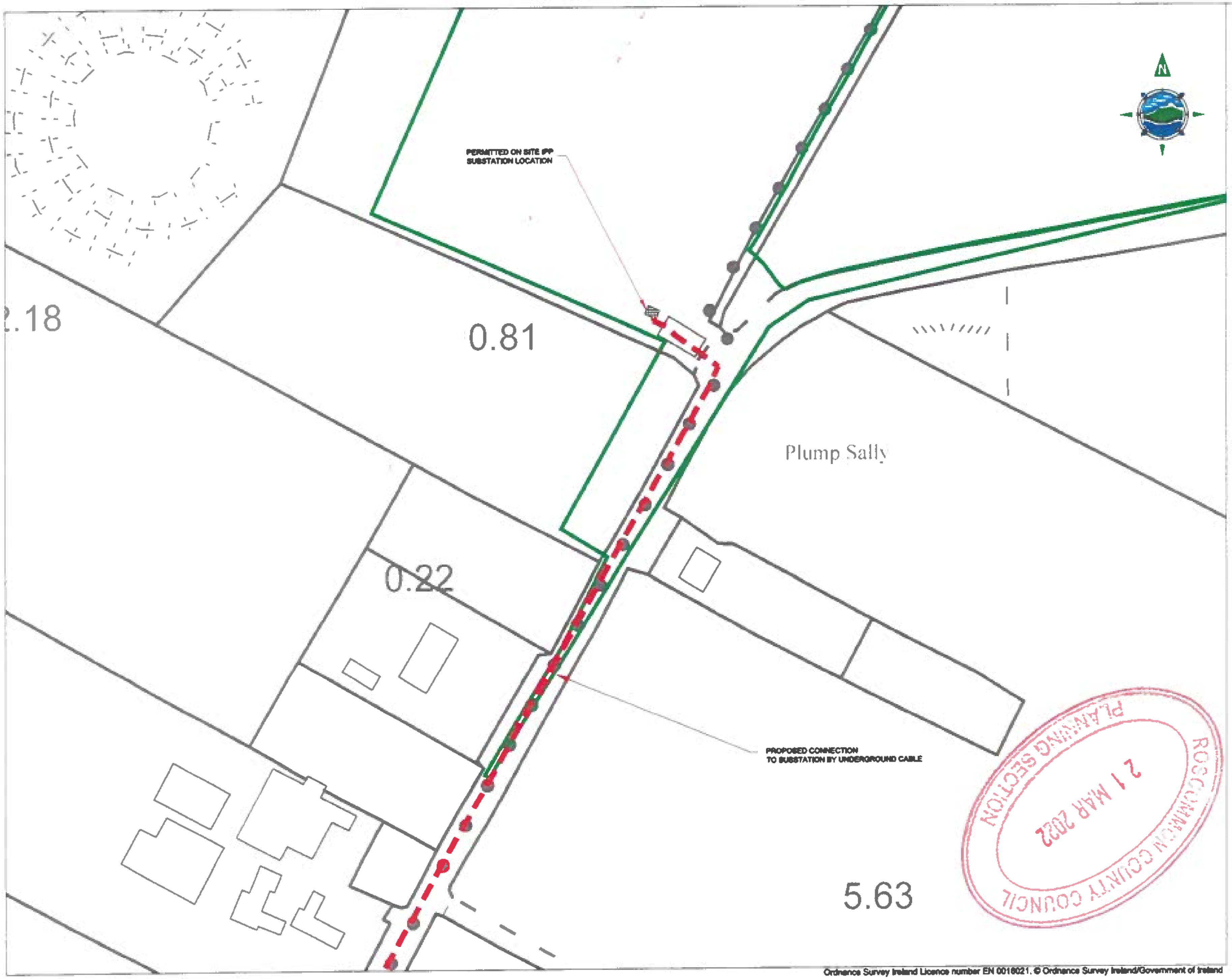
ROSCOMMON COUNTY COUNCIL
21 MAR 2022
PLANNING SECTION

Signature: _____

Date: 14/03/2022

Note: This application **must** be accompanied by:-

(a) €80 fee
(b) Site Location map to a scale of 1:2500 clearly identifying the location
(c) Site Layout plan to the scale of 1:500 indicating exact location of proposed development
(d) Details specification of development proposed



Ordnance Survey Ireland Licence number EN 0016021. © Ordnance Survey Ireland/Government of Ireland

GENERAL LEGEND

PERMITTED SOLAR FARM BOUNDARY

GRID CORRIDOR FOR 20kV UNDERGROUND CABLE

EXISTING ESB SUBSTATION LOCATION

KEY PLAN

NOTES.

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER/EMPLOYERS REPRESENTATIVE, AS APPROPRIATE, TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. THE CONTRACTOR SHALL UNDERTAKE A THOROUGH CHECK FOR THE ACTUAL LOCATION OF ALL SERVICES/UTILITIES, ABOVE AND BELOW GROUND, BEFORE ANY WORK COMMENCES
5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

10m 0 10m 20m 30m

Rev	Date	Description	By	Chkd.
A	[illegible]	APPLICATION ISSUE	[illegible]	[illegible]

Client: ELGIN ENERGY

Project: CASTLEREA SOLAR FARM GRID CONNECTION SECTION 5 APPLICATION

Title: SITE LAYOUT PLAN - Sheet 1 of 4 -

Scale @ A1: 1:500

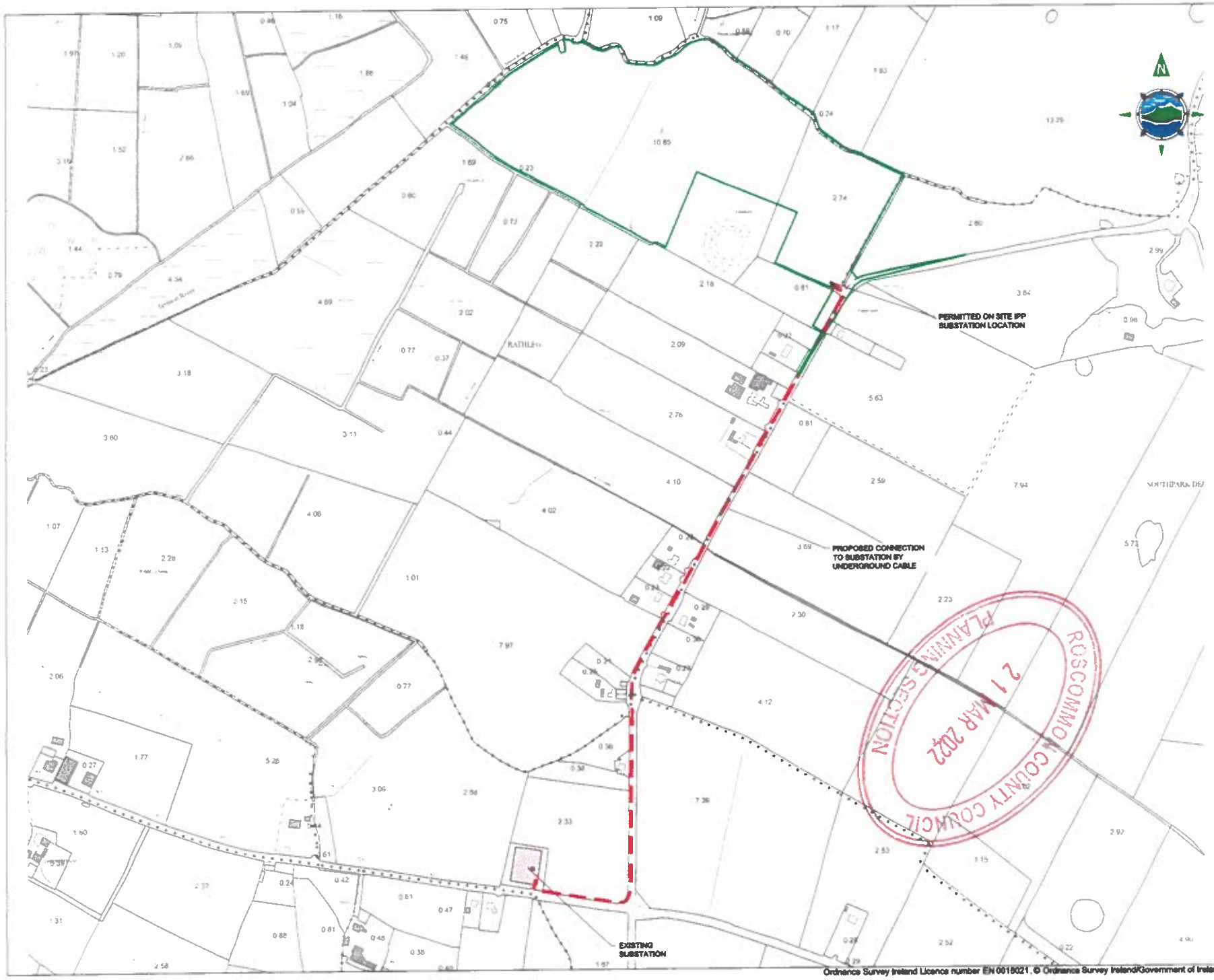
Prepared by:	Checked:	Date:
M. Nolan	J. Staunton	July 2021

Project Director: S. Tinnelly

Drawing Status: Final

TOBIN CONSULTING ENGINEERS

Drawing No. 78794-3101 Revision: A



GENERAL LEGEND

PERMITTED SOLAR FARM BOUNDARY

GRID CORRIDOR FOR UNDERGROUND CABLE

EXISTING ESB SUBSTATION LOCATION

NOTES:

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
2. ALL DIMENSIONS TO BE CHECKED BY THE CONTRACTOR ON SITE.
3. ENGINEER/EMPLOYERS REPRESENTATIVE, AS APPROPRIATE, TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES.
4. THE CONTRACTOR SHALL UNDERTAKE A THOROUGH CHECK FOR THE ACTUAL LOCATION OF ALL SERVICES/UTILITIES, ABOVE AND BELOW GROUND, BEFORE ANY WORK COMMENCES.
5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

OSI 1:5,000 Sheet No: 3592

50m 0 50m 100m 150m

Rev	Date	Description	By	Chkd.
A	18.01.21	APPLICATION ISSUE	MH	AB

Client: ELGIN ENERGY

Project: CASTLEREA SOLAR FARM GRID CONNECTION SECTION 5 APPLICATION

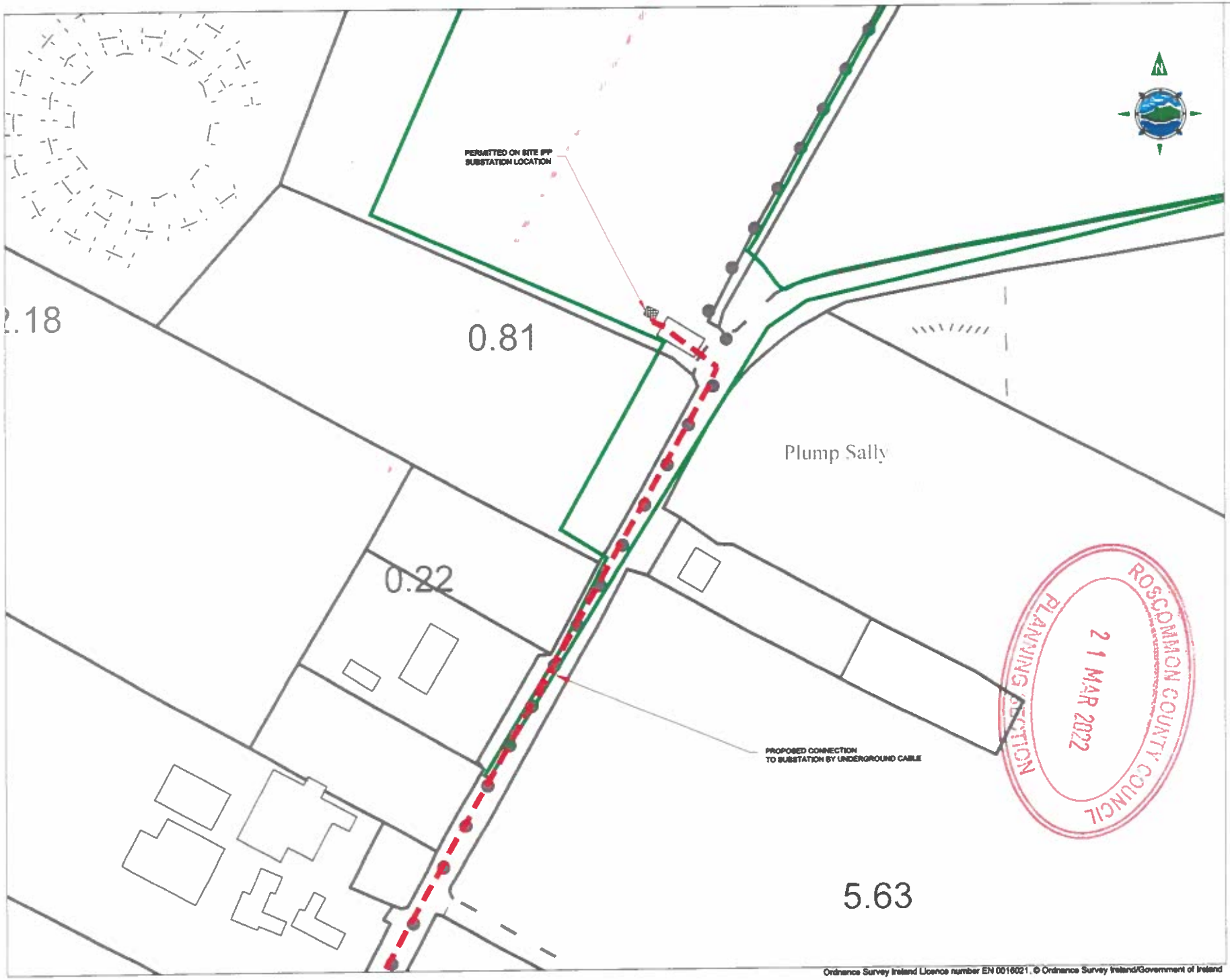
Title: SITE LOCATION MAP

Scale @ A1: 1:2,500

Prepared by:	Checked:	Date:
M. Nolan	J. Staunton	July 2021
Project Director:	S. Tinnelly	
Drawing Status:	Final	

TOBIN
CONSULTING ENGINEERS
Block 10-4, Blanchardstown Corporate Park, Dublin 15, Ireland.
tel: +353-(0)1-8020400
fax: +353-(0)1-8020500
e-mail: dublin@tobin.ie
www.tobin.ie

Drawing No.: 78794-3100 | Revision: A



GENERAL LEGEND

PERMITTED SOLAR FARM BOUNDARY

GRID CORRIDOR FOR 38kV UNDERGROUND CABLE

EXISTING ESB SUBSTATION LOCATION

KEY PLAN

NOTES.

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER/EMPLOYERS REPRESENTATIVE, AS APPROPRIATE, TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. THE CONTRACTOR SHALL UNDERTAKE A THOROUGH CHECK FOR THE ACTUAL LOCATION OF ALL SERVICES/UTILITIES, ABOVE AND BELOW GROUND, BEFORE ANY WORK COMMENCES
5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

OSI 1:5,000 Sheet No: 2892

10m 0 10m 20m 30m

Rev	Date	Description	By	Chkd.
A	30.07.21	APPLICATION ISSUE	MH	JS

Client: ELGIN ENERGY

Project: CASTLEREA SOLAR FARM GRID CONNECTION SECTION 5 APPLICATION

Title: SITE LAYOUT PLAN - Sheet 1 of 4 -

Scale @ A1:	1:500		
Prepared by: M. Nolan	Checked: J. Staunton	Date: July 2021	
Project Director: S. Tinnelly			
Drawing Status: Final			

TOBIN CONSULTING ENGINEERS

Block 10-4, Blanchardstown Corporate Park, Dublin 15, Ireland.
tel: +353-(0)1-8030400
fax: +353-(0)1-8030409
e-mail: dublin@tobin.ie
www.tobin.ie

Drawing No.: 78794-3101 | Revision: A

GENERAL LEGEND

PERMITTED SOLAR FARM BOUNDARY

GRID CORRIDOR FOR 38kV UNDERGROUND CABLE

EXISTING ESB SUBSTATION LOCATION

KEY PLAN

NOTES.

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER/EMPLOYERS REPRESENTATIVE, AS APPROPRIATE, TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. THE CONTRACTOR SHALL UNDERTAKE A THOROUGH CHECK FOR THE ACTUAL LOCATION OF ALL SERVICES/UTILITIES, ABOVE AND BELOW GROUND, BEFORE ANY WORK COMMENCES
5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

OSI 1:5,000 Sheet No: [illegible]

10m 0 10m 20m 30m

Rev	Date	Description	By	Chkd.
A	[illegible]	APPLICATION ISSUE	[illegible]	[illegible]

Client: ELGIN ENERGY

Project: CASTLEREA SOLAR FARM GRID CONNECTION SECTION 5 APPLICATION

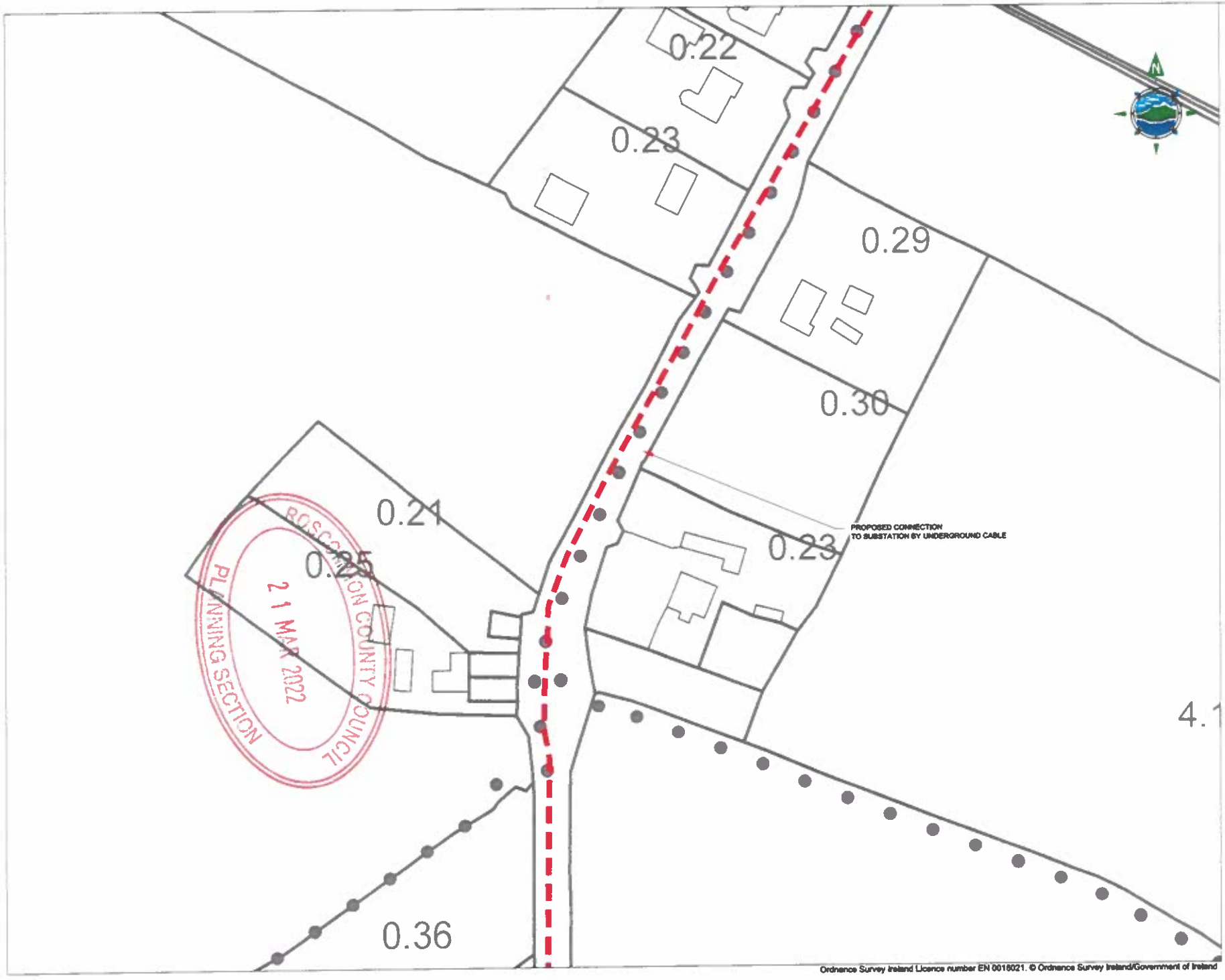
Title: SITE LAYOUT PLAN - Sheet 2 of 4 -

Scale @ A1	1:500	
Prepared by: M. Nolan	Checked: J. Staunton	Date: July 2021
Project Director:	S. Tinnelly	
Drawing Status:	Final	

TOBIN CONSULTING ENGINEERS

Block 10-4, Blanchardstown Corporate Park, Dublin 15, Ireland.
tel: +353-(0)1-8030406
fax: +353-(0)1-8030409
e-mail: dublin@tobin.ie
www.tobin.ie

Drawing No. 78794-3102 Revision: A



GENERAL LEGEND

PERMITTED SOLAR FARM BOUNDARY

GRID CORRIDOR FOR 38kV UNDERGROUND CABLE

EXISTING 038 SUBSTATION LOCATION

KEY PLAN

NOTES.

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE.
3. ENGINEER/EMPLOYERS REPRESENTATIVE, AS APPROPRIATE, TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES.
4. THE CONTRACTOR SHALL UNDERTAKE A THOROUGH CHECK FOR THE ACTUAL LOCATION OF ALL SERVICES/UTILITIES, ABOVE AND BELOW GROUND, BEFORE ANY WORK COMMENCES.
5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD.

OSI 1:5,000 Sheet No: 3858

10m 0 10m 20m 30m

Rev	Date	Description	By	Chkd
A	MAR 21	APPLICATION ISSUE	MH	JS

Client: ELGIN ENERGY

Project: CASTLEREA SOLAR FARM GRID CONNECTION SECTION 5 APPLICATION

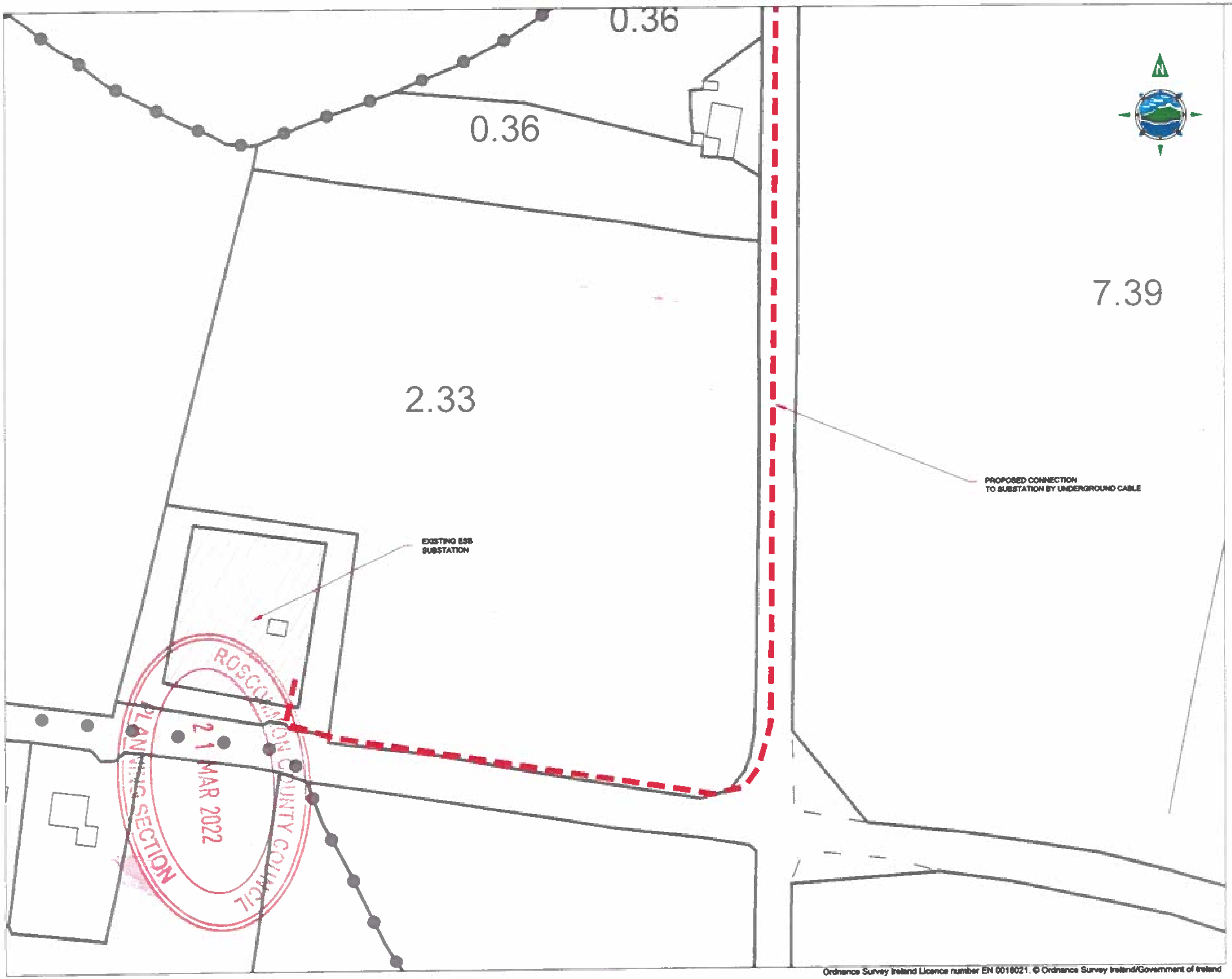
Title: SITE LAYOUT PLAN - Sheet 3 of 4 -

Scale @ A1	1:500
Prepared by: M. Nolan	Checked: J. Staunton
Date: July 2021	
Project Director: S. Tinnelly	
Drawing Status: Final	

TOBIN CONSULTING ENGINEERS

Block 10-4, Blanchardstown Corporate Park, Dublin 15, Ireland.
tel: +353-(0)1-8030400
fax: +353-(0)1-8030409
e-mail: dublin@tobin.ie
www.tobin.ie

Drawing No. 78794-3103 Revision A



Ordnance Survey Ireland Licence number EN 0016021. © Ordnance Survey Ireland/Government of Ireland

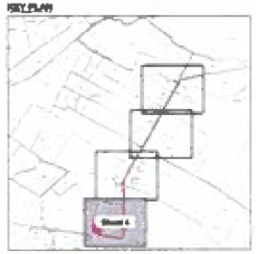
GENERAL LEGEND

PERMITTED SOLAR FARM BOUNDARY

GRID CORRIDOR FOR 38kV UNDERGROUND CABLE

EXISTING ESB SUBSTATION LOCATION

KEY PLAN



NOTES.

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER/EMPLOYERS REPRESENTATIVE, AS APPROPRIATE, TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. THE CONTRACTOR SHALL UNDERTAKE A THOROUGH CHECK FOR THE ACTUAL LOCATION OF ALL SERVICES/UTILITIES ABOVE AND BELOW GROUND, BEFORE ANY WORK COMMENCES
5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

10m 0 10m 20m 30m

Rev	Date	Description	By	Chkd.

Client: ELGIN ENERGY

Project: CASTLEREA SOLAR FARM GRID CONNECTION SECTION 5 APPLICATION

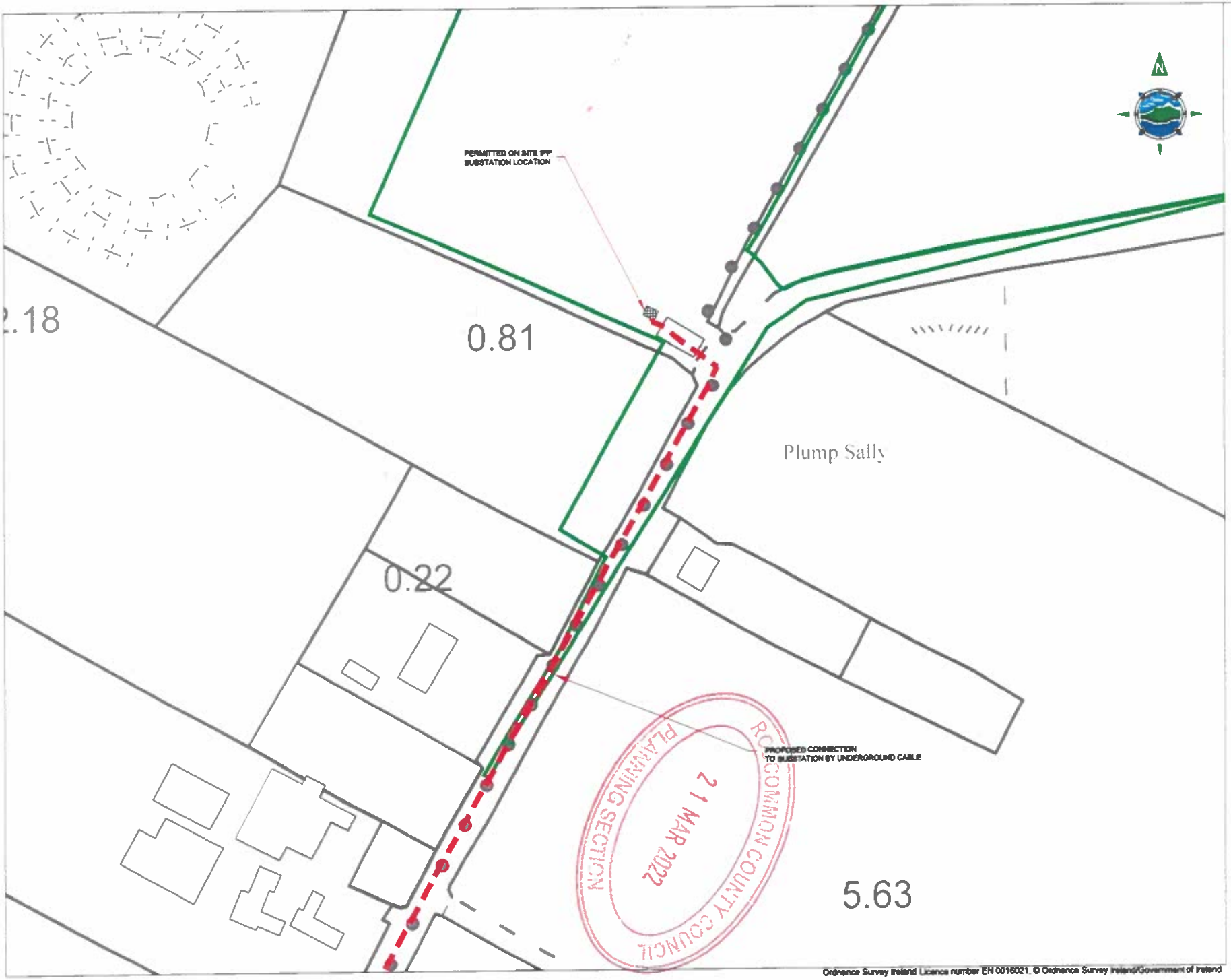
Title: SITE LAYOUT PLAN - Sheet 4 of 4 -

Scale @ A1: 1:500		
Prepared by: M. Nolan	Checked: J. Staunton	Date: July 2021
Project Director: S. Tinnelly		
Drawing Status: Final		

TOBIN CONSULTING ENGINEERS

Drawing No. 78794-3104

Revision: A



GENERAL LEGEND

PERMITTED SOLAR FARM BOUNDARY

GRID CORRIDOR FOR 38kV UNDERGROUND CABLE

EXISTING ESB SUBSTATION LOCATION

KEY PLAN

NOTES.

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. EMPLOYER/EMPLOYERS REPRESENTATIVE, AS APPROPRIATE, TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. THE CONTRACTOR SHALL UNDERTAKE A THOROUGH CHECK FOR THE ACTUAL LOCATION OF ALL SERVICES/UTILITIES ABOVE AND BELOW GROUND, BEFORE ANY WORK COMMENCES
5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

OSI 1:5,000 Sheet No: 3002

10m 0 10m 20m 30m

Rev	Date	Description	By	Chkd
A	30.07.21	APPLICATION ISSUE	MR	JS

Client: ELGIN ENERGY

Project:
CASTLEREA SOLAR FARM
GRID CONNECTION
SECTION 5 APPLICATION

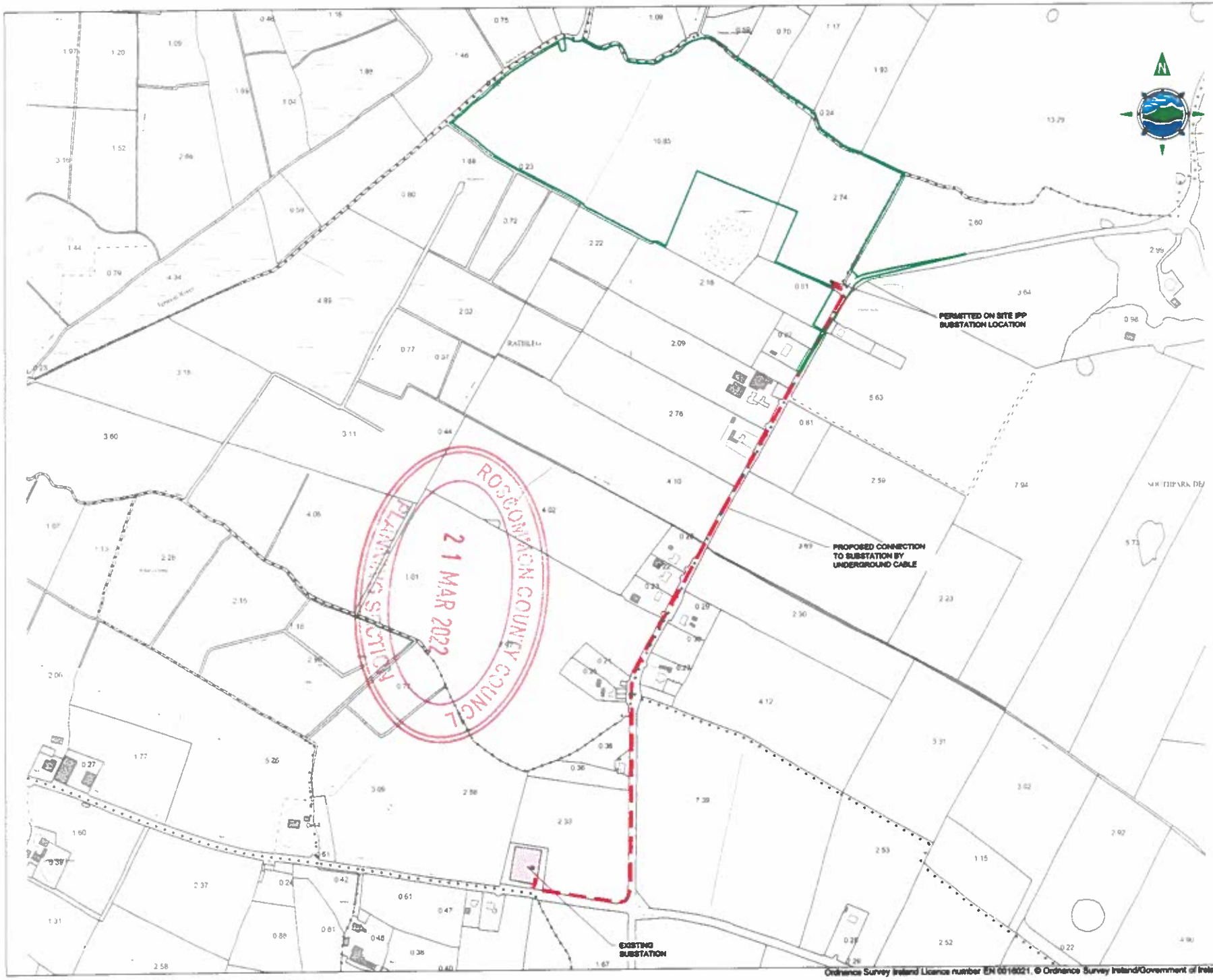
Title:
SITE LAYOUT PLAN
- Sheet 1 of 4 -

Scale @ A1	1:500		
Prepared by: M. Nolan	Checked: J. Staunton	Date: July 2021	
Project Director:	S. Tinnelly		
Drawing Status:	Final		

TOBIN
CONSULTING ENGINEERS

Block 10-4, Blanchardstown Corporate Park, Dublin 15, Ireland.
tel: +353-(0)1-8030400
fax: +353-(0)1-8030409
e-mail: dublin@tobin.ie
www.tobin.ie

Drawing No. 78794-3101 | Revision A



GENERAL LEGEND

PERMITTED SOLAR FARM BOUNDARY

GRID CORRIDOR FOR UNDERGROUND CABLE

EXISTING ESB SUBSTATION LOCATION

NOTES.

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
2. ALL DIMENSIONS TO BE CHECKED BY THE CONTRACTOR ON SITE.
3. ENGINEER/EMPLOYERS REPRESENTATIVE, AS APPROPRIATE, TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES.
4. THE CONTRACTOR SHALL UNDERTAKE A THOROUGH CHECK FOR THE ACTUAL LOCATION OF ALL SERVICES/UTILITIES, ABOVE AND BELOW GROUND, BEFORE ANY WORK COMMENCES.
5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

OSI 1:5,000 Sheet No: 3002

50m 0 50m 100m 150m

Rev	Date	Description	By	Chkd.
A	8.3.21	APPLICATION ISSUE	MN	JS

Client: ELGIN ENERGY

Project: CASTLEREA SOLAR FARM GRID CONNECTION SECTION 5 APPLICATION

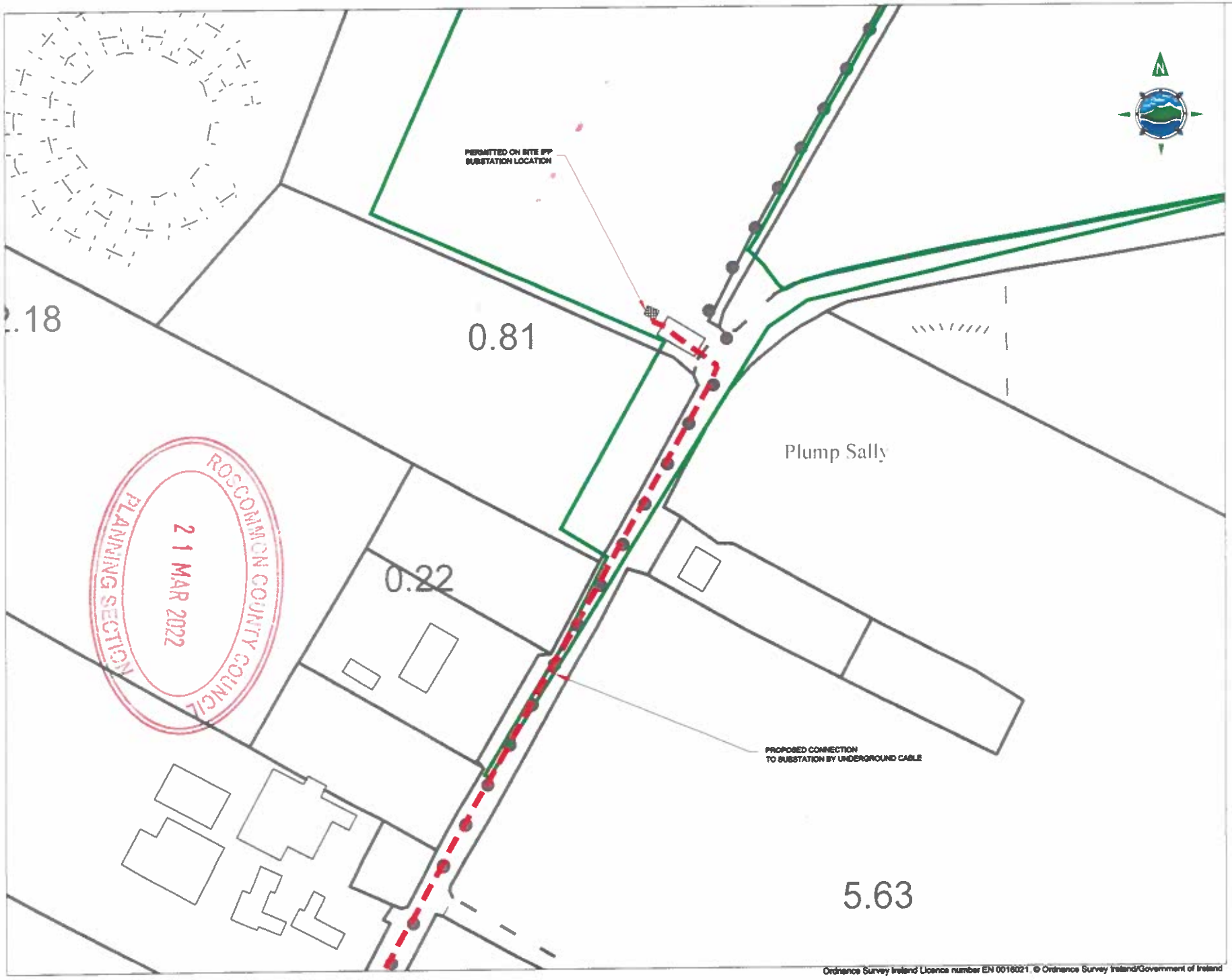
Title: SITE LOCATION MAP

Scale @ A1:	1:2,500	
Prepared by: M. Nolan	Checked: J. Staunton	Date: July 2021
Project Director:	S. Tinnelly	
Drawing Status:	Final	

TOBIN CONSULTING ENGINEERS

Block 10-4, Blanchardstown Corporate Park, Dublin 15, Ireland.
tel: +353-(0)1-8020400
fax: +353-(0)1-8020400
e-mail: dublin@tobin.ie
www.tobin.ie

Drawing No.: 78794-3100 Revision: A



GENERAL LEGEND

PERMITTED SOLAR FARM BOUNDARY

GRID CORRIDOR FOR 38kV UNDERGROUND CABLE

EXISTING ESB SUBSTATION LOCATION

KEY PLAN

NOTES.

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER/EMPLOYERS REPRESENTATIVE, AS APPROPRIATE, TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. THE CONTRACTOR SHALL UNDERTAKE A THOROUGH CHECK FOR THE ACTUAL LOCATION OF ALL SERVICES/UTILITIES, ABOVE AND BELOW GROUND, BEFORE ANY WORK COMMENCES
5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

OSI 1:5,000 Sheet No: 3892

10m 0 10m 20m 30m

Rev.	Date	Description	By	Chkd.
A	JULY 21	APPLICATION ISSUE	MN	JS

Client: ELGIN ENERGY

Project: CASTLEREA SOLAR FARM GRID CONNECTION SECTION 5 APPLICATION

Title: SITE LAYOUT PLAN - Sheet 1 of 4 -

Scale @ A1	1:500	
Prepared by: M. Nolan	Checked: J. Staunton	Date: July 2021
Project Director:	S. Tinnelly	
Drawing Status:	Final	

TOBIN CONSULTING ENGINEERS

Block 10-4, Blanchardstown Corporate Park, Dublin 15, Ireland.
tel: +353-(0)1-8020600
fax: +353-(0)1-8020666
e-mail: dublin@tobin.ie
www.tobin.ie

Drawing No.: 78794-3101 | Revision: A

GENERAL LEGEND

PERMITTED SOLAR FARM BOUNDARY

GRID CORRIDOR FOR 38kV UNDERGROUND CABLE

EXISTING ESB SUBSTATION LOCATION

KEY PLAN

NOTES.

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER/EMPLOYERS REPRESENTATIVE, AS APPROPRIATE, TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. THE CONTRACTOR SHALL UNDERTAKE A THOROUGH CHECK FOR THE ACTUAL LOCATION OF ALL SERVICES/UTILITIES ABOVE AND BELOW GROUND, BEFORE ANY WORK COMMENCES
5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

OSI 1:5,000 Sheet No: 2002

10m 0 10m 20m 30m

Rev	Date	Description	By	Chkd.
A	[illegible]	APPLICATION ISSUE	MH	JS

Client: ELGIN ENERGY

Project:
CASTLEREA SOLAR FARM
GRID CONNECTION
SECTION 5 APPLICATION

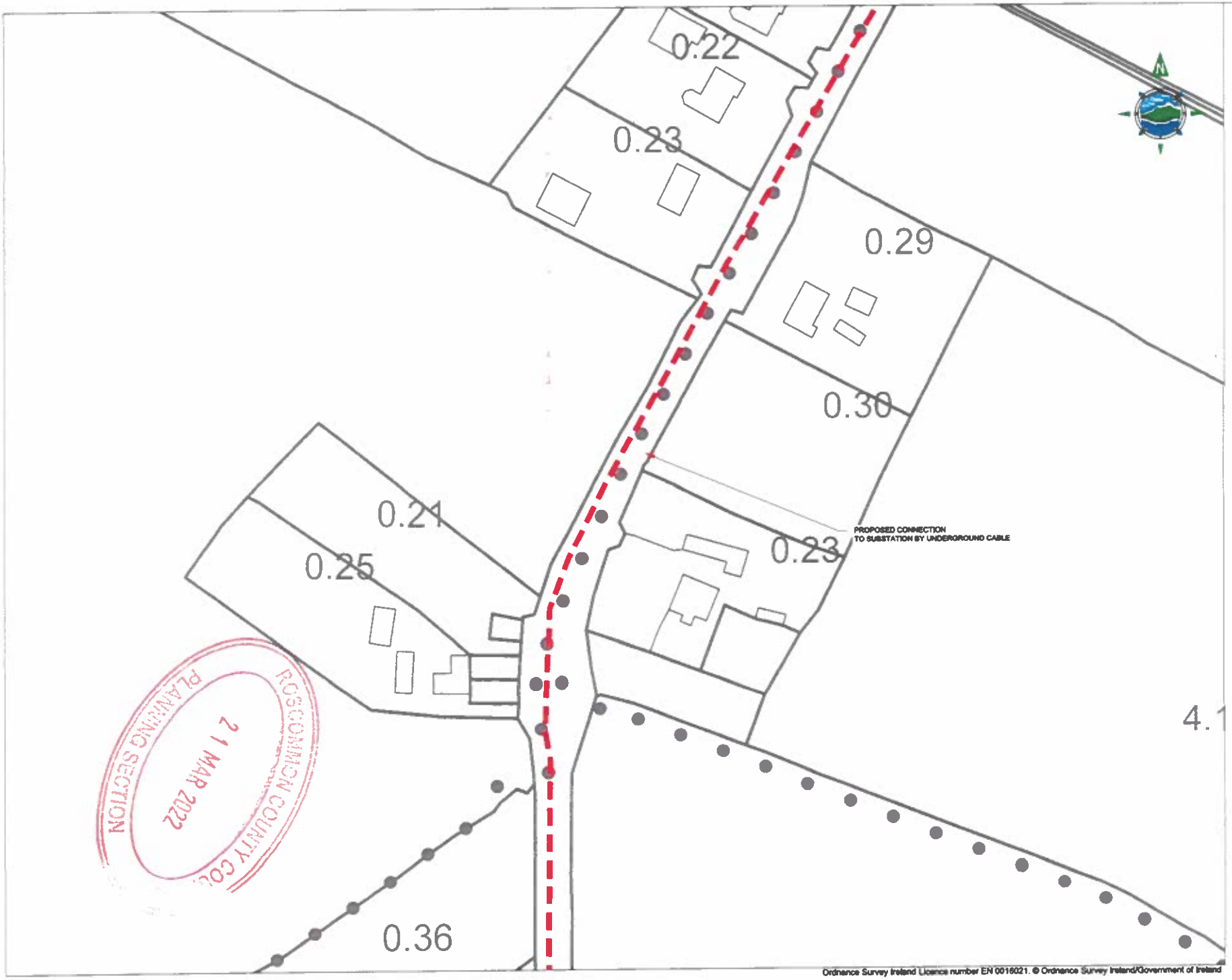
Title:
SITE LAYOUT PLAN
- Sheet 2 of 4 -

Scale @ A1	1:500
Prepared by: M. Nolan	Checked: J. Staunton
Date: July 2021	
Project Director:	S. Tinnelly
Drawing Status:	Final

TOBIN
CONSULTING ENGINEERS

Block 10-4, Blanchardstown Corporate Park, Dublin 15, Ireland.
tel: +353-(0)1-8030400
fax: +353-(0)1-8030409
e-mail: dublin@tobin.ie
www.tobin.ie

Drawing No. 78794-3102 | Revision: A



GENERAL LEGEND

PERMITTED SOLAR FARM BOUNDARY

GRID CORRIDOR FOR 38kV UNDERGROUND CABLE

EXISTING ESB SUBSTATION LOCATION

KEY PLAN

NOTES.

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER/EMPLOYERS REPRESENTATIVE, AS APPROPRIATE, TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. THE CONTRACTOR SHALL UNDERTAKE A THOROUGH CHECK FOR THE ACTUAL LOCATION OF ALL SERVICES/UTILITIES, ABOVE AND BELOW GROUND, BEFORE ANY WORK COMMENCES
5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

OSI 1:5,000 Sheet No: 2892

10m 0 10m 20m 30m

Rev	Date	Description	By	Chkd.
A	JUL'21	APPLICATION ISSUE	MN	JS

Client: ELGIN ENERGY

Project:
CASTLEREA SOLAR FARM
GRID CONNECTION
SECTION 5 APPLICATION

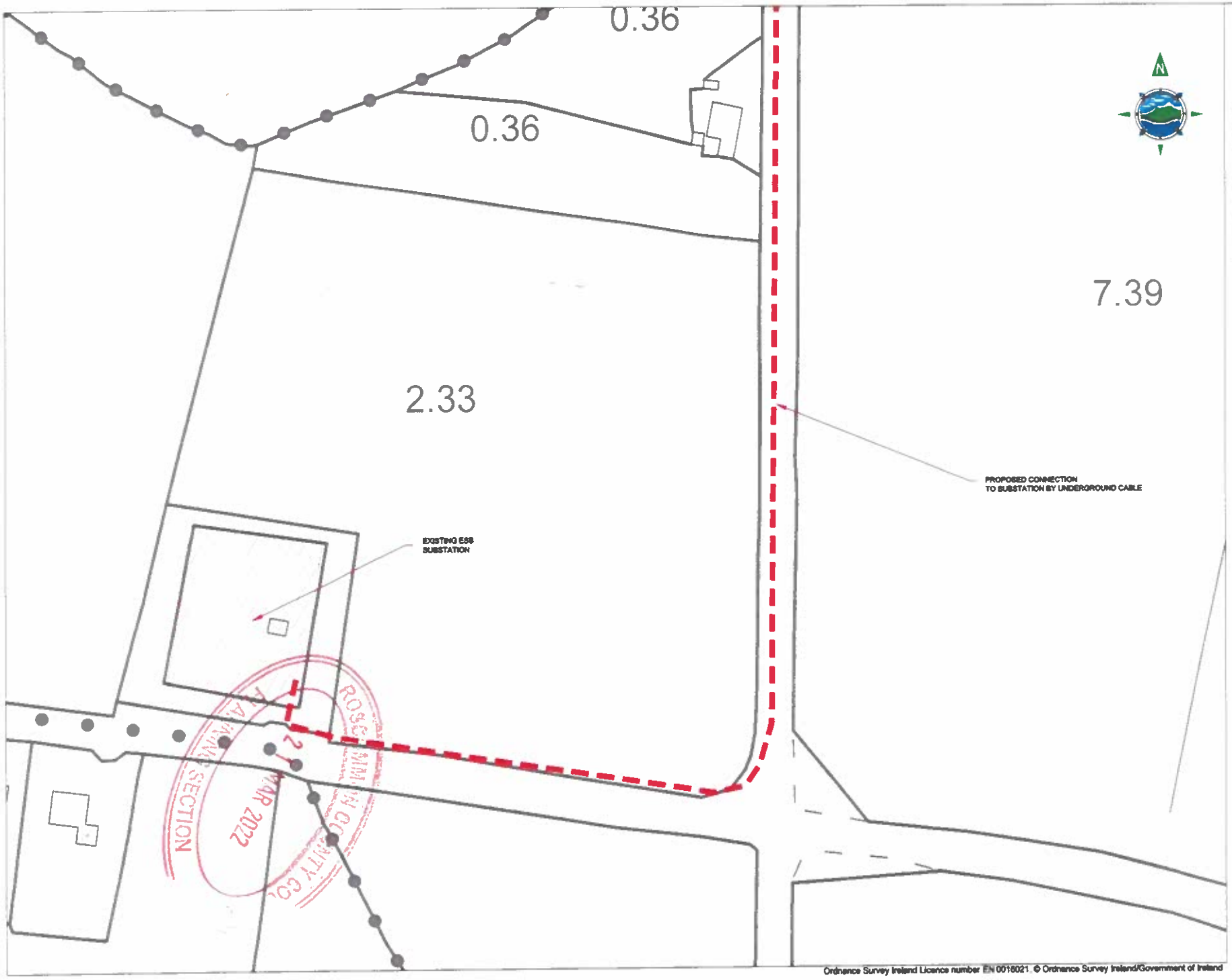
Title:
SITE LAYOUT PLAN
- Sheet 3 of 4 -

Scale @ A1	1:500		
Prepared by:	Checked:	Date:	
M. Nolan	J. Staunton	July 2021	
Project Director:	B. Tinnelly		
Drawing Status:	Final		

TOBIN
CONSULTING ENGINEERS

Block 10-4, Blanchardstown Corporate Park,
Dublin 15, Ireland.
tel: +353-(0)1-8026400
fax: +353-(0)1-8020400
e-mail: dublin@tobin.ie
www.tobin.ie

Drawing No. 78794-3103 Revision: A



GENERAL LEGEND

PERMITTED SOLAR FARM BOUNDARY

GRID CORRIDOR FOR 38kV UNDERGROUND CABLE

EXISTING ESB SUBSTATION LOCATION

KEY PLAN

NOTES.

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING.
2. ALL DRAWINGS TO BE CHECKED BY THE CONTRACTOR ON SITE
3. ENGINEER/EMPLOYERS REPRESENTATIVE, AS APPROPRIATE, TO BE INFORMED BY THE CONTRACTOR OF ANY DISCREPANCIES BEFORE ANY WORK COMMENCES
4. THE CONTRACTOR SHALL UNDERTAKE A THOROUGH CHECK FOR THE ACTUAL LOCATION OF ALL SERVICES/UTILITIES, ABOVE AND BELOW GROUND, BEFORE ANY WORK COMMENCES
5. ALL LEVELS SHOWN RELATE TO ORDNANCE SURVEY DATUM AT MALIN HEAD

OSI 1:5,000 Sheet No. 3898

10m 0 10m 20m 30m

Rev	Date	Description	By	Chkd.
A	26.07.21	APPLICATION ISSUE	MH	JS

Client: ELGIN ENERGY

Project: CASTLEREA SOLAR FARM GRID CONNECTION SECTION 5 APPLICATION

Title: SITE LAYOUT PLAN - Sheet 4 of 4 -

Scale @ A1	1:500	
Prepared by: M. Nolan	Checked: J. Staunton	Date: July 2021
Project Director:	S. Tinnelly	
Drawing Status:	Final	

TOBIN CONSULTING ENGINEERS

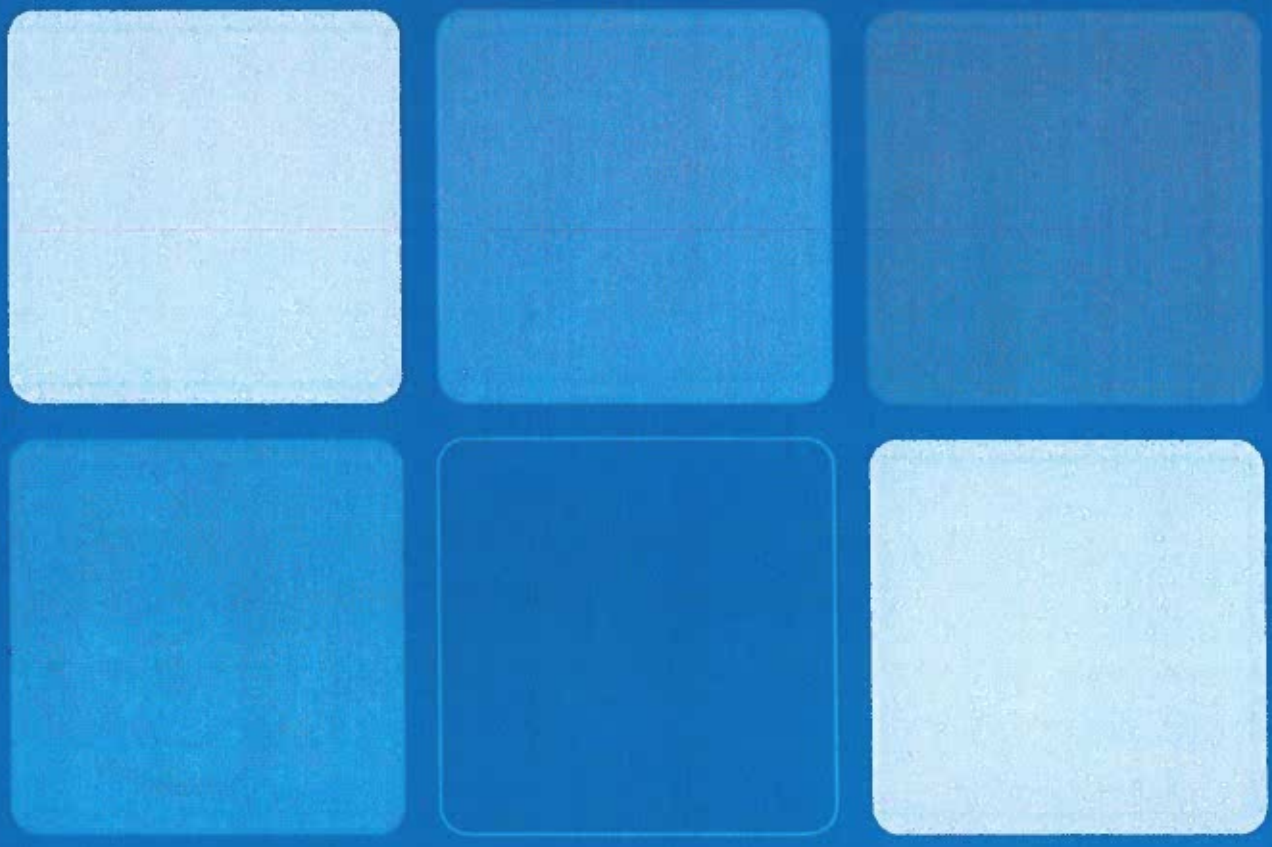
Block 10-4, Blanchardstown Corporate Park, Dublin 15, Ireland.
tel: +353-(0)1-8224400
fax: +353-(0)1-8224499
e-mail: dublin@tobin.ie
www.tobin.ie

Drawing No. 78794-3104 Revision: A

Ecological Impact Assessment

for Elgin Energy Services Ltd

at the site of proposed Solar PV Farm, Castlerea, County Roscommon



Ecological Impact Assessment

for Elgin Energy Services Ltd

at the site of proposed Solar PV Farm,
Castlerea, County Roscommon

RPS
Elmwood House
74 Boucher Road
Belfast
BT13 3PH

Tel: +44 (0)28 9066 7914
Fax: +44 (0)28 9066 8286

QUALITY MANAGEMENT

Client:	Elgin Energy Services Ltd
Project:	Castlerea Solar PV Farm, Co. Roscommon
Document Ref:	NI1695_Rpt_Ec01

Rev.	Status	Author	Reviewed By	Approved By	Office of Origin	Issue Date
D04	Final draft	DMC	SL	JMC	Belfast	08.05.2016
A01	For planning	DMC	PMK	JMC	Belfast	17.05.2016
A02	For planning	DMC	PMK	JMC	Belfast	29.06.2017

CONTENTS

1 INTRODUCTION

1.1 INTRODUCTION

RPS was commissioned by Elgin Energy Services Ltd to undertake an Ecological Impact Assessment (EcIA) of a 12.04 ha site in the townland of Rathleg, approximately 2km east of Castlerea, Co. Roscommon. It is a low-lying site that lies between the R377 and the Termon River.

1.2 PROPOSED DEVELOPMENT

- The Solar PV installation has a life expectancy of 30 years. During its lifetime, the application site will continue to be used for sheep grazing and at the end of its operation, all infrastructure will be decommissioned, removed and the land will be returned to its former agricultural use.
- The proposed development has been designed to fit within existing field boundaries. Construction and operational maintenance will utilise existing field openings where available and accordingly the majority of vegetation will be retained in its entirety.
- There will be no cut and fill on the site. Proposals have been designed to work with the existing contours of the land.
- Panels will not be placed within the root protection areas of any trees. In some instances a separation distance of 2.5m x tree height can be imposed around the trees to negate the potential for over-shadowing.
- Within the land parcel, the key element of the proposed development will comprise the installation and layout of solar panels, effectively laid out in south facing rows within the fields. Rows may be separated by a distance of between 2 - 6m depending on the topography of the site. Panels always remain south facing. They do not move to follow the path of the sun.
- The panel size will be set on a frame table at an inclination of between 10 and 25 degrees. Each frame table will be supported on galvanised steel posts/frames that will be driven or screwed into the ground to depths of up to 1.5m. No concrete foundations are required, minimising ground disturbance. The front (lower) edge of the panels will sit typically between 0.6 and 0.8m above ground, with the higher edge of the panel located at a height between 2.1m to 2.8m. Again, this depends on localised topography.
- Client GRP Terminal station and ESB Terminal Station - The development will be served by an on-site terminal and switchgear enclosure. The ESB terminal station constitutes a brick building measuring 3.93m (l) x 4.430m (b) x 2.975 (h) which will be constructed atop a concrete slab 150mm in depth. The switchgear enclosure is a prefabricated building measuring 4.83m (l) x 5.28m (b) x 3.325m (h). There will be a small containerised storage unit adjacent to these structures the dimensions of which are 3.65m (l) x 3.05m (w) x 3.08m (h). This detail is illustrated on the planning drawings. It is currently proposed to connect the project into the ESB Network via a route along the R377 to the existing 38kV Castlerea substation by means of approximately 1.2km of underground cable. For clarity, the application does not include the grid connection, but this report includes an assessment of the underground route for completeness.
- PV Inverter Stations - The proposal will be facilitated by 4 no. PV inverter stations. These are small modular cabin like buildings which will be sensitively positioned throughout the site. They are constructed on a concrete base, with approximate footprint dimensions of 7m x 2.5m, rising to a height of 3m. These stations are connected to the modules of panels by cabling which has been buried underground. The panels themselves generate Direct Current (DC) electricity which is converted into

Alternating Current (AC) electricity by the inverter stations before being fed into the terminal station and then onward to the local electricity grid network.

- The proposal includes underground cabling between the modules and the inverter stations, however this will be buried.
- The entire site will be enclosed with perimeter post and wire (deer) fencing, which is typically located approximately 5 metres from the outer field boundaries on the inside edge.
- Internal site access will be via existing tracks where possible. A small number of permeable stone access tracks will be constructed throughout the land to provide access to each of the inverter stations during occasional maintenance. Access tracks will be no more than 3.5m wide.
- CCTV Cameras - A number of CCTV cameras (7 no.) will be positioned throughout the site, mounted on poles approximately 3m high. This is an essential element of the proposal, and is required to monitor the site and detect any unauthorised access. They will be directed into the solar farm, and will therefore avoid impacting detrimentally on nearby residential amenity.
- The location of the site and the site boundary are illustrated in **Figure 1.0 Site Location**.

RPS

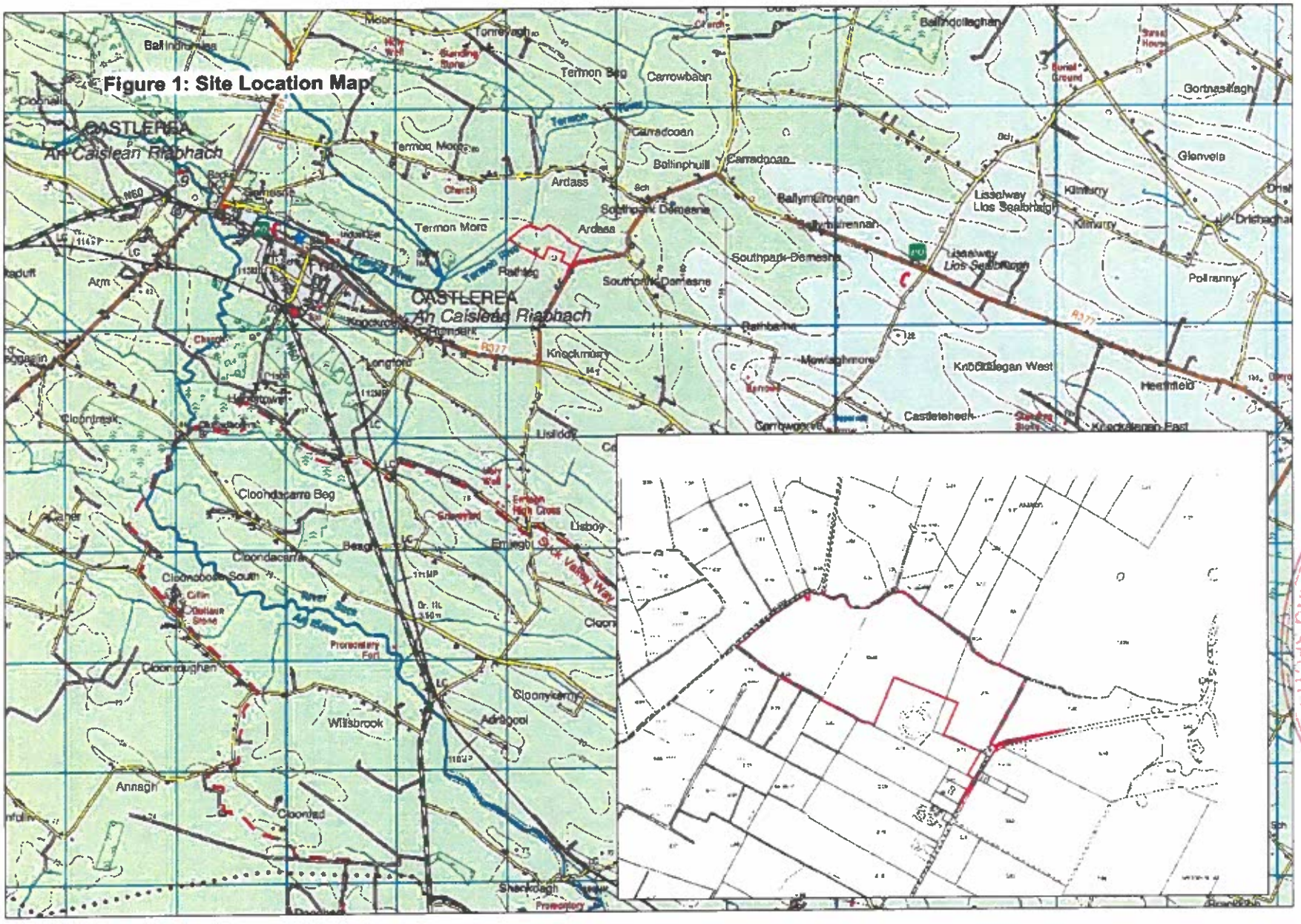


Figure 1: Site Location Map

2 LEGISLATION & PLANNING POLICY

2.1 EUROPEAN COUNCIL DIRECTIVES

Council Directive on the Conservation of Natural Habitats of Wild Fauna and Flora (92/43/EEC) (The Habitats Directive)

The main aim of the Directive is to promote the maintenance of biodiversity through the conservation of natural habitats and wild species listed on the Annexes of the Directive. Member States are required to take measures to maintain or restore, at favourable conservation status, biodiversity whilst taking account of economic, social, cultural requirements and regional and local characteristics. It gives effect to site and species protection measures through establishment of the Natura 2000 network and designation of European Sites including Special Areas of Conservation (SAC) and Special Protected Areas (SPA). It also establishes a list of species (other than birds) whose habitats must be protected to secure their survival. These priority species and habitats are subject to a higher level of protection. The Directive also requires appropriate assessment of any plan or project not directly connected with or necessary to the management of a European Site, but likely to have significant effects upon a European site, either individually or in combination with other plans or projects.

Council Directive on the Conservation of Wild Birds (2009/147/EC) (The Birds Directive)

The Directive provides a framework for the conservation and management of, and human interactions with, wild birds in Europe. It makes provisions for the maintenance of the wild bird populations across their natural range; conserves the habitats for rare or vulnerable species listed in Annex I and of migratory species through the classification of SPAs and provides protection for all wild birds.

2.2 IRISH LEGISLATION

S.I. No. 355 of 2015 provides that The Wildlife Act 1976, the Wildlife (Amendment) Act 2000, the Wildlife (Amendment) Act 2010, the Wildlife (Amendment) Act 2012, the European Communities (Birds and Natural Habitats) (Restrictions of the Use of Poison Bait) Regulations 2010 (S.I. 481 of 2010), the European Communities (Birds and Natural Habitats) Regulations 2011, the European Communities (Birds and Natural Habitats) (Amendment) Regulations 2013, and the European Communities (Birds and Natural Habitats) (Amendment) Regulations 2015 shall be construed together as one.

European Communities (Birds and Natural Habitats) Regulations 2011 to 2015

The Regulations give effect to requirements relating to the designation of protected sites under the Birds Directive and Habitats Directive. The Regulations provide for the protection and management of European Sites and place obligations on all competent authorities to have regard to the requirements of the Habitats Directive. The Regulations also provide for the protection of species of European importance.

Wildlife Acts 1976 to 2012

The Acts provides for *inter alia* the protection of wildlife. The Acts prohibit the intentional killing, taking or injuring of certain wild birds or wild animals; or the intentional destruction, uprooting or picking of certain wild plants.

Taken as a whole, nature conservation legislation is of key importance in undertaking EclA for proposed development as it shapes planning policy.

2.3 PLANNING POLICY

Roscommon County Development Plan 2014 – 2020

An overarching theme of the County Development Plan (CDP) in relation to Natural Heritage and Biodiversity is to ensure that there are no detrimental impacts to the natural heritage and biodiversity of the County. CDP policies in relation to Natural Heritage and Biodiversity are set out at Appendix I of this Ecological Impact Assessment.

County Roscommon Heritage Plan 2012 – 2016

The aim of the County Roscommon Heritage Plan 2012 – 2016 is to continue to create and promote an increased knowledge, awareness and appreciation of the natural, built and cultural heritage of County Roscommon and to conserve it for future generations'.

3 METHODOLOGY

3.1 STATEMENT OF AUTHORITY

The site surveyor and report author is David McCormick, a consultant Ecologist with RPS and holds a BSc (Hons) in Physical Geography and English and an MSc in Ecological Management and Conservation Biology. He has over six years experience of ecological field survey including habitat, mammal, amphibian and invertebrate survey and is a protected species license holder. David is also currently an associate member of the Chartered Institute of Ecology and Environmental Management (ACIEEM).

The approver is James McCrory, a Senior Associate with RPS who holds a BA in Plant Sciences and a MSc in Habitat Creation and Management. James is a Chartered Ecologist (CEcol), a Chartered Environmentalist (CEnv) and a full member of CIEEM; and also a Chartered Biologist (CBiol) and full member of the Royal Society of Biology. He was a member of the CIEEM technical working group updating the seminal Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland (CIEEM, 2016).

The information prepared and provided is true and accurate at the time of issue of the report and has been prepared and provided in accordance with the CIEEM Code of Professional Conduct (CIEEM 2013). We confirm that the professional judgement expressed herein is the true and bona fide opinion of our professional ecologists.

3.2 DESK STUDY

The National Biodiversity Data Centre (NBDC) is a national organisation that collates, manages and analyses and disseminates data on Ireland's biodiversity. It is funded by the Heritage Council and the Department of Arts, Heritage and the Gaeltacht. The NBDC provides access to all validated biodiversity data through Biodiversity Maps, the on-line biodiversity data portal.

Biodiversity records and full species accounts can be viewed and scrutinised through an interactive Biodiversity Maps portal (http://maps.biodiversityireland.ie/#/Home). This is a tool that can be used to help make a preliminary assessment of biodiversity issues when considering site-specific proposed development.

The chosen search area using the NBDC search tool was customised in order to captures all records within a minimum 1km distance of the proposed development site. The principal purpose of this task is to capture any records of protected species or species of natural heritage importance in close proximity to the site boundary. The zone of influence of the proposed development does not extend further than this.

A NPWS data set of Annex I habitats was reviewed to check for any records at the site of proposed development.

3.3 HABITAT SURVEY

A habitat survey was undertaken at the proposed development on 30th March 2016. The habitats along the proposed electrical connection route along the R377 were also surveyed. The survey was undertaken in accordance with the Heritage Council's Best Practice Guidance for Habitat Survey and Mapping (Heritage Council, 2011).

The survey was extended to include further information on the potential of the habitats identified to support species protected by law or of natural heritage importance. All habitats were mapped and categorised in accordance with the Heritage Council *Guide to Habitats in Ireland* (Fossitt, 2000). A search was undertaken for protected and invasive flora species. Aerial photographs were used as an aid to mapping habitats.

4 BASELINE ECOLOGICAL CONDITIONS

4.1 DESIGNATED SITES

The site of the proposed development is not located within the boundary of statutory or non-statutory designated sites of international, national or local nature conservation importance.

The site lies within the River Suck Catchment Area. There is a hydrological link between the proposed site and three European sites namely:

- Bellanagare Bog Special Area of Conservation (SAC) and Special Protected Area (SPA)
- Cloonchambers Bog SAC
- River Suck Callows SPA

Of these three European sites, only the River Suck Callows SPA is downstream of the site of proposed development. The site abuts the Termon River, a tributary of the Francis River which in turn joins the River Suck at Castlerea (as shown in Figure 1). This hydrological corridor is 39km long.

The River Suck Callows is classified as a SPA as it supports significant populations of the following species:

- Whooper Swan (*Cygnus cygnus*) [A038]
- Wigeon (*Anas penelope*) [A050]
- Golden Plover (*Pluvialis apricaria*) [A140]
- Lapwing (*Vanellus vanellus*) [A142]
- Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395]

Bellanagare Bog SAC and SPA

Ballanagare Bog SAC is designated for the following habitats and species listed on Annexes I and II of the. Habitats Directive:

- Active raised bogs [7110]
- Degraded raised bogs still capable of natural regeneration [7120]
- Depressions on peat substrates of the *Rhynchosporion* [7150]
- *Euphydryas aurinia* (Marsh Fritillary) [1065].

Bellanagare Bog is classified as a SPA as it supports significant populations of the following species:

- Greenland White-fronted Goose (Anser albifrons flavirostris) [A395]

Bellanagare Bog SAC and SPA lies approx. 3.5 km north of the proposed development. The site is also a proposed Natural Heritage Area (pNHA).

Cloonchambers Bog SAC

Cloonchambers Bog SAC is selected for the following habitats and species listed on Annex I and II of the E.U. Habitats Directive:

- Active raised bogs [7110]
- Degraded raised bogs still capable of natural regeneration [7120]
- Depressions on peat substrates of the *Rhynchosporion* [7150]
- *Euphydryas aurinia* (Marsh Fritillary) [1065].

This SAC lies approx. 5.3 km east of the proposed development. The site is also a proposed Natural Heritage Area (pNHA).

Corliskea, Trien and Cloonfelliv Bog SAC

This bog complex is selected for the following habitats listed on Annex I of the E.U. Habitats Directive:

- Active raised bogs [7110]
- Degraded raised bogs still capable of natural regeneration [7120]
- Depressions on peat substrates of the *Rhynchosporion* [7150]
- Bog woodland [91D0].

This SAC complex lies approx. 5.7 km southwest of the proposed development. The site is also a proposed Natural Heritage Area (pNHA).

Drumalough Bog SAC

This bog complex is selected for the following habitats listed on Annex I of the E.U. Habitats Directive:

- Active raised bogs [7110]
- Degraded raised bogs still capable of natural regeneration [7120]
- Depressions on peat substrates of the *Rhynchosporion* [7150].

This SAC complex lies approx. 6.8 km west-southwest of the proposed development. The site is also a proposed Natural Heritage Area (pNHA).

Mullygollan Turlough SAC

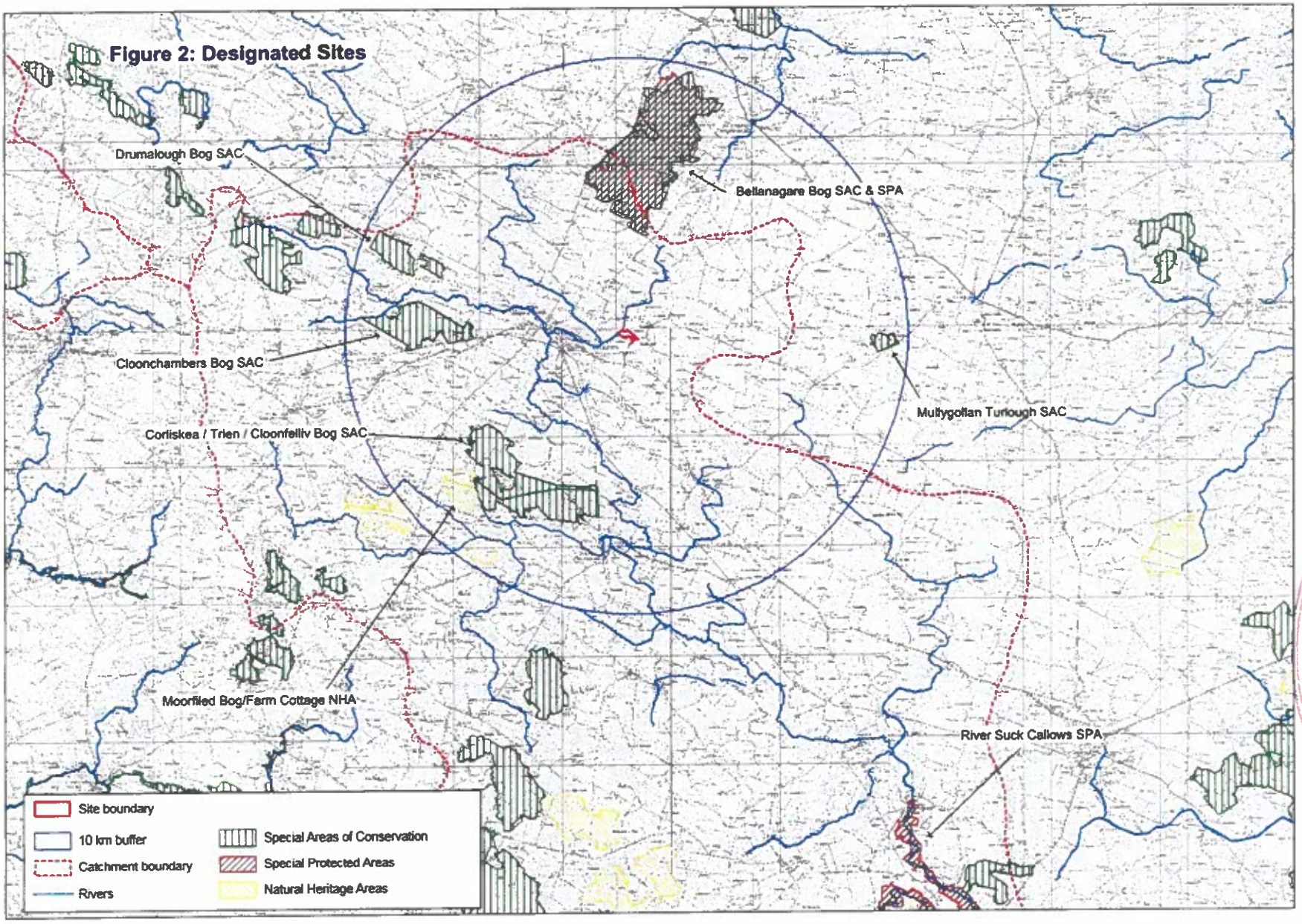
This SAC is selected for the following habitats listed on Annex I of the E.U. Habitats Directive:

- Turloughs [3180]

This SAC approx. 8.6 km east of the proposed development. The site is also a proposed Natural Heritage Area (pNHA).

The nearest Natural Heritage Area (NHA) to the development site Moorfield Bog/Farm approx. 7.3km from the development site. This habitat abuts the Corliskea, Trien and Cloonfelliv Bog SAC bog complex.

The boundaries of each of these designated sites, rivers and river catchments relative to the proposed development is illustrated in **Figure 2 Designated Sites**.



4.2 HABITATS

4.2.1 Desktop search

A review of NBDC records and NPWS Annex I databases found no priority habitats within 5km the site (within 5km).

4.2.2 Field Survey

A map illustrating the findings of extended Phase 1 habitat survey can be found in **Figure 3.0 Habitat Survey Results Map**. A suite of photographic plates illustrating the site of proposed development are contained at Appendix IV of this report.

Site of proposed development

Drainage ditches (FW4)

The drainage ditch along the sites eastern boundary is shallow. Sweet grass *Glyceria* spp. is abundant with occasional water starwort *Callitriche* sp.

Watercress *Rorippa nasturtium-aquaticum* (see Plate 1) and sweet grass are dominant in the drainage ditch travelling along the northern site boundary. Occasional species include fool's watercress *Apium nodiflorum* and bur-reed *Sparganium* sp. This larger deeper ditch morphs into a narrow meandering stream that flows into the Termon River.

Depositing / lowland river (FW2)

The Termon River and aforementioned stream have a gravel cobbled bottom with larger rock-boulders. The main Termon River along the sites is rather featureless due to it channelized appearance so pools and riffles are scarcely present (see Plate 2). Long threads of filamentous algae were noted. Occasional marsh marigold *Caltha palustris* occurs along the river's edge. The bank was seen to be eroding in places. The site is more elevated than the enclosures on the other side of the river.

Spring (FP1) - Target Note 1

This feature is shown in Plate 3. Watercress covers most of this feature except where the large upwelling of underground water occurs which appears to be considerably deep. This feature abuts the River Termon into which this upwelling of water flows. The spring may be a **calcareous spring** (FP1) on account of the watercress which is more prevalent over lime. There was no evidence of marl or tufa formation. Mosses were notably absent. The site boundary navigates around this feature.

Grasslands

The main site is comprised of three field parcels. The largest, central parcel is mostly comprised **improved agricultural grassland** (GA1), where as the parcel furthest west is largely comprised of **wet grassland** (GS4). Both these parcels are separated by an **earth bank** (BL2) accompanied by an open defunct **hedgerow** (WL1). Trees/shrubs are scarcely present in this hedgerow. Sheep freely graze both parcels and the ring fort.

The smallest parcel (to the east) is comprised of **Improved agricultural grassland** (GA1) only. This parcel is enclosed by a post and wire fence.

Wet grassland (GS4)

This habitat can be subdivided into two broad wet grassland communities.

The first (shown in Plate 4) is comprised of abundant soft rush *Juncus effusus* with frequent sharp-flowered rush *J. acutiflorus* / jointed rush *J. articulatus* and sedges *Carex* spp. Other than tufted hair-grass *Deschampsia cespitosa*, grasses were difficult to identify in the trampled ground. However, they appear to include bents *Agrostis* spp. Flowering herbs were evidenced from overwintering dead stems or newly emerging shoots. Species include frequent iris *Iris pseudacorus* with scatterings of emerging meadow vetchling *Lathyrus pratensis*, meadowsweet *Filipendula ulmaria* and common sorrel *Rumex acetosa*. This *Juncus* dominated wet grassland generally occurs adjacent to Termon River.

The other wet grassland community is more diverse. Here purple moor-grass *Molinia caerulea* is abundant with frequent sharp-flowered rush / jointed rush, sedges and a fescue *Festuca* sp. Soft rush and hard rush *J. inflexus* are scarcely present. Grasses include tufted hair-grass, bent grasses and crested dog's-tail *Cynosurus cristatus*. Bryophytes occur most notably in the tussock and include common tamarisk-moss *Thuidium tamariscinum* and neat feather-moss *Pseudoscleropodium purum*. These tussocks are evident in Plate 5.

Frequent flowering herbs include iris and a tormentil *Potentilla* sp. The remaining herbs comprised overwintering basal leaves or dead stems or newly emerging shoots. These are meadowsweet, marsh thistle *Cirsium palustre*, common sorrel, marsh cinquefoil *Potentilla palustris*, an umbelifer sp. and willowherb *Epilobium* sp.

These habitats are grazed by sheep. Being a smaller animal than cattle, they are not poaching these wet grassland soils as cattle would if the ground has not dried out sufficiently.

Sheep are selective grazers. They are known to avoid soft rush *J. effusus*. As such, this species is expected to increase in its relative abundance throughout the site without any management intervention (such as cutting or treating with an herbicide).

The contrasting soft rush and purple moor-grass communities are evident in Plate 6.

A circular area of raised ground occurs in this western parcel. Species resemble those in the drier, improved grassland parcels to the east. A similarly dry area occurs in the furthest west corner of the site.

Improved agricultural grassland (GA1)

The sward is tightly grazed by sheep as shown in Plate 7. Species composition is very variable across this habitat. In places grasses are entirely dominant with little to no herb or bryophyte cover. Elsewhere in damp areas bryophytes are dominant typically pointed spear-moss *Calliergonella cuspidata*. Grasses that were evident during survey were bent grasses, crested dog's-tail, sedges and perennial ryegrass *Lolium perenne*. Common sorrel is the most common herb and is tightly grazed as are all herbs. Iris is frequent either as scattered individuals or as dense pockets. Flowering herbs include locally frequent common sorrel and

Earth banks BL2

Along the Termon River and its tributary (and the drainage ditch that abuts the centre field) are mounds of soils - materials produced from channel deepening (examples of which are visible in Plate 2). These stony impoverished banks have completed re-vegetated and include species which do well in sandy conditions. These include yarrow *Achillea millefolium*, plantains *Plantago* spp. such as ribwort plantain *Plantago lanceolata*, daisy *Bellis perennis*, self-heal *Prunella vulgaris*, catsear *Hypochaeris radicata*, sedges, fescue (grass) and the moss *Rhytidiadelphus squarrosus* (springy turf-moss).

Hedgerows (WL1) and Treelines (WL2)

The single internal hedgerow separates the largest centre parcel and the parcel to the west. It is comprised of an earth bank with very intermittent hawthorn and beech *Fagus sylvatica*. It is barely recognisable as a hedgerow. Intermittent hawthorn and alder *Alnus glutinosa* align the drainage ditch along the sites northern boundary.

A more intact hedgerow - field boundary feature aligns the sites eastern boundary abutting the drainage ditch. This feature is shown in Plate 10. It is a double row of native trees comprised of ash *Fraxinus excelsior*, alder and hawthorn. This feature has a relatively impoverished woodland ground flora with only scatterings of lesser celandine and tufted hair-grass. Shrubs include frequent ivy *Hedera helix* and bramble *Rubus fruiticosus* agg. Snowberry *Symphoricarpos albus* is prominent by the site entrance where this linear feature expands into a small pocket of **mixed broadleaved woodland** (WD1) along the roadside. This mixed broadleaved woodland in small part lies within the site boundary.

Habitats adjoining the site

Ring fort

The centre field is inclusive of a ring fort which has similar plant assemblages to the aforementioned **earth banks (BL2)**. Also present here lesser celandine *Ranunculus ficaria* and large stands of common nettle *Urtica dioica* in the hollows. Shrubs occur here which comprise of scattered hawthorn *Crataegus monogyna* occasional elder *Sambucus nigra*.

Other grasslands

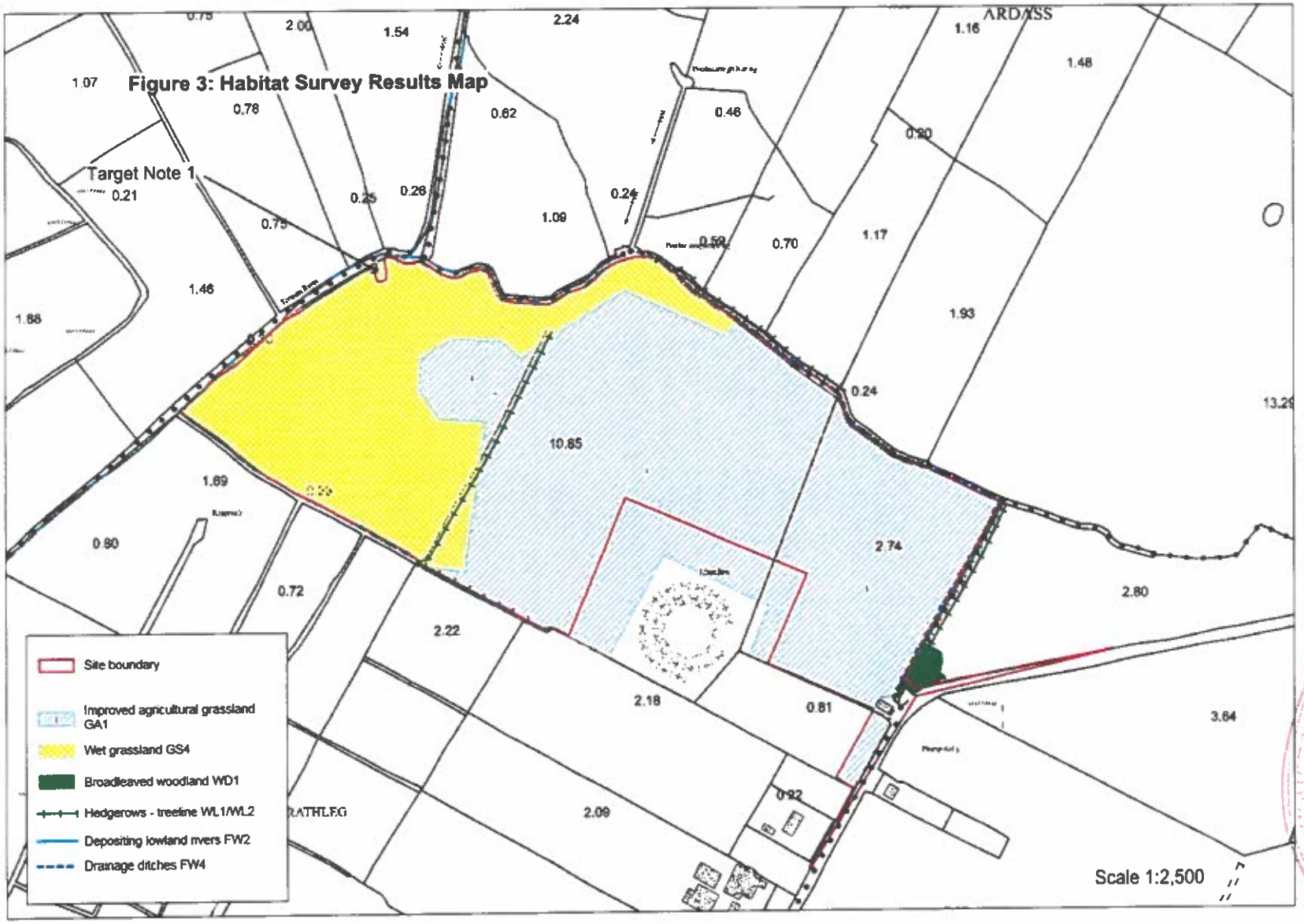
Wet grassland (GS4) enclosures are the dominant habitats to the west and northwest of the site whilst **improved agricultural grassland (GA1)** is the dominant habitat to the south and northeast.

Electrical Cable Route

The cable route is comprised of public road with narrow grass verge and adjoining hedgerows, post and wire fence or stone wall. The hedgerows are mostly low and box-cut with occasional less managed sections of unmanaged ash trees. Occasional dwellings occur on either side.

RPS

Figure 3: Habitat Survey Results Map



4.3 SPECIES

4.3.1 Existing records

A search of the existing records held by NBDC is included as Appendix V. The search area was customised (measuring 9 km²) in order to ensure all records within 1km of the site boundary were captured. Those species afforded protection under national and international legislation are highlighted.

Records for smooth newt *Lissotriton vulgaris*, otter *Lutra lutra* and badger *Meles meles* occur within the search area. Bird records include curlew *Numenius arquata*, lapwing *Vanellus vanellus*, yellow hammer *Emberiza citrinella*, common grasshopper warbler *Locustella naevia*, house martin *Delichon urbicum*, house sparrow *Passer domesticus*, sky lark *Alauda arvensis*, common swift *Apus apus*, common linnet *Carduelis cannabina*, common kestrel *Falco tinnunculus*, and spotted flycatcher *Muscicapa striata*.

4.3.2 Badger

No badger setts or badger signs for found during site survey. However, badgers may frequent the site to feed or forage. The aforementioned NBDC records confirm their presence in the wider area.

4.3.3 Bats

A study undertaken by Lundy *et al.* (2011) used the existing database of species records, collated and maintained by Bat Conservation Ireland to apply analysis of the habitat and landscape associations of all species that commonly occur in Ireland namely; common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, Leisler's bat, Daubenton's bat, Natterer's bat, whiskered bat, brown long-eared bat and the lesser horseshoe bat. Using the 'bat landscapes data' derived from that study available on the NBDC website it is possible to get a general picture as to the favourability of lands inside a 5km grid that overlays the Castlerea Solar PV Farm site are for bats.

Table 1 lists the 'habitat suitability index' scores for 'all bats' and each of the eight individual bat species in the 5km grid square that overlays the site.

The index ranges from 0 to 100 with 0 being least favourable and 100 most favourable for bats. A score between 31 and 38 for example is considered medium; 39 - 47 is high and 48 - 72 very high.

Table 1: Bat Landscape Importance Records

Common Name	Scientific Name	Habitat Suitability Index
All Bats	*Vespertilionidae* spp	26.78
Brown long-eared bat	*Plecotus auritus*	34
Common pipistrelle	*Pipistrellus pipistrellus*	42
Soprano pipistrelle	*Pipistrellus pygmaeus*	43
Nathusius' pipistrelle	*Pipistrellus nathusii*	4
Leisler's bat	*Nyctalus leisleri*	39
Daubenton's bat	*Myotis daubentonii*	33
Whiskered bat	*Myotis mystacinus*	13
Natterer's bat	*Myotis nattereri*	32
Lesser horseshoe bat.	*Rhinolophus hipposideros*	0

It must be noted, these indices are broad generalisations of species' geographical occurrence. A 5km grid squares that scores less favourably may still have local areas of abundance, for example, an area of semi-natural broadleaved woodland and adjoining river or lake.

It is evidenced from site survey and othophotography that woodlands, hedgerows and tree lines scarcely occur or are absent from the solar farm site and the immediate wider countryside. Woodlands, hedgerows and tree lines are strongly associated with bat foraging and commuting.

This site is therefore not likely to be an area of local 'abundance'. It does however have water courses and a wooded eastern site boundary. Some bat activity perhaps that of common species such as those scoring high in Table 1 above are therefore likely to frequent parts of the site. Leisler's bat may forage over the open grasslands. This species is not as reliant on hedgerows for foraging - commuting.

The site has no natural (typically mature - veteran trees or damaged younger trees with suitable entrance points) or built structures that could support roosting bats within the site. There is a relatively newly built shed at the site entrance. There were no obvious bat entry points (gaps - fissures) in the structure including evidence like droppings or urine staining. It is unlikely to be used by roosting bats.

4.3.4 Other species

A single Snipe *Gallingago Gallingago* was flushed from wet grassland habitat on site during survey. NBDC records show the species to be ubiquitous in this region during the breeding season. This single sighting was recorded during very late winter season.

5 LIKELY SIGNIFICANT EFFECTS OF THE PROPOSED DEVELOPMENT

5.1 IMPACT ASSESSMENT

The information gathered from desk study and survey has been used to undertake an EcIA of the proposed development upon the identified ecological features. The EcIA has been undertaken following the methodology set out in CIEEM (2016) and with reference to BS 42020:2013. EcIA is based upon a source-pathway-receptor model, where the source is defined as the individual elements of the proposed development that have the potential to affect identified ecological features. The pathway is defined as the means or route by which a source can affect the ecological features. An ecological feature is defined as the species, habitat or ecologically functioning unit of natural heritage importance. Each element can exist independently however an effect is created where there is a linkage between the source, pathway and feature.

A significant effect is defined in CIEEM (2016) as –

"an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project. A significant effect is a positive or negative ecological effect that should be given weight in judging whether to authorise a project: it can influence whether permission is given or refused and, if given, whether the effect is important enough to warrant conditions, restrictions or further requirements such as monitoring".

BS 42020:2013 states that if an effect is sufficiently important to be given weight in the planning balance or to warrant the imposition of a planning condition, e.g. to provide or guarantee necessary mitigation measures, it is likely to be "significant" in that context at the level under consideration. The converse is also true: insignificant effects would not warrant a refusal of permission or the imposition of conditions.

Likely significant effects are predicted on the basis of the proposed development described in Section 1.2 and are set out within the context of Section 5.2 below (CIEEM, 2016, para 6.23).

5.2 SENSITIVE DESIGN AND DESIGN MITIGATION

5.2.1 Sensitive design

To reinforce the sensitive design approach employed at the site it is worth confirming:

- The proposed solar PV farm has been designed to fit into existing field parcels. No boundaries will be removed to facilitate the arrays, security fencing or any other ancillary development. The layout of arrays in each field has been designed to maintain a set-back buffer of approximately 5m from all ditches, treelines and hedges.
- Secure perimeter fencing will be constructed to leave a 150mm gap left at the bottom of all fencing to allow for unimpeded mammal access throughout the site.
- To facilitate grid connection, an electrical cable will be constructed in a shallow trench within the roadbed or in a grass verge. No hedgerow, treeline or ditch will be interfered with for the construction of the electrical cable.

- The proposed development includes a landscape mitigation strategy (Refer to Drawing No. 1695.1.11) comprising enhancement to existing field boundary hedgerows with trees; and hedge planting which is appropriate to the local setting, location and the wider context of the site.

Site design drawings show the layout of all proposed infrastructure and are included as Drawing No's 1695.1.01 -1695.1.04 as part of the planning application.

5.2.2 Design Mitigation

Construction

It shall be a condition of the contract of construction that all construction works shall comply with:

- Technical Guidance C648: Control of Water Pollution from Linear Construction Projects, (CIRIA, 2006)
- Technical Guidance C532: Control of Water Pollution from Construction Sites: Guidance for Consultants and Contractors (CIRIA, 2001);
- PPG 5: Works and maintenance in or near water; and
- PPG 6: Working at demolition & construction sites.

Concrete will not be produced on site.

Stone which is imported to site to be used for tracks and hardstanding areas shall be washed stone.

All stoned areas will be laid with a geotextile layer.

Leaking or empty drums will be removed from the site immediately and disposed of via a registered waste disposal contractor.

All valves and trigger guns shall be protected from vandalism within a secured compound to prevent unauthorised interference and shall be turned off and securely locked when not in use.

Any tanks or drums shall be stored in a secure container or compound, which shall be kept locked when not in use.

The risk of spilling fuel is at its greatest during refuelling of plant. Refuelling of mobile plant will be undertaken in a designated area, on an impermeable surface well away from any drains or waterbodies.

Hoses and valves will be checked prior to each use for signs of wear, and ensure that they are turned off and securely locked when not in use. Diesel pumps and similar equipment will be placed on drip trays to collect minor spillages or leaks.

Operation

Solar panel cleaning will typically be undertaking by whisking off any dry floating dust or leaves from the module with a dry whisk or cloth. For other hard foreign matter such as bird droppings or dirt the module is scraped with non woven fabric or hair brush. If there are coloured substances such as bird droppings or plant resins etc. the coloured substances need to be removed by cleaning, normally with de-ionized water which is sprayed onto the module and scraped with a hair brush. The cleaning contractor will bring the de-ionised water to the site and there will be no requirement for any abstraction from the local water courses. Where particularly oily substances are present these may be removed using a water and alcohol mix but this

will only be required where particularly stubborn deposits exist and will be sprayed onto the module by hand and removed using a hair brush.

Maintenance is typically carried out quarterly. In addition, the site will be remotely monitored for any reduction in output. If any change is recorded a site visit will take place.

Site Drainage

The existing site is Greenfield. The proposals for the site will not increase the rate of discharge from the current pre-development run-off rates as there are limited areas of hard standing associated with the development.

The panels are being installed on the land as it is currently, and therefore there will be no changes made to existing ground levels or ground cover. Therefore existing surface runoff paths are unchanged. Installation of the panels will have minimal impact on the ground as the posts are embedded into the ground. Rainwater falling on the panels will be directed towards the existing ground as it is now.

There is no other significant infrastructure being installed that will impact on runoff. Proposed stoned tracks will be permeable so as not to impact on existing run off rates. Stones will be placed on the existing ground surfaces to create access roads. Surface water runoff will soak into the tracks where it will infiltrate into the ground as it does now. The station building will have gutters and downpipes, and rudimentary soakaways will be provided for each pipe (consisting of a stone pit).

Small areas of roofs will be created by the inverter stations but these are insignificant in comparison to the size of the site, and any runoff will soak away.

To summarise, there is unlikely to be any increase in run-off as a result of development of the site and there are no formal drainage systems being installed.

5.3 DESIGNATED SITES

In relation to wetland habitat special conservation interests, a path of possible effect exists between the proposed development and the River Suck Callows SPA (refer to report section 4.1 and Figure 2) via a 39km hydrological link.

Sediment, including all soils, mud, clay, silt, sand etc, is the single main pollutant generated at construction sites and largely arises from the erosion of exposed soils by surface water runoff. Fuels, lubricants and other chemicals can also escape to the water environment if their use is not controlled.

There are no significant earthworks required for the development of this solar PV farm.

The strict controls to be employed to reduce risks to suspended sediment and polluting substances entering a watercourse as set out in section 5.2 of this report have been considered. They are not novel proposals, and are enforceable through the construction contract and by planning condition. Their efficacy is not uncertain.

In relation to mobile species qualifying interests and special conservation interests, there is no published policy advice in Ireland in relation to the possible effects of solar development on bird species.

In Northern Ireland, NIEA (2015) has published advice for non-EIA development indicating where impacts of solar farms on natural heritage interests can occur and provides advice on assessment and mitigation that should be applied for all solar farm proposals. It contains a flowchart to help consider impacts upon SPA features. If the proposed development is greater than 500m from a SPA or a known flyway to a designated

SPA, then "no impact is envisaged". In this instance, the nearest SPA is Ballanagare Bog, 3.5 km north of the site. The SPA qualifying interest in this instance is the Greenland White-fronted Goose *Anser albifrons flavirostris*.

The other 'mobile' species considered is marsh fritillary butterfly *Euphydryas aurinia* [1065], a qualifying interest at Bellanagare Bog SAC and Cloochambers Bog SAC. These sites are 3.5km and 5.3km distance respectively from the proposed development. There is no pathway of appreciable effect upon this species.

There is no hydrological link between the proposed development site and Drumalough Bog SAC; Mullygollan Turlough SAC; and Corliskea, Trien and Cloonfelliv Bog SAC and therefore no pathway of appreciable effect upon their qualifying habitats. Furthermore, there are no qualifying mobile species that may be impacted by the development.

It is considered that the proposed development is in compliance with County Development Plan policy 7.1 on the protection of designated sites (refer to Appendix I).

A screening for appropriate assessment has been undertaken is included as Appendix II to this report. It is concluded that the proposed development will not delay or hinder the maintenance or restoration to favourable conservation condition, the qualifying interests for which the SACs has been designated or the special conservation interests for which the SPAs have been designated.

No significant negative effects are predicted upon designated sites. This prediction is made with confidence.

5.4 HABITATS

NIEA (2015) notes that "whether proposals are within designated sites or priority habitat, they have the potential for direct loss of habitat from the footprint of the proposal and associated access roads. Cabling has the potential to create new drainage pathways if present within a wet habitat or peatland. There can also be indirect impacts on sensitive habitat outside the development footprint from construction activities."

5.4.1 Field boundaries

Earth banks (BL2), hedgerows (WL1), treelines (WL2) and drainage ditches (FW4) occupy internal and field boundaries and the proposed site boundary. The mixed broadleaved woodland (WD1) in small part lies within the site boundary. These features are considered to be of ecological value at a Local level.

The proposed solar PV farm has been designed to fit into existing field parcels. No boundaries will be removed to facilitate the arrays, security fencing or any other ancillary development. The layout of arrays in each field has been designed to maintain a set-back buffer 5m from all ditches, treelines and hedgerows. There will be some tree removal at the mixed broadleaved woodland (WD1) (maximum of 2 trees and underlying shrub) to facilitate site access where these features occur within the site boundary. The overall impact is therefore deemed to be Negligible. This prediction is made with confidence.

5.4.2 Grasslands

The habitat impacted by the construction and operation of the proposed development are the two principal grassland habitats namely **improved agricultural grassland (GA1)** and **wet grassland (GS4)**.

The wet grassland in the western parcel is grazed by sheep which is resulting in herb species being outcompeted by the more vigorous rush species .Flowering herbs are and will continue to be a small component of the overall sward. As a result this wet grassland is of lower ecological value. These wet grassland communities are considered to be of ecological value only at a local level.

Where solar arrays are proposed, the fields in which they will be installed will retain their grass/herb sward. Some changes to the communities of grasses and herbs beneath the solar arrays are anticipated given the change in regime of direct light penetration and precipitation. Where infrastructure is proposed such as tracks and 4 No PV inverter stations, this will result in a direct loss in both these habitats. The overall impact (habitat loss and disturbance) is in deemed insignificant. This prediction is made with confidence.

These improved agricultural grassland communities in the central and eastern parcels are considered to be of ecological value at a Site level only. Therefore, overall impact (habitat loss and disturbance) is in deemed Negligible. This prediction is made with confidence.

The earth banks BL2 along the Termon River and its tributary will be leveled for the purposes of accommodating track and erecting panels. The grassland communities on these banks or mounds are of ecological value at a Site level only. Only common plant species occur. The overall impact (habitat loss and disturbance) is in deemed Negligible. This prediction is made with confidence.

5.4.3 Electrical cable route

The cable route is comprised of public road with narrow grass verge and adjoining hedgerows, post and wire fence or stone wall. These hedgerows and stone wall are of Local ecological value. The electrical cable will be constructed in a shallow trench within the roadbed or in a grass verge. No hedgerows or stone walls will be damaged or disturbed for the construction of the electrical cable. The overall impact is in deemed Negligible. This prediction is made with confidence.

5.4.4 Species

NBDC records indicate the presence of badger, otter and smooth newt in the wider countryside. The water bodies that abut the site will not be impacted by the development as per design mitigation (Section 5.2 above).

No excavations or field signs of badger or otter were recorded on site but these species may use the area to forage. The shed structure at the site entrance is very unlikely to support bats.

The proposed development will safeguard and retain all natural habitat field boundaries. Security fencing will have a 150mm gap at ground level to allow ground mammals forage within or travel through the site.

There are no records of breeding snipe at the site.

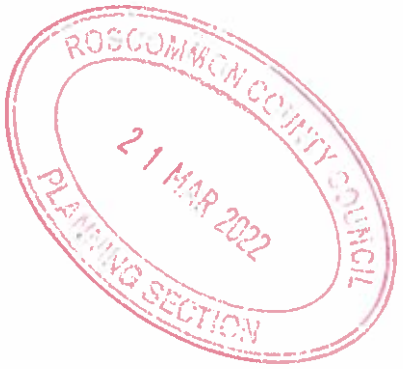
No significant effect upon any protected species is predicted. This prediction is made with confidence.

5.5 ENHANCEMENT

Hedgerow planting is proposed as part of a landscape mitigation strategy (Refer to Drawing No. 1695.1.11) along the southern boundary of the site. The hedgerow (with trees) will be comprised of native tree and shrub species applicable to soil type. Species include alder, common birch *Betula pubescens*, silver birch *Betula pendula*, bird cherry *Prunus padus*, hawthorn, blackthorn *Prunus spinosa*, elder and guelder rose *Viburnum opulus*.

5.6 RESIDUAL EFFECTS

The residual impact on designated sites, local habitats and their associated wildlife is considered to be of negligible significance. This prediction is made with confidence.



6 REFERENCES

Biodiversity Ireland (2016) *National Biodiversity Data Centre Mapping System.* Available: http://maps.biodiversityireland.ie. [accessed 14.04.2016].

CIEEM (2016) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester.

Fossitt, J.A. (2000) A Guide to Habitats in Ireland, The Heritage Council, Kilkenny.

Lundy MG, Aughney T, Montgomery WI, Roche N (2011) Landscape conservation for Irish bats & species specific roosting characteristics. Bat Conservation Ireland.

NIEA (2015) Standing Advice Series (No.21) Energy Generation – Solar farms. Advice for planning officers and applicants seeking planning permission for solar farms which may impact on natural heritage. Department of the Environment, Belfast.

NPWS (2016) Conservation Objectives: Corliskea/Trien/Cloonfelliv Bog SAC 002110. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2015) Conservation Objectives: Bellanagare Bog SAC 000592. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2015) Conservation objectives for Bellanagare Bog SPA [004105]. Generic Version 4.0. Department of Arts, Heritage and the Gaeltacht.

NPWS (2016) Conservation Objectives: Cloonchambers Bog SAC 000600. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2015) Conservation objectives for Drumalough Bog SAC [002338]. Generic Version 4.0. Department of Arts, Heritage and the Gaeltacht.

NPWS (2015) Conservation objectives for Mullygollan Turlough SAC [000612]. Generic Version 4.0. Department of Arts, Heritage and the Gaeltacht.

NPWS (2015) Conservation objectives for River Suck Callows SPA [004097]. Generic Version 4.0. Department of Arts, Heritage and the Gaeltacht.

Roscommon County Council (2014) Roscommon County Development Plan 2015 – 2021, Available: http://www.roscommoncoco.ie/en/Services/Planning/Plans/County_Development_Plan_2014_-_2020/ [accessed 19.04.2016].

Smith, G., O'Donoghue, P., O'Hara, K. and Delaney, E. (2011) *Best Practice Guidance for Habitat Survey and Mapping*, The Heritage Council, Kilkenny.JNCC (2010) *Handbook for Phase 1 habitat survey – a technique for environmental audit*, 5th Revised Reprint, Joint Nature Conservation Committee, Peterborough.

APPENDIX I COUNTY DEVELOPMENT PLAN POLICIES

Policy ref.	Text
Policy 7.1	Protect proposed and designated Natural Heritage Areas, Special Protection Areas and Special Areas of Conservation.
Policy 7.2	Protect geological Natural Heritage Areas as they become proposed, designated and notified to Roscommon County Council during the lifetime of this plan.
Policy 7.3	Protect any additional areas that may be proposed or designated during the lifetime of the plan in accordance with Policy above
Policy 7.4	Promote development in these areas, for recreational and educational purposes, where it would not conflict with the preservation and protection of these sites.
Policy 7.5	It is Council policy to implement the mitigation measures as set out in Section 11.3 of the Environmental Report accompanying the Development Plan, which are envisaged to prevent, reduce and, as fully as possible, offset any significant adverse impacts on the environment of implementing the County Development Plan. These mitigation measures refer to biodiversity, human health, geology and soils, water quality, flooding,air,climatic factors, transport infrastructure, wastewater treatment, waste management, cultural assets and landscape as referred to in Table 48 of the Environmental report.
Policy 7.6	Raise awareness of the importance of geological heritage and disseminate information on sites of geological importance in County Roscommon.
Policy 7.7	Have regard to the recommendations set out in the 'Waterways Corridor Study 2004 - A Study of the area surrounding Lanesborough to Shannonbridge', Waterways Corridor Study 2004 - The Shannon River between Roosky and Lanesborough' and the 'Waterways Corridor Study 2005 – A Study of the area surrounding the Upper Shannon navigation down to Roosky, including the Boyle River, Lough Allen, Lough Key and the Camadoe waters' (www.roscommoncoco.ie)
Policy 7.8	Safeguard and enhance riparian zones along waterways as well as canal towpaths where they occur in the interests of enhancing the public's interface and enjoyment of these natural amenities.
Objective 7.1	Maintain or restore the favourable conservation condition of a designated or proposed designated site under the control of the Planning Authority.
Objective 7.2	Ensure Appropriate Assessment Screening, and, where required, Appropriate Assessment, is carried out for any plan or project which, individually, or in combination with other plans and projects is likely to have a significant direct or indirect impact on any Natura 2000 site or sites; in accordance with best practice guidance as issued by the National Parks & Wildlife Service of the Department of Arts, Heritage & the Gaeltacht and/or the Department of Environment, Community & Local Government.
Objective 7.3	Preserve and protect sites of county geological importance from inappropriate development where they comprise designated sites or national heritage areas.
Objective 7.4	Refer all planning applications within County Geological Sites to the Geological Survey of Ireland for consultation and have regard to their recommendations.
Objective 7.5	Protect and promote the conservation of biodiversity outside of designated areas, while allowing for appropriate development, access and recreational activity.
Objective 7.6	Continue to carry out habitat mapping for the county to identify significant local habitats in the county. Mapping of habitats should prioritise: Habitats listed in Annex 2 of the EU Habitats Directive; Species listed in Annex 2 of the EU Habitats Directive; and Species listed in Annex 1 of the Birds Directive.
Objective 7.7	Co-operate with statutory and other relevant agencies to identify, protect and conserve a representative sample of the county's wildlife habitats of local or regional importance, not otherwise protected by legislation.
Objective 7.8	Identify, protect and conserve, in co-operation with the relevant statutory authorities and other groups, vulnerable, rare and threatened species or wild flora and fauna and their habitats. These include plant and animal species afforded protection under the Wildlife Acts and the EU Habitats & Birds Directives.
Objective 7.9	Retain where feasible and enhance important landscape features, such as lakes, rivers, wetlands, stonewalls, hedgerows etc, which form wildlife corridors and link habitats, where they provide, stepping stones necessary for wildlife to flourish.

Policy ref.	Text
Objective 7.10	Integrate biodiversity considerations into all Roscommon County Council activities
Objective 7.11	Ensure that the conservation and management of biodiversity is a key priority in water resource management.
Objective 7.12	Require that floodlighting proposals for historic structures are accompanied by a Bat Survey, carried out at the appropriate time of year by a suitably qualified person, so as to identify bat species present on the site and to specify mitigation measures required to ensure minimal disturbance to bats, if any, on the site.
Objective 7.13	Seek to minimize light intrusion by having regard to impacts of floodlighting and public lighting in public/open spaces in or close to designated areas.
Objective 7.14	Have regard to the recommendations of any national guidelines, which may come about during the lifetime of this plan, with respect to potential impacts on nature conservation, when considering development applications relating to activities; such as use of jet-ski's and power boats on sites of nature conservation importance.
Objective 7.15	Ensure that any development, which impacts on a townland boundary, roadside hedgerows or hedgerows which form links with other habitats and form wildlife corridors; should first seek to retain, translocate or replace with native species of local provenance, these hedges. The overall goal should be to have no net loss of the hedgerow resource.
Objective 7.16	The retention, re-location, or re-establishment of hedgerows in planning consents shall be an aim of the Planning Authority for those seeking Planning Permission where feasible.
Objective 7.17	Carry out a tree survey of the county to identify trees suitable for Tree Preservation Orders.
Objective 7.18	Commit to using native species where ever possible in its landscaping work and on Roscommon County Council property
Objective 7.19	Assess applications for quarrying activity in proximity to eskers, having regard to the designated status of the esker and conserve them from inappropriate development.
Objective 7.20	Seek hydrological reports for significant developments within and close to peatlands so as to assess impacts on the integrity of peatland ecosystems.
Objective 7.21	Support projects which plan for future re-use of industrial cutaway bogs as sites for habitat creation, amenity use and economic use.
Objective 7.22	Seek hydrological reports for significant developments within and close to turloughs so as to assess impacts on the integrity of the turlough system and associated groundwater levels.
Objective 7.23	Support the work of the National Wetlands Wilderness Park committee.
Objective 7.24	Promote awareness and educational opportunities relating to wetlands in the county
Objective 7.25	Ensure that the County's wetlands are retained for their biodiversity and flood protection values.
Objective 7.26	Ensure that where flood alleviation works take place the natural heritage and landscape character of rivers, streams and watercourses are protected and enhanced to the greatest extent possible.
Objective 7.27	Encourage sensitive development, which does not lead to a loss of, or cause damage to, the character, the principal components of, or the setting of parks, gardens and demesnes of special historic interest and which are protected.
Objective 7.28	In order to facilitate development, a condition of planning permission may include seed or cutting collection from rare plants surviving in a heritage garden or park, in order to facilitate survival of a rare species.
Objective 7.29	To co-operate with the Department of Arts, Heritage & the Gaeltacht and other interested groups to facilitate the protection, promotion and enhancement of heritage gardens and parks in the county.

Policy ref.	Text
Objective 7.30	Maintain and preserve the aesthetic value of inland waterways and the waterway corridors in the county from the impacts of dispersed and highly visible development.
Objective 7.31	Support the growth and development of local communities within the inland waterway corridors whilst maintaining their distinctive character.
Objective 7.32	Seek to enhance public access to inland waterways as a condition of any development granted along inland waterways.
Objective 7.33	Support initiatives, which reduce the risks of invasions, help control and manage new and established invasive species, monitor impacts, raise public awareness, improve legislation and address international obligations.
Objective 7.34	Implement conditions as appropriate, as part of a grant of a planning permission or a waste permit, to prevent spread of invasive species.
Objective 7.35	Encourage the use of native species in amenity planting and stocking and related community actions to reduce the introduction and spread of non-native species.
Objective 7.36	Investigate the development of a local authority staff code of practice (COP) in relation to invasive species where resources permit.

APPENDIX II SCREENING FOR APPROPRIATE ASSESSMENT

Screening for Appropriate Assessment

Name of Project or Plan.	Solar PV farm at Rathleg, Castlerea, Co. Roscommon.
Competent Authority project reference file number:	None available. Project not yet submitted for consent.
Name and location of Natura 2000 site	Hydrologically linked Approx. 3.5km upstream: Bellanagare Bog SAC [000592] and Bellanagare Bog SPA [004105] Approx. 5.3km upstream: Cloochambers Bog SAC [000600] Approx. 38.6km downstream: River Suck Callows SPA [004097] Within 10km with no hydrological link Distance approx. 5.7km: Corliskea/Trien/Cloonfelliv Bog SAC [002110] Distance approx. 8.6km: Mullygollan Turlough SAC [000612] Distance approx. 6.8km: Drumalough Bog SAC [002338]
Natura 2000 site features:	Qualifying Interests, Special Conservation Interests and Conservation Objectives of the European sites are referred to in **Appendix III of** this report.

Description of the Project or Plan:	<u>Size and scale</u> Small (4.2MVA) renewable energy generation by installation of solar PV arrays and ancillary infrastructure across 11.87 ha of improved agricultural grassland and wet grassland habitat. <u>Resource requirements (water abstraction etc)</u> None. <u>Emission (disposal to land, water or air)</u> No appreciable off-site emissions. <u>Excavation requirements</u> No large scale earthworks required. The solar farm is designed to fit into the existing landscape of a network of agricultural fields. <u>Transportation requirements</u> The local road network will experience an additional 1 (one) AADT upon completion of the proposed development. <u>Duration of construction, operation, de-commissioning etc</u> All enabling and construction works require a three month programme. Permission is being sought for 30 years. During its lifetime, the application site will continue to be used for sheep grazing and at the end of its operation all infrastructure will be decommissioned, removed and the land will be returned to its former agricultural use. This is a requirement of the lease agreement between Elgin Energy and the owner of the lands.
Is the proposal directly connected with or necessary to management of the site for conservation of N2K features? If yes proceed no further.	No.
Describe the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on the Natura 2000 site.	In relation to wetland habitat qualifying interests and special conservation interests, pollution events or the erosion of exposed soils by surface water runoff at a construction site can result in deterioration of downstream wetlands. In relation to mobile species qualifying interests and special conservation interests, construction noise and visual disturbance can result in displacement of species of the loss of attractiveness of a part of the territory of a species.

N2K Feature	**Describe any likely direct or indirect effects to the N2K features arising as a result of:** • **loss;** • **reduction of habitat area;** • **disturbance;** • **habitat or species fragmentation;** • **reduction in species density;**	**<u>Is there a likely significant effect?</u>** Habitat loss within a European site will not occur. Habitat reduction within a European site will not occur. Rationale:

	• changes in key indicators of conservation value (e.g. water quality, climate change).	Hydrological link River Suck Callows SPA [004097] Mobile species qualifying interests (QIs) Bellanagare Bog SAC [000592] Marsh Fritillary *Euphydryas aurinia* [1065] Cloochambers Bog SAC [000600] Marsh Fritillary *Euphydryas aurinia* [1065] Mobile species special conservation interests (SCIs) Bellanagare Bog SPA [000592] Greenland White-fronted Goose *Anser albifrons flavirostris* [A395] In relation to mobile species QIs and SCIs, there is no published policy advice in Ireland in relation to the possible effects of solar development on bird species. In Northern Ireland, NIEA (2015) has published advice for non-EIA development indicating where impacts of solar farms on natural heritage interests can occur and provides advice on assessment and mitigation that should be applied for all solar farm proposals. It contains a flowchart to help consider impacts upon SPA features. If the proposed development is greater than 500m from a SPA or a known flyway to a designated SPA, then "no impact is envisaged". In this instance, the nearest SPA (Bellanagare Bog) is more than 3km from the site of proposed development. There is no pathway of appreciable effect upon Greenland White-fronted Goose *Anser albifrons flavirostris* [A395]. The SAC sites with a mobile species QI (namely Marsh Fritillary) are Bellanagare Bog SAC and Cloochambers Bog SAC. Disturbance to this QI will not occur. These sites are 3.5km and 5.3km distance respectively from the proposed development. There is no pathway of appreciable effect upon this species. In relation to wetland habitat and special conservation interests, a path of possible effect (measuring approx. 38.6km) exists between the proposed development and a downstream designated site namely River Suck Callows SPA [004097]. The proposed development is a solar PV farm. There are no significant earthworks required for the development of this solar PV farm. The strict controls to be employed to reduce risks to suspended sediment and polluting substances entering a watercourse as set out in section 5.2 of the Ecology report have been considered. They are not novel proposals, and are enforceable through the construction contract and by planning condition. Their efficacy is not uncertain. There is no pathway of appreciable effect upon special conservation interests listed in **Appendix III** of this report. There is no hydrological link between the proposed development site and the following European Sites:

		▪ Corliskea/Trien/Cloonfelliv Bog SAC [002110] ▪ Mullygollan Turlough SAC [000612] ▪ Drumalough Bog SAC [002338] Furthermore, there are no qualifying mobile species that may be impacted by the development. Only qualifying habitats occur listed in **Appendix III** of this report. There is no pathway of appreciable effect upon these habitats.

Describe any potential effects on the Natura 2000 site as a whole in terms of: interference with the key relationships that define the structure or function of the site	It is concluded that the proposed development will not delay or hinder the maintenance or restoration to favourable conservation condition, the qualifying interests for which the SACs has been designated or the special conservation interests for which the SPAs have been designated.

Provide details of any other projects or plans that together with the project or plan being assessed could (directly or indirectly) affect the site.	**Provide details of any likely in-combination effects and quantify their significance –** The following spatial Plans have been considered: • Roscommon County Development Plan 2014 - 2020 The planning portal of Roscommon County Council was searched for planning applications or recently approved development which may result in a pathway of additional, additive, incremental, associated, connected or synergistic effects which may fall under in-combination effects and which could be considered to significantly affect the COs of the European sites being considered. No planning applications or recently approved developments occur that are considered to result in a pathway of additional, additive, incremental, associated, connected or synergistic effects were found to occur.

Is the potential scale or magnitude of any effect likely to be significant?		
Alone?	**Yes**	**No X**
In-combination with other projects of plans?	**Yes**	**No X**

Conclusion: Is the proposal likely to have a significant effect on an N2K site?	**Yes No X**

Data collected to carry out the assessment

Who carried out the assessment?	David McCormick BSc (Hons) MSc ACIEEM
Sources of data	NPWS, Roscommon County Council, Elgin Energy Services Ltd.
Level of assessment completed	Step 1 of Article 6(3); a screening exercise
Where can the full results of the assessment be accessed and viewed?	Roscommon County Council Planning Portal: http://www.roscommoncoco.ie/en/Services/Planning/

APPENDIX III QUALIFYING INTERESTS, SPECIAL CONSERVATION INTERESTS AND CONSERVATION OBJECTIVES OF THE EUROPEAN SITES REFERRED TO IN THE REPORT

Qualifying Interest * denotes a priority habitat	Conservation Objective	Published
4 no. features at Bellanagare Bog SAC [000592]		
▪ Active raised bogs [7110] ▪ Degraded raised bogs still capable of natural regeneration [7120] ▪ Depressions on peat substrates of the *Rhynchosporion* [7150] ▪ *Euphydryas aurinia* (Marsh Fritillary) [1065].	17 no. attributes for Active Raised Bog including area, range, structure, functions and typical species of active raised bog habitat [7110].	27.11.2015 Conservation Objectives: Bellanagare Bog SAC 000592 (v1)
1 no. feature Bellanagare at Bog SPA [004105]		
▪ Greenland White-fronted Goose (*Anser albifrons flavirostris)* [A395]	Site specific Conservation Objectives have not been published. The generic CO is 'to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA'.	13.02.2015 (Generic v4)
4 no. features Cloonchambers Bog SPA [000600]		
▪ Active raised bogs [7110] ▪ Degraded raised bogs still capable of natural regeneration [7120] ▪ Depressions on peat substrates of the Rhynchosporion [7150] ▪ Euphydryas aurinia (Marsh Fritillary) [1065]	17 no. attributes for Active Raised Bog including area, range, structure, functions and typical species of active raised bog habitat [7110].	18.01.2016 Conservation Objectives: Cloonchambers Bog SAC 000600 (v1)
5 no. features at River Suck Callows SPA [004097]		
▪ Whooper Swan (*Cygnus cygnus*) [A038] ▪ Wigeon (*Anas penelope*) [A050] ▪ Golden Plover (*Pluvialis apricaria*) [A140] ▪ Lapwing (*Vanellus vanellus*) [A142] ▪ Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395]	Site specific COs have not been published. The generic CO is 'to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA' and 'to maintain or restore the favourable conservation condition of the wetland habitat within the River Suck Callows SPA as a resource for the regularly-occurring migratory waterbirds that utilise it'.	13.02.2015 (Generic v4)
4 no. features at Corliskea/Trien/Cloonfelliv Bog SAC [002110]		
▪ Active raised bogs [7110] ▪ Degraded raised bogs still capable of natural regeneration [7120] ▪ Depressions on peat substrates of the Rhynchosporion [7150] ▪ Bog woodland [91D0]	17 no. attributes for Active Raised Bog [7110], including area, range, structure, functions and typical species of active raised bog habitat. 10 no. attributes for Bog Woodland [91D0], including area, range, structure, functions and typical species of bog woodland habitat.	

1 no. features at Mullygollan Turlough SAC [000612]		
▪ Turloughs [3180]	Site specific Conservation Objectives have not been published. The generic CO is 'to maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected'.	13.02.2015 (Generic v4)
3 no features at Drumalough Bog SAC [002338]		
▪ Active raised bogs [7110] ▪ Degraded raised bogs still capable of natural regeneration [7120] ▪ Depressions on peat substrates of the Rhynchosporion [7150]	Site specific Conservation Objectives have not been published. The generic CO is 'to maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected'.	13.02.2015 (Generic v4)

APPENDIX IV PHOTOGRAPHIC PLATES

Plate 1: drainage ditch filled with watercress *Rorippa nasturtium-aquaticum*. Further along sweet grass *Glyceria* sp. is dominant.

Plate 2: the Termon River travelling southwest on the western site boundary.

Plate 3: Target Note 3 - the upwelling of underground water and stream outflow into the River Termon.

Plate 4: wet grassland (GS4) with abundant soft rush *J. effusus*.

Plate 5: wet grassland (GS4) with tussocks of abundant purple moor-grass and bryophytes.

Plate 6: showing the contrasting wet grassland communities: Soft rush dominant community to the foreground and purple moor-grass community to the background.

Plate 7: showing the large centre land parcel - improved agricultural grassland (GA1) habitat.

Plate 8: showing the internal earth bank (BL2) with very intermittent hawthorn and beech mapped in Figure 3 as hedgerow (WL1).

Plate 9: showing double hedgerow along the eastern site boundary.

Plate 10: showing the ring fort with large stand of common nettle (with iris) in the hollow with scattered hawthorn.

APPENDIX V BIOLOGICAL RECORDS HELD BY NBDC

Species group	Scientific name	Common name	Record count	Date of last record	Title of dataset	Designation
amphibian	Lissotriton vulgaris	Smooth Newt	1	31/05/1975	Reptiles and Amphibians Distribution Atlas 1978 (An Foras Forbartha)	Protected Species: Wildlife Acts
annelid	Eiseniella tetraedra		2	15/08/2008	EPA River Biologists data	
annelid	Glossiphonia complanata		2	15/08/2008	EPA River Biologists data	
bird	Aegithalos caudatus	Long-tailed Tit	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Alauda arvensis	Sky Lark	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Anas platyrhynchos	Mallard	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Protected Species: EU Birds Directive >> Annex II, Section I Bird Species || Protected Species: EU Birds Directive >> Annex III, Section I Bird Species
bird	Anthus pratensis	Meadow Pipit	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Apus apus	Common Swift	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Carduelis cannabina	Common Linnet	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Carduelis carduelis	European Goldfinch	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Carduelis chloris	European Greenfinch	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	

bird	Certhia familiaris	Eurasian Treecreeper	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Columba oenas	Stock Pigeon	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Columba palumbus	Common Wood Pigeon	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Protected Species: EU Birds Directive >> Annex II, Section I Bird Species || Protected Species: EU Birds Directive >> Annex III, Section I Bird Species
bird	Corvus cornix	Hooded Crow	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Corvus frugilegus	Rook	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Corvus monedula	Eurasian Jackdaw	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Cyanistes caeruleus	Blue Tit	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Delichon urbicum	House Martin	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Emberiza citrinella	Yellowhammer	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
bird	Emberiza schoeniclus	Reed Bunting	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Erithacus rubecula	European Robin	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	

bird	Falco tinnunculus	Common Kestrel	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Fringilla coelebs	Chaffinch	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Gallinula chloropus	Common Moorhen	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Hirundo rustica	Barn Swallow	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Locustella naevia	Common Grasshopper Warbler	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Motacilla alba	White Wagtail	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Motacilla cinerea	Grey Wagtail	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Muscicapa striata	Spotted Flycatcher	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Numenius arquata	Eurasian Curlew	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Protected Species: EU Birds Directive >> Annex II, Section II Bird Species || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
bird	Parus major	Great Tit	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	

bird	Passer domesticus	House Sparrow	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Periparus ater	Coal Tit	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Phasianus colchicus	Common Pheasant	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Protected Species: EU Birds Directive >> Annex II, Section I Bird Species || Protected Species: EU Birds Directive >> Annex III, Section I Bird Species
bird	Phylloscopus collybita	Common Chiffchaff	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Phylloscopus trochilus	Willow Warbler	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Pica pica	Black-billed Magpie	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Prunella modularis	Hedge Accentor	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Regulus regulus	Goldcrest	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Saxicola torquata	Stonechat	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Sturnus vulgaris	Common Starling	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Sylvia communis	Common Whitethroat	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	

bird	Troglodytes troglodytes	Winter Wren	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Turdus merula	Common Blackbird	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Turdus philomelos	Song Thrush	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Turdus viscivorus	Mistle Thrush	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Vanellus vanellus	Northern Lapwing	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Protected Species: EU Birds Directive >> Annex II, Section II Bird Species || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
bony fish (Actinopterygii)	Phoxinus phoxinus	Minnow	1	15/08/2005	EPA River Biologists data	
flowering plant	Crataegus monogyna	Hawthorn	1	15/08/2008	EPA River Biologists data	
flowering plant	Fraxinus excelsior	Ash	2	15/08/2008	EPA River Biologists data	
flowering plant	Iris pseudacorus	Yellow Iris	1	15/08/2005	EPA River Biologists data	
flowering plant	Lemna trisulca	Ivy-leaved Duckweed	1	15/08/2005	EPA River Biologists data	
flowering plant	Lythrum salicaria	Purple-loosestrife	1	15/08/2005	EPA River Biologists data	
flowering plant	Phalaris arundinacea	Reed Canary-grass	1	15/08/2005	EPA River Biologists data	
flowering plant	Sparganium erectum	Branched Bur-reed	1	15/08/2005	EPA River Biologists data	
insect - beetle (Coleoptera)	Elmis aenea		2	15/08/2008	EPA River Biologists data	
insect - beetle (Coleoptera)	Limnius volckmari		1	15/08/2005	EPA River Biologists data	
insect - beetle (Coleoptera)	Oulimnius tuberculatus		1	15/08/2005	EPA River Biologists data	
insect - mayfly (Ephemeroptera)	Serratella ignita		1	15/08/2005	EPA River Biologists data	
mollusc	Ancylus fluviatilis		1	15/08/2005	EPA River Biologists data	
moss	Fontinalis antipyretica	Greater Water-moss	1	15/08/2008	EPA River Biologists data	

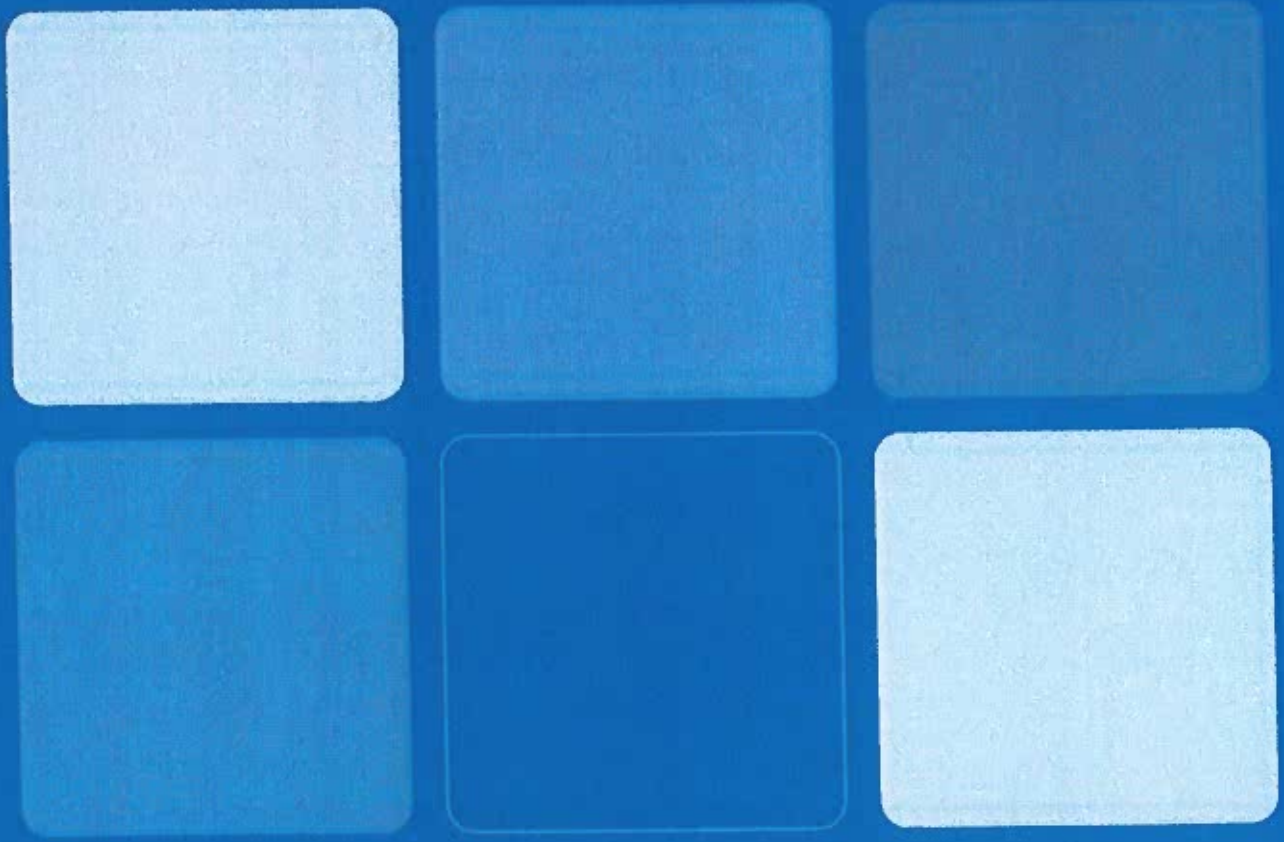

21 MAR 2022

RPS

Ecological Impact Assessment

for Elgin Energy Services Ltd

at the site of proposed Solar PV Farm, Castlerea, County Roscommon



RPS

Ecological Impact Assessment

for Elgin Energy Services Ltd

at the site of proposed Solar PV Farm,
Castlerea, County Roscommon

RPS
Elmwood House
74 Boucher Road
Belfast
BT13 3PH

Tel: +44 (0)28 9066 7914
Fax: +44 (0)28 9066 8286

QUALITY MANAGEMENT

Client:	Elgin Energy Services Ltd
Project:	Castlerea Solar PV Farm, Co. Roscommon
Document Ref:	NI1695_Rpt_Ec01

Rev.	Status	Author	Reviewed By	Approved By	Office of Origin	Issue Date
D04	Final draft	DMC	SL	JMC	Belfast	08.05.2016
A01	For planning	DMC	PMK	JMC	Belfast	17.05.2016
A02	For planning	DMC	PMK	JMC	Belfast	29.06.2017

CONTENTS

1 INTRODUCTION

1.1 INTRODUCTION

RPS was commissioned by Elgin Energy Services Ltd to undertake an Ecological Impact Assessment (EcIA) of a 12.04 ha site in the townland of Rathleg, approximately 2km east of Castlerea, Co. Roscommon. It is a low-lying site that lies between the R377 and the Termon River.

1.2 PROPOSED DEVELOPMENT

- The Solar PV installation has a life expectancy of 30 years. During its lifetime, the application site will continue to be used for sheep grazing and at the end of its operation, all infrastructure will be decommissioned, removed and the land will be returned to its former agricultural use.
- The proposed development has been designed to fit within existing field boundaries. Construction and operational maintenance will utilise existing field openings where available and accordingly the majority of vegetation will be retained in its entirety.
- There will be no cut and fill on the site. Proposals have been designed to work with the existing contours of the land.
- Panels will not be placed within the root protection areas of any trees. In some instances a separation distance of 2.5m x tree height can be imposed around the trees to negate the potential for over-shadowing.
- Within the land parcel, the key element of the proposed development will comprise the installation and layout of solar panels, effectively laid out in south facing rows within the fields. Rows may be separated by a distance of between 2 - 6m depending on the topography of the site. Panels always remain south facing. They do not move to follow the path of the sun.
- The panel size will be set on a frame table at an inclination of between 10 and 25 degrees. Each frame table will be supported on galvanised steel posts/frames that will be driven or screwed into the ground to depths of up to 1.5m. No concrete foundations are required, minimising ground disturbance. The front (lower) edge of the panels will sit typically between 0.6 and 0.8m above ground, with the higher edge of the panel located at a height between 2.1m to 2.8m. Again, this depends on localised topography.
- Client GRP Terminal station and ESB Terminal Station - The development will be served by an on-site terminal and switchgear enclosure. The ESB terminal station constitutes a brick building measuring 3.93m (l) x 4.430m (b) x 2.975 (h) which will be constructed atop a concrete slab 150mm in depth. The switchgear enclosure is a prefabricated building measuring 4.83m (l) x 5.28m (b) x 3.325m (h). There will be a small containerised storage unit adjacent to these structures the dimensions of which are 3.65m (l) x 3.05m (w) x 3.08m (h). This detail is illustrated on the planning drawings. It is currently proposed to connect the project into the ESB Network via a route along the R377 to the existing 38kV Castlerea substation by means of approximately 1.2km of underground cable. For clarity, the application does not include the grid connection, but this report includes an assessment of the underground route for completeness.
- PV Inverter Stations - The proposal will be facilitated by 4 no. PV inverter stations. These are small modular cabin like buildings which will be sensitively positioned throughout the site. They are constructed on a concrete base, with approximate footprint dimensions of 7m x 2.5m, rising to a height of 3m. These stations are connected to the modules of panels by cabling which has been buried underground. The panels themselves generate Direct Current (DC) electricity which is converted into

Alternating Current (AC) electricity by the inverter stations before being fed into the terminal station and then onward to the local electricity grid network.

- The proposal includes underground cabling between the modules and the inverter stations, however this will be buried.
- The entire site will be enclosed with perimeter post and wire (deer) fencing, which is typically located approximately 5 metres from the outer field boundaries on the inside edge.
- Internal site access will be via existing tracks where possible. A small number of permeable stone access tracks will be constructed throughout the land to provide access to each of the inverter stations during occasional maintenance. Access tracks will be no more than 3.5m wide.
- CCTV Cameras - A number of CCTV cameras (7 no.) will be positioned throughout the site, mounted on poles approximately 3m high. This is an essential element of the proposal, and is required to monitor the site and detect any unauthorised access. They will be directed into the solar farm, and will therefore avoid impacting detrimentally on nearby residential amenity.
- The location of the site and the site boundary are illustrated in **Figure 1.0 Site Location**.

RPS

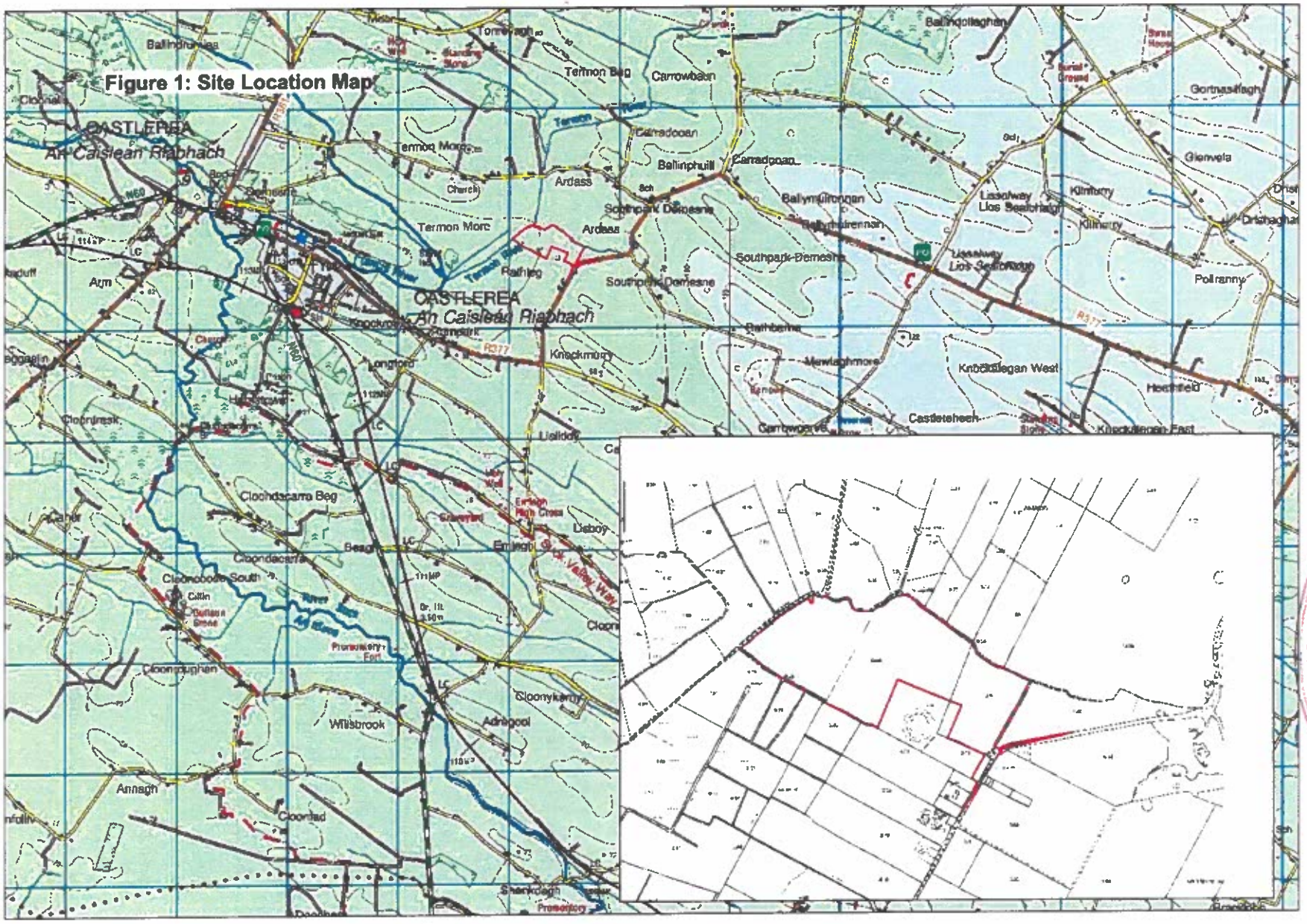


Figure 1: Site Location Map

2 LEGISLATION & PLANNING POLICY

2.1 EUROPEAN COUNCIL DIRECTIVES

Council Directive on the Conservation of Natural Habitats of Wild Fauna and Flora (92/43/EEC) (The Habitats Directive)

The main aim of the Directive is to promote the maintenance of biodiversity through the conservation of natural habitats and wild species listed on the Annexes of the Directive. Member States are required to take measures to maintain or restore, at favourable conservation status, biodiversity whilst taking account of economic, social, cultural requirements and regional and local characteristics. It gives effect to site and species protection measures through establishment of the Natura 2000 network and designation of European Sites including Special Areas of Conservation (SAC) and Special Protected Areas (SPA). It also establishes a list of species (other than birds) whose habitats must be protected to secure their survival. These priority species and habitats are subject to a higher level of protection. The Directive also requires appropriate assessment of any plan or project not directly connected with or necessary to the management of a European Site, but likely to have significant effects upon a European site, either individually or in combination with other plans or projects.

Council Directive on the Conservation of Wild Birds (2009/147/EC) (The Birds Directive)

The Directive provides a framework for the conservation and management of, and human interactions with, wild birds in Europe. It makes provisions for the maintenance of the wild bird populations across their natural range; conserves the habitats for rare or vulnerable species listed in Annex I and of migratory species through the classification of SPAs and provides protection for all wild birds.

2.2 IRISH LEGISLATION

S.I. No. 355 of 2015 provides that The Wildlife Act 1976, the Wildlife (Amendment) Act 2000, the Wildlife (Amendment) Act 2010, the Wildlife (Amendment) Act 2012, the European Communities (Birds and Natural Habitats) (Restrictions of the Use of Poison Bait) Regulations 2010 (S.I. 481 of 2010), the European Communities (Birds and Natural Habitats) Regulations 2011, the European Communities (Birds and Natural Habitats) (Amendment) Regulations 2013, and the European Communities (Birds and Natural Habitats) (Amendment) Regulations 2015 shall be construed together as one.

European Communities (Birds and Natural Habitats) Regulations 2011 to 2015

The Regulations give effect to requirements relating to the designation of protected sites under the Birds Directive and Habitats Directive. The Regulations provide for the protection and management of European Sites and place obligations on all competent authorities to have regard to the requirements of the Habitats Directive. The Regulations also provide for the protection of species of European importance.

Wildlife Acts 1976 to 2012

The Acts provides for *inter alia* the protection of wildlife. The Acts prohibit the intentional killing, taking or injuring of certain wild birds or wild animals; or the intentional destruction, uprooting or picking of certain wild plants.

Taken as a whole, nature conservation legislation is of key importance in undertaking EclA for proposed development as it shapes planning policy.

2.3 PLANNING POLICY

Roscommon County Development Plan 2014 – 2020

An overarching theme of the County Development Plan (CDP) in relation to Natural Heritage and Biodiversity is to ensure that there are no detrimental impacts to the natural heritage and biodiversity of the County. CDP policies in relation to Natural Heritage and Biodiversity are set out at Appendix I of this Ecological Impact Assessment.

County Roscommon Heritage Plan 2012 – 2016

The aim of the County Roscommon Heritage Plan 2012 – 2016 is to continue to create and promote an increased knowledge, awareness and appreciation of the natural, built and cultural heritage of County Roscommon and to conserve it for future generations'.

3 METHODOLOGY

3.1 STATEMENT OF AUTHORITY

The site surveyor and report author is David McCormick, a consultant Ecologist with RPS and holds a BSc (Hons) in Physical Geography and English and an MSc in Ecological Management and Conservation Biology. He has over six years experience of ecological field survey including habitat, mammal, amphibian and invertebrate survey and is a protected species license holder. David is also currently an associate member of the Chartered Institute of Ecology and Environmental Management (ACIEEM).

The approver is James McCrory, a Senior Associate with RPS who holds a BA in Plant Sciences and a MSc in Habitat Creation and Management. James is a Chartered Ecologist (CEcol), a Chartered Environmentalist (CEnv) and a full member of CIEEM; and also a Chartered Biologist (CBiol) and full member of the Royal Society of Biology. He was a member of the CIEEM technical working group updating the seminal Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland (CIEEM, 2016).

The information prepared and provided is true and accurate at the time of issue of the report and has been prepared and provided in accordance with the CIEEM Code of Professional Conduct (CIEEM 2013). We confirm that the professional judgement expressed herein is the true and bona fide opinion of our professional ecologists.

3.2 DESK STUDY

The National Biodiversity Data Centre (NBDC) is a national organisation that collates, manages and analyses and disseminates data on Ireland's biodiversity. It is funded by the Heritage Council and the Department of Arts, Heritage and the Gaeltacht. The NBDC provides access to all validated biodiversity data through Biodiversity Maps, the on-line biodiversity data portal.

Biodiversity records and full species accounts can be viewed and scrutinised through an interactive Biodiversity Maps portal (http://maps.biodiversityireland.ie/#/Home). This is a tool that can be used to help make a preliminary assessment of biodiversity issues when considering site-specific proposed development.

The chosen search area using the NBDC search tool was customised in order to captures all records within a minimum 1km distance of the proposed development site. The principal purpose of this task is to capture any records of protected species or species of natural heritage importance in close proximity to the site boundary. The zone of influence of the proposed development does not extend further than this.

A NPWS data set of Annex I habitats was reviewed to check for any records at the site of proposed development.

3.3 HABITAT SURVEY

A habitat survey was undertaken at the proposed development on 30th March 2016. The habitats along the proposed electrical connection route along the R377 were also surveyed. The survey was undertaken in accordance with the Heritage Council's Best Practice Guidance for Habitat Survey and Mapping (Heritage Council, 2011).

The survey was extended to include further information on the potential of the habitats identified to support species protected by law or of natural heritage importance. All habitats were mapped and categorised in accordance with the Heritage Council *Guide to Habitats in Ireland* (Fossitt, 2000). A search was undertaken for protected and invasive flora species. Aerial photographs were used as an aid to mapping habitats.

4 BASELINE ECOLOGICAL CONDITIONS

4.1 DESIGNATED SITES

The site of the proposed development is not located within the boundary of statutory or non-statutory designated sites of international, national or local nature conservation importance.

The site lies within the River Suck Catchment Area. There is a hydrological link between the proposed site and three European sites namely:

- Bellanagare Bog Special Area of Conservation (SAC) and Special Protected Area (SPA)
- Cloonchambers Bog SAC
- River Suck Callows SPA

Of these three European sites, only the River Suck Callows SPA is downstream of the site of proposed development. The site abuts the Termon River, a tributary of the Francis River which in turn joins the River Suck at Castlerea (as shown in Figure 1). This hydrological corridor is 39km long.

The River Suck Callows is classified as a SPA as it supports significant populations of the following species:

- Whooper Swan (*Cygnus cygnus*) [A038]
- Wigeon (*Anas penelope*) [A050]
- Golden Plover (*Pluvialis apricaria*) [A140]
- Lapwing (*Vanellus vanellus*) [A142]
- Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395]

Bellanagare Bog SAC and SPA

Ballanagare Bog SAC is designated for the following habitats and species listed on Annexes I and II of the. Habitats Directive:

- Active raised bogs [7110]
- Degraded raised bogs still capable of natural regeneration [7120]
- Depressions on peat substrates of the *Rhynchosporion* [7150]
- *Euphydryas aurinia* (Marsh Fritillary) [1065].

Bellanagare Bog is classified as a SPA as it supports significant populations of the following species:

- Greenland White-fronted Goose (Anser albifrons flavirostris) [A395]

Bellanagare Bog SAC and SPA lies approx. 3.5 km north of the proposed development. The site is also a proposed Natural Heritage Area (pNHA).

Cloonchambers Bog SAC

Cloonchambers Bog SAC is selected for the following habitats and species listed on Annex I and II of the E.U. Habitats Directive:

- Active raised bogs [7110]
- Degraded raised bogs still capable of natural regeneration [7120]
- Depressions on peat substrates of the *Rhynchosporion* [7150]
- *Euphydryas aurinia* (Marsh Fritillary) [1065].

This SAC lies approx. 5.3 km east of the proposed development. The site is also a proposed Natural Heritage Area (pNHA).

Corliskea, Trien and Cloonfelliv Bog SAC

This bog complex is selected for the following habitats listed on Annex I of the E.U. Habitats Directive:

- Active raised bogs [7110]
- Degraded raised bogs still capable of natural regeneration [7120]
- Depressions on peat substrates of the *Rhynchosporion* [7150]
- Bog woodland [91D0].

This SAC complex lies approx. 5.7 km southwest of the proposed development. The site is also a proposed Natural Heritage Area (pNHA).

Drumalough Bog SAC

This bog complex is selected for the following habitats listed on Annex I of the E.U. Habitats Directive:

- Active raised bogs [7110]
- Degraded raised bogs still capable of natural regeneration [7120]
- Depressions on peat substrates of the *Rhynchosporion* [7150].

This SAC complex lies approx. 6.8 km west-southwest of the proposed development. The site is also a proposed Natural Heritage Area (pNHA).

Mullygollan Turlough SAC

This SAC is selected for the following habitats listed on Annex I of the E.U. Habitats Directive:

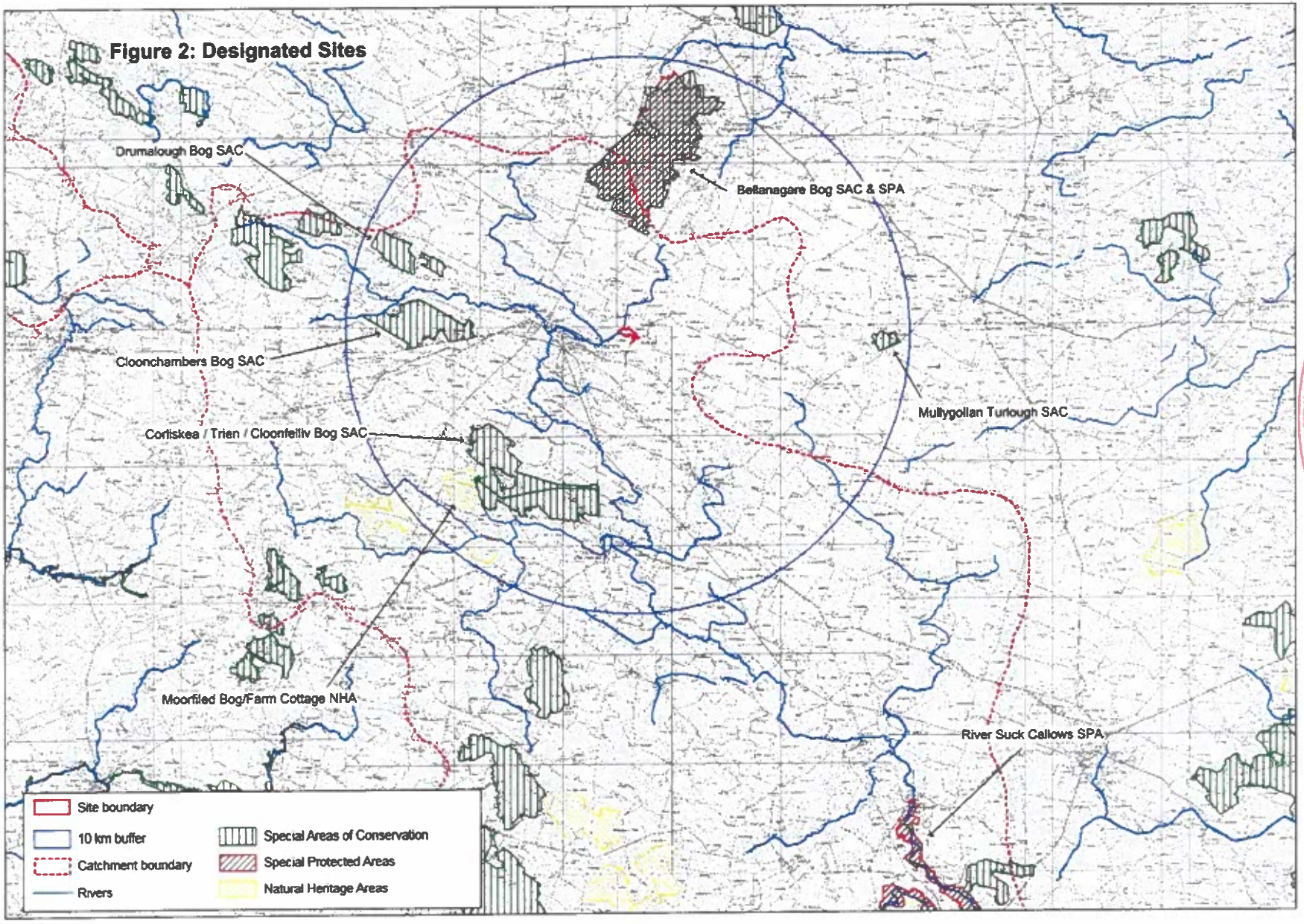
- Turloughs [3180]

This SAC approx. 8.6 km east of the proposed development. The site is also a proposed Natural Heritage Area (pNHA).

The nearest Natural Heritage Area (NHA) to the development site Moorfield Bog/Farm approx. 7.3km from the development site. This habitat abuts the Corliskea, Trien and Cloonfelliv Bog SAC bog complex.

The boundaries of each of these designated sites, rivers and river catchments relative to the proposed development is illustrated in **Figure 2 Designated Sites**.

RPS



4.2 HABITATS

4.2.1 Desktop search

A review of NBDC records and NPWS Annex I databases found no priority habitats within 5km the site (within 5km).

4.2.2 Field Survey

A map illustrating the findings of extended Phase 1 habitat survey can be found in **Figure 3.0 Habitat Survey Results Map**. A suite of photographic plates illustrating the site of proposed development are contained at Appendix IV of this report.

Site of proposed development

Drainage ditches (FW4)

The drainage ditch along the sites eastern boundary is shallow. Sweet grass *Glyceria* spp. is abundant with occasional water starwort *Callitriche* sp.

Watercress *Rorippa nasturtium-aquaticum* (see Plate 1) and sweet grass are dominant in the drainage ditch travelling along the northern site boundary. Occasional species include fool's watercress *Apium nodiflorum* and bur-reed *Sparganium* sp. This larger deeper ditch morphs into a narrow meandering stream that flows into the Termon River.

Depositing / lowland river (FW2)

The Termon River and aforementioned stream have a gravel cobbled bottom with larger rock-boulders. The main Termon River along the sites is rather featureless due to it channelized appearance so pools and riffles are scarcely present (see Plate 2). Long threads of filamentous algae were noted. Occasional marsh marigold *Caltha palustris* occurs along the river's edge. The bank was seen to be eroding in places. The site is more elevated than the enclosures on the other side of the river.

Spring (FP1) - Target Note 1

This feature is shown in Plate 3. Watercress covers most of this feature except where the large upwelling of underground water occurs which appears to be considerably deep. This feature abuts the River Termon into which this upwelling of water flows. The spring may be a **calcareous spring** (FP1) on account of the watercress which is more prevalent over lime. There was no evidence of marl or tufa formation. Mosses were notably absent. The site boundary navigates around this feature.

Grasslands

The main site is comprised of three field parcels. The largest, central parcel is mostly comprised **improved agricultural grassland** (GA1), where as the parcel furthest west is largely comprised of **wet grassland** (GS4). Both these parcels are separated by an **earth bank** (BL2) accompanied by an open defunct **hedgerow** (WL1). Trees/shrubs are scarcely present in this hedgerow. Sheep freely graze both parcels and the ring fort.

The smallest parcel (to the east) is comprised of **improved agricultural grassland** (GA1) only. This parcel is enclosed by a post and wire fence.

Wet grassland (GS4)

This habitat can be subdivided into two broad wet grassland communities.

The first (shown in Plate 4) is comprised of abundant soft rush *Juncus effusus* with frequent sharp-flowered rush *J. acutiflorus* / jointed rush *J. articulatus* and sedges *Carex* spp. Other than tufted hair-grass *Deschampsia cespitosa*, grasses were difficult to identify in the trampled ground. However, they appear to include bents *Agrostis* spp. Flowering herbs were evidenced from overwintering dead stems or newly emerging shoots. Species include frequent iris *Iris pseudacorus* with scatterings of emerging meadow vetchling *Lathyrus pratensis*, meadowsweet *Filipendula ulmaria* and common sorrel *Rumex acetosa*. This *Juncus* dominated wet grassland generally occurs adjacent to Termon River.

The other wet grassland community is more diverse. Here purple moor-grass *Molinia caerulea* is abundant with frequent sharp-flowered rush / jointed rush, sedges and a fescue *Festuca* sp. Soft rush and hard rush *J. inflexus* are scarcely present. Grasses include tufted hair-grass, bent grasses and crested dog's-tail *Cynosurus cristatus*. Bryophytes occur most notably in the tussock and include common tamarisk-moss *Thuidium tamariscinum* and neat feather-moss *Pseudoscleropodium purum*. These tussocks are evident in Plate 5.

Frequent flowering herbs include iris and a tormentil *Potentilla* sp. The remaining herbs comprised overwintering basal leaves or dead stems or newly emerging shoots. These are meadowsweet, marsh thistle *Cirsium palustre*, common sorrel, marsh cinquefoil *Potentilla palustris*, an umbelifer sp. and willowherb *Epilobium* sp.

These habitats are grazed by sheep. Being a smaller animal than cattle, they are not poaching these wet grassland soils as cattle would if the ground has not dried out sufficiently.

Sheep are selective grazers. They are known to avoid soft rush *J. effusus*. As such, this species is expected to increase in its relative abundance throughout the site without any management intervention (such as cutting or treating with an herbicide).

The contrasting soft rush and purple moor-grass communities are evident in Plate 6.

A circular area of raised ground occurs in this western parcel. Species resemble those in the drier, improved grassland parcels to the east. A similarly dry area occurs in the furthest west corner of the site.

Improved agricultural grassland (GA1)

The sward is tightly grazed by sheep as shown in Plate 7. Species composition is very variable across this habitat. In places grasses are entirely dominant with little to no herb or bryophyte cover. Elsewhere in damp areas bryophytes are dominant typically pointed spear-moss *Calliergonella cuspidata*. Grasses that were evident during survey were bent grasses, crested dog's-tail, sedges and perennial ryegrass *Lolium perenne*. Common sorrel is the most common herb and is tightly grazed as are all herbs. Iris is frequent either as scattered individuals or as dense pockets. Flowering herbs include locally frequent common sorrel and

Earth banks BL2

Along the Termon River and its tributary (and the drainage ditch that abuts the centre field) are mounds of soils - materials produced from channel deepening (examples of which are visible in Plate 2). These stony impoverished banks have completed re-vegetated and include species which do well in sandy conditions. These include yarrow *Achillea millefolium*, plantains *Plantago* spp. such as ribwort plantain *Plantago lanceolata*, daisy *Bellis perennis*, self-heal *Prunella vulgaris*, catsear *Hypochaeris radicata*, sedges, fescue (grass) and the moss *Rhytidiadelphus squarrosus* (springy turf-moss).

Hedgerows (WL1) and Treelines (WL2)

The single internal hedgerow separates the largest centre parcel and the parcel to the west. It is comprised of an earth bank with very intermittent hawthorn and beech *Fagus sylvatica*. It is barely recognisable as a hedgerow. Intermittent hawthorn and alder *Alnus glutinosa* align the drainage ditch along the sites northern boundary.

A more intact hedgerow - field boundary feature aligns the sites eastern boundary abutting the drainage ditch. This feature is shown in Plate 10. It is a double row of native trees comprised of ash *Fraxinus excelsior*, alder and hawthorn. This feature has a relatively impoverished woodland ground flora with only scatterings of lesser celandine and tufted hair-grass. Shrubs include frequent ivy *Hedera helix* and bramble *Rubus fruiticosus* agg. Snowberry *Symphoricarpos albus* is prominent by the site entrance where this linear feature expands into a small pocket of **mixed broadleaved woodland** (WD1) along the roadside. This mixed broadleaved woodland in small part lies within the site boundary.

Habitats adjoining the site

Ring fort

The centre field is inclusive of a ring fort which has similar plant assemblages to the aforementioned **earth banks (BL2)**. Also present here lesser celandine *Ranunculus ficaria* and large stands of common nettle *Urtica dioica* in the hollows. Shrubs occur here which comprise of scattered hawthorn *Crataegus monogyna* occasional elder *Sambucus nigra*.

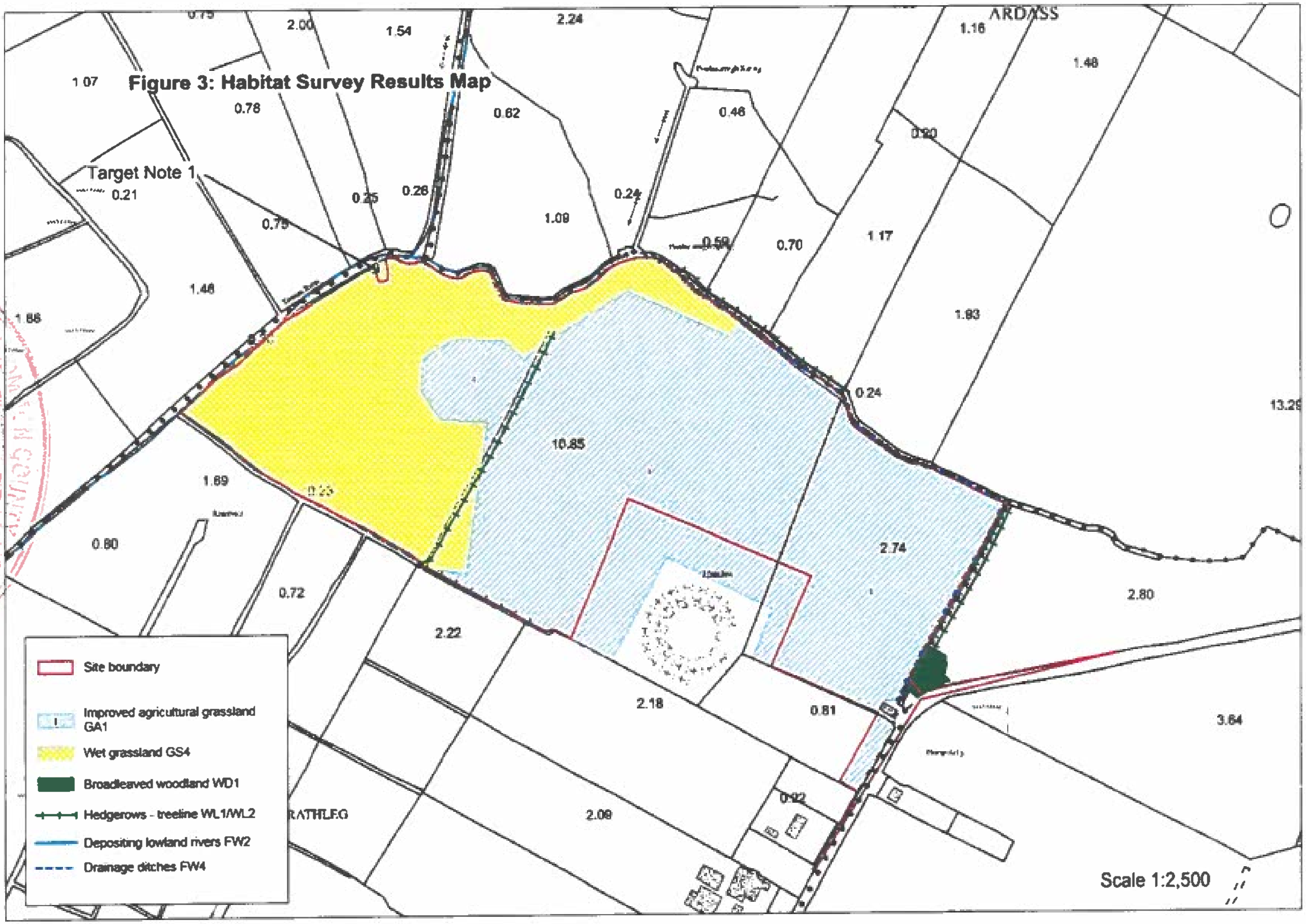
Other grasslands

Wet grassland (GS4) enclosures are the dominant habitats to the west and northwest of the site whilst **improved agricultural grassland (GA1)** is the dominant habitat to the south and northeast.

Electrical Cable Route

The cable route is comprised of public road with narrow grass verge and adjoining hedgerows, post and wire fence or stone wall. The hedgerows are mostly low and box-cut with occasional less managed sections of unmanaged ash trees. Occasional dwellings occur on either side.

Figure 3: Habitat Survey Results Map



4.3 SPECIES

4.3.1 Existing records

A search of the existing records held by NBDC is included as Appendix V. The search area was customised (measuring 9 km²) in order to ensure all records within 1km of the site boundary were captured. Those species afforded protection under national and international legislation are highlighted.

Records for smooth newt *Lissotriton vulgaris*, otter *Lutra lutra* and badger *Meles meles* occur within the search area. Bird records include curlew *Numenius arquata*, lapwing *Vanellus vanellus*, yellow hammer *Emberiza citrinella*, common grasshopper warbler *Locustella naevia*, house martin *Delichon urbicum*, house sparrow *Passer domesticus*, sky lark *Alauda arvensis*, common swift *Apus apus*, common linnet *Carduelis cannabina*, common kestrel *Falco tinnunculus*, and spotted flycatcher *Muscicapa striata*.

4.3.2 Badger

No badger setts or badger signs for found during site survey. However, badgers may frequent the site to feed or forage. The aforementioned NBDC records confirm their presence in the wider area.

4.3.3 Bats

A study undertaken by Lundy *et al.* (2011) used the existing database of species records, collated and maintained by Bat Conservation Ireland to apply analysis of the habitat and landscape associations of all species that commonly occur in Ireland namely; common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, Leisler's bat, Daubenton's bat, Natterer's bat, whiskered bat, brown long-eared bat and the lesser horseshoe bat. Using the 'bat landscapes data' derived from that study available on the NBDC website it is possible to get a general picture as to the favourability of lands inside a 5km grid that overlays the Castlerea Solar PV Farm site are for bats.

Table 1 lists the 'habitat suitability index' scores for 'all bats' and each of the eight individual bat species in the 5km grid square that overlays the site.

The index ranges from 0 to 100 with 0 being least favourable and 100 most favourable for bats. A score between 31 and 38 for example is considered medium; 39 - 47 is high and 48 - 72 very high.

Table 1: Bat Landscape Importance Records

Common Name	Scientific Name	Habitat Suitability Index
All Bats	*Vespertilionidae* spp	26.78
Brown long-eared bat	*Plecotus auritus*	34
Common pipistrelle	*Pipistrellus pipistrellus*	42
Soprano pipistrelle	*Pipistrellus pygmaeus*	43
Nathusius' pipistrelle	*Pipistrellus nathusii*	4
Leisler's bat	*Nyctalus leisleri*	39
Daubenton's bat	*Myotis daubentonii*	33
Whiskered bat	*Myotis mystacinus*	13
Natterer's bat	*Myotis nattereri*	32
Lesser horseshoe bat.	*Rhinolophus hipposideros*	0

It must be noted, these indices are broad generalisations of species' geographical occurrence. A 5km grid squares that scores less favourably may still have local areas of abundance, for example, an area of semi-natural broadleaved woodland and adjoining river or lake.

It is evidenced from site survey and othophotography that woodlands, hedgerows and tree lines scarcely occur or are absent from the solar farm site and the immediate wider countryside. Woodlands, hedgerows and tree lines are strongly associated with bat foraging and commuting.

This site is therefore not likely to be an area of local 'abundance'. It does however have water courses and a wooded eastern site boundary. Some bat activity perhaps that of common species such as those scoring high in Table 1 above are therefore likely to frequent parts of the site. Leisler's bat may forage over the open grasslands. This species is not as reliant on hedgerows for foraging - commuting.

The site has no natural (typically mature - veteran trees or damaged younger trees with suitable entrance points) or built structures that could support roosting bats within the site. There is a relatively newly built shed at the site entrance. There were no obvious bat entry points (gaps - fissures) in the structure including evidence like droppings or urine staining. It is unlikely to be used by roosting bats.

4.3.4 Other species

A single Snipe *Gallingago Gallingago* was flushed from wet grassland habitat on site during survey. NBDC records show the species to be ubiquitous in this region during the breeding season. This single sighting was recorded during very late winter season.

5 LIKELY SIGNIFICANT EFFECTS OF THE PROPOSED DEVELOPMENT

5.1 IMPACT ASSESSMENT

The information gathered from desk study and survey has been used to undertake an EcIA of the proposed development upon the identified ecological features. The EcIA has been undertaken following the methodology set out in CIEEM (2016) and with reference to BS 42020:2013. EcIA is based upon a source-pathway-receptor model, where the source is defined as the individual elements of the proposed development that have the potential to affect identified ecological features. The pathway is defined as the means or route by which a source can affect the ecological features. An ecological feature is defined as the species, habitat or ecologically functioning unit of natural heritage importance. Each element can exist independently however an effect is created where there is a linkage between the source, pathway and feature.

A significant effect is defined in CIEEM (2016) as –

"an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project. A significant effect is a positive or negative ecological effect that should be given weight in judging whether to authorise a project: it can influence whether permission is given or refused and, if given, whether the effect is important enough to warrant conditions, restrictions or further requirements such as monitoring".

BS 42020:2013 states that if an effect is sufficiently important to be given weight in the planning balance or to warrant the imposition of a planning condition, e.g. to provide or guarantee necessary mitigation measures, it is likely to be "significant" in that context at the level under consideration. The converse is also true: insignificant effects would not warrant a refusal of permission or the imposition of conditions.

Likely significant effects are predicted on the basis of the proposed development described in Section 1.2 and are set out within the context of Section 5.2 below (CIEEM, 2016, para 6.23).

5.2 SENSITIVE DESIGN AND DESIGN MITIGATION

5.2.1 Sensitive design

To reinforce the sensitive design approach employed at the site it is worth confirming:

- The proposed solar PV farm has been designed to fit into existing field parcels. No boundaries will be removed to facilitate the arrays, security fencing or any other ancillary development. The layout of arrays in each field has been designed to maintain a set-back buffer of approximately 5m from all ditches, treelines and hedges.
- Secure perimeter fencing will be constructed to leave a 150mm gap left at the bottom of all fencing to allow for unimpeded mammal access throughout the site.
- To facilitate grid connection, an electrical cable will be constructed in a shallow trench within the roadbed or in a grass verge. No hedgerow, treeline or ditch will be interfered with for the construction of the electrical cable.

- The proposed development includes a landscape mitigation strategy (Refer to Drawing No. 1695.1.11) comprising enhancement to existing field boundary hedgerows with trees; and hedge planting which is appropriate to the local setting, location and the wider context of the site.

Site design drawings show the layout of all proposed infrastructure and are included as Drawing No's 1695.1.01 -1695.1.04 as part of the planning application.

5.2.2 Design Mitigation

Construction

It shall be a condition of the contract of construction that all construction works shall comply with:

- Technical Guidance C648: Control of Water Pollution from Linear Construction Projects, (CIRIA, 2006)
- Technical Guidance C532: Control of Water Pollution from Construction Sites: Guidance for Consultants and Contractors (CIRIA, 2001);
- PPG 5: Works and maintenance in or near water; and
- PPG 6: Working at demolition & construction sites.

Concrete will not be produced on site.

Stone which is imported to site to be used for tracks and hardstanding areas shall be washed stone.

All stoned areas will be laid with a geotextile layer.

Leaking or empty drums will be removed from the site immediately and disposed of via a registered waste disposal contractor.

All valves and trigger guns shall be protected from vandalism within a secured compound to prevent unauthorised interference and shall be turned off and securely locked when not in use.

Any tanks or drums shall be stored in a secure container or compound, which shall be kept locked when not in use.

The risk of spilling fuel is at its greatest during refuelling of plant. Refuelling of mobile plant will be undertaken in a designated area, on an impermeable surface well away from any drains or waterbodies.

Hoses and valves will be checked prior to each use for signs of wear, and ensure that they are turned off and securely locked when not in use. Diesel pumps and similar equipment will be placed on drip trays to collect minor spillages or leaks.

Operation

Solar panel cleaning will typically be undertaking by whisking off any dry floating dust or leaves from the module with a dry whisk or cloth. For other hard foreign matter such as bird droppings or dirt the module is scraped with non woven fabric or hair brush. If there are coloured substances such as bird droppings or plant resins etc. the coloured substances need to be removed by cleaning, normally with de-ionized water which is sprayed onto the module and scraped with a hair brush. The cleaning contractor will bring the de-ionised water to the site and there will be no requirement for any abstraction from the local water courses. Where particularly oily substances are present these may be removed using a water and alcohol mix but this

will only be required where particularly stubborn deposits exist and will be sprayed onto the module by hand and removed using a hair brush.

Maintenance is typically carried out quarterly. In addition, the site will be remotely monitored for any reduction in output. If any change is recorded a site visit will take place.

Site Drainage

The existing site is Greenfield. The proposals for the site will not increase the rate of discharge from the current pre-development run-off rates as there are limited areas of hard standing associated with the development.

The panels are being installed on the land as it is currently, and therefore there will be no changes made to existing ground levels or ground cover. Therefore existing surface runoff paths are unchanged. Installation of the panels will have minimal impact on the ground as the posts are embedded into the ground. Rainwater falling on the panels will be directed towards the existing ground as it is now.

There is no other significant infrastructure being installed that will impact on runoff. Proposed stoned tracks will be permeable so as not to impact on existing run off rates. Stones will be placed on the existing ground surfaces to create access roads. Surface water runoff will soak into the tracks where it will infiltrate into the ground as it does now. The station building will have gutters and downpipes, and rudimentary soakaways will be provided for each pipe (consisting of a stone pit).

Small areas of roofs will be created by the inverter stations but these are insignificant in comparison to the size of the site, and any runoff will soak away.

To summarise, there is unlikely to be any increase in run-off as a result of development of the site and there are no formal drainage systems being installed.

5.3 DESIGNATED SITES

In relation to wetland habitat special conservation interests, a path of possible effect exists between the proposed development and the River Suck Callows SPA (refer to report section 4.1 and Figure 2) via a 39km hydrological link.

Sediment, including all soils, mud, clay, silt, sand etc, is the single main pollutant generated at construction sites and largely arises from the erosion of exposed soils by surface water runoff. Fuels, lubricants and other chemicals can also escape to the water environment if their use is not controlled.

There are no significant earthworks required for the development of this solar PV farm.

The strict controls to be employed to reduce risks to suspended sediment and polluting substances entering a watercourse as set out in section 5.2 of this report have been considered. They are not novel proposals, and are enforceable through the construction contract and by planning condition. Their efficacy is not uncertain.

In relation to mobile species qualifying interests and special conservation interests, there is no published policy advice in Ireland in relation to the possible effects of solar development on bird species.

In Northern Ireland, NIEA (2015) has published advice for non-EIA development indicating where impacts of solar farms on natural heritage interests can occur and provides advice on assessment and mitigation that should be applied for all solar farm proposals. It contains a flowchart to help consider impacts upon SPA features. If the proposed development is greater than 500m from a SPA or a known flyway to a designated

SPA, then "no impact is envisaged". In this instance, the nearest SPA is Ballanagare Bog, 3.5 km north of the site. The SPA qualifying interest in this instance is the Greenland White-fronted Goose *Anser albifrons flavirostris*.

The other 'mobile' species considered is marsh fritillary butterfly *Euphydryas aurinia* [1065], a qualifying interest at Bellanagare Bog SAC and Cloochambers Bog SAC. These sites are 3.5km and 5.3km distance respectively from the proposed development. There is no pathway of appreciable effect upon this species.

There is no hydrological link between the proposed development site and Drumalough Bog SAC; Mullygollan Turlough SAC; and Corliskea, Trien and Cloonfelliv Bog SAC and therefore no pathway of appreciable effect upon their qualifying habitats. Furthermore, there are no qualifying mobile species that may be impacted by the development.

It is considered that the proposed development is in compliance with County Development Plan policy 7.1 on the protection of designated sites (refer to Appendix I).

A screening for appropriate assessment has been undertaken is included as Appendix II to this report. It is concluded that the proposed development will not delay or hinder the maintenance or restoration to favourable conservation condition, the qualifying interests for which the SACs has been designated or the special conservation interests for which the SPAs have been designated.

No significant negative effects are predicted upon designated sites. This prediction is made with confidence.

5.4 HABITATS

NIEA (2015) notes that "whether proposals are within designated sites or priority habitat, they have the potential for direct loss of habitat from the footprint of the proposal and associated access roads. Cabling has the potential to create new drainage pathways if present within a wet habitat or peatland. There can also be indirect impacts on sensitive habitat outside the development footprint from construction activities."

5.4.1 Field boundaries

Earth banks (BL2), hedgerows (WL1), treelines (WL2) and drainage ditches (FW4) occupy internal and field boundaries and the proposed site boundary. The mixed broadleaved woodland (WD1) in small part lies within the site boundary. These features are considered to be of ecological value at a Local level.

The proposed solar PV farm has been designed to fit into existing field parcels. No boundaries will be removed to facilitate the arrays, security fencing or any other ancillary development. The layout of arrays in each field has been designed to maintain a set-back buffer 5m from all ditches, treelines and hedgerows. There will be some tree removal at the mixed broadleaved woodland (WD1) (maximum of 2 trees and underlying shrub) to facilitate site access where these features occur within the site boundary. The overall impact is therefore deemed to be Negligible. This prediction is made with confidence.

5.4.2 Grasslands

The habitat impacted by the construction and operation of the proposed development are the two principal grassland habitats namely **improved agricultural grassland (GA1)** and **wet grassland (GS4)**.

The wet grassland in the western parcel is grazed by sheep which is resulting in herb species being outcompeted by the more vigorous rush species .Flowering herbs are and will continue to be a small component of the overall sward. As a result this wet grassland is of lower ecological value. These wet grassland communities are considered to be of ecological value only at a local level.

Where solar arrays are proposed, the fields in which they will be installed will retain their grass/herb sward. Some changes to the communities of grasses and herbs beneath the solar arrays are anticipated given the change in regime of direct light penetration and precipitation. Where infrastructure is proposed such as tracks and 4 No PV inverter stations, this will result in a direct loss in both these habitats. The overall impact (habitat loss and disturbance) is in deemed insignificant. This prediction is made with confidence.

These improved agricultural grassland communities in the central and eastern parcels are considered to be of ecological value at a Site level only. Therefore, overall impact (habitat loss and disturbance) is in deemed Negligible. This prediction is made with confidence.

The earth banks BL2 along the Termon River and its tributary will be leveled for the purposes of accommodating track and erecting panels. The grassland communities on these banks or mounds are of ecological value at a Site level only. Only common plant species occur. The overall impact (habitat loss and disturbance) is in deemed Negligible. This prediction is made with confidence.

5.4.3 Electrical cable route

The cable route is comprised of public road with narrow grass verge and adjoining hedgerows, post and wire fence or stone wall. These hedgerows and stone wall are of Local ecological value. The electrical cable will be constructed in a shallow trench within the roadbed or in a grass verge. No hedgerows or stone walls will be damaged or disturbed for the construction of the electrical cable. The overall impact is in deemed Negligible. This prediction is made with confidence.

5.4.4 Species

NBDC records indicate the presence of badger, otter and smooth newt in the wider countryside. The water bodies that abut the site will not be impacted by the development as per design mitigation (Section 5.2 above).

No excavations or field signs of badger or otter were recorded on site but these species may use the area to forage. The shed structure at the site entrance is very unlikely to support bats.

The proposed development will safeguard and retain all natural habitat field boundaries. Security fencing will have a 150mm gap at ground level to allow ground mammals forage within or travel through the site.

There are no records of breeding snipe at the site.

No significant effect upon any protected species is predicted. This prediction is made with confidence.

5.5 ENHANCEMENT

Hedgerow planting is proposed as part of a landscape mitigation strategy (Refer to Drawing No. 1695.1.11) along the southern boundary of the site. The hedgerow (with trees) will be comprised of native tree and shrub species applicable to soil type. Species include alder, common birch *Betula pubescens*, silver birch *Betula pendula*, bird cherry *Prunus padus*, hawthorn, blackthorn *Prunus spinosa*, elder and guelder rose *Viburnum opulus*.

5.6 RESIDUAL EFFECTS

The residual impact on designated sites, local habitats and their associated wildlife is considered to be of negligible significance. This prediction is made with confidence.

6 REFERENCES

Biodiversity Ireland (2016) *National Biodiversity Data Centre Mapping System*. Available: http://maps.biodiversityireland.ie. [accessed 14.04.2016].

CIEEM (2016) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester.

Fossitt, J.A. (2000) A Guide to Habitats in Ireland, The Heritage Council, Kilkenny.

Lundy MG, Aughney T, Montgomery WI, Roche N (2011) Landscape conservation for Irish bats & species specific roosting characteristics. Bat Conservation Ireland.

NIEA (2015) Standing Advice Series (No.21) Energy Generation – Solar farms. Advice for planning officers and applicants seeking planning permission for solar farms which may impact on natural heritage. Department of the Environment, Belfast.

NPWS (2016) Conservation Objectives: Corliskea/Trien/Cloonfelliv Bog SAC 002110. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2015) Conservation Objectives: Bellanagare Bog SAC 000592. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2015) Conservation objectives for Bellanagare Bog SPA [004105]. Generic Version 4.0. Department of Arts, Heritage and the Gaeltacht.

NPWS (2016) Conservation Objectives: Cloonchambers Bog SAC 000600. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

NPWS (2015) Conservation objectives for Drumalough Bog SAC [002338]. Generic Version 4.0. Department of Arts, Heritage and the Gaeltacht.

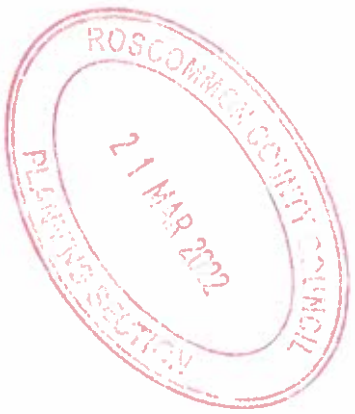
NPWS (2015) Conservation objectives for Mullygollan Turlough SAC [000612]. Generic Version 4.0. Department of Arts, Heritage and the Gaeltacht.

NPWS (2015) Conservation objectives for River Suck Callows SPA [004097]. Generic Version 4.0. Department of Arts, Heritage and the Gaeltacht.

Roscommon County Council (2014) Roscommon County Development Plan 2015 – 2021, Available: http://www.roscommoncoco.ie/en/Services/Planning/Plans/County_Development_Plan_2014_-_2020/ [accessed 19.04.2016].

Smith, G., O'Donoghue, P., O'Hara, K. and Delaney, E. (2011) *Best Practice Guidance for Habitat Survey and Mapping*, The Heritage Council, Kilkenny.JNCC (2010) *Handbook for Phase 1 habitat survey – a technique for environmental audit*, 5th Revised Reprint, Joint Nature Conservation Committee, Peterborough.

APPENDIX I COUNTY DEVELOPMENT PLAN POLICIES

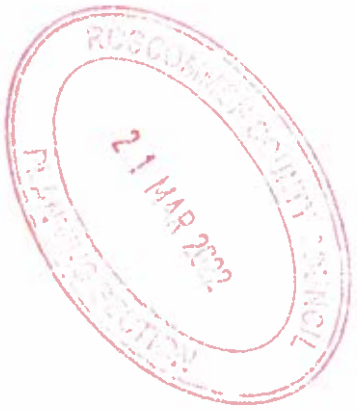


Policy ref.	Text
Policy 7.1	Protect proposed and designated Natural Heritage Areas, Special Protection Areas and Special Areas of Conservation.
Policy 7.2	Protect geological Natural Heritage Areas as they become proposed, designated and notified to Roscommon County Council during the lifetime of this plan.
Policy 7.3	Protect any additional areas that may be proposed or designated during the lifetime of the plan in accordance with Policy above
Policy 7.4	Promote development in these areas, for recreational and educational purposes, where it would not conflict with the preservation and protection of these sites.
Policy 7.5	It is Council policy to implement the mitigation measures as set out in Section 11.3 of the Environmental Report accompanying the Development Plan, which are envisaged to prevent, reduce and, as fully as possible, offset any significant adverse impacts on the environment of implementing the County Development Plan. These mitigation measures refer to biodiversity, human health, geology and soils, water quality, flooding,air,climatic factors, transport infrastructure, wastewater treatment, waste management, cultural assets and landscape as referred to in Table 48 of the Environmental report.
Policy 7.6	Raise awareness of the importance of geological heritage and disseminate information on sites of geological importance in County Roscommon.
Policy 7.7	Have regard to the recommendations set out in the 'Waterways Corridor Study 2004 - A Study of the area surrounding Lanesborough to Shannonbridge', Waterways Corridor Study 2004 - The Shannon River between Roosky and Lanesborough' and the 'Waterways Corridor Study 2005 – A Study of the area surrounding the Upper Shannon navigation down to Roosky, including the Boyle River, Lough Allen, Lough Key and the Carnadoe waters' (www.roscommoncoco.ie)
Policy 7.8	Safeguard and enhance riparian zones along waterways as well as canal towpaths where they occur in the interests of enhancing the public's interface and enjoyment of these natural amenities.
Objective 7.1	Maintain or restore the favourable conservation condition of a designated or proposed designated site under the control of the Planning Authority.
Objective 7.2	Ensure Appropriate Assessment Screening, and, where required, Appropriate Assessment, is carried out for any plan or project which, individually, or in combination with other plans and projects is likely to have a significant direct or indirect impact on any Natura 2000 site or sites; in accordance with best practice guidance as issued by the National Parks & Wildlife Service of the Department of Arts, Heritage & the Gaeltacht and/or the Department of Environment, Community & Local Government.
Objective 7.3	Preserve and protect sites of county geological importance from inappropriate development where they comprise designated sites or national heritage areas.
Objective 7.4	Refer all planning applications within County Geological Sites to the Geological Survey of Ireland for consultation and have regard to their recommendations.
Objective 7.5	Protect and promote the conservation of biodiversity outside of designated areas, while allowing for appropriate development, access and recreational activity.
Objective 7.6	Continue to carry out habitat mapping for the county to identify significant local habitats in the county. Mapping of habitats should prioritise: Habitats listed in Annex 2 of the EU Habitats Directive; Species listed in Annex 2 of the EU Habitats Directive; and Species listed in Annex 1 of the Birds Directive.
Objective 7.7	Co-operate with statutory and other relevant agencies to identify, protect and conserve a representative sample of the county's wildlife habitats of local or regional importance, not otherwise protected by legislation.
Objective 7.8	Identify, protect and conserve, in co-operation with the relevant statutory authorities and other groups, vulnerable, rare and threatened species or wild flora and fauna and their habitats. These include plant and animal species afforded protection under the Wildlife Acts and the EU Habitats & Birds Directives.
Objective 7.9	Retain where feasible and enhance important landscape features, such as lakes, rivers, wetlands, stonewalls, hedgerows etc, which form wildlife corridors and link habitats, where they provide, stepping stones necessary for wildlife to flourish.

Policy ref.	Text
Objective 7.10	Integrate biodiversity considerations into all Roscommon County Council activities
Objective 7.11	Ensure that the conservation and management of biodiversity is a key priority in water resource management.
Objective 7.12	Require that floodlighting proposals for historic structures are accompanied by a Bat Survey, carried out at the appropriate time of year by a suitably qualified person, so as to identify bat species present on the site and to specify mitigation measures required to ensure minimal disturbance to bats, if any, on the site.
Objective 7.13	Seek to minimize light intrusion by having regard to impacts of floodlighting and public lighting in public/open spaces in or close to designated areas.
Objective 7.14	Have regard to the recommendations of any national guidelines, which may come about during the lifetime of this plan, with respect to potential impacts on nature conservation, when considering development applications relating to activities; such as use of jet-ski's and power boats on sites of nature conservation importance.
Objective 7.15	Ensure that any development, which impacts on a townland boundary, roadside hedgerows or hedgerows which form links with other habitats and form wildlife corridors; should first seek to retain, translocate or replace with native species of local provenance, these hedges. The overall goal should be to have no net loss of the hedgerow resource.
Objective 7.16	The retention, re-location, or re-establishment of hedgerows in planning consents shall be an aim of the Planning Authority for those seeking Planning Permission where feasible.
Objective 7.17	Carry out a tree survey of the county to identify trees suitable for Tree Preservation Orders.
Objective 7.18	Commit to using native species where ever possible in its landscaping work and on Roscommon County Council property
Objective 7.19	Assess applications for quarrying activity in proximity to eskers, having regard to the designated status of the esker and conserve them from inappropriate development.
Objective 7.20	Seek hydrological reports for significant developments within and close to peatlands so as to assess impacts on the integrity of peatland ecosystems.
Objective 7.21	Support projects which plan for future re-use of industrial cutaway bogs as sites for habitat creation, amenity use and economic use.
Objective 7.22	Seek hydrological reports for significant developments within and close to turloughs so as to assess impacts on the integrity of the turlough system and associated groundwater levels.
Objective 7.23	Support the work of the National Wetlands Wilderness Park committee.
Objective 7.24	Promote awareness and educational opportunities relating to wetlands in the county
Objective 7.25	Ensure that the County's wetlands are retained for their biodiversity and flood protection values.
Objective 7.26	Ensure that where flood alleviation works take place the natural heritage and landscape character of rivers, streams and watercourses are protected and enhanced to the greatest extent possible.
Objective 7.27	Encourage sensitive development, which does not lead to a loss of, or cause damage to, the character, the principal components of, or the setting of parks, gardens and demesnes of special historic interest and which are protected.
Objective 7.28	In order to facilitate development, a condition of planning permission may include seed or cutting collection from rare plants surviving in a heritage garden or park, in order to facilitate survival of a rare species.
Objective 7.29	To co-operate with the Department of Arts, Heritage & the Gaeltacht and other interested groups to facilitate the protection, promotion and enhancement of heritage gardens and parks in the county.

Policy ref.	Text
Objective 7.30	Maintain and preserve the aesthetic value of inland waterways and the waterway corridors in the county from the impacts of dispersed and highly visible development.
Objective 7.31	Support the growth and development of local communities within the inland waterway corridors whilst maintaining their distinctive character.
Objective 7.32	Seek to enhance public access to inland waterways as a condition of any development granted along inland waterways.
Objective 7.33	Support initiatives, which reduce the risks of invasions, help control and manage new and established invasive species, monitor impacts, raise public awareness, improve legislation and address international obligations.
Objective 7.34	Implement conditions as appropriate, as part of a grant of a planning permission or a waste permit, to prevent spread of invasive species.
Objective 7.35	Encourage the use of native species in amenity planting and stocking and related community actions to reduce the introduction and spread of non-native species.
Objective 7.36	Investigate the development of a local authority staff code of practice (COP) in relation to invasive species where resources permit.

APPENDIX II SCREENING FOR APPROPRIATE ASSESSMENT



RPS

Screening for Appropriate Assessment

Name of Project or Plan.	Solar PV farm at Rathleg, Castlerea, Co. Roscommon.
Competent Authority project reference file number:	None available. Project not yet submitted for consent.
Name and location of Natura 2000 site	Hydrologically linked Approx. 3.5km upstream: Bellanagare Bog SAC [000592] and Bellanagare Bog SPA [004105] Approx. 5.3km upstream: Cloochambers Bog SAC [000600] Approx. 38.6km downstream: River Suck Callows SPA [004097] Within 10km with no hydrological link Distance approx. 5.7km: Corliskea/Trien/Cloonfelliv Bog SAC [002110] Distance approx. 8.6km: Mullygollan Turlough SAC [000612] Distance approx. 6.8km: Drumalough Bog SAC [002338]
Natura 2000 site features:	Qualifying Interests, Special Conservation Interests and Conservation Objectives of the European sites are referred to in **Appendix III of** this report.

Description of the Project or Plan:	Size and scale Small (4.2MVA) renewable energy generation by installation of solar PV arrays and ancillary infrastructure across 11.87 ha of improved agricultural grassland and wet grassland habitat. Resource requirements (water abstraction etc) None. Emission (disposal to land, water or air) No appreciable off-site emissions. Excavation requirements No large scale earthworks required. The solar farm is designed to fit into the existing landscape of a network of agricultural fields. Transportation requirements The local road network will experience an additional 1 (one) AADT upon completion of the proposed development. Duration of construction, operation, de-commissioning etc All enabling and construction works require a three month programme. Permission is being sought for 30 years. During its lifetime, the application site will continue to be used for sheep grazing and at the end of its operation all infrastructure will be decommissioned, removed and the land will be returned to its former agricultural use. This is a requirement of the lease agreement between Elgin Energy and the owner of the lands.
Is the proposal directly connected with or necessary to management of the site for conservation of N2K features? If yes proceed no further.	No.
Describe the individual elements of the project (either alone or in combination with other plans or projects) likely to give rise to impacts on the Natura 2000 site.	In relation to wetland habitat qualifying interests and special conservation interests, pollution events or the erosion of exposed soils by surface water runoff at a construction site can result in deterioration of downstream wetlands. In relation to mobile species qualifying interests and special conservation interests, construction noise and visual disturbance can result in displacement of species of the loss of attractiveness of a part of the territory of a species.

N2K Feature	**Describe any likely direct or indirect effects to the N2K features arising as a result of:** • **loss;** • **reduction of habitat area;** • **disturbance;** • **habitat or species fragmentation;** • **reduction in species density;**	**Is there a likely significant effect?** Habitat loss within a European site will not occur. Habitat reduction within a European site will not occur. Rationale:

	• changes in key indicators of conservation value (e.g. water quality, climate change).	Hydrological link River Suck Callows SPA [004097] Mobile species qualifying interests (QIs) Bellanagare Bog SAC [000592] Marsh Fritillary *Euphydryas aurinia* [1065] Cloochambers Bog SAC [000600] Marsh Fritillary *Euphydryas aurinia* [1065] Mobile species special conservation interests (SCIs) Bellanagare Bog SPA [000592] Greenland White-fronted Goose *Anser albifrons flavirostris* [A395] In relation to mobile species QIs and SCIs, there is no published policy advice in Ireland in relation to the possible effects of solar development on bird species. In Northern Ireland, NIEA (2015) has published advice for non-EIA development indicating where impacts of solar farms on natural heritage interests can occur and provides advice on assessment and mitigation that should be applied for all solar farm proposals. It contains a flowchart to help consider impacts upon SPA features. If the proposed development is greater than 500m from a SPA or a known flyway to a designated SPA, then "no impact is envisaged". In this instance, the nearest SPA (Bellanagare Bog) is more than 3km from the site of proposed development. There is no pathway of appreciable effect upon Greenland White-fronted Goose *Anser albifrons flavirostris* [A395]. The SAC sites with a mobile species QI (namely Marsh Fritillary) are Bellanagare Bog SAC and Cloochambers Bog SAC. Disturbance to this QI will not occur. These sites are 3.5km and 5.3km distance respectively from the proposed development. There is no pathway of appreciable effect upon this species. In relation to wetland habitat and special conservation interests, a path of possible effect (measuring approx. 38.6km) exists between the proposed development and a downstream designated site namely River Suck Callows SPA [004097]. The proposed development is a solar PV farm. There are no significant earthworks required for the development of this solar PV farm. The strict controls to be employed to reduce risks to suspended sediment and polluting substances entering a watercourse as set out in section 5.2 of the Ecology report have been considered. They are not novel proposals, and are enforceable through the construction contract and by planning condition. Their efficacy is not uncertain. There is no pathway of appreciable effect upon special conservation interests listed in **Appendix III** of this report. There is no hydrological link between the proposed development site and the following European Sites:

		• Corliskea/Trien/Cloonfelliv Bog SAC [002110] • Mullygollan Turlough SAC [000612] • Drumalough Bog SAC [002338] Furthermore, there are no qualifying mobile species that may be impacted by the development. Only qualifying habitats occur listed in **Appendix III** of this report. There is no pathway of appreciable effect upon these habitats.

Describe any potential effects on the Natura 2000 site as a whole in terms of: interference with the key relationships that define the structure or function of the site	It is concluded that the proposed development will not delay or hinder the maintenance or restoration to favourable conservation condition, the qualifying interests for which the SACs has been designated or the special conservation interests for which the SPAs have been designated.

Provide details of any other projects or plans that together with the project or plan being assessed could (directly or indirectly) affect the site.	**Provide details of any likely in-combination effects and quantify their significance –** The following spatial Plans have been considered: • Roscommon County Development Plan 2014 - 2020 The planning portal of Roscommon County Council was searched for planning applications or recently approved development which may result in a pathway of additional, additive, incremental, associated, connected or synergistic effects which may fall under in-combination effects and which could be considered to significantly affect the COs of the European sites being considered. No planning applications or recently approved developments occur that are considered to result in a pathway of additional, additive, incremental, associated, connected or synergistic effects were found to occur.

Is the potential scale or magnitude of any effect likely to be significant?		
Alone?	**Yes**	**No X**
In-combination with other projects of plans?	**Yes**	**No X**

Conclusion: Is the proposal likely to have a significant effect on an N2K site?	**Yes No X**

Data collected to carry out the assessment

Who carried out the assessment?	David McCormick BSc (Hons) MSc ACIEEM
Sources of data	NPWS, Roscommon County Council, Elgin Energy Services Ltd.
Level of assessment completed	Step 1 of Article 6(3); a screening exercise
Where can the full results of the assessment be accessed and viewed?	Roscommon County Council Planning Portal: http://www.roscommoncoco.ie/en/Services/Planning/

APPENDIX III QUALIFYING INTERESTS, SPECIAL CONSERVATION INTERESTS AND CONSERVATION OBJECTIVES OF THE EUROPEAN SITES REFERRED TO IN THE REPORT

Qualifying Interest * denotes a priority habitat	Conservation Objective	Published
4 no. features at Bellanagare Bog SAC [000592]		
▪ Active raised bogs [7110] ▪ Degraded raised bogs still capable of natural regeneration [7120] ▪ Depressions on peat substrates of the *Rhynchosporion* [7150] ▪ *Euphydryas aurinia* (Marsh Fritillary) [1065].	17 no. attributes for Active Raised Bog including area, range, structure, functions and typical species of active raised bog habitat [7110].	27.11.2015 Conservation Objectives: Bellanagare Bog SAC 000592 (v1)
1 no. feature Bellanagare at Bog SPA [004105]		
▪ Greenland White-fronted Goose (*Anser albifrons flavirostris)* [A395]	Site specific Conservation Objectives have not been published. The generic CO is 'to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA'.	13.02.2015 (Generic v4)
4 no. features Cloonchambers Bog SPA [000600]		
▪ Active raised bogs [7110] ▪ Degraded raised bogs still capable of natural regeneration [7120] ▪ Depressions on peat substrates of the Rhynchosporion [7150] ▪ Euphydryas aurinia (Marsh Fritillary) [1065]	17 no. attributes for Active Raised Bog including area, range, structure, functions and typical species of active raised bog habitat [7110].	18.01.2016 Conservation Objectives: Cloonchambers Bog SAC 000600 (v1)
5 no. features at River Suck Callows SPA [004097]		
▪ Whooper Swan (*Cygnus cygnus*) [A038] ▪ Wigeon (*Anas penelope*) [A050] ▪ Golden Plover (*Pluvialis apricaria*) [A140] ▪ Lapwing (*Vanellus vanellus*) [A142] ▪ Greenland White-fronted Goose (*Anser albifrons flavirostris*) [A395]	Site specific COs have not been published. The generic CO is 'to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA' and 'to maintain or restore the favourable conservation condition of the wetland habitat within the River Suck Callows SPA as a resource for the regularly-occurring migratory waterbirds that utilise it'.	13.02.2015 (Generic v4)
4 no. features at Corliskea/Trien/Cloonfelliv Bog SAC [002110]		
▪ Active raised bogs [7110] ▪ Degraded raised bogs still capable of natural regeneration [7120] ▪ Depressions on peat substrates of the Rhynchosporion [7150] ▪ Bog woodland [91D0]	17 no. attributes for Active Raised Bog [7110], including area, range, structure, functions and typical species of active raised bog habitat. 10 no. attributes for Bog Woodland [91D0], including area, range, structure, functions and typical species of bog woodland habitat.	

1 no. features at Mullygollan Turlough SAC [000612]		
• Turloughs [3180]	Site specific Conservation Objectives have not been published. The generic CO is 'to maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected'.	13.02.2015 (Generic v4)
3 no features at Drumalough Bog SAC [002338]		
• Active raised bogs [7110] • Degraded raised bogs still capable of natural regeneration [7120] • Depressions on peat substrates of the Rhynchosporion [7150]	Site specific Conservation Objectives have not been published. The generic CO is 'to maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the SAC has been selected'.	13.02.2015 (Generic v4)

APPENDIX IV PHOTOGRAPHIC PLATES

Plate 1: drainage ditch filled with watercress *Rorippa nasturtium-aquaticum*. Further along sweet grass *Glyceria* sp. is dominant.

Plate 2: the Termon River travelling southwest on the western site boundary.

Plate 3: Target Note 3 - the upwelling of underground water and stream outflow into the River Termon.

Plate 4: wet grassland (GS4) with abundant soft rush *J. effusus*.

Plate 5: wet grassland (GS4) with tussocks of abundant purple moor-grass and bryophytes.

Plate 6: showing the contrasting wet grassland communities: Soft rush dominant community to the foreground and purple moor-grass community to the background.

Plate 7: showing the large centre land parcel - improved agricultural grassland (GA1) habitat.

Plate 8: showing the internal earth bank (BL2) with very intermittent hawthorn and beech mapped in Figure 3 as hedgerow (WL1).

Plate 9: showing double hedgerow along the eastern site boundary.

Plate 10: showing the ring fort with large stand of common nettle (with iris) in the hollow with scattered hawthorn.

APPENDIX V BIOLOGICAL RECORDS HELD BY NBDC

Species group	Scientific name	Common name	Record count	Date of last record	Title of dataset	Designation
amphibian	Lissotriton vulgaris	Smooth Newt	1	31/05/1975	Reptiles and Amphibians Distribution Atlas 1978 (An Foras Forbartha)	Protected Species: Wildlife Acts
annelid	Eiseniella tetraedra		2	15/08/2008	EPA River Biologists data	
annelid	Glossiphonia complanata		2	15/08/2008	EPA River Biologists data	
bird	Aegithalos caudatus	Long-tailed Tit	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Alauda arvensis	Sky Lark	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Anas platyrhynchos	Mallard	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Protected Species: EU Birds Directive >> Annex II, Section I Bird Species || Protected Species: EU Birds Directive >> Annex III, Section I Bird Species
bird	Anthus pratensis	Meadow Pipit	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Apus apus	Common Swift	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Carduelis cannabina	Common Linnet	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Carduelis carduelis	European Goldfinch	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Carduelis chloris	European Greenfinch	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	

bird	Certhia familiaris	Eurasian Treecreeper	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Columba oenas	Stock Pigeon	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Columba palumbus	Common Wood Pigeon	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Protected Species: EU Birds Directive >> Annex II, Section I Bird Species || Protected Species: EU Birds Directive >> Annex III, Section I Bird Species
bird	Corvus cornix	Hooded Crow	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Corvus frugilegus	Rook	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Corvus monedula	Eurasian Jackdaw	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Cyanistes caeruleus	Blue Tit	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Delichon urbicum	House Martin	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Emberiza citrinella	Yellowhammer	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
bird	Emberiza schoeniclus	Reed Bunting	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Erithacus rubecula	European Robin	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	

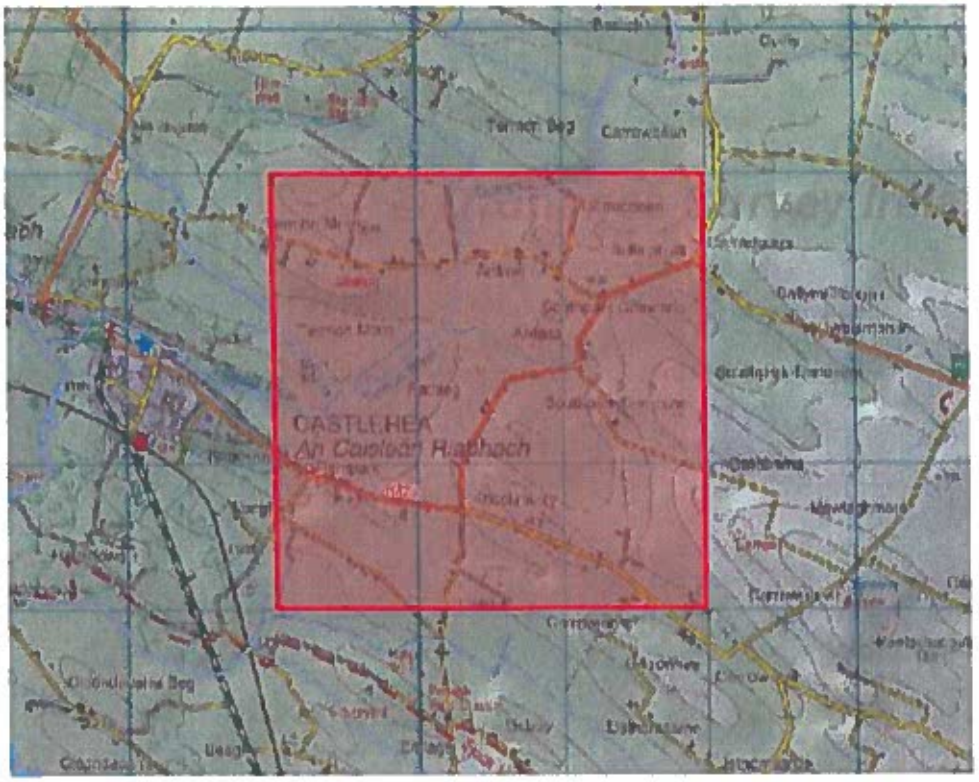
bird	Falco tinnunculus	Common Kestrel	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Fringilla coelebs	Chaffinch	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Gallinula chloropus	Common Moorhen	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Hirundo rustica	Barn Swallow	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Locustella naevia	Common Grasshopper Warbler	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Motacilla alba	White Wagtail	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Motacilla cinerea	Grey Wagtail	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Muscicapa striata	Spotted Flycatcher	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Numenius arquata	Eurasian Curlew	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Protected Species: EU Birds Directive >> Annex II, Section II Bird Species || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
bird	Parus major	Great Tit	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	

bird	Passer domesticus	House Sparrow	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Periparus ater	Coal Tit	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Phasianus colchicus	Common Pheasant	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Protected Species: EU Birds Directive >> Annex II, Section I Bird Species || Protected Species: EU Birds Directive >> Annex III, Section I Bird Species
bird	Phylloscopus collybita	Common Chiffchaff	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Phylloscopus trochilus	Willow Warbler	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Pica pica	Black-billed Magpie	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Prunella modularis	Hedge Accentor	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Regulus regulus	Goldcrest	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Saxicola torquata	Stonechat	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Sturnus vulgaris	Common Starling	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
bird	Sylvia communis	Common Whitethroat	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	

bird	Troglodytes troglodytes	Winter Wren	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Turdus merula	Common Blackbird	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Turdus philomelos	Song Thrush	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Turdus viscivorus	Mistle Thrush	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	
bird	Vanellus vanellus	Northern Lapwing	1	31/07/1991	The Second Atlas of Breeding Birds in Britain and Ireland: 1988-1991	Protected Species: Wildlife Acts || Protected Species: EU Birds Directive >> Annex II, Section II Bird Species || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
bony fish (Actinopterygii)	Phoxinus phoxinus	Minnow	1	15/08/2005	EPA River Biologists data	
flowering plant	Crataegus monogyna	Hawthorn	1	15/08/2008	EPA River Biologists data	
flowering plant	Fraxinus excelsior	Ash	2	15/08/2008	EPA River Biologists data	
flowering plant	Iris pseudacorus	Yellow Iris	1	15/08/2005	EPA River Biologists data	
flowering plant	Lemna trisulca	Ivy-leaved Duckweed	1	15/08/2005	EPA River Biologists data	
flowering plant	Lythrum salicaria	Purple-loosestrife	1	15/08/2005	EPA River Biologists data	
flowering plant	Phalaris arundinacea	Reed Canary-grass	1	15/08/2005	EPA River Biologists data	
flowering plant	Sparganium erectum	Branched Bur-reed	1	15/08/2005	EPA River Biologists data	
insect - beetle (Coleoptera)	Elmis aenea		2	15/08/2008	EPA River Biologists data	
insect - beetle (Coleoptera)	Limnius volckmari		1	15/08/2005	EPA River Biologists data	
insect - beetle (Coleoptera)	Oulimnius tuberculatus		1	15/08/2005	EPA River Biologists data	
insect - mayfly (Ephemeroptera)	Serratella ignita		1	15/08/2005	EPA River Biologists data	
mollusc	Ancylus fluviatilis		1	15/08/2005	EPA River Biologists data	
moss	Fontinalis antipyretica	Greater Water-moss	1	15/08/2008	EPA River Biologists data	

terrestrial mammal	Apodemus sylvaticus	Wood Mouse	1	28/05/2011	Atlas of Mammals in Ireland 2010-2015	
terrestrial mammal	Lepus timidus subsp. hibernicus	Irish Hare	1	23/04/1991	Badger and Habitats Survey of Ireland	
terrestrial mammal	Lutra lutra	European Otter	2	01/09/2010	Atlas of Mammals in Ireland 2010-2015	Protected Species: EU Habitats Directive >> Annex II || Protected Species: EU Habitats Directive >> Annex IV || Protected Species: Wildlife Acts
terrestrial mammal	Meles meles	Eurasian Badger	7	23/04/1991	Badger and Habitats Survey of Ireland	Protected Species: Wildlife Acts

Species list for a User-Defined Polygon



Quality of information

The National Biodiversity Data Centre makes every effort to ensure the quality of the information available on this website and updates the information regularly. Before relying on the information on this site, however, users should carefully evaluate its accuracy, currency, completeness and relevance for their purposes. The National Biodiversity Data Centre cannot guarantee and assumes no legal liability or responsibility for the accuracy, currency or completeness of the information.

To assist the Centre in the provision of high quality information, should you identify an error in any of the information provided, please notify the Centre and every effort will be made to

Background

The National Biodiversity Data Centre is committed to the goals and principles of making biodiversity data openly and universally available. This commitment is given on the understanding that the provision of data will further the conservation of biological diversity.

This spreadsheet provides a summary of the data contained in the National Biodiversity Data Centre, maintained by the National Biodiversity Data Centre, for the given area of your query.

Use of this information is encouraged for decision making, research and sharing knowledge on Ireland's biodiversity. When using this information, please note:

- The information contained in this spreadsheet can only be considered a guide to the conservation importance or value of a given area, as the available data is unlikely to be systematic or complete.
- Absence of records of threatened or protected species from an area does not imply that they are not present within the given area. Their absence may be due to lack of adequate surveys of the area.
- The interpretation of the information generated in this query should be undertaken by a qualified ecologist to ensure its meaning is not misunderstood.
- The use of this information for decision making should in no way be seen as a substitute for appropriate contemporary field survey. It can, however, be used to prioritise elements of biodiversity for more detailed study.

Use of this information in reports or other published sources must be accompanied by an acknowledgement as follows: 'Information from the National Biodiversity Data Centre downloaded from Biodiversity Maps on [*18 March 2016*].'

The Centre would welcome notification to info@biodiversityireland.ie of any reports or other publications in which this summary information is used.

Disclaimer

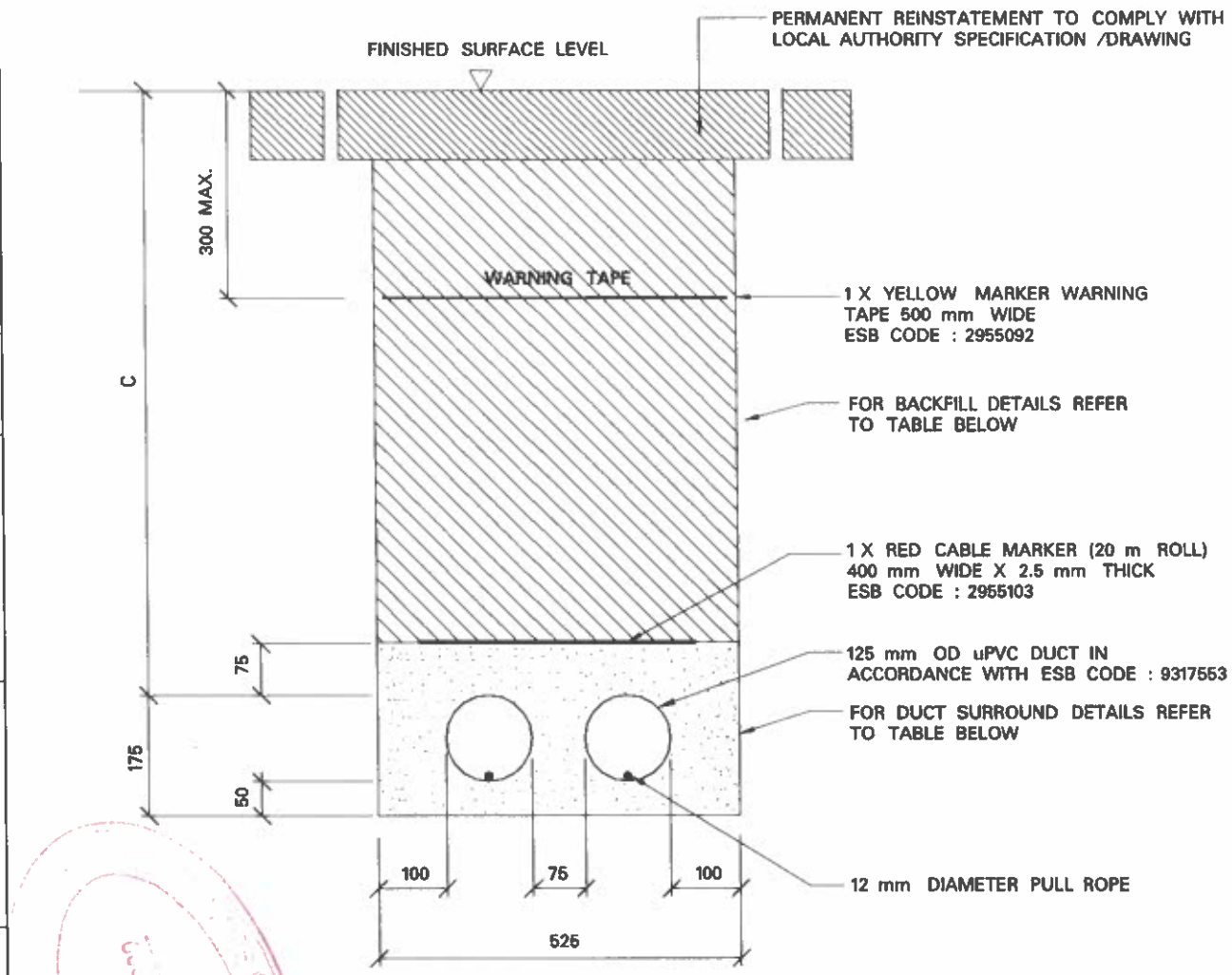
This website & mapping system is presented by the National Biodiversity Data Centre free of charge for the benefit of the public. The National Biodiversity Data Centre does not accept any liability for any injury, loss or damage of any kind incurred by use of or reliance on the information.

The National Biodiversity Data Centre accepts no liability for any interference with or damage to a user's computer system, software or data occurring in connection with this website. Users are encouraged to take appropriate and adequate precautions to ensure that whatever is selected from this site is free of viruses or other contamination that may interfere with or damage the user's computer system, software or data.

Quality of information

The National Biodiversity Data Centre makes every effort to ensure the quality of the information available on this website and updates the information regularly. Before relying on the information on this site, however, users should carefully evaluate its accuracy, currency, completeness and relevance for their purposes. The National Biodiversity Data Centre cannot guarantee and assumes no legal liability or responsibility for the accuracy, currency or completeness of the information.

To assist the Centre in the provision of high quality information, should you identify an error in any of the information provided, please notify the Centre and every effort will be made to rectify the error.



TRENCH LOCATION	MIN. DEPTH OF COVER TO TOP OF DUCTS (C)	TRENCH BACKFILL DETAILS	DUCT SURROUND MATERIAL
EXISTING FOOTPATH (NON HOUSING ESTATE)	450 mm	CL 804	ESB N APPROVED SAND
NEW ESTATE & NON ESTATE FOOTPATH	600 mm	CL 804	ESB N APPROVED SAND
NEW & EXISTING ESTATE ROADS, ESTATE GRASS VERGES & ADJOINING ROADS	600 mm	CL 804	ESB N APPROVED SAND
ESTATE OPEN GRASSED AREAS	600 mm	SUITABLE BACKFILL MATERIAL	CBGM B
NEW & EXISTING NON ESTATE ROADS	750 mm	CL 804	ESB N APPROVED SAND
FARM LAND, FOREST TRACK, BOG LAND, PUBLIC OPEN GRASSED AREAS & PRIVATE PROPERTY	750 mm	CL 804	CBGM B

NOTES:

1. RED CBGM B BACKFILL IN ACCORDANCE WITH CLAUSE 822 AND COMPACTED TO CLAUSE 813.10 AND TABLE 8/4 OF N.R.A. SPECIFICATION FOR ROADWORKS (15 N/mm² AFTER 7 DAYS)
2. ESB N APPROVED WELL COMPACTED NATURAL UNWASHED SAND TO BS 882 OR EQUIVALENT MATERIAL APPROVED BY ESB NETWORKS. MAXIMUM THERMAL RESISTIVITY OF THE SURROUND MATERIAL SHALL BE 1.0 K.mW AT 0% MOISTURE CONTENT

ESB International

Rev	Date	Revision Description	Dm	Prod	Ver	App
1	22/11/13	BACKFILL AND SURROUND MATERIALS REVISED	GR	GR	TS	MA
0	29/03/13	ISSUED FOR CONSTRUCTION				

Purpose of Issue - Preliminary unless indicated
Tender ☐ Client Approval ☐ Construction ☒ As-built ☐ Revised ☐

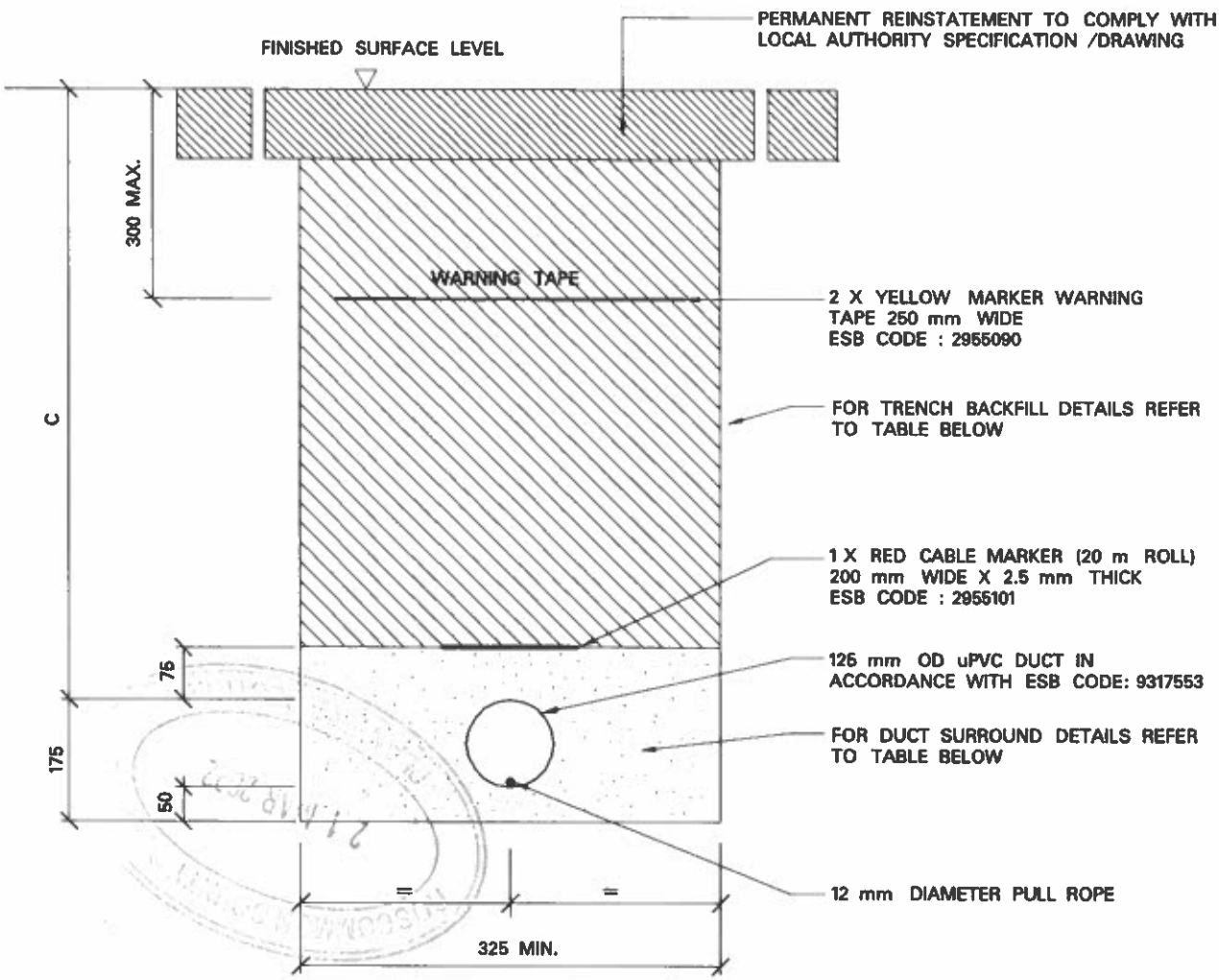
Drawn	Produced	Verified	Approved	Approved date
C.Ryan	C.Ryan	M.Ahet	T.Sheridan	02/12/13

Client Ref: TC210096 | No. of Shts: - | Size: A4 | Scale: N.T.S.

Drawing Number: PE424-D7002-008-002-001 (SHEET / REV)

Drawing Title: MV DOUBLE CIRCUIT TRENCH CROSS SECTION 2 WAY DUCT FORMATION

Client: ESB NETWORKS
Project: MV Standard Drawings
Contract: MV CABLES STANDARDS
Production Unit: Civil Building and Environmental



TRENCH LOCATION	MIN. DEPTH OF COVER TO TOP OF DUCTS (C)	TRENCH BACKFILL DETAILS	DUCT SURROUND MATERIAL
EXISTING FOOTPATH (NON HOUSING ESTATE)	450 mm	CL 804	ESB N APPROVED SAND
NEW ESTATE & NON ESTATE FOOTPATH	600 mm	CL 804	ESB N APPROVED SAND
NEW & EXISTING ESTATE ROADS, ESTATE GRASS VERGES & ADJOINING ROADS	600 mm	CL 804	ESB N APPROVED SAND
ESTATE OPEN GRASSED AREAS	600 mm	SUITABLE BACKFILL MATERIAL	CBGM B
NEW & EXISTING NON ESTATE ROADS	750 mm	CL 804	ESB N APPROVED SAND
FARM LAND, FOREST TRACK, BOG LAND, PUBLIC OPEN GRASSED AREAS & PRIVATE PROPERTY	750 mm	CL 804	CBGM B

NOTES:

1. RED CBGM B BACKFILL IN ACCORDANCE WITH CLAUSE 822 AND COMPACTED TO CLAUSE 813.10 AND TABLE 8/4 OF N.R.A. SPECIFICATION FOR ROADWORKS (15 N/mm^2 AFTER 7 DAYS)
2. ESB N APPROVED WELL COMPACTED NATURAL UNWASHED SAND TO BS 882 OR EQUIVALENT MATERIAL APPROVED BY ESB NETWORKS. MAXIMUM THERMAL RESISTIVITY OF THE SURROUND MATERIAL SHALL BE 1.0 K.m/W AT 0% MOISTURE CONTENT

ESB International

Rev	Date	Revision Description	Drn	Prod	Ver	App
1	28/11/13	BACKFILL AND SURROUND MATERIALS REVISED	GR	GR	TS	MA
0	08/03/13	ISSUED FOR CONSTRUCTION	GR	GR	TS	MA

Purpose of Issue - Preliminary unless indicated
Tender ☐ Client Approval ☐ Construction ☒ As-built ☐ Revised ☐

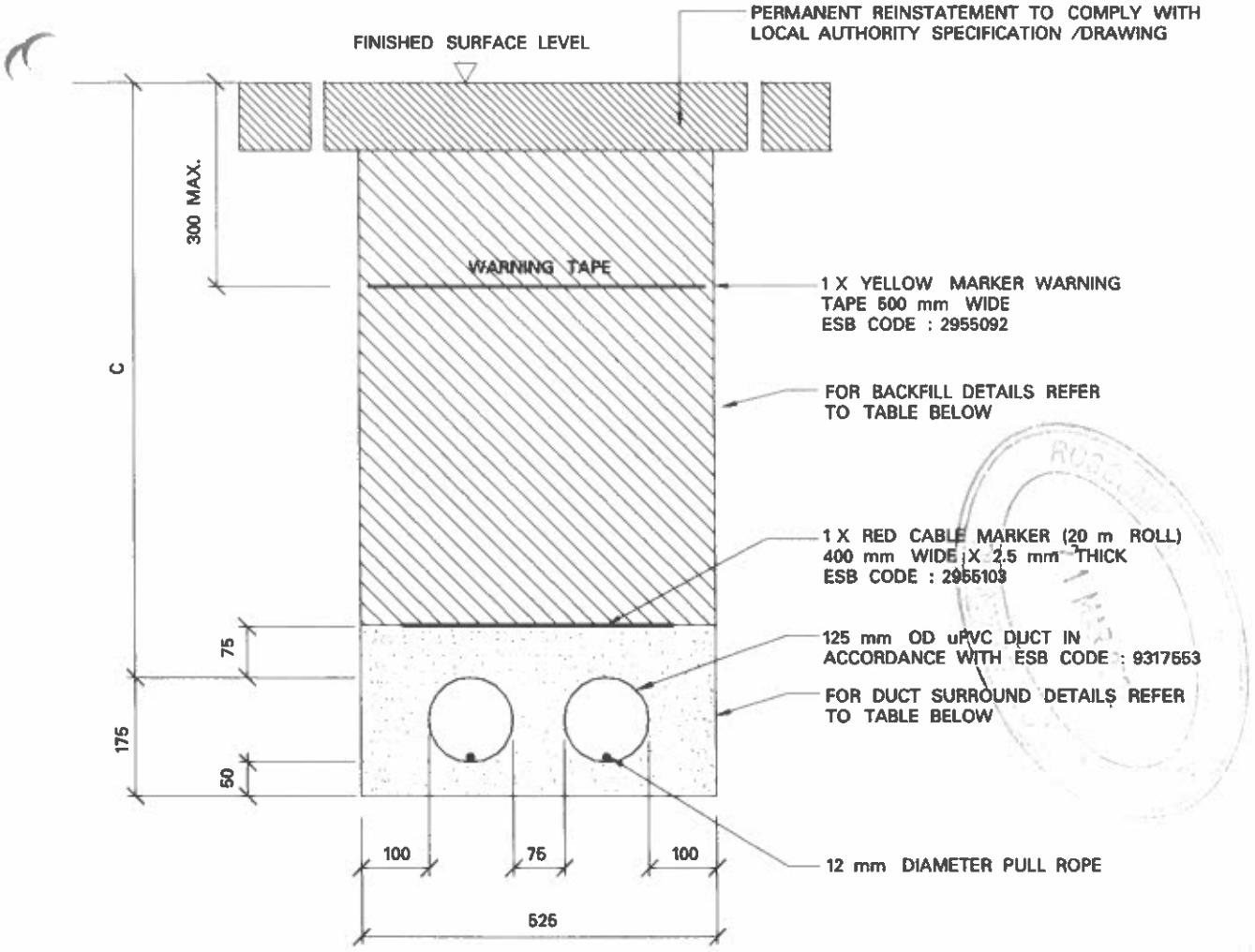
Drawn	Produced	Verified	Approved	Approved date
G.Ryan	G.Ryan	M.Allen	T.Sheridan	02/12/13

Client Ref: TC210096 | No. of Shts: - | Size: A4 | Scale: N.T.S.

Drawing Number: PE424-D7002-008-001-001 (SHEET / REV)

Drawing Title: MV SINGLE CIRCUIT TRENCH CROSS SECTION 1 WAY DUCT FORMATION

Client: ESB NETWORKS
Project: MV Standard Drawings
Contract: MV CABLES STANDARDS
Production Unit: Civil Building and Environmental



TRENCH LOCATION	MIN. DEPTH OF COVER TO TOP OF DUCTS (C)	TRENCH BACKFILL DETAILS	DUCT SURROUND MATERIAL
EXISTING FOOTPATH (NON HOUSING ESTATE)	450 mm	CL 804	ESB N APPROVED SAND
NEW ESTATE & NON ESTATE FOOTPATH	600 mm	CL 804	ESB N APPROVED SAND
NEW & EXISTING ESTATE ROADS, ESTATE GRASS VERGES & ADJOINING ROADS	600 mm	CL 804	ESB N APPROVED SAND
ESTATE OPEN GRASSED AREAS	600 mm	SUITABLE BACKFILL MATERIAL	CBGM B
NEW & EXISTING NON ESTATE ROADS	750 mm	CL 804	ESB N APPROVED SAND
FARM LAND, FOREST TRACK, BOG LAND, PUBLIC OPEN GRASSED AREAS & PRIVATE PROPERTY	750 mm	CL 804	CBGM B

NOTES:

1. RED CBGM B BACKFILL IN ACCORDANCE WITH CLAUSE 822 AND COMPACTED TO CLAUSE 813.10 AND TABLE 8/4 OF N.R.A. SPECIFICATION FOR ROADWORKS (15 N/mm² AFTER 7 DAYS)

2. ESB N APPROVED WELL COMPACTED NATURAL UNWASHED SAND TO BS 882 OR EQUIVALENT MATERIAL APPROVED BY ESB NETWORKS. MAXIMUM THERMAL RESISTIVITY OF THE SURROUND MATERIAL SHALL BE 1.0 K.m/W AT 0% MOISTURE CONTENT

ESB International

Rev	Date	Revision Description	Dm	Prod	Ver	App
1	28/11/13	BACKFILL AND SURROUND MATERIALS REVISED	GR	GR	TS	MA
0	26/09/13	ISSUED FOR CONSTRUCTION				

Purpose of Issue - Preliminary unless indicated
Tender ☐ Client Approval ☐ Construction ☒ As-built ☐ Revised ☐

Drawn	Produced	Verified	Approved	Approved date
G.Ryan	G.Ryan	M.Ahmet	T.Sheridan	02/12/13

Client Ref: TC210096 | No. of Shts: - | Size: A4 | Scale: N.T.S.

Drawing Number: PE424-D7002-008-002-001 (SHEET / REV)

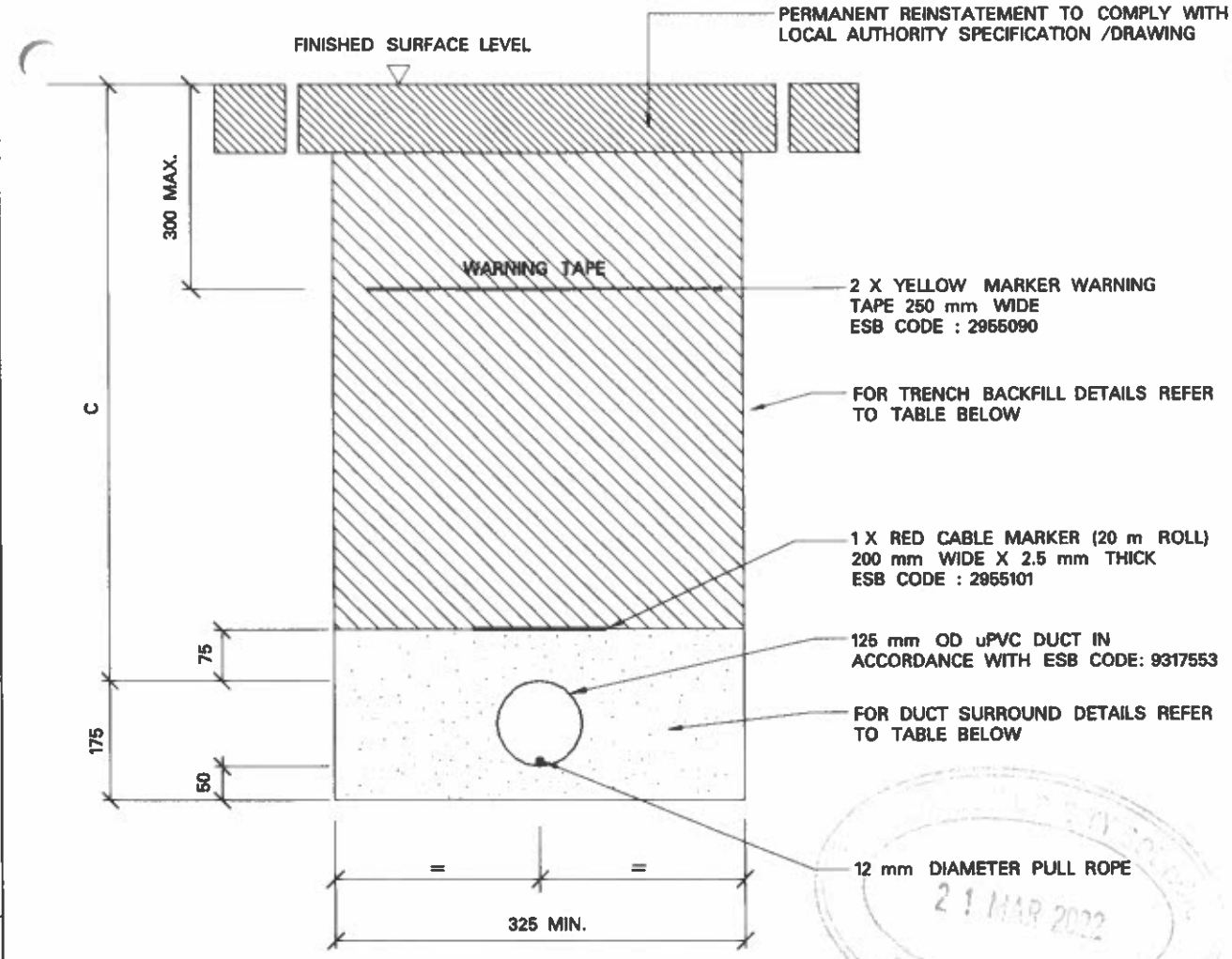
Drawing Title: MV DOUBLE CIRCUIT TRENCH CROSS SECTION 2 WAY DUCT FORMATION

Client: ESB NETWORKS

Project: MV Standard Drawings

Contract: MV CABLES STANDARDS

Production Unit: Civil Building and Environmental



TRENCH LOCATION	MIN. DEPTH OF COVER TO TOP OF DUCTS (C)	TRENCH BACKFILL DETAILS	DUCT SURROUND MATERIAL
EXISTING FOOTPATH (NON HOUSING ESTATE)	450 mm	CL 804	ESB N APPROVED SAND
NEW ESTATE & NON ESTATE FOOTPATH	600 mm	CL 804	ESB N APPROVED SAND
NEW & EXISTING ESTATE ROADS, ESTATE GRASS VERGES & ADJOINING ROADS	600 mm	CL 804	ESB N APPROVED SAND
ESTATE OPEN GRASSED AREAS	600 mm	SUITABLE BACKFILL MATERIAL	CBGM B
NEW & EXISTING NON ESTATE ROADS	750 mm	CL 804	ESB N APPROVED SAND
FARM LAND, FOREST TRACK, BOG LAND, PUBLIC OPEN GRASSED AREAS & PRIVATE PROPERTY	750 mm	CL 804	CBGM B

NOTES:

1. RED CBGM B BACKFILL IN ACCORDANCE WITH CLAUSE 822 AND COMPACTED TO CLAUSE 813.10 AND TABLE 8/4 OF N.R.A. SPECIFICATION FOR ROADWORKS (15 N/mm^2 AFTER 7 DAYS)
2. ESB N APPROVED WELL COMPACTED NATURAL UNWASHED SAND TO BS 882 OR EQUIVALENT MATERIAL APPROVED BY ESB NETWORKS. MAXIMUM THERMAL RESISTIVITY OF THE SURROUND MATERIAL SHALL BE 1.0 K.m/W AT 0% MOISTURE CONTENT

ESB International

ESB International, Stephen Court, 18-21 St. Stephen's Green, Dublin 2, Ireland. Tel: (01) 703 8000 Fax: +353 (01) 703 8085

Rev	Date	Revision Description	Drn	Prod	Ver	App
1	28/11/13	BACKFILL AND SURROUND MATERIALS REVISED				
0	29/08/13	ISSUED FOR CONSTRUCTION	GR	GR	TS	MA

Purpose of Issue - Preliminary unless indicated
Tender ☐ Client Approval ☐ Construction ☒ As-built ☐ Revised ☐

Drawn	Produced	Verified	Approved	Approved date
G.Ryan	G.Ryan	M.Amet	T.Sheridan	02/12/13

Client Ref	No. of Shts	Size	Scale
TC210096	-	A4	N.T.S.

Drawing Number: PE424-D7002-008-001-001 (SHEET / REV)

Drawing Title: MV SINGLE CIRCUIT TRENCH CROSS SECTION 1 WAY DUCT FORMATION

Client: ESB NETWORKS

Project: MV Standard Drawings

Contract: MV CABLES STANDARDS

Production Unit: Civil Building and Environmental

ESB NETWORKS

Specification Number:	**18152**
Title:	**Functional Specification for the Installation of Ducts and Ancillary Structures for 20kV Underground Power Cables and Associated Communications Cables for Contestable Projects**
Revision Number:	**0**
Issue Date:	**December 2013**
Latest Review Date:	**December 2018**

(ESB Specifications are subject to change, this specification version shall only be used for the purpose/project for which it was issued by ESB to you)

Approved for issue: **Specifications Manager**

ESB Networks

History of Revisions

Rev No	Date	Revision Content
0	2013	New Document

Note:

This specification will be reviewed at minimum before the Latest Review Date, but may also be reviewed in the interim. Consequently the "Latest Review Date" does not indicate that this particular version of the Specification is current. Accordingly, only the version of the specification issued by ESB to the user for the particular purpose/project should be used.

ESB Technical Specification Approval

Title	**Functional Specification for the Installation of Ducts and Ancillary Structures for 20kV Underground Power Cables and Associated Communications Cable for Contestable Projects**
Specification revision number & date	Doculive Spec. No. : 18152 Rev: 0 Date: December 2013 Consultant Reference No.: PG___-___-___-___ Rev: Date:
Produced by:	ESB Networks
Contract Conditions Reviewed:	

Eirgrid

Department:	N/A
Accepted::	
Date:	

ESB Networks:

Department:	**Asset Management**
Approved :	**Asset Manager, Underground Networks**
Date:	**December 2013**

Table of Contents

1.0 Scope

This document specifies the requirements for the supply and installation of **Ducts and Ancillary Structures for 20kV Underground Power Cables and Associated Communications Cables on the ESB Networks Distribution System**.

The materials used and construction methods employed shall comply with the requirements of

1. This specification and also
2. Specification Number 18149 – General Specification for Contestably Built Underground Networks
3. Specification Number 18153 – Functional Specification for the Installation of 20kV Underground Power Cables for Contestable Projects
4. The individual ESB Networks **materials** Specifications for ducting and cable materials and components and ancillary structures

In the event of any dispute arising from a difference of interpretation regarding the contents of these specifications, ESB Networks interpretation shall be taken as final.

2.0 Cable Route

2.1 Design Review

Cable route design and associated risk assessment shall be submitted to ESB Networks for review prior to any works commencing on site.

2.2 Cable Route Terrain

The route of the cable duct shall follow solid stable ground on flat or gently graded slopes not subject to erosion. Trial excavations shall be conducted in advance to determine the suitability of the route.

Where the gradient of the route exceeds 1 in 3 metres, specialist measures shall be designed and implemented to achieve satisfactory long term duct and cable performance.

Where the route cannot avoid unstable wet ground, bogland, landfill or steep slopes, etc., specialist measures shall be designed and implemented to achieve satisfactory long term duct and cable performance.

Where there are multi circuit situations e.g. near or in electricity switching stations, provision shall be for separation from other circuits to avoid derating of the existing or proposed cables.

The design of measures to deal with any such situations shall be submitted to ESB Networks for review.

2.3 Bridges / Culverts / Non Standard Terrain / other Services etc.

Provision shall be made for additional protection of the cable duct where burial depth to specification cannot be achieved. These additional measures shall be submitted to ESB Networks for review. ESB Networks will provide guidance on each case.

Higher voltage underground cables shall be routed under lower voltage cables for safety reasons.

2.4 Reinstatement Finishes

The reinstatement and surface finish for trenches, manholes and joint bays shall be agreed in advance with the local authority, relevant public body or private landowners.

Upon completion of the works, a statement of satisfaction with the completed works shall be obtained from the relevant landowners, public body or local authority.

3.0 Duct Installation

3.1 Supervision

All works shall be continuously supervised by competent persons. Quality control checks shall be carried out throughout the installation phase and along the full length of the route.

3.2 Works Included

Duct installation shall also include cleaning, proving, draw rope installation, and capping of the ducts. It shall also include excavation of joint bays, backfilling around direct buried cable joints (with the cable jointer in attendance) and reinstatement of joint bays to facilitate cable installation and jointing.

Sand used in the backfilling of directly buried cable joints shall comply with BS EN 126120 (BS882).

3.3 Transport, Storage and Handling of Ducts

Great care shall be taken during handling of ducts to avoid damage. Ducts shall be delivered with end caps in place which shall remain in place until installation of the duct to prevent the entry of dirt.

The ducts shall not be stored in a place where they are likely to be in contact with surface water or other foreign matter which could make its way into the ducts. The method of stacking shall be such as to avoid distortion and the integrity of the ducts shall be maintained throughout their site storage and transport. The bales of ducts shall not be stacked over two tiers.

The Quality Assurance management system shall include detailed inspection of delivered ducts and accessories. Each delivery of ducts shall be inspected to ensure compliance with specification and to verify the following:

- Correct labelling
- Correct dimensions
- Duct ovality
- Duct caps are installed
- Correct packaging on delivery and storage

Ducts which have become discoloured due to external storage and/or UV exposure shall not be installed.

3.4 Materials

- All ducts and associated installation materials detailed in this specification shall be supplied by an ESB Networks approved manufacturer. Details are available on ESB Networks website: (http://www.esb.ie/esbnetworks/en/download_documents/builders_developers/approved_material.jsp)
- Ducts for use at MV shall be 125mm UPVC – see Appendix 2 for summary technical requirements.
- Concrete for structural work shall be in accordance with the NRA "Specification for Road Works", except where amended below.
- Cement Bound Material shall be used for duct surround and trench backfill and shall comply with CGBM B, 15N/mm2 after 7 days. The maximum thermal resistivity shall be 1.0Km/watt at 0% moisture content, in accordance with Series 1000 of the NRA "Specification of Road Works" and it shall be in final position within its 'setting time'. Test sheets confirming the thermal properties shall be available for on-site inspection and shall be submitted with the 'as-built' documentation.
- Concrete for road reinstatement shall be grade C40/N20 with a minimum cement content of 350 kg/m3 in accordance with Series 1000 of the NRA "Specification for Road Works".
- Concrete for joint bay and communication chambers shall be grade C35/N30 with a minimum cement content of 325 kg/m3.
- Formed finishes to Joint Bays shall be to class F2 and unformed finishes shall be to class U1 in accordance with Clause 1708 of Series 1000 of the NRA "Specification for Road Works".
- Pre-Cast Joint Bays and Chambers shall be obtained from approved ESB Networks suppliers only.
- Pea gravel and foam concrete shall not be used for duct surround materials.

The materials supplied and used shall comply with the following ESB Materials Specifications:

Spec No.	Material
16001	Plastic Warning and Protection Tapes, Tiles and Concrete Marker Posts
16002	Plastic Cable Ties
16110	Galvanised Steel Cable Protection Covers Plates and Cast Steel Warning Plate
16112	Lubricant for Pulling Power Cables into Cable Ducts
16113	Plastic Ducts and Fittings for Power and Telecommunications Cables

3.4.1 MV Joint Bay Reinstatement Sand

The bedding sand used around electric cables shall be natural unwashed sand in accordance with BS EN 16120 (BS882). The grading, when determined in accordance with BS812, Section 103.1, shall comply with grading limit C in Table 4 of BS 882 -1992 (shown below) or the grading curve shown below .

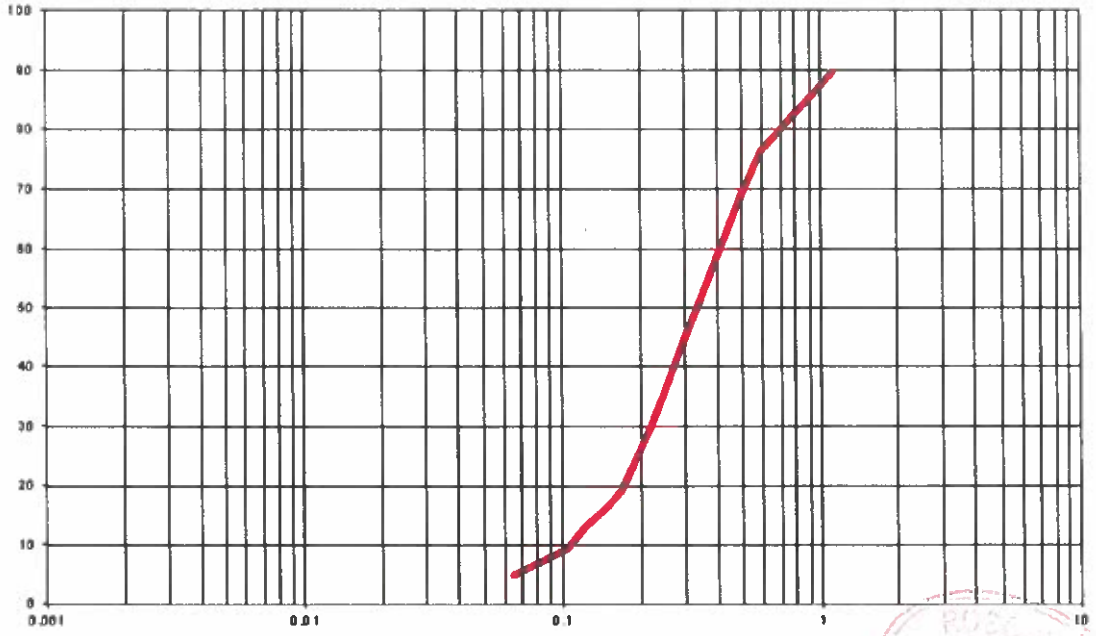
The sand shall have a maximum resistivity of 2.5 K. m/watt at 0% moisture content. Test sheets confirming the thermal properties shall be available for on-site inspection and shall be submitted with the 'as-built' documentation.

The sand shall be manually compacted around the cable and joints.

Pea gravel and foam concrete shall not be used for cable surround materials.

BS882 Sieve Size	**3/16"**	**1/8"**	**7**	**14**	**25**	**52**	**100**
% Passing weight	**95**	**89**	**84**	**75**	**54**	**18**	**1.6**

Thermal Sand Grading Curve



3.4.2 Underground Cable Protection Material for Unavoidably Shallow Depths

Wherever the trench layout and burial depth standards set out in this specification cannot be achieved, because of the terrain or the presence of other services, the design for all such deviations from the standards shall be submitted by the IPP for review and comment by ESB Networks.

The following additional materials shall be used in these situations:

3.4.2.1 Heavy Duty Underground Cable Protection Plate

Description:

750mm long x 200mm wide x 6mm thick galvanised steel plate, with red marker strip fixed to top surface. These shall be laid over the power and communication ducts as specified in the design drawings.

3.4.2.2 Surface Cable Markers

Description:

Metallic plate; 300mm x150mm; 4 screw-holes and hold down bolts. These shall be placed on footpaths/fences, bridges, walkways etc., where cable depth is unavoidably shallow. They shall be fitted to solid durable surfaces and shall be fitted flush with their surround when placed on footpaths or walkways, with full embedment of hold down bolts.

3.4.2.3 Marker Posts

Description:

Corrosion proof aluminium triangular danger sign, with 750mm base, and with centred lightning symbol, on engineering grade fluorescent yellow background. They shall be installed in adequately sized concrete foundations and shall be placed at both sides of river crossings, wherever directional drilling has been used and where burial depth is not to standard. They shall also be used in non roadway routes and in forestry routes to delineate the duct route and joint bay positions.

3.4.2.4 Other items for unavoidably shallow burial depths

For additional mechanical protection underneath and at the side of the duct route, 6mm thick galvanised steel plate and A393 reinforcement mesh may be required, as specified by ESB Networks.

3.5 Trench Layout

The trench layout shall be as per the relevant ESB Networks drawing(s) in the Appendices to this specification. The specification of the relevant Local Authorities shall be followed for the excavation and reinstatement of the ducted cable trenches.

Where a change in the gradient of the trench is required to accommodate other services, the gradient change shall be as minimal as possible. Ducts shall be laid in straight lines to even gradients.

Ducts may be laid to slow and even curves on plan to avoid an obstruction. If a change in direction is required, bends formed by evenly bending the ducts themselves only shall be used and the couplers shall be braced so that there is no bending or stress on the coupler. No heat shall be applied to the ducts when bending ducts. The spacing of the ducts shall be in accordance with the drawings in the Appendices to this specification.

Natural bends in the ducts shall be as wide and gradual as possible. Clearances from other services shall be strictly observed and shall be maintained at all times.

The duct route shall be designed and constructed to ensure that the cable manufacturer's maximum tensile and sidewall pressure forces shall not be exceeded on the relevant MV Cable. Design calculations to confirm this requirement shall be included in the design review submission.

3.6 Joint Bays

Joint bays shall be provided to meet the requirements of standard cable drum lengths and/or as required to limit cable pulling forces.

Joint Bay locations shall be chosen with suitable terrain and access to facilitate the operation of cable pulling equipment, cable jointing and future operation of the installation. A hard core surface shall be provided at either end of the Joint Bay as detailed in drawings in the Appendices to this specification.

The construction of the joint bays shall be as specified by ESB Networks and pre-cast joint bays shall be sourced from an approved ESB Networks Supplier.

Pre-cabling temporary backfill and reinstatement shall comply with the drawing in the Appendices to this Specification.

3.7 Communications Chamber

Communications chambers shall be provided to meet the requirements of standard telecommunications cable drum lengths or as required to limit cable pulling forces.

Communications Chamber locations shall be chosen with suitable terrain and access to facilitate the operation of cable pulling equipment, cable jointing and future operation of the installation.

The construction of the Communication Chamber shall be as specified by ESB Networks and shall be sourced from an approved ESB Networks Supplier. The chamber shall be installed as detailed in drawing in the Appendices to this specification.

3.8 Cable Sheath Sectionalising Chamber

Cable Sheath Sectionalising Chambers shall be installed at every second joint bay subject to the distance between chambers not exceeding 2.5km. Cable Sheath Sectionalising Chamber locations shall be chosen with suitable terrain and access to facilitate the cable installation and future operation of the installation.

The construction of the Cable Sheath Sectionalising Chambers shall be as specified by ESB Networks and shall be sourced from an approved ESB Networks Supplier.

The chamber shall be installed as detailed in drawing in the Appendices to this specification.

3.9 Lubrication Points

Lubrication points shall be provided to ensure cable installation can be carried out without exceeding the manufacturer's maximum permissible cable pulling forces of the proposed cable. Lubrication points shall be installed in cable runs in close proximity to areas of high bend concentration. Optimised positions shall be chosen, e.g. on the crest of steep incline for maximum lubricant dispersion on the route. Lubrication points shall be properly sealed to prevent the ingress of dirt.

Lubrication Point locations shall be chosen with suitable terrain and access to facilitate the operation at any phase of the development and future operation of the installation.

The construction of the Lubrication Points shall be as specified by ESB Networks and shall be sourced from an approved ESB Networks Supplier.

The chamber shall be installed as detailed in drawings in the Appendices to this specification.

3.10 Clearances from Other Services and ESB Networks LV, MV and HV Cables

A minimum clearance of 300mm from outermost power duct edge to other normal service shall be strictly observed. A clearance of 600mm from outer most power duct edge to transmission high pressure infrastructure services shall be observed. See Appendix 3 for requirements.

Deviations from ESB Networks minimum clearances may be unavoidable at "Pinch Points". Where reduced clearances only can be achieved, the design shall be submitted to ESB Networks for review.

Written clarification in respect of reduced clearances shall be obtained from the relevant utility owner and, in the case of LV, MV and HV cables , clarification shall be obtained from ESB Networks and shall be included in the 'as built' documentation.

3.11 Joining of Ducts

As the duct is installed the socket end shall be towards the duct lay and the inside of the socket and the spigot end shall be cleaned with a dry cloth before being pushed together by hand. A wooden batten shall then be placed across the socket at the leading end. The duct shall be tapped home with a hammer until the ring mark on the duct, indicating the fully "home " position, meets the edge of the socket.

3.12 Cutting of Ducts

Where duct cutting is required, they shall be suitably held, supported and protected during the process. All ends shall be cut square to the longitudinal axis of the pipe and suitably finished (chamfered) with no rough edges.

3.13 Avoidance of Power Duct Crossovers

Duct crossovers shall be prevented and shall be deemed an unacceptable defect. Cables shall not be installed in ducting that contains a crossover of the ducts.

3.14 Bends

Bends in the ducts shall be as large and as gradual as possible to minimise thrust force on socket and the spigot end.

The term "Bends", also includes trench offsets/sidesteps both in the horizontal and vertical plane, which may be necessary to avoid obstructions e.g. manholes or to maintain clearances with other under ground services running parallel and diagonal to the trench.

At all trench route deviations/bends, the radius of the overall bend shall be maximised/made uniform over the entire bend. The centre of rotation of the arc shall be chosen so that the bend radius is as large as possible and such that at the start and finish of the bend (i.e. where it meets the straight duct sections) the radius is no worse than that at any intermediate point on the arc.

IPP shall use ESB Networks approved pre-formed bends only and these are available in angles of 11^0, 22.5^0, 45^0, 90^0. Duct lengths shall not be bent at bend positions – preformed bends in conjunction with straight duct sections shall be used to ensure that there are no cable ripping protruding edges at duct joint positions for any direction of cable pull.

3.15 Avoidance of Crinkling/Flattening of Ducts While Laying Ducts at Bend Positions

The ducts shall be uniformly/regularly supported as they are being formed around the curve to avoid imposing concentrated (point) sidewall forces which result in crinkling or excessive flattening of the ducts at the bend position.

3.16 Trenchless Technology

Should it be necessary to cross obstacles such as bridges, railways, water courses etc. with the cable duct(s), and all possible routes and installation possibilities have been thoroughly examined and are deemed not possible, then the method of installing the cable duct(s) by trenchless technology may be accepted by ESB Networks. Details of such locations and the proposed design and mechanical protective measures shall be submitted to ESB Networks for review and comment.

The route length undertaken using trenchless technology shall be an absolute minimum and shall only be that length required to clear the crossing that cannot be undertaken by conventional trenching methods

The design for the proposed crossing by trenchless technology shall be submitted to ESB Networks for review and comment

The following duct type shall be used for directional drilling for MV ducting and it shall be chamfered to allow correct transition to the standard ducting I.D

Type and Size of Duct
125mm HDPE for Directional Drilling SDR 14.7 (to allow 3x400 sq 20kv cable)

3.17 Dirt Ingress into the Ducts

Dirt ingress into the ducts shall be prevented as any dirt or pebbles trapped in the ducts may lead to cable failure. During cable pulling, dirt or other sharp objects will be pressed between the duct and cable resulting in deep scores and gashes on the cable sheath which may result in cable failure. Allowing dirt to enter ducts

and attempting to remove it later by cleaning the ducts with brushes is not acceptable.

The ingress of dirt into the ducts shall be prevented by the following measures:

- On delivery from the supplier, the ducts shall be fitted with end caps. These shall remain in place to prevent dirt entering on the duct bales.
- When the ducts are installed, rubber bungs shall be immediately fitted to exposed installed duct ends and retained in place at all times. These bungs shall be fitted with an internal D-ring to facilitate the tying of draw rope.
- Trenches, joint bays, etc. shall be kept free of water so as to prevent any risk of the cables and other materials to be laid in the trenches etc. being detrimentally affected.

3.18 ESB Networks Approved Protection Strip, Warning Tape and Marker Posts

ESB Networks Protection Strip (Red) and ESB Networks Warning Tape (Yellow), shall be used at all times as specified in the relevant ESB Networks drawings in the Appendices to this specification.

Where ducts are laid, the red protection strip shall be placed on top of the CGBM B layer. In all situations yellow warning tape shall be placed higher up in the trench, at a distance of not more than 300mm below the finished surface.

Sufficient parallel layers of red marker strip and yellow marking tape shall be used to fully cover and slightly extend beyond the full plan widths of the ducts below it. The layer of backfill immediately underneath the yellow marker tape or red marker strip shall be properly levelled and compacted prior to laying the marker tape and warning strip evenly along the trench.

ESB Networks cable protection and marking materials shall not be used over any other ducting which is not intended for use by ESB Networks.

3.19 Trench backfilling

Provision shall be made to prevent duct movement during the placing of the duct surround. All duct bedding, duct surround and backfill materials shall be suitably compacted in layers using manually operated vibrating plate which shall not crush the ducts beneath.

3.20 Reinstatement Specifications General Requirements

All reinstatement works shall be in accordance with the NRA Specification for Road Works and any conditions specified in the Road Opening Licence and/or route consents. If any part of the route impinges on private property, the reinstatement specification shall be as agreed with the Landowner.

3.21 Cleaning, Proving, Roping and Capping

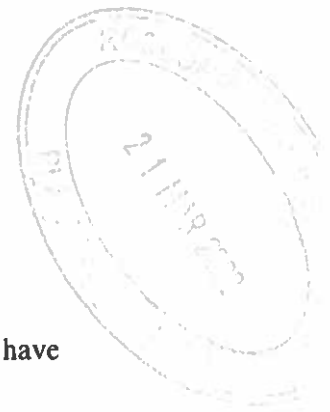
When the ducts have been installed and backfilled the duct run shall be thoroughly cleaned by pulling the appropriate size of ESB Networks approved duct brush through the duct and shall be proven by pulling the appropriate size of ESB Networks approved mandrel through the duct.

Each duct shall be cleaned and proven at completion/handover and immediately prior to pulling in the cable winch rope and the cable in the case where the IPP is also responsible for cable installation.

Duct Cleaning – Brushes

Brushes with the specified dimensions only shall be used to ensure that any dirt or debris within ducts is transported out of the ducts rather than being merely loosened up and left within. The brush shall have the following dimensions:

Duct Outside Diameter	Minimum Length of Brush	Brush Code
125mm UPVC	250mm	8783254



Brushes shall be cleaned regularly using a power hose. Approved Brushes have two sets of brushes per core.

Duct Proving – Mandrel

Proving shall be achieved by pulling a sponge, cleaning brush and mandrel assembly through the duct. The equipment shall have the following dimensions:

Type and size of duct	Mandrel Code	Brush Code	Sonde	Sponge
125mm UPVC SDR 17.6	8783229	8783254	required	125mm
125mm HDPE for Directional Drilling SDR 11.0	8783228	8783250	required	125mm

All mandrels are stamped with their size and the corresponding duct size to which they are applicable.

Duct Cleaning – Sponge

A sponge shall be used to remove excess water and pre-lubricate the duct prior to cable pulling.

Duct Proving – General

ESB Networks reserves the right to witness the duct proving tests.

ESB Networks approved duct brushes, mandrels and sponges are designed to provide thorough cleaning and a tight fit. The minimum rope size used shall be 12mm polypropylene. Cleaning and proving shall be carried out using a winch which has a calibrated dynamometer and printout. Pulling tension shall not exceed 1 Tonne (10kN). The results shall be submitted to ESB Networks for review.

Following the duct proving process, water sealing rubber bungs shall be fitted to prevent water, sand or other debris getting into the ducts. The ducts shall then be left roped in preparation for cable pulling.

Use of a Transmitter (Sonde)

A Sonde shall be connected close to the mandrel or brush to help locate a blockage quickly. It can be purchased for specific use with a C.A.T. or other precise cable location instruments, equipped with a Sonde detector.

Duct Lubrication Materials

Ducts and cables shall be thoroughly lubricated for all cable pulls. Only ESB Networks approved lubricants which are tested so as not to damage the cable insulations semi-conductive layers and outer sheath shall be used. Petroleum based oils or greases shall not be used for power cables.

The list of approved suppliers is available from the following ESB Networks web site address:

http://www.esb.ie/esbnetworks/en/download_documents/builders_developers/approved_material.jsp

3.22 Recording of Duct Installation

This shall be as specified in ESB General Specification for Contestably Built Underground Networks.

4.0 Appendices

Appendix 1	ESB Approved Chambers and Covers
Appendix 2	Supply of Ducts
Appendix 3	10 / 20 kV Clearances
Appendix 4	Ducting & Cable Installation Forms
Appendix 5	Drawings

1.0	Trench Layout 10 / 20 kV Single Circuit (Roadway)
1.1	Trench Layout 10 / 20 kV Single Circuit (Grassed Area)
1.2	Trench Layout 10 / 20 kV Single Circuit (Template)
1.3	Trench Layout 10 / 20 kV Double Circuit (Roadway)
1.4	Trench Layout 10 / 20 kV Double Circuit (Grassed Area)
1.5	Trench Layout 10 / 20 kV Double Circuit (Template)
1.6	10 / 20 kV Single Circuit Ducts and Single Comms Duct - Plan
1.7	Communication Chamber - Section
1.8	10 / 20 kV Single Circuit Ducts and Single Comms Duct – Section
1.9	10 / 20 kV Single Circuit Ducts – Plan
1.10	Required Cable Installation Solid Ground - Plan
1.11	10 / 20 kV Single Circuit Joint Bay – Section
1.12	10 / 20 kV Single Circuit Joint Bay – Section backfill detail no cable
1.13	10 / 20 kV Single Circuit Joint Bay – Section backfill detail with cable
1.14	Cable Screen Sectionalising Chamber – Section
1.15	10 / 20 kV Single Circuit Ducts and Cable Screen Sectionalising Chamber– Plan
1.16	10 / 20 kV Single Circuit Ducts and Cable Screen Sectionalising Chamber– Section
1.17	10 / 20 kV Single Circuit Ducts and Cable Screen Sectionalising Chamber– Elevation
1.18	Joint Bay: Cable Screen Sectionalising Chamber and Communication Chamber

Appendix 1. ESB Networks Approved Communications, Lubrication Point and Cable Screen Sectionalising Chamber (Photograph) and Chamber Cover

ESB Networks Approved Communication and Cable Screen Sectionalising Chamber

DT6S

Description

Material

Spheroidal graphite cast iron in accordance with ISO 1083 and NF EN 1563.

Frame

One piece monoblock construction, incorporating 4 No. Lifting Points for handling and 6 No. 20 mm diameter holes for fixing to chamber. Safety grids can be accommodated.

Covers

- Double triangular non-rock with feature to prevent displacement in longitudinal direction.
- Separate sections of cover loosely coupled with nut and bolt.

Handling

Each cover section is fitted with a keyhole for lifting.

Coating

Non-toxic water based black paint.

Product Certification

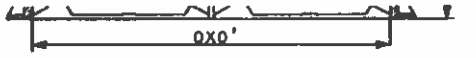
KITEMARK.

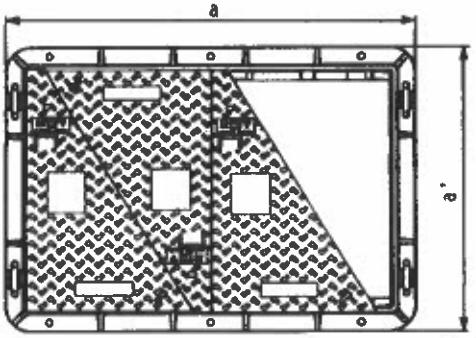
Place of Installation

In accordance with EN 124 Standard.
Group 5 : Areas imposing high wheel loads (e.g. docks, aircraft pavement) ; and lower groups.

Options

- Special badging: please enquire.





Ref.	Dimensions (mm)			Weights (kg)		
	a x a' overall flange	o x o' clear opening	h height	Frame	Cover(s)	Total
DT6S 107.075	1220 x 950	1070 x 750	150	110	4 x 51	314

Appendix 2. Supply of Ducts

All ducts must be supplied in accordance with the summary of requirements and properties listed below.

ESB Networks Specification for Red 125mm uPVC Mains (ABRIDGED FROM ESBN SPEC. 16113)

	MAINS CABLE DUCT
Duct outside Diameter (Mean)	125.0mm – 125.4mm
Duct Type	uPVC, Spigot & socket type 6m lengths measured end to end
Duct Rating	Normal duty per EN 50086–2 Specification
uPVC &MDPE Material Quality	Virgin or **own** clean reworked material .Use of externally sourced reworked or reprocessed material is not acceptable to ESB Networks
Duct Colour – External and Internal Surfaces	Red – BS Type 5252 04E53 – 04E56 Minimum 0. 3 mm thickness of red coloured material required throughout length of duct on both internal and external duct surfaces
Duct Deformation Requirement	Must pass EN50086 – 2 <5% deformation requirement for 500N loading on 200mm sample
Impact Resistance	Per EN 50086 – 2 12 samples. 7.5 kg striker: 2m fall height:>150 Joules – no crack in at least 9 samples; Duct temperature;15-20 deg C
Duct Minimum Wall Thickness	The larger of the two criteria below; Wall thickness to pass 5% deformation / impact requirement above ESB Networks minimum wall thickness of 3.8mm (required for cable pulling)
Duct Spigot (plain) End	Spigot; plain end bevelled to allow easy jointing of duct on site, minimum thickness 1.3mm, bevel length ≥ 5mm ;end cut square
Duct Socket (expanded) End	Push Fit Type Tapered Socket 3.4mm minimum expanded wall thickness 110.0mm– 116.0mm socket length; end cut square
Black indelible Circumferential mark on plain duct end for correct push-in distance	Black circumferential mark required to indicate correct push in distance for duct jointing for spigot and socket joints. Location: 110mm – 116mm from duct plain end to match socket length below
Duct Ovality incl. Socket	- 2.00mm. max.
Eccentricity and misalignment of expanded Socket relative to duct centre line axis	Zero offset of the expanded socket centre line relative to the duct centreline is required. Also the expanded socket centre line and the duct longitudinal axis must be collinear – no deviation angle allowed
Duct Inner Surface	Smooth low friction surface completely free of surface ripples and waves, sharp edges & protrusions. Friction coefficient <0.25
DUCT MARKING **Duct Legend Content:**	"DANGER ELECTRICITY CABLES" in 18-20mm lettering height ;" Batch No , Manufacturers Name, Date of manufacture & ESB Networks Spec 16113 " in 6mm minimum lettering height
Maximum Spacing between Consecutive Legends	Maximum 150mm gap between consecutive Legends
Colour of Legend	Black
Size of Lettering for main safety legend above	Three 18- 20mm height legends disposed @ 120° apart on duct circumference.
Durability of Duct Legend Lettering &Circumferential mark	Legend/Mark shall not wash off or become illegible due to Irish outdoor weather effects

Red Colour Fastness	**1 year** minimum required so as to provide 12 month storage period at builder's provider's premises. . 1 year outdoor weathering test required or suitable accelerated colourfastness test
Bend Radius for all Bend Angles For 125MM Duct	For all Angles ;radius = **1.2m minimum** for 11°, 22°, 45° & 90°. Material as per duct specification above. (3.8mm minimum wall thickness) 150 mm straight section between. start of bend section and circumferential mark
Bend ovality	2mm max (Same as for straight duct)
Duct Length	Duct Length to be 6m measured end to end
Endcaps for Ducting	Bag of 15 duct end caps to be supplied with each bale of ducts - capable of fitting each duct end. Caps securely fitted on two lowest rows and top row in bale at both ends, which will not fall off during transport. Caps to be securely fitted to ducts to eliminate falling off during transport.
Packaging Support for duct bale Or coil	Duct bales to be held in position by at least two sets of good quality timber battens supported by steel straps. Supplementary support to prevent overstressing and breakage of timber battens to be provided by polypropylene tension straps or other suitable means. Collapsed bales are a safety hazard; which must be designed out.
Labels for Duct Bales/ Pallet of Bends /Coils of Ducting	Indelible Weatherproof labels to be placed on each bale of ducting stating; "Approved for ESB Networks use ". A4 size laminated Installation Labels as provided by ESB Networks in 2007 to be fixed to each bale of ducting , Each bend to be labelled "Approved for ESB Networks use " & labelled with ESB Networks Installation requirements.

ESB Networks Specification for 125mm Red HDPE Ducting for Directional Drilling/Trenchless Technology use only

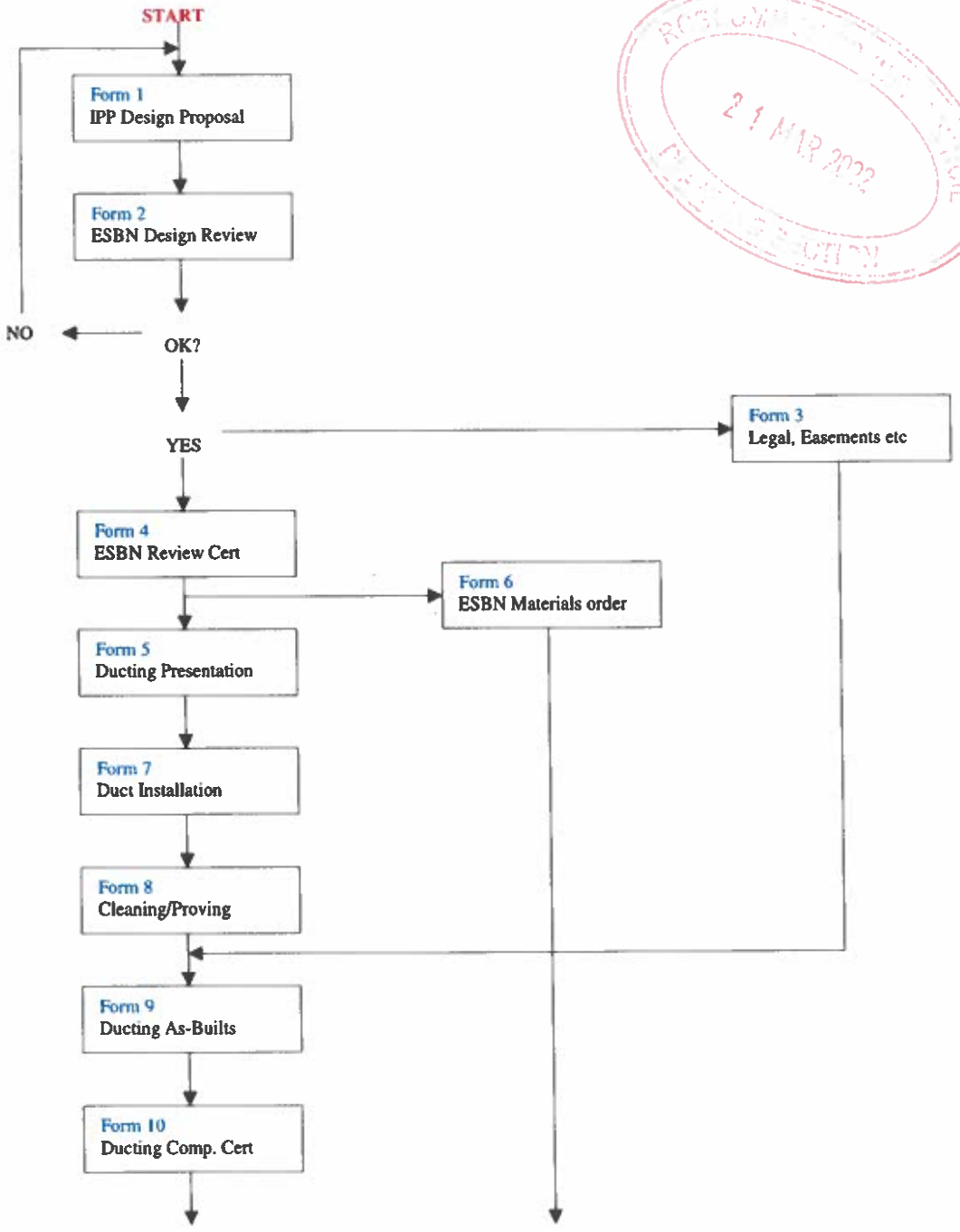
HDPE CABLE DUCT- DIRECTIONAL DRILLING USE ONLY	
Approved ESB Networks suppliers	- see approved list, available on ESB Networks website
Duct outside Diameter (Mean)	125.0mm – 125.4mm
Duct Type	HDPE: Coiled approx 3.5m coil diameter
Duct Wall Thickness	8.5mm
Duct Rating	Heavy duty per EN 50086 – 2 Specification
uPVC Quality	100% Virgin Material
Duct Colour – Outside	Red – BS Type 5252 04E53 –04E56 Minimum 1mm thickness of colour material if dual layer extrusion
Duct Deformation Requirement	Must pass EN50086 – 2 <5% deformation requirement for 750N loading on 200mm sample
Impact Resistance	Per 50086 – 2; 12 samples. 7.5kg striker: Minimum fall height of 2Mts:>150 Joules – no crack in at least 9 samples
Duct Minimum Wall Thickness	The larger of the two criteria below: Wall thickness to pass 5% deformation / impact requirement above & ESB Networks minimum wall thickness of 8.5mm (existing stock 8.5 mm required from year 2004 onwards as soon as existing stock is used up)
Duct End	Ends of each length bevelled to allow easy jointing of duct on site, minimum thickness of plain end to be 2.4mm, bevel length ≥ 5mm
Circumferential Mark On pipe end for correct push-in distance	Circumferential ring mark required to indicate Correct push in distance for duct jointing Location: to match half long coupler length less half coupler centre stop thickness
Duct Ovality	2.00mm. max.
Duct Inner Surface	Smooth low friction surface completely free of ripples, sharp edges & protrusions. Friction coefficient <0.28
Duct Marking Legend Content: **Repetition Rate/Gap between Legend**	**"Danger Electricity Cables"** 150mm max. gap between adjoining legends.
Colour of Legend	Black
Size of Legend Lettering	3 X 20mm height i.e. 3 lines of 20mm height @ 120° apart.
Batch No., Manufacturers Name AND Date of Manufacture	Letter sizing should not be less than 6mm.
Red Colour Fastness	1 year minimum required so as to provide 12 month storage period 1 year outdoor weathering test required or suitable accelerated colourfastness test to prove that duct meets Specification
Endcaps for Ducting	Endcaps to be supplied on both ends of coil
Couplers	Slip or rubber gasket type with no internal obstructions/sharp edges .A Centring ridge is required which does not protrude above the duct wall. The coupler must effectively seal out water over the 40 year lifetime of the installation even at bend positions when buried 3 m below groundwater level

Appendix 3. 10-20kV Clearances

ESB Cable Type	Clearance From	Minimum Clearance for General Parallel Run	Minimum Clearance at Networks Pinch Points and Crossings
MV & LV Mains	Gas Water Sewerage Telecoms including Fibre Optic Cable	300mm lateral clearance ESB cables must not be laid above parallel runs of other services.	100mm minimum, but in this case, concrete slabs or bricks bedded in sand must be placed between the electricity cables/ducts and the conflicting service. ESB to cross underneath except where necessary due to of depth of other service. Whenever possible cross at right angles to minimise extent of areas of close proximity to other service. Place red strip accurately over ESB ducts.
MV & LV Mains	Large infrastructure e.g. large high pressure gas mains, large main drainage sewers and large high pressure waterpipes (where cabling is done in conjunction with or subsequent to such works).	600mm lateral clearance is recommended. Actual clearance should be agreed in writing.	100mm minimum, but in this case, concrete slabs or bricks bedded in sand must be placed between the electricity cables/ducts and the conflicting service. ESB to cross above except where necessary due to of depth of other service. Whenever possible cross at right angles to minimise extent of areas of close proximity to other service. Place red strip accurately over ESB ducts.
MV & LV Mains	HV cables i.e. 38kV, 110kV & 220kV cables.	Minimum clearance is dictated by risks of considerable derating of both MV/LV and HV cables. Minimum clearance for avoiding derating should be 2m or more. If less than 2m then for 38kV and 110kV cables consult Underground Networks Section, AM. For Eirgrid cable consult the Transmission System Operator.	For parallel runs: If clearance is less than 2m for more than 2m length of parallel run, then for 38/110kV cables, see Section 3.3 of this manual or consult, ESBN representative. For crossings: Maintain **200mm** min. vertical clearance. Consult the Sections listed above if the number of MV cables exceeds two cables. See Section 3..3.12
MV & LV Mains	MV & LV Mains Cable	**Case 1: In Same Trench** **75mm min.** separation, both horizontally and vertically, edge to edge between adjacent ducts if there are **not** more than 2 layers of ducts with max. of 2 ducts per layer ***OR*** if the number of ducts **exceeds two** in any horizontal layer, minimum. separation both horizontally and vertically edge to edge must be **150mm** **Case 2: New Trench** If new trench is being dug parallel to existing cables min separation should be **150mm**. This requires use of a "Safe System of Work for Digging". Risk of collapse of existing trench must be considered and protected against as necessary in each case. See Section 1.4.7. & Section 1.4.8.7 for protection of any exposed cables/ducts.	

Appendix 4. 10-20kV Ducting & Cable Installation (+ Fibre Cable)

The following flow chart is the project process for a non-contestable 10-20kV & communication ducting and cables. This process is aimed at how ESB Networks and the IPP interact and the roles ESB Networks have.



Cable Installation

Appendix 5. Quick Reference Guide

Quick Reference Guide for 10/20kV Ducting

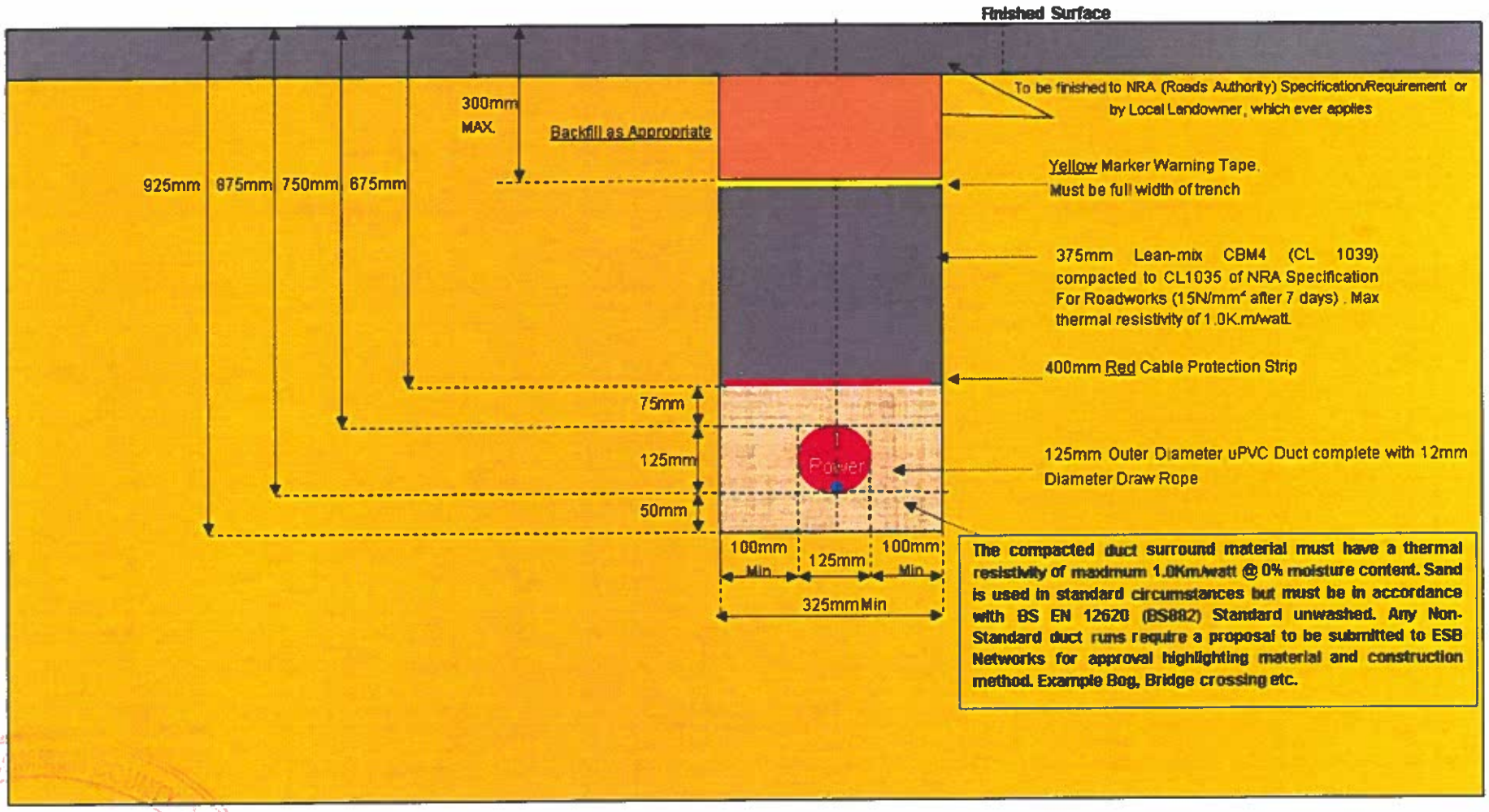
This document is only a quick reference guide and it must be read in conjunction with ESB Networks 'Specification for the Installation of MV Ducts'.

Link for approved suppliers

http://www.esb.ie/esbnetworks/en/download_documents/builders_developers/approved_material.jsp

1.0: Trench Layout 10/20kV Ducting – **One Power Duct** (Roadway)

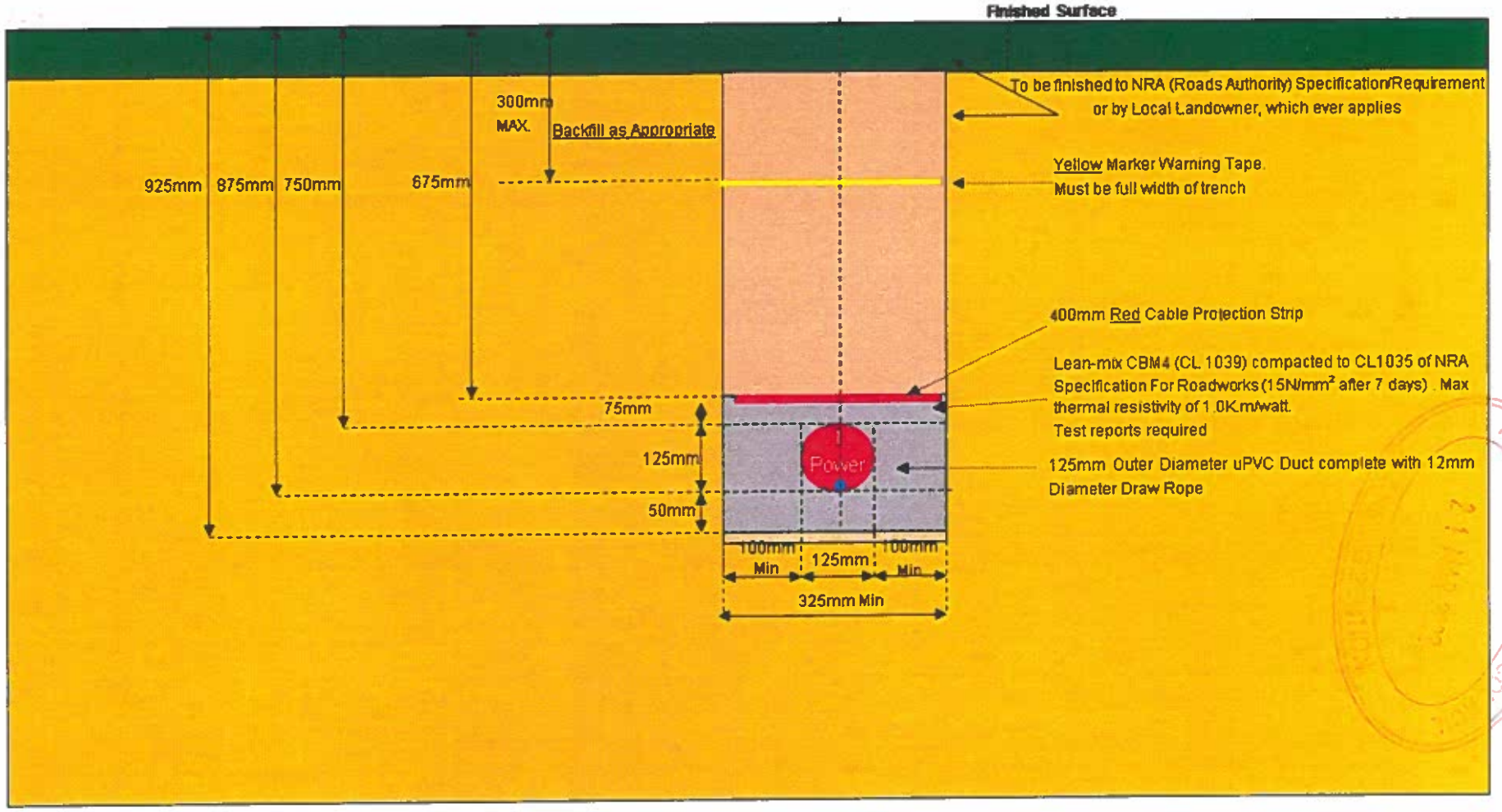
Drawing Not To Scale



1.1: Trench Layout 10/20kV Ducting – **One Power Duct** (Grassed Area)

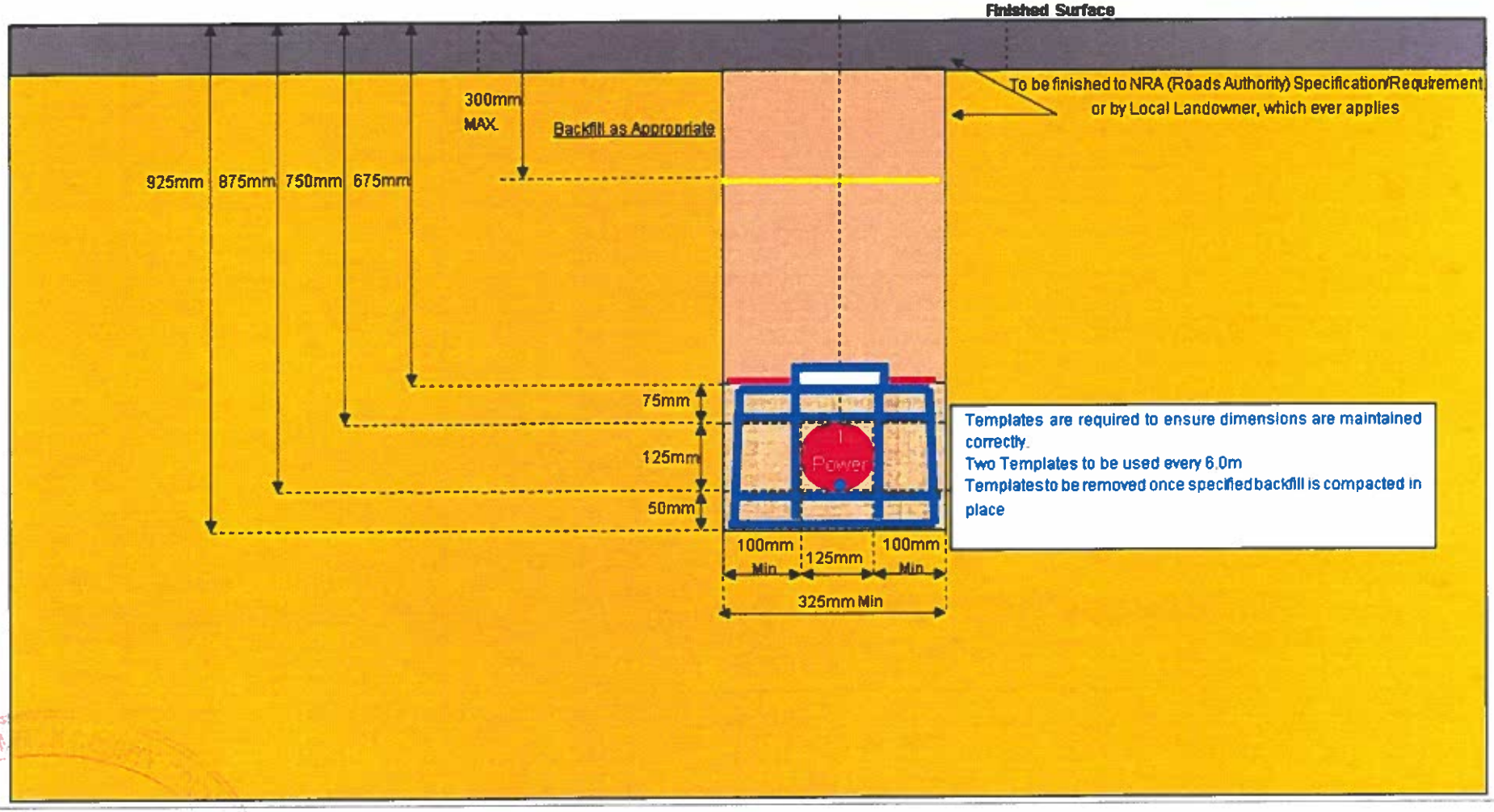
Permanent Reinstatement in Private Property, Public Open Space Grassed Areas , Grass Verges, Medians and other Grassed Areas

Drawing Not To Scale



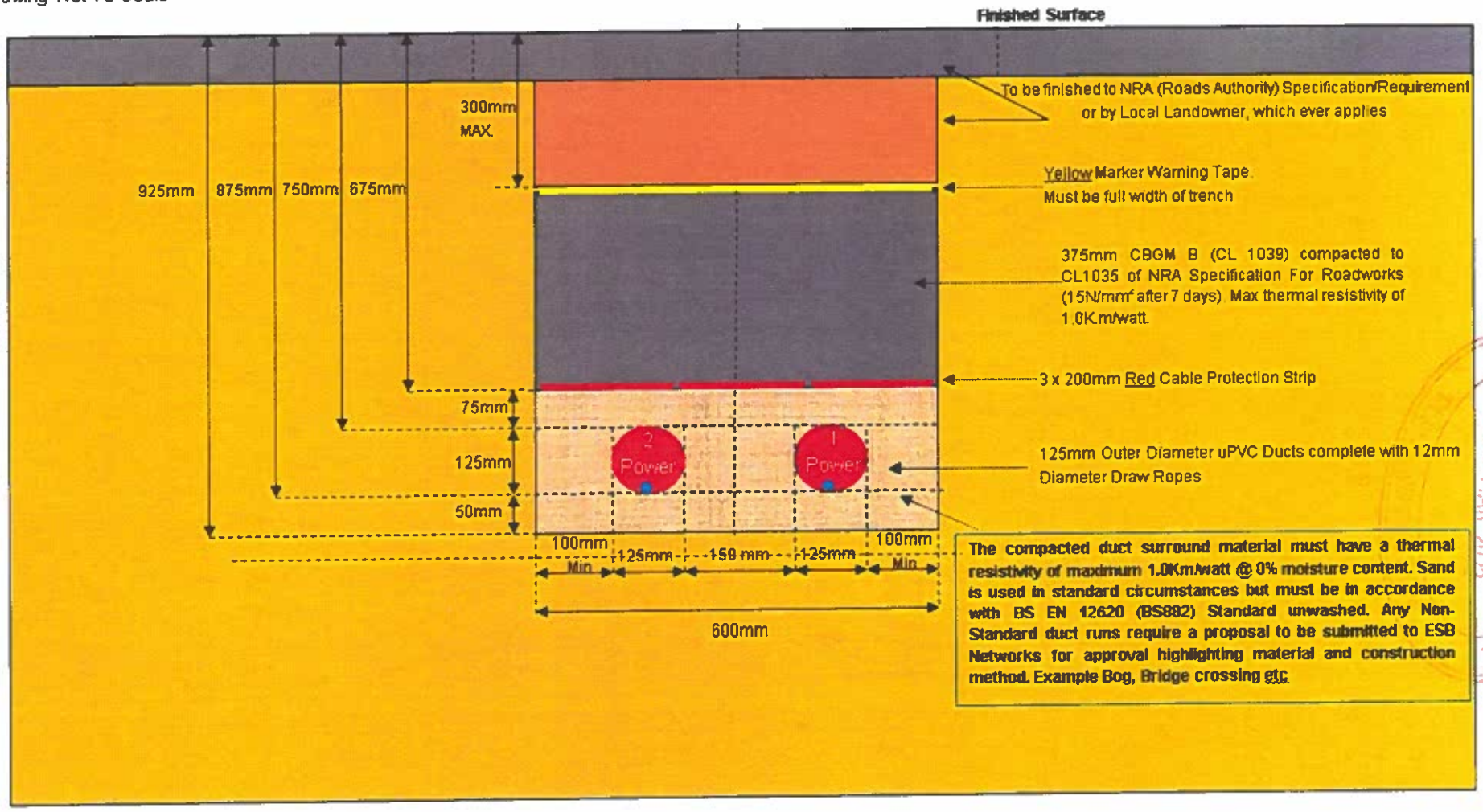
1.2: Trench Layout 10/20kV Ducting – **One Power Duct** (Template)

Drawing Not To Scale



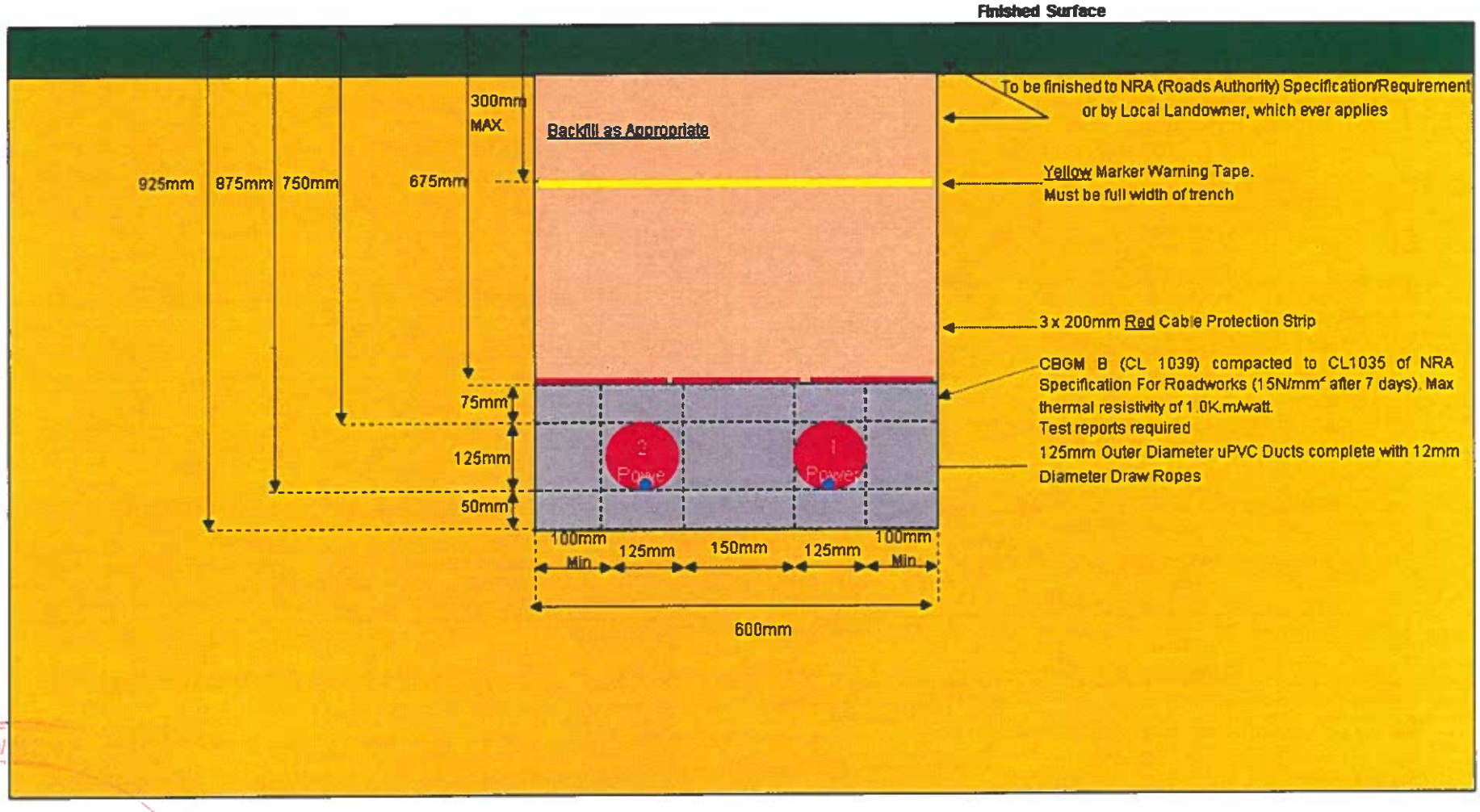
1.3: Trench Layout 10/20kV Ducting – **2 Power Ducts** (Roadway)

Drawing Not To Scale



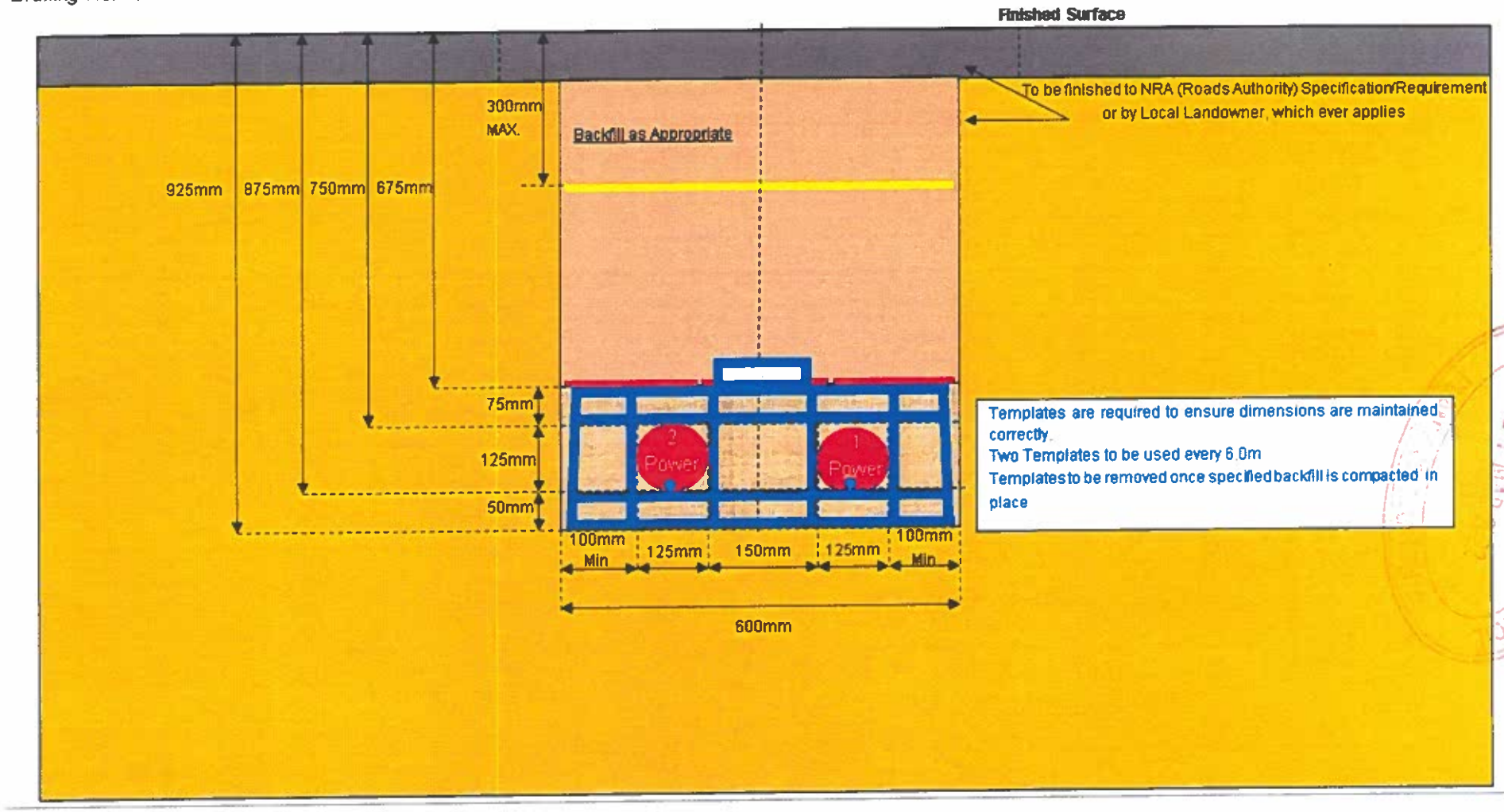
1.4: Trench Layout 10/20kV Ducting – **2 Power Ducts** (Grassed Area)

Drawing Not To Scale ***Permanent Reinstatement in Private Property, Public Open Space Grassed Areas , Grass Verges, Medians and other Grassed Areas***



1.5: Trench Layout 10/20kV Ducting – **2 Power Ducts** (Template)

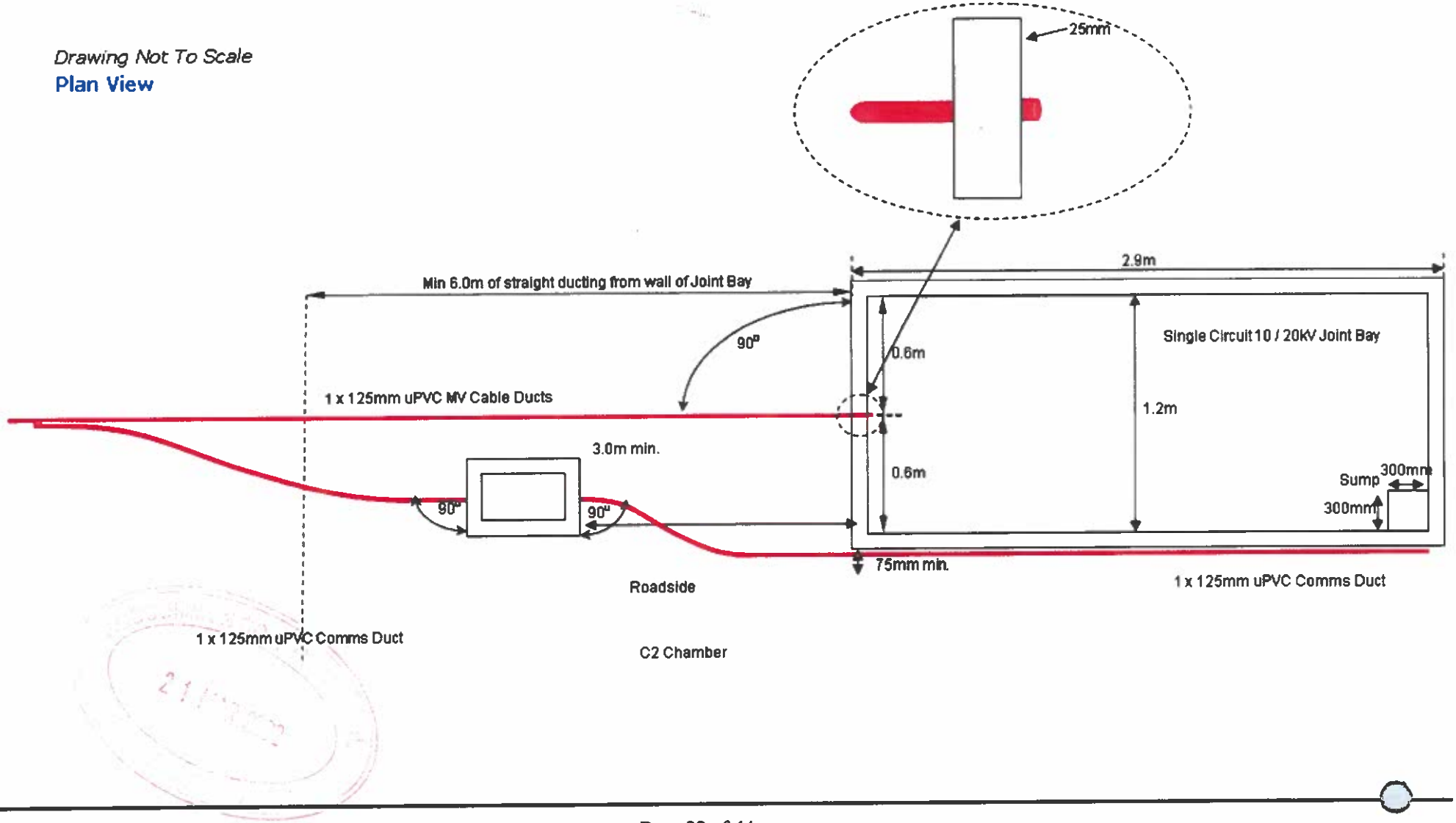
Drawing Not To Scale



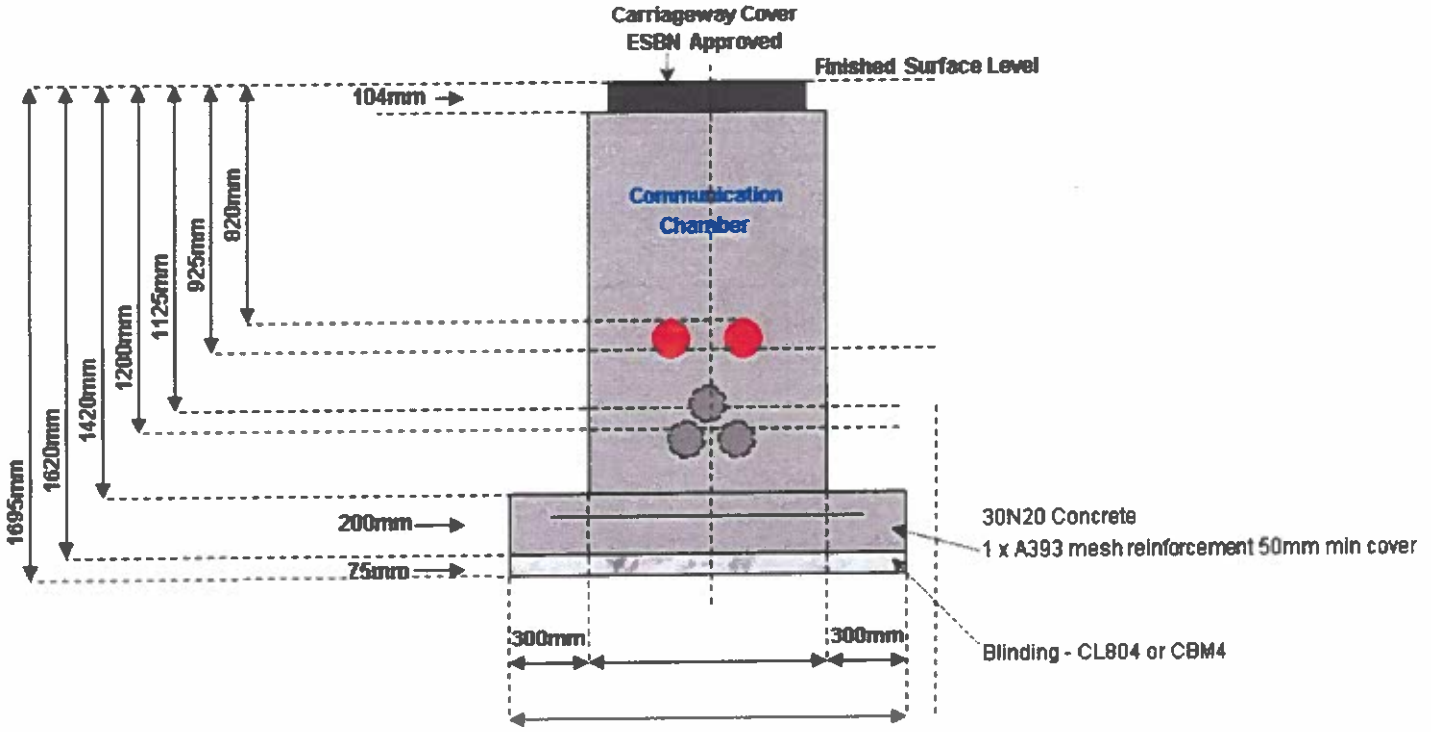
1.6: Joint Bay Layout 10/20kV Ducting – **One Power Duct**

Drawing Not To Scale

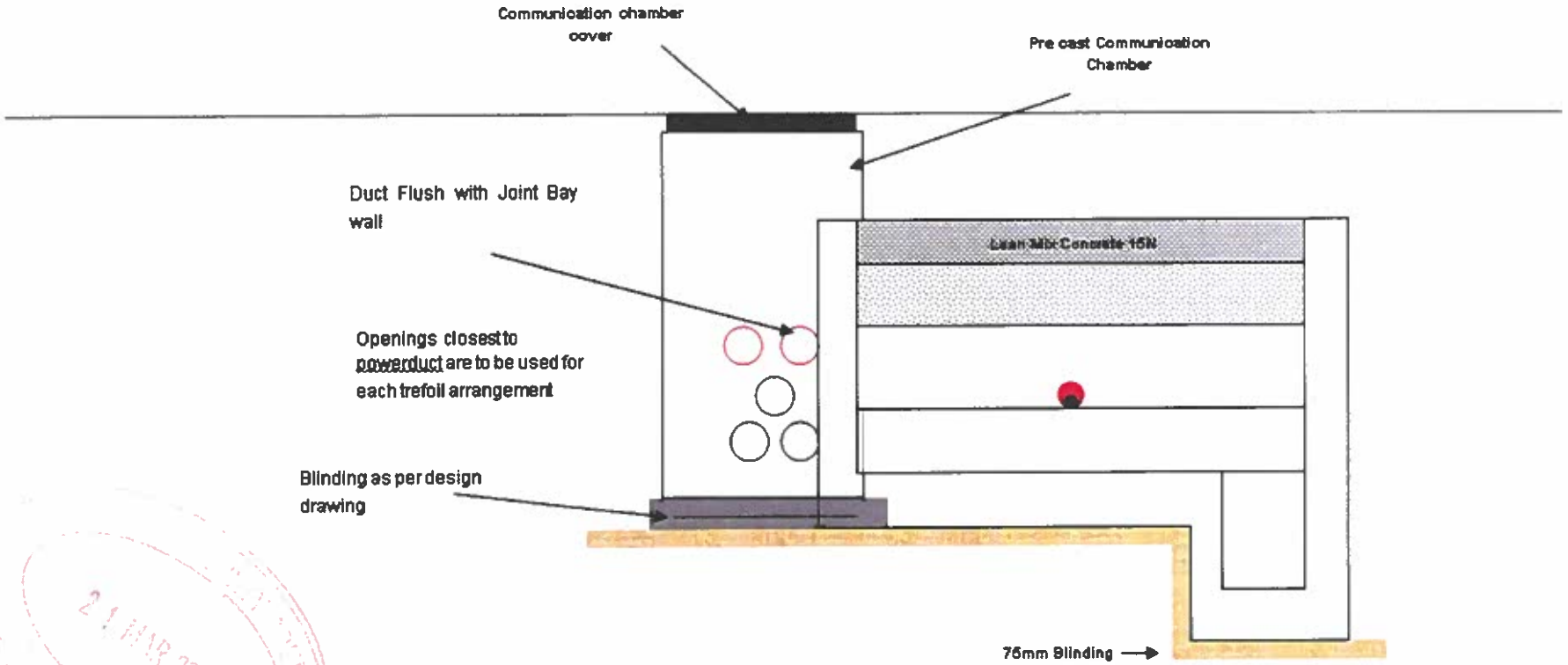
Plan View



1.7: Joint Bay Layout 10/20kV Ducting – **Communication Chamber**

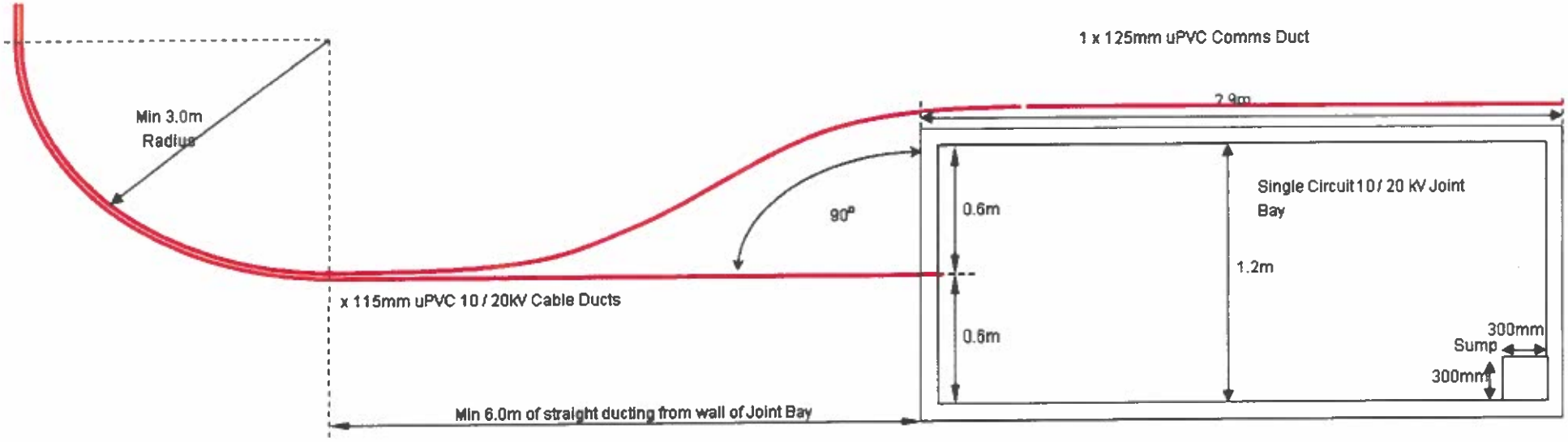


1.8: Joint Bay Layout 10/20kV Ducting – **One Power Duct**



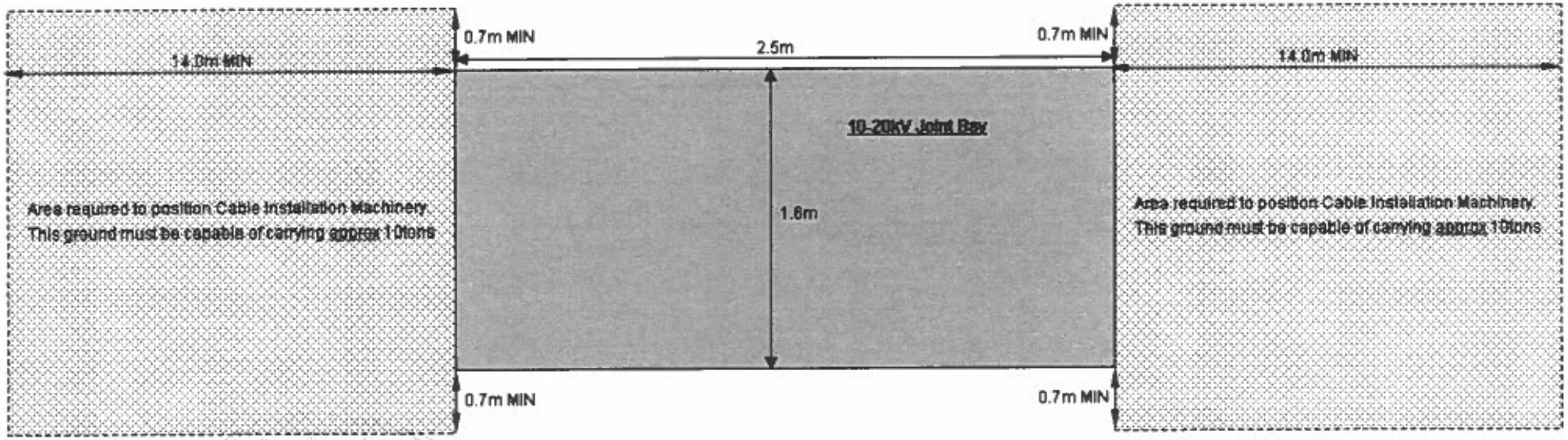
1.9: Joint Bay Layout 10/20kV Ducting – **One Power Duct**

Drawing Not To Scale



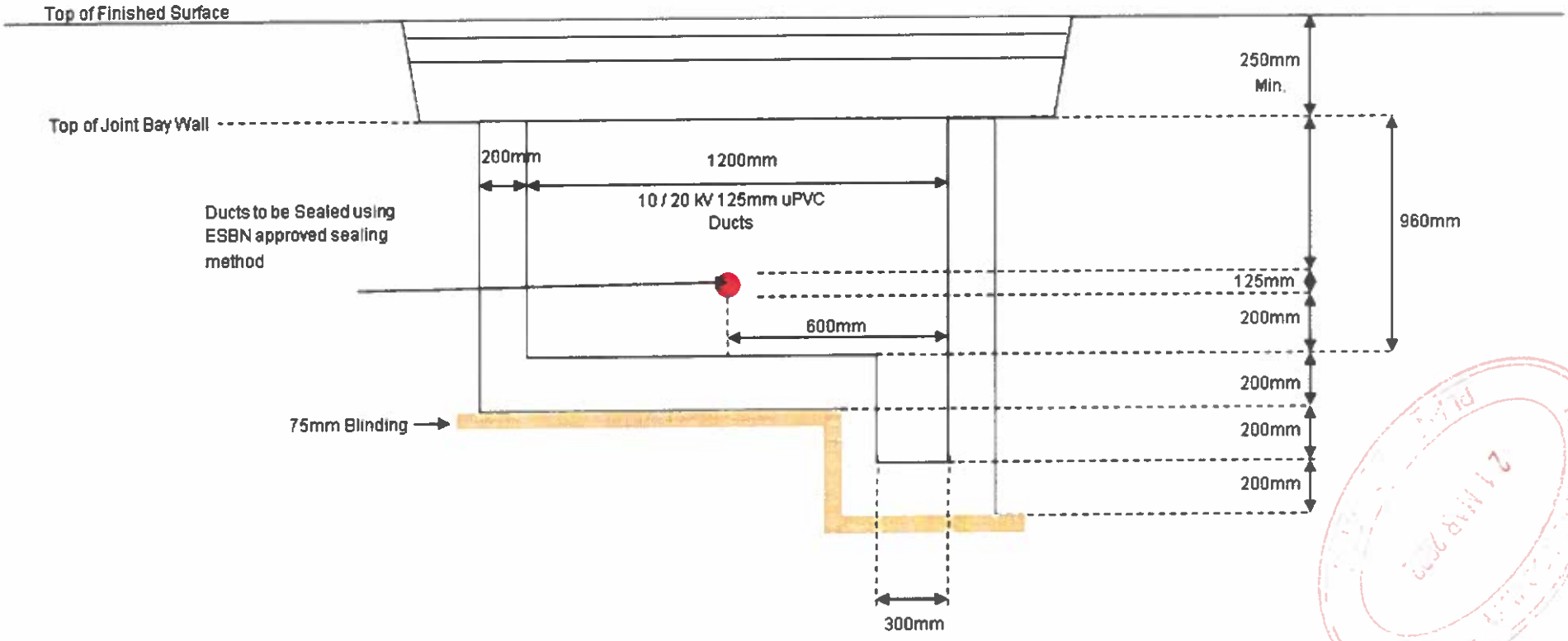
1.10: Required Ground & Surface for MV Cable Installation

Drawing Not To Scale
Please note that this temporary surface 'Area' either side of the Joint Bays, strengthened to carry cable laying machinery , shown in plan elevation below , may need to be removed /replanted reinstated after cable installation, this must be assessed on a case by case basis



1.11 10 / 20 kV Single Circuit Joint Bay

End View Drawing Not To Scale

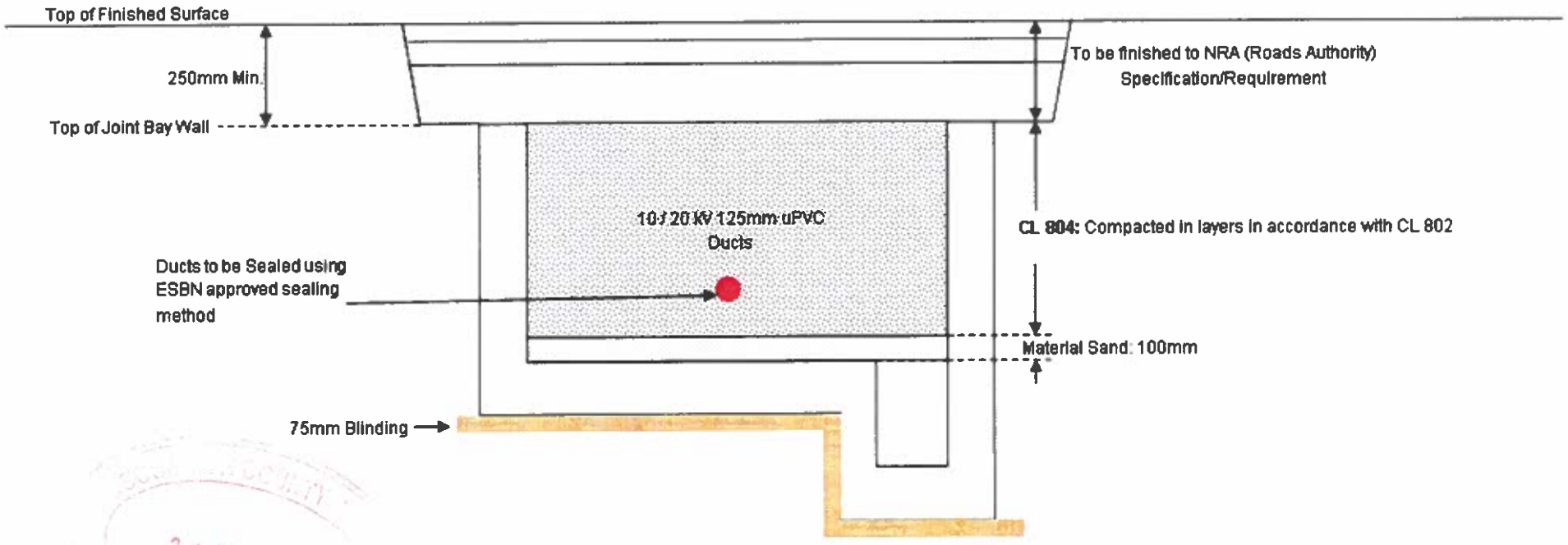


1.12 : 10 / 20 kV Single Circuit Joint Bay

Backfilling of Joint Bay with **no** 10 / 20 kV Power Cables in place

ESB Networks require a copy of the agreement between the IPP and the Roads Authority stating how the road is to be completed.

Drawing Not To Scale

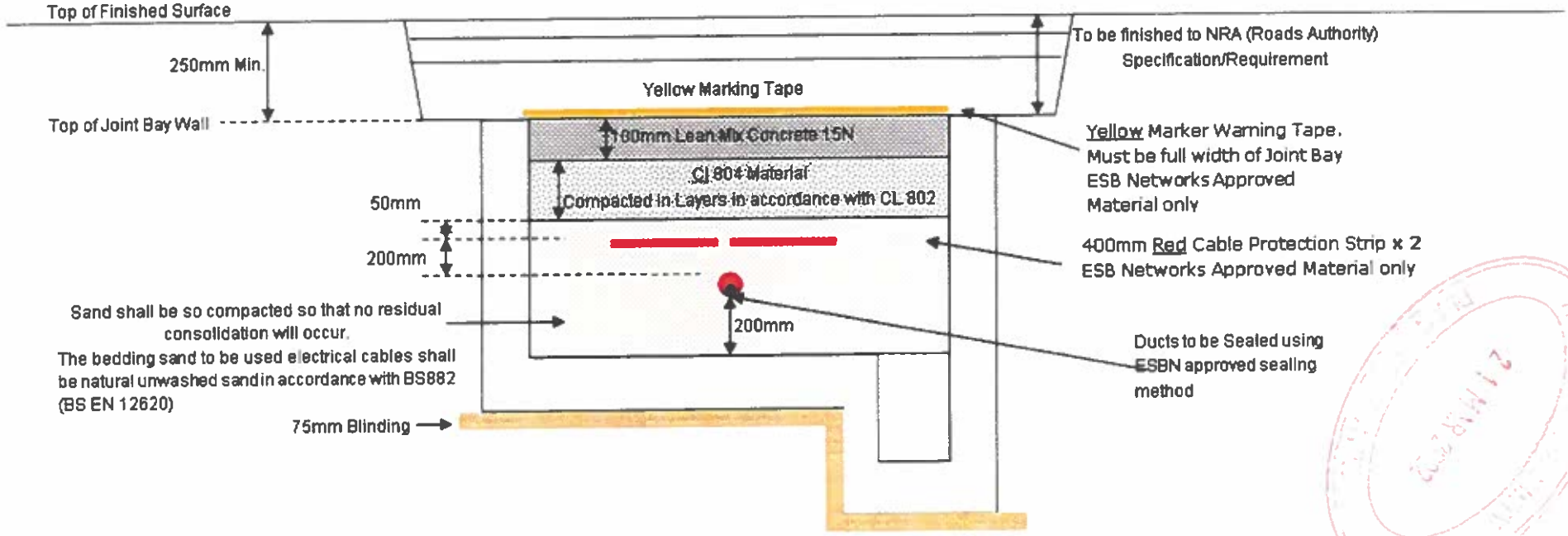


1.13: 38kV Single Circuit Joint Bay

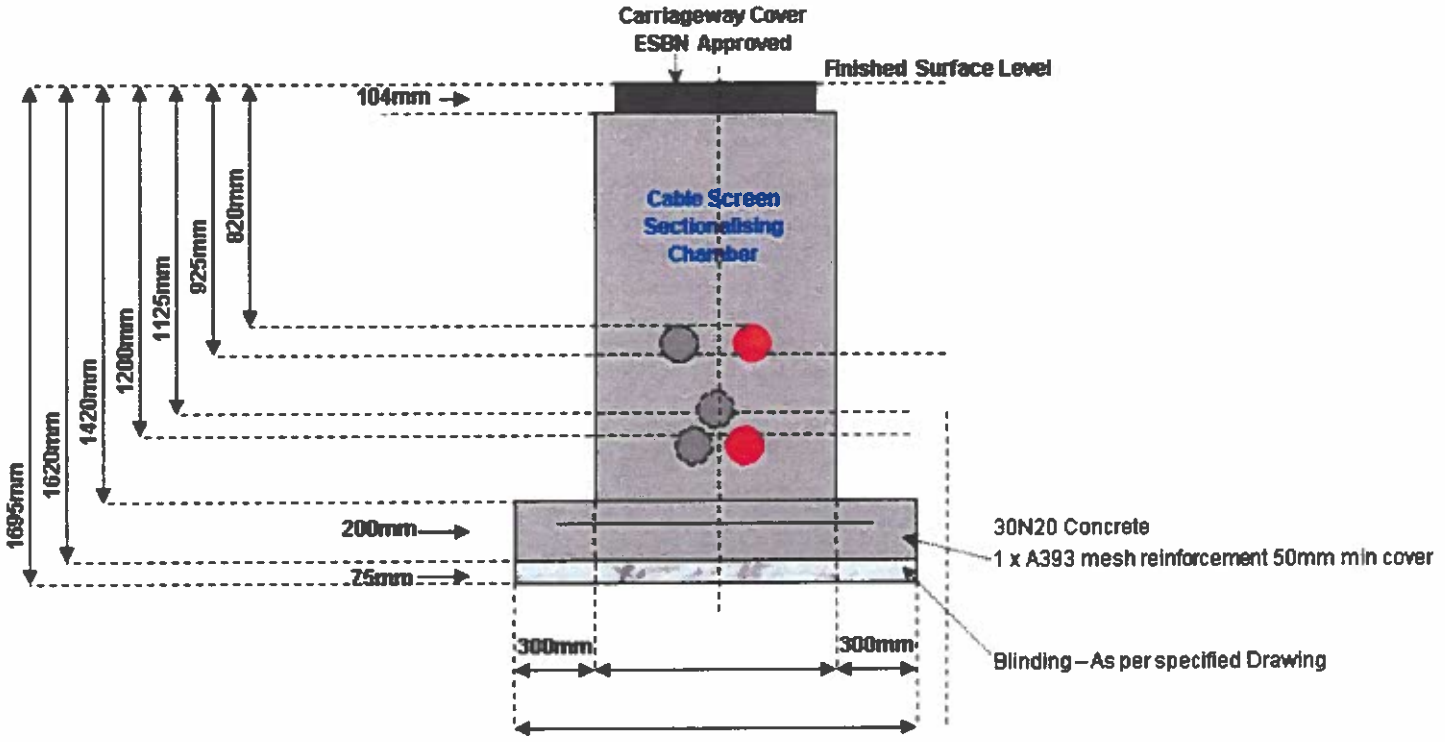
Backfilling of Joint Bay with 10 / 20 kV Power cables in place

ESB Networks require a copy of the agreement between the IPP and the Roads Authority stating how the road is to be completed.

Joint Bay End view Drawing Not To Scale



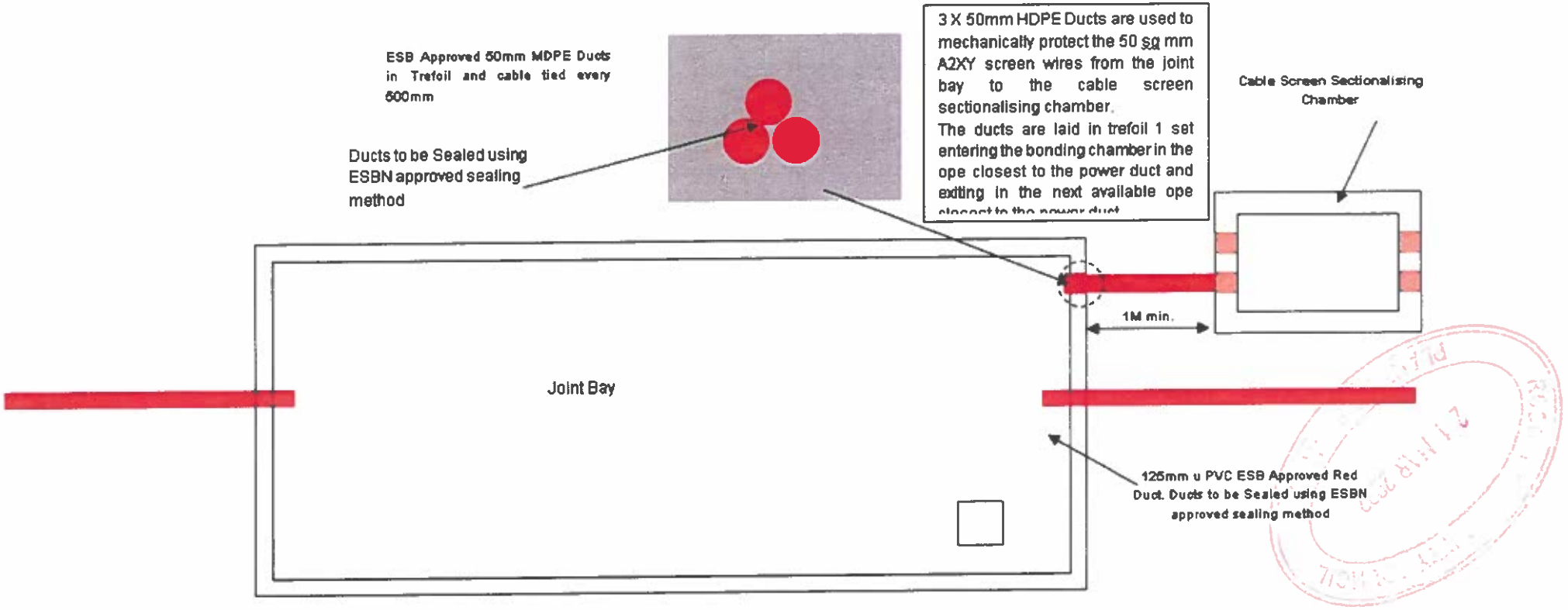
1.14: Joint Bay Layout 10/20kV Ducting – **Cable Screen Sectionalising Chamber**



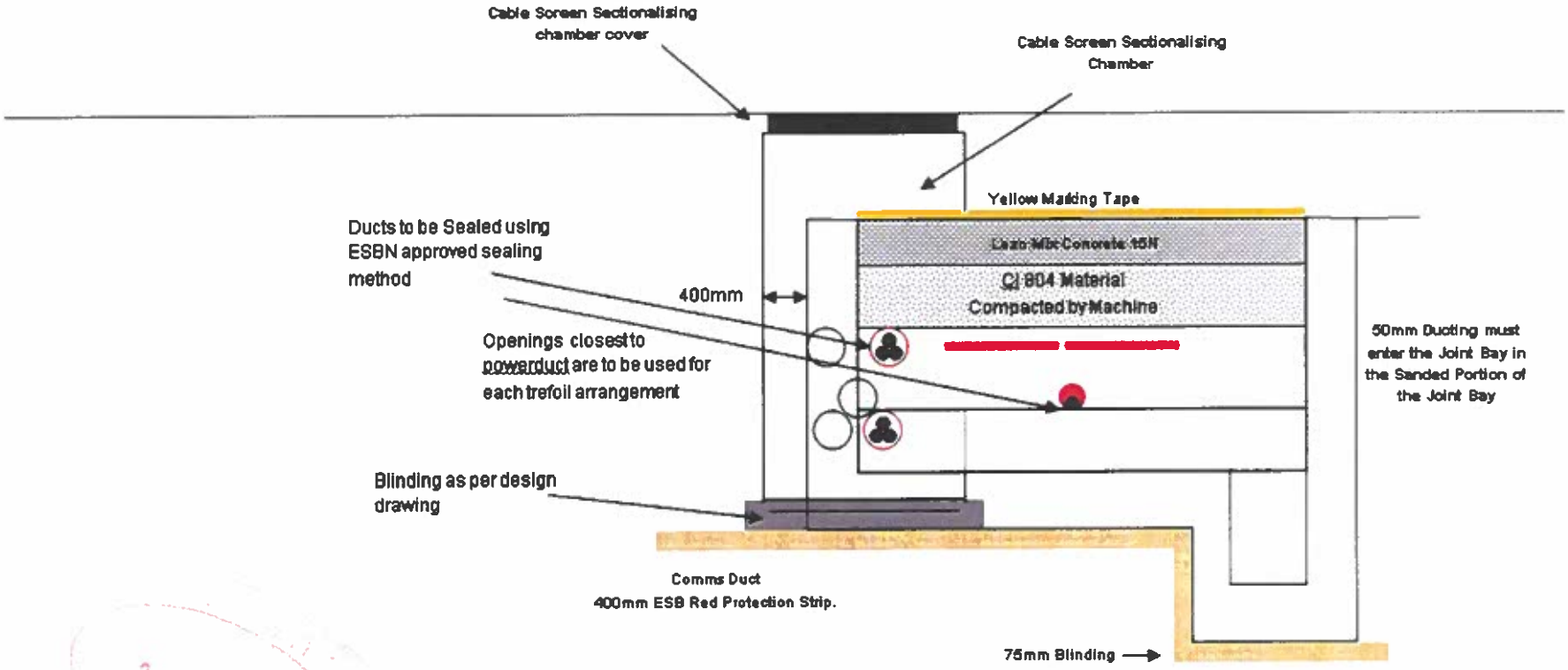
1.15: Cable Screen Sectionalising Chamber Layout 10/20kV Ducting – **One Power Duct**

Drawing Not To Scale

Plan View Joint Bay



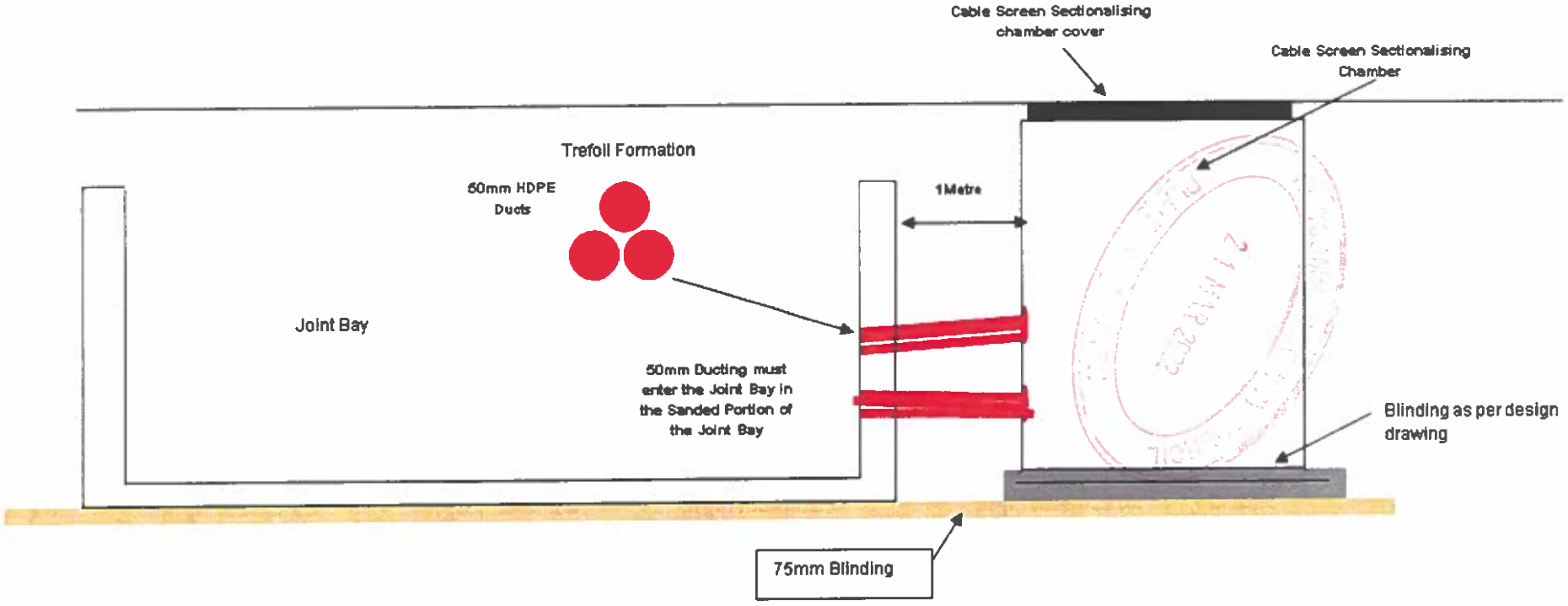
1.16: Joint Bay and Cable Screen Sectionalising Chamber



1.17: Joint Bay and Cable Screen Sectionalising Chamber

Drawing Not To Scale

Side View

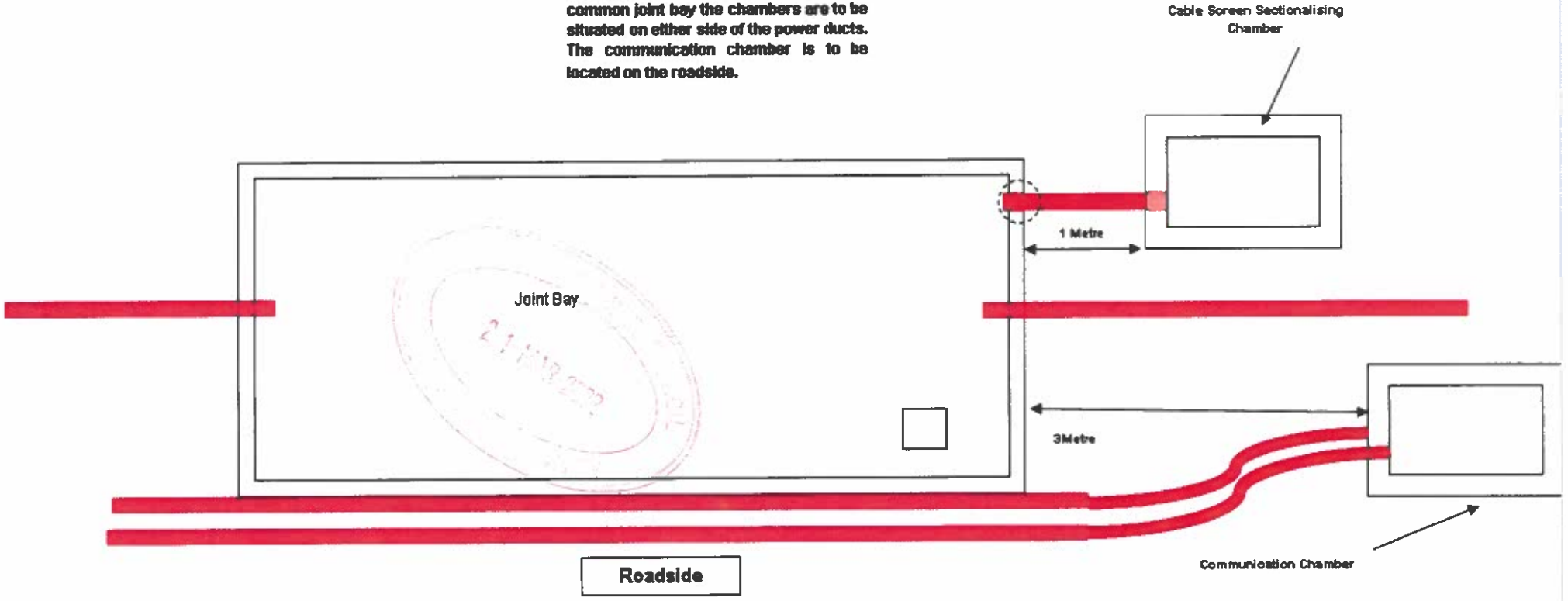


1.18: Joint Bay: Cable Screen Sectionalising Chamber and Communication Chamber

Drawing Not To Scale

Plan View

When a communications cable chamber and a Cable screen sectionalising chamber are to be constructed at a common joint bay the chambers are to be situated on either side of the power ducts. The communication chamber is to be located on the roadside.



NETWORKS

Specification Number:	**18152**
Title:	**Functional Specification for the Installation of Ducts and Ancillary Structures for 20kV Underground Power Cables and Associated Communications Cables for Contestable Projects**
Revision Number:	**0**
Issue Date:	**December 2013**
Latest Review Date:	**December 2018**

(ESB Specifications are subject to change, this specification version shall only be used for the purpose/project for which it was issued by ESB to you)

Approved for issue: **Specifications Manager**
ESB Networks

History of Revisions

Rev No	Date	Revision Content
0	2013	New Document

Note:

This specification will be reviewed at minimum before the Latest Review Date, but may also be reviewed in the interim. Consequently the "Latest Review Date" does not indicate that this particular version of the Specification is current. Accordingly, only the version of the specification issued by ESB to the user for the particular purpose/project should be used.

ESB Technical Specification Approval

Title	**Functional Specification for the Installation of Ducts and Ancillary Structures for 20kV Underground Power Cables and Associated Communications Cable for Contestable Projects**
Specification revision number & date	Doculive Spec. No. : 18152 Rev: 0 Date: December 2013 Consultant Reference No.: PG___-____-____-___ Rev: Date:
Produced by:	ESB Networks
Contract Conditions Reviewed:	

Eirgrid

Department:	N/A
Accepted::	
Date:	

ESB Networks:

Department:	**Asset Management**
Approved :	**Asset Manager, Underground Networks**
Date:	**December 2013**

Table of Contents

1.0 Scope

This document specifies the requirements for the supply and installation of **Ducts and Ancillary Structures for 20kV Underground Power Cables and Associated Communications Cables on the ESB Networks Distribution System**.

The materials used and construction methods employed shall comply with the requirements of

1. This specification and also
2. Specification Number 18149 – General Specification for Contestably Built Underground Networks
3. Specification Number 18153 – Functional Specification for the Installation of 20kV Underground Power Cables for Contestable Projects
4. The individual ESB Networks **materials** Specifications for ducting and cable materials and components and ancillary structures

In the event of any dispute arising from a difference of interpretation regarding the contents of these specifications, ESB Networks interpretation shall be taken as final.

2.0 Cable Route

2.1 Design Review

Cable route design and associated risk assessment shall be submitted to ESB Networks for review prior to any works commencing on site.

2.2 Cable Route Terrain

The route of the cable duct shall follow solid stable ground on flat or gently graded slopes not subject to erosion. Trial excavations shall be conducted in advance to determine the suitability of the route.

Where the gradient of the route exceeds 1 in 3 metres, specialist measures shall be designed and implemented to achieve satisfactory long term duct and cable performance.

Where the route cannot avoid unstable wet ground, bogland, landfill or steep slopes, etc., specialist measures shall be designed and implemented to achieve satisfactory long term duct and cable performance.

Where there are multi circuit situations e.g. near or in electricity switching stations, provision shall be for separation from other circuits to avoid derating of the existing or proposed cables.

The design of measures to deal with any such situations shall be submitted to ESB Networks for review.

2.3 Bridges / Culverts / Non Standard Terrain / other Services etc.

Provision shall be made for additional protection of the cable duct where burial depth to specification cannot be achieved. These additional measures shall be submitted to ESB Networks for review. ESB Networks will provide guidance on each case.

Higher voltage underground cables shall be routed under lower voltage cables for safety reasons.

2.4 Reinstatement Finishes

The reinstatement and surface finish for trenches, manholes and joint bays shall be agreed in advance with the local authority, relevant public body or private landowners.

Upon completion of the works, a statement of satisfaction with the completed works shall be obtained from the relevant landowners, public body or local authority.

3.0 Duct Installation

3.1 Supervision

All works shall be continuously supervised by competent persons. Quality control checks shall be carried out throughout the installation phase and along the full length of the route.

3.2 Works Included

Duct installation shall also include cleaning, proving, draw rope installation, and capping of the ducts. It shall also include excavation of joint bays, backfilling around direct buried cable joints (with the cable jointer in attendance) and reinstatement of joint bays to facilitate cable installation and jointing.

Sand used in the backfilling of directly buried cable joints shall comply with BS EN 126120 (BS882).

3.3 Transport, Storage and Handling of Ducts

Great care shall be taken during handling of ducts to avoid damage. Ducts shall be delivered with end caps in place which shall remain in place until installation of the duct to prevent the entry of dirt.

The ducts shall not be stored in a place where they are likely to be in contact with surface water or other foreign matter which could make its way into the ducts. The method of stacking shall be such as to avoid distortion and the integrity of the ducts shall be maintained throughout their site storage and transport. The bales of ducts shall not be stacked over two tiers.

The Quality Assurance management system shall include detailed inspection of delivered ducts and accessories. Each delivery of ducts shall be inspected to ensure compliance with specification and to verify the following:

- Correct labelling
- Correct dimensions
- Duct ovality
- Duct caps are installed
- Correct packaging on delivery and storage

Ducts which have become discoloured due to external storage and/or UV exposure shall not be installed.

3.4 Materials

- All ducts and associated installation materials detailed in this specification shall be supplied by an ESB Networks approved manufacturer. Details are available on ESB Networks website: (http://www.esb.ie/esbnetworks/en/download_documents/builders_developers/approved_material.jsp)
- Ducts for use at MV shall be 125mm UPVC – see Appendix 2 for summary technical requirements.
- Concrete for structural work shall be in accordance with the NRA "Specification for Road Works", except where amended below.
- Cement Bound Material shall be used for duct surround and trench backfill and shall comply with CGBM B, 15N/mm2 after 7 days. The maximum thermal resistivity shall be 1.0Km/watt at 0% moisture content, in accordance with Series 1000 of the NRA "Specification of Road Works" and it shall be in final position within its 'setting time'. Test sheets confirming the thermal properties shall be available for on-site inspection and shall be submitted with the 'as-built' documentation.
- Concrete for road reinstatement shall be grade C40/N20 with a minimum cement content of 350 kg/m3 in accordance with Series 1000 of the NRA "Specification for Road Works".
- Concrete for joint bay and communication chambers shall be grade C35/N30 with a minimum cement content of 325 kg/m3.
- Formed finishes to Joint Bays shall be to class F2 and unformed finishes shall be to class U1 in accordance with Clause 1708 of Series 1000 of the NRA "Specification for Road Works".
- Pre-Cast Joint Bays and Chambers shall be obtained from approved ESB Networks suppliers only.
- Pea gravel and foam concrete shall not be used for duct surround materials.

The materials supplied and used shall comply with the following ESB Materials Specifications:

Spec No.	Material
16001	Plastic Warning and Protection Tapes, Tiles and Concrete Marker Posts
16002	Plastic Cable Ties
16110	Galvanised Steel Cable Protection Covers Plates and Cast Steel Warning Plate
16112	Lubricant for Pulling Power Cables into Cable Ducts
16113	Plastic Ducts and Fittings for Power and Telecommunications Cables

3.4.1 MV Joint Bay Reinstatement Sand

The bedding sand used around electric cables shall be natural unwashed sand in accordance with BS EN 16120 (BS882). The grading, when determined in accordance with BS812, Section 103.1, shall comply with grading limit C in Table 4 of BS 882 -1992 (shown below) or the grading curve shown below .

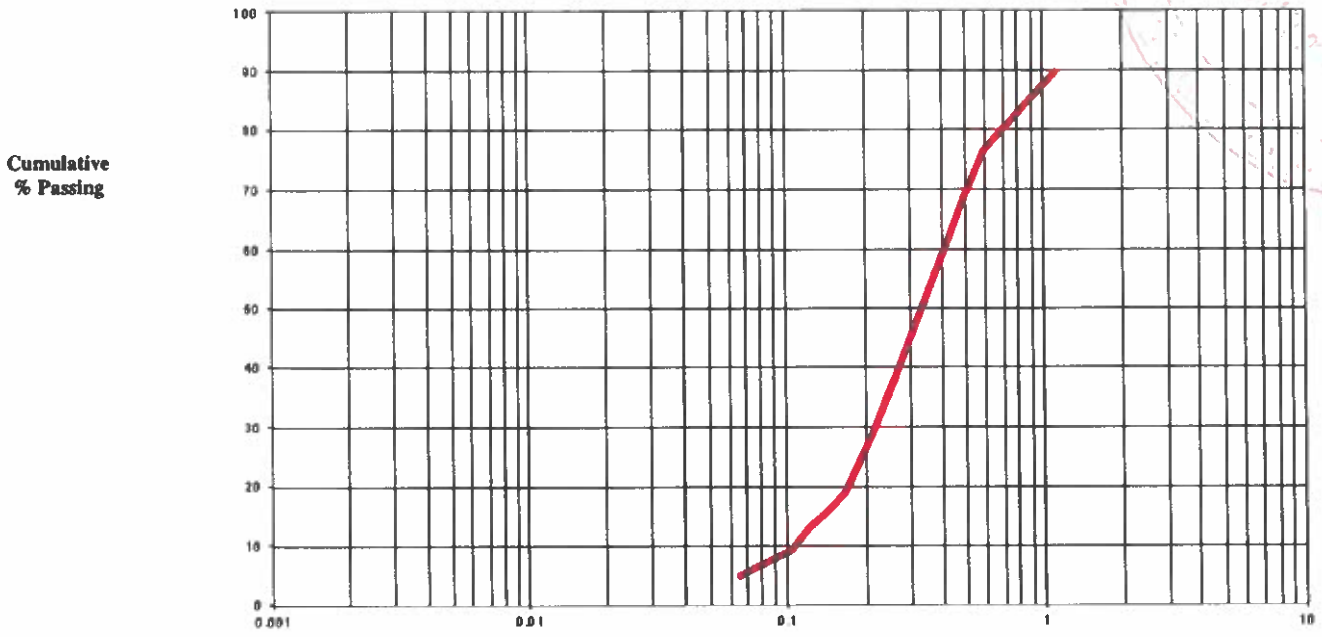
The sand shall have a maximum resistivity of 2.5 K. m/watt at 0% moisture content. Test sheets confirming the thermal properties shall be available for on-site inspection and shall be submitted with the 'as-built' documentation.

The sand shall be manually compacted around the cable and joints.

Pea gravel and foam concrete shall not be used for cable surround materials.

BS882 Sieve Size	**3/16"**	**1/8"**	**7**	**14**	**25**	**52**	**100**
% Passing weight	**95**	**89**	**84**	**75**	**54**	**18**	**1.6**

Thermal Sand Grading Curve



3.4.2 Underground Cable Protection Material for Unavoidably Shallow Depths

Wherever the trench layout and burial depth standards set out in this specification cannot be achieved, because of the terrain or the presence of other services, the design for all such deviations from the standards shall be submitted by the IPP for review and comment by ESB Networks.

The following additional materials shall be used in these situations:

3.4.2.1 Heavy Duty Underground Cable Protection Plate

Description:

750mm long x 200mm wide x 6mm thick galvanised steel plate, with red marker strip fixed to top surface. These shall be laid over the power and communication ducts as specified in the design drawings.

3.4.2.2 Surface Cable Markers

Description:

Metallic plate; 300mm x150mm; 4 screw-holes and hold down bolts. These shall be placed on footpaths/fences, bridges, walkways etc., where cable depth is unavoidably shallow. They shall be fitted to solid durable surfaces and shall be fitted flush with their surround when placed on footpaths or walkways, with full embedment of hold down bolts.

3.4.2.3 Marker Posts

Description:

Corrosion proof aluminium triangular danger sign, with 750mm base, and with centred lightning symbol, on engineering grade fluorescent yellow background. They shall be installed in adequately sized concrete foundations and shall be placed at both sides of river crossings, wherever directional drilling has been used and where burial depth is not to standard. They shall also be used in non roadway routes and in forestry routes to delineate the duct route and joint bay positions.

3.4.2.4 Other items for unavoidably shallow burial depths

For additional mechanical protection underneath and at the side of the duct route, 6mm thick galvanised steel plate and A393 reinforcement mesh may be required, as specified by ESB Networks.

3.5 Trench Layout

The trench layout shall be as per the relevant ESB Networks drawing(s) in the Appendices to this specification. The specification of the relevant Local Authorities shall be followed for the excavation and reinstatement of the ducted cable trenches.

Where a change in the gradient of the trench is required to accommodate other services, the gradient change shall be as minimal as possible. Ducts shall be laid in straight lines to even gradients.

Ducts may be laid to slow and even curves on plan to avoid an obstruction. If a change in direction is required, bends formed by evenly bending the ducts themselves only shall be used and the couplers shall be braced so that there is no bending or stress on the coupler. No heat shall be applied to the ducts when bending ducts. The spacing of the ducts shall be in accordance with the drawings in the Appendices to this specification.

Natural bends in the ducts shall be as wide and gradual as possible. Clearances from other services shall be strictly observed and shall be maintained at all times.

The duct route shall be designed and constructed to ensure that the cable manufacturer's maximum tensile and sidewall pressure forces shall not be exceeded on the relevant MV Cable. Design calculations to confirm this requirement shall be included in the design review submission.

3.6 Joint Bays

Joint bays shall be provided to meet the requirements of standard cable drum lengths and/or as required to limit cable pulling forces.

Joint Bay locations shall be chosen with suitable terrain and access to facilitate the operation of cable pulling equipment, cable jointing and future operation of the installation. A hard core surface shall be provided at either end of the Joint Bay as detailed in drawings in the Appendices to this specification.

The construction of the joint bays shall be as specified by ESB Networks and pre-cast joint bays shall be sourced from an approved ESB Networks Supplier.

Pre-cabling temporary backfill and reinstatement shall comply with the drawing in the Appendices to this Specification.

3.7 Communications Chamber

Communications chambers shall be provided to meet the requirements of standard telecommunications cable drum lengths or as required to limit cable pulling forces.

Communications Chamber locations shall be chosen with suitable terrain and access to facilitate the operation of cable pulling equipment, cable jointing and future operation of the installation.

The construction of the Communication Chamber shall be as specified by ESB Networks and shall be sourced from an approved ESB Networks Supplier. The chamber shall be installed as detailed in drawing in the Appendices to this specification.

3.8 Cable Sheath Sectionalising Chamber

Cable Sheath Sectionalising Chambers shall be installed at every second joint bay subject to the distance between chambers not exceeding 2.5km. Cable Sheath Sectionalising Chamber locations shall be chosen with suitable terrain and access to facilitate the cable installation and future operation of the installation.

The construction of the Cable Sheath Sectionalising Chambers shall be as specified by ESB Networks and shall be sourced from an approved ESB Networks Supplier.

The chamber shall be installed as detailed in drawing in the Appendices to this specification.

3.9 Lubrication Points

Lubrication points shall be provided to ensure cable installation can be carried out without exceeding the manufacturer's maximum permissible cable pulling forces of the proposed cable. Lubrication points shall be installed in cable runs in close proximity to areas of high bend concentration. Optimised positions shall be chosen, e.g. on the crest of steep incline for maximum lubricant dispersion on the route. Lubrication points shall be properly sealed to prevent the ingress of dirt.

Lubrication Point locations shall be chosen with suitable terrain and access to facilitate the operation at any phase of the development and future operation of the installation.

The construction of the Lubrication Points shall be as specified by ESB Networks and shall be sourced from an approved ESB Networks Supplier.

The chamber shall be installed as detailed in drawings in the Appendices to this specification.

3.10 Clearances from Other Services and ESB Networks LV, MV and HV Cables

A minimum clearance of 300mm from outermost power duct edge to other normal service shall be strictly observed. A clearance of 600mm from outer most power duct edge to transmission high pressure infrastructure services shall be observed. See Appendix 3 for requirements.

Deviations from ESB Networks minimum clearances may be unavoidable at "Pinch Points". Where reduced clearances only can be achieved, the design shall be submitted to ESB Networks for review.

Written clarification in respect of reduced clearances shall be obtained from the relevant utility owner and, in the case of LV, MV and HV cables , clarification shall be obtained from ESB Networks and shall be included in the 'as built' documentation.

3.11 Joining of Ducts

As the duct is installed the socket end shall be towards the duct lay and the inside of the socket and the spigot end shall be cleaned with a dry cloth before being pushed together by hand. A wooden batten shall then be placed across the socket at the leading end. The duct shall be tapped home with a hammer until the ring mark on the duct, indicating the fully "home " position, meets the edge of the socket.

3.12 Cutting of Ducts

Where duct cutting is required, they shall be suitably held, supported and protected during the process. All ends shall be cut square to the longitudinal axis of the pipe and suitably finished (chamfered) with no rough edges.

3.13 Avoidance of Power Duct Crossovers

Duct crossovers shall be prevented and shall be deemed an unacceptable defect. Cables shall not be installed in ducting that contains a crossover of the ducts.

3.14 Bends

Bends in the ducts shall be as large and as gradual as possible to minimise thrust force on socket and the spigot end.

The term "Bends", also includes trench offsets/sidesteps both in the horizontal and vertical plane, which may be necessary to avoid obstructions e.g. manholes or to maintain clearances with other under ground services running parallel and diagonal to the trench.

At all trench route deviations/bends, the radius of the overall bend shall be maximised/made uniform over the entire bend. The centre of rotation of the arc shall be chosen so that the bend radius is as large as possible and such that at the start and finish of the bend (i.e. where it meets the straight duct sections) the radius is no worse than that at any intermediate point on the arc.

IPP shall use ESB Networks approved pre-formed bends only and these are available in angles of 11^0, 22.5^0, 45^0, 90^0. Duct lengths shall not be bent at bend positions – preformed bends in conjunction with straight duct sections shall be used to ensure that there are no cable ripping protruding edges at duct joint positions for any direction of cable pull.

3.15 Avoidance of Crinkling/Flattening of Ducts While Laying Ducts at Bend Positions

The ducts shall be uniformly/regularly supported as they are being formed around the curve to avoid imposing concentrated (point) sidewall forces which result in crinkling or excessive flattening of the ducts at the bend position.

3.16 Trenchless Technology

Should it be necessary to cross obstacles such as bridges, railways, water courses etc. with the cable duct(s), and all possible routes and installation possibilities have been thoroughly examined and are deemed not possible, then the method of installing the cable duct(s) by trenchless technology may be accepted by ESB Networks. Details of such locations and the proposed design and mechanical protective measures shall be submitted to ESB Networks for review and comment.

The route length undertaken using trenchless technology shall be an absolute minimum and shall only be that length required to clear the crossing that cannot be undertaken by conventional trenching methods

The design for the proposed crossing by trenchless technology shall be submitted to ESB Networks for review and comment

The following duct type shall be used for directional drilling for MV ducting and it shall be chamfered to allow correct transition to the standard ducting I.D

Type and Size of Duct
125mm HDPE for Directional Drilling SDR 14.7 (to allow 3x400 sq 20kv cable)

3.17 Dirt Ingress into the Ducts

Dirt ingress into the ducts shall be prevented as any dirt or pebbles trapped in the ducts may lead to cable failure. During cable pulling, dirt or other sharp objects will be pressed between the duct and cable resulting in deep scores and gashes on the cable sheath which may result in cable failure. Allowing dirt to enter ducts

and attempting to remove it later by cleaning the ducts with brushes is not acceptable.

The ingress of dirt into the ducts shall be prevented by the following measures:

- On delivery from the supplier, the ducts shall be fitted with end caps. These shall remain in place to prevent dirt entering on the duct bales.
- When the ducts are installed, rubber bungs shall be immediately fitted to exposed installed duct ends and retained in place at all times. These bungs shall be fitted with an internal D-ring to facilitate the tying of draw rope.
- Trenches, joint bays, etc. shall be kept free of water so as to prevent any risk of the cables and other materials to be laid in the trenches etc. being detrimentally affected.

3.18 ESB Networks Approved Protection Strip, Warning Tape and Marker Posts

ESB Networks Protection Strip (Red) and ESB Networks Warning Tape (Yellow), shall be used at all times as specified in the relevant ESB Networks drawings in the Appendices to this specification.

Where ducts are laid, the red protection strip shall be placed on top of the CGBM B layer. In all situations yellow warning tape shall be placed higher up in the trench, at a distance of not more than 300mm below the finished surface.

Sufficient parallel layers of red marker strip and yellow marking tape shall be used to fully cover and slightly extend beyond the full plan widths of the ducts below it. The layer of backfill immediately underneath the yellow marker tape or red marker strip shall be properly levelled and compacted prior to laying the marker tape and warning strip evenly along the trench.

ESB Networks cable protection and marking materials shall not be used over any other ducting which is not intended for use by ESB Networks.

3.19 Trench backfilling

Provision shall be made to prevent duct movement during the placing of the duct surround. All duct bedding, duct surround and backfill materials shall be suitably compacted in layers using manually operated vibrating plate which shall not crush the ducts beneath.

3.20 Reinstatement Specifications General Requirements

All reinstatement works shall be in accordance with the NRA Specification for Road Works and any conditions specified in the Road Opening Licence and/or route consents. If any part of the route impinges on private property, the reinstatement specification shall be as agreed with the Landowner.

3.21 Cleaning, Proving, Roping and Capping

When the ducts have been installed and backfilled the duct run shall be thoroughly cleaned by pulling the appropriate size of ESB Networks approved duct brush through the duct and shall be proven by pulling the appropriate size of ESB Networks approved mandrel through the duct.

Each duct shall be cleaned and proven at completion/handover and immediately prior to pulling in the cable winch rope and the cable in the case where the IPP is also responsible for cable installation.

Duct Cleaning – Brushes

Brushes with the specified dimensions only shall be used to ensure that any dirt or debris within ducts is transported out of the ducts rather than being merely loosened up and left within. The brush shall have the following dimensions:

Duct Outside Diameter	Minimum Length of Brush	Brush Code
125mm UPVC	250mm	8783254

Brushes shall be cleaned regularly using a power hose. Approved Brushes have two sets of brushes per core.

Duct Proving – Mandrel

Proving shall be achieved by pulling a sponge, cleaning brush and mandrel assembly through the duct. The equipment shall have the following dimensions:

Type and size of duct	Mandrel Code	Brush Code	Sonde	Sponge
125mm UPVC SDR 17.6	8783229	8783254	required	125mm
125mm HDPE for Directional Drilling SDR 11.0	8783228	8783250	required	125mm

All mandrels are stamped with their size and the corresponding duct size to which they are applicable.

Duct Cleaning – Sponge

A sponge shall be used to remove excess water and pre-lubricate the duct prior to cable pulling.

Duct Proving – General

ESB Networks reserves the right to witness the duct proving tests.

ESB Networks approved duct brushes, mandrels and sponges are designed to provide thorough cleaning and a tight fit. The minimum rope size used shall be 12mm polypropylene. Cleaning and proving shall be carried out using a winch which has a calibrated dynamometer and printout. Pulling tension shall not exceed 1 Tonne (10kN). The results shall be submitted to ESB Networks for review.

Following the duct proving process, water sealing rubber bungs shall be fitted to prevent water, sand or other debris getting into the ducts. The ducts shall then be left roped in preparation for cable pulling.

Use of a Transmitter (Sonde)

A Sonde shall be connected close to the mandrel or brush to help locate a blockage quickly. It can be purchased for specific use with a C.A.T. or other precise cable location instruments, equipped with a Sonde detector.

Duct Lubrication Materials

Ducts and cables shall be thoroughly lubricated for all cable pulls. Only ESB Networks approved lubricants which are tested so as not to damage the cable insulations semi-conductive layers and outer sheath shall be used. Petroleum based oils or greases shall not be used for power cables.

The list of approved suppliers is available from the following ESB Networks web site address:

http://www.esb.ie/esbnetworks/en/download_documents/builders_developers/approved_material.jsp

3.22 Recording of Duct Installation

This shall be as specified in ESB General Specification for Contestably Built Underground Networks.

4.0 Appendices

Appendix 1	ESB Approved Chambers and Covers
Appendix 2	Supply of Ducts
Appendix 3	10 / 20 kV Clearances
Appendix 4	Ducting & Cable Installation Forms
Appendix 5	Drawings

1.0	Trench Layout 10 / 20 kV Single Circuit (Roadway)
1.1	Trench Layout 10 / 20 kV Single Circuit (Grassed Area)
1.2	Trench Layout 10 / 20 kV Single Circuit (Template)
1.3	Trench Layout 10 / 20 kV Double Circuit (Roadway)
1.4	Trench Layout 10 / 20 kV Double Circuit (Grassed Area)
1.5	Trench Layout 10 / 20 kV Double Circuit (Template)
1.6	10 / 20 kV Single Circuit Ducts and Single Comms Duct - Plan
1.7	Communication Chamber - Section
1.8	10 / 20 kV Single Circuit Ducts and Single Comms Duct – Section
1.9	10 / 20 kV Single Circuit Ducts – Plan
1.10	Required Cable Installation Solid Ground - Plan
1.11	10 / 20 kV Single Circuit Joint Bay – Section
1.12	10 / 20 kV Single Circuit Joint Bay – Section backfill detail no cable
1.13	10 / 20 kV Single Circuit Joint Bay – Section backfill detail with cable
1.14	Cable Screen Sectionalising Chamber – Section
1.15	10 / 20 kV Single Circuit Ducts and Cable Screen Sectionalising Chamber– Plan
1.16	10 / 20 kV Single Circuit Ducts and Cable Screen Sectionalising Chamber– Section
1.17	10 / 20 kV Single Circuit Ducts and Cable Screen Sectionalising Chamber– Elevation
1.18	Joint Bay: Cable Screen Sectionalising Chamber and Communication Chamber

Appendix 1. ESB Networks Approved Communications, Lubrication Point and Cable Screen Sectionalising Chamber (Photograph) and Chamber Cover

ESB Networks Approved Communication and Cable Screen Sectionalising Chamber

DT6S

Description

Material
Spheroidal graphite cast iron in accordance with ISO 1083 and NF EN 1563.

Frame
One piece monoblock construction, incorporating 4 No. Lifting Points for handling and 6 No. 20 mm diameter holes for fixing to chamber. Safety grids can be accommodated.

Covers
- Double triangular non-rock with feature to prevent displacement in longitudinal direction.
- Separate sections of cover loosely coupled with nut and bolt.

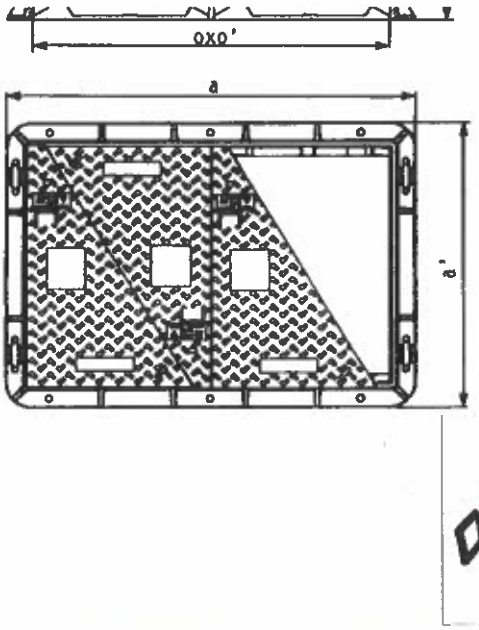
Handling
Each cover section is fitted with a keyhole for lifting.

Coating
Non-toxic water based black paint.

Product Certification
KITEMARK.

Place of Installation
In accordance with EN 124 Standard.
Group 5 : Areas imposing high wheel loads (e.g. docks, aircraft pavement), and lower groups.

Options
- Special bedging: please enquire.



Ref.	Dimensions (mm)			Weight (kg)		
	a x a' overall flange	o x o' clear opening	h height	Frame	Cover(s)	Total
DT6S 107.075	1220 x 950	1070 x 750	150	110	4 x 51	314

Appendix 2. Supply of Ducts

All ducts must be supplied in accordance with the summary of requirements and properties listed below.

ESB Networks Specification for Red 125mm uPVC Mains (ABRIDGED FROM ESBN SPEC. 16113)

	MAINS CABLE DUCT
Duct outside Diameter (Mean)	125.0mm – 125.4mm
Duct Type	uPVC, Spigot & socket type 6m lengths measured end to end
Duct Rating	Normal duty per EN 50086–2 Specification
uPVC &MDPE Material Quality	Virgin or **own** clean reworked material .Use of externally sourced reworked or reprocessed material is not acceptable to ESB Networks
Duct Colour – External and Internal Surfaces	Red – BS Type 5252 04E53 – 04E56 Minimum 0. 3 mm thickness of red coloured material required throughout length of duct on both internal and external duct surfaces
Duct Deformation Requirement	Must pass EN50086 – 2 <5% deformation requirement for 500N loading on 200mm sample
Impact Resistance	Per EN 50086 – 2 12 samples. 7.5 kg striker: 2m fall height:>150 Joules – no crack in at least 9 samples; Duct temperature;15-20 deg C
Duct Minimum Wall Thickness	The larger of the two criteria below; Wall thickness to pass 5% deformation / impact requirement above ESB Networks minimum wall thickness of 3.8mm (required for cable pulling)
Duct Spigot (plain) End	Spigot; plain end bevelled to allow easy jointing of duct on site, minimum thickness 1.3mm, bevel length ≥ 5mm ;end cut square
Duct Socket (expanded) End	Push Fit Type Tapered Socket 3.4mm minimum expanded wall thickness 110.0mm– 116.0mm socket length; end cut square
Black indelible Circumferential mark on plain duct end for correct push-in distance	Black circumferential mark required to indicate correct push in distance for duct jointing for spigot and socket joints. Location: 110mm – 116mm from duct plain end to match socket length below
Duct Ovality incl. Socket	- 2.00mm. max.
Eccentricity and misalignment of expanded Socket relative to duct centre line axis	Zero offset of the expanded socket centre line relative to the duct centreline is required. Also the expanded socket centre line and the duct longitudinal axis must be collinear – no deviation angle allowed
Duct Inner Surface	Smooth low friction surface completely free of surface ripples and waves, sharp edges & protrusions. Friction coefficient <0.25
DUCT MARKING **Duct Legend Content:**	"DANGER ELECTRICITY CABLES" in 18-20mm lettering height ;" Batch No , Manufacturers Name, Date of manufacture & ESB Networks Spec 16113 " in 6mm minimum lettering height
Maximum Spacing between Consecutive Legends	Maximum 150mm gap between consecutive Legends
Colour of Legend	Black
Size of Lettering for main safety legend above	Three 18- 20mm height legends disposed @ 120° apart on duct circumference.
Durability of Duct Legend Lettering &Circumferential mark	Legend/Mark shall not wash off or become illegible due to Irish outdoor weather effects

Red Colour Fastness	**1 year** minimum required so as to provide 12 month storage period at builder's provider's premises. . 1 year outdoor weathering test required or suitable accelerated colourfastness test
Bend Radius for all Bend Angles For 125MM Duct	For all Angles ;radius = **1.2m minimum** for 11°, 22°, 45° & 90°. Material as per duct specification above. (3.8mm minimum wall thickness) 150 mm straight section between. start of bend section and circumferential mark
Bend ovality	2mm max (Same as for straight duct)
Duct Length	Duct Length to be 6m measured end to end
Endcaps for Ducting	Bag of 15 duct end caps to be supplied with each bale of ducts - capable of fitting each duct end. Caps securely fitted on two lowest rows and top row in bale at both ends, which will not fall off during transport. Caps to be securely fitted to ducts to eliminate falling off during transport.
Packaging Support for duct bale Or coil	Duct bales to be held in position by at least two sets of good quality timber battens supported by steel straps. Supplementary support to prevent overstressing and breakage of timber battens to be provided by polypropylene tension straps or other suitable means. Collapsed bales are a safety hazard; which must be designed out.
Labels for Duct Bales/ Pallet of Bends /Coils of Ducting	Indelible Weatherproof labels to be placed on each bale of ducting stating; "Approved for ESB Networks use ". A4 size laminated Installation Labels as provided by ESB Networks in 2007 to be fixed to each bale of ducting , Each bend to be labelled "Approved for ESB Networks use " & labelled with ESB Networks Installation requirements.

ESB Networks Specification for 125mm Red HDPE Ducting for Directional Drilling/Trenchless Technology use only

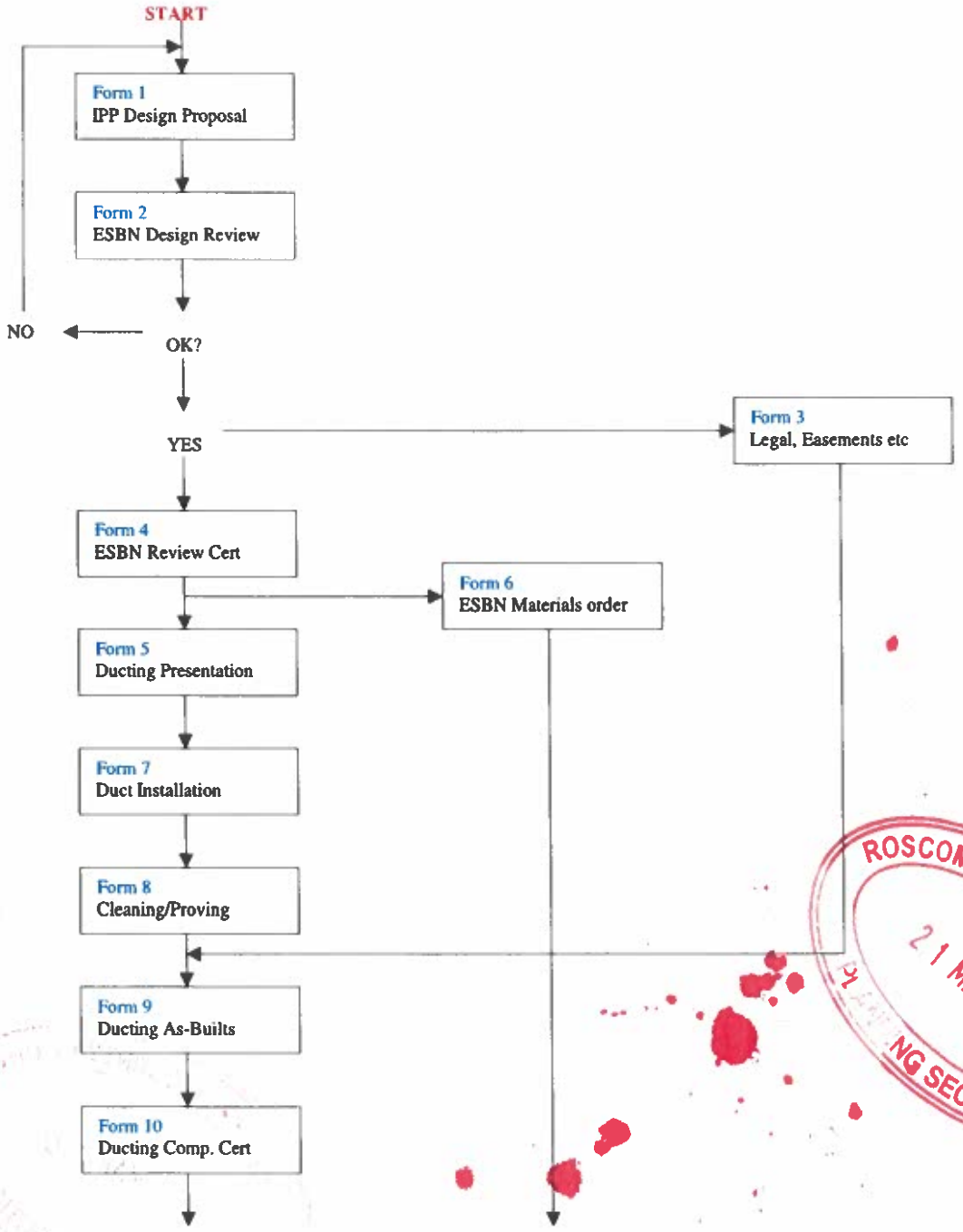
HDPE CABLE DUCT- DIRECTIONAL DRILLING USE ONLY	
Approved ESB Networks suppliers	- see approved list, available on ESB Networks website
Duct outside Diameter (Mean)	125.0mm – 125.4mm
Duct Type	HDPE: Coiled approx 3.5m coil diameter
Duct Wall Thickness	8.5mm
Duct Rating	Heavy duty per EN 50086 – 2 Specification
uPVC Quality	100% Virgin Material
Duct Colour – Outside	Red – BS Type 5252 04E53 –04E56 Minimum 1mm thickness of colour material if dual layer extrusion
Duct Deformation Requirement	Must pass EN50086 – 2 <5% deformation requirement for 750N loading on 200mm sample
Impact Resistance	Per 50086 – 2; 12 samples. 7.5kg striker: Minimum fall height of 2Mts:>150 Joules – no crack in at least 9 samples
Duct Minimum Wall Thickness	The larger of the two criteria below: Wall thickness to pass 5% deformation / impact requirement above & ESB Networks minimum wall thickness of 8.5mm (existing stock 8.5 mm required from year 2004 onwards as soon as existing stock is used up)
Duct End	Ends of each length bevelled to allow easy jointing of duct on site, minimum thickness of plain end to be 2.4mm, bevel length ≥ 5mm
Circumferential Mark On pipe end for correct push-in distance	Circumferential ring mark required to indicate Correct push in distance for duct jointing Location: to match half long coupler length less half coupler centre stop thickness
Duct Ovality	2.00mm. max.
Duct Inner Surface	Smooth low friction surface completely free of ripples, sharp edges & protrusions. Friction coefficient <0.28
Duct Marking Legend Content: Repetition Rate/Gap between Legend	**"Danger Electricity Cables"** 150mm max. gap between adjoining legends.
Colour of Legend	Black
Size of Legend Lettering	3 X 20mm height i.e. 3 lines of 20mm height @ 120° apart.
Batch No., Manufacturers Name AND Date of Manufacture	Letter sizing should not be less than 6mm.
Red Colour Fastness	1 year minimum required so as to provide 12 month storage period 1 year outdoor weathering test required or suitable accelerated colourfastness test to prove that duct meets Specification
Endcaps for Ducting	Endcaps to be supplied on both ends of coil
Couplers	Slip or rubber gasket type with no internal obstructions/sharp edges .A Centring ridge is required which does not protrude above the duct wall. The coupler must effectively seal out water over the 40 year lifetime of the installation even at bend positions when buried 3 m below groundwater level

Appendix 3. 10-20kV Clearances

ESB Cable Type	Clearance From	Minimum Clearance for General Parallel Run	Minimum Clearance at Networks Pinch Points and Crossings
MV & LV Mains	Gas Water Sewerage Telecoms including Fibre Optic Cable	300mm lateral clearance ESB cables must not be laid above parallel runs of other services.	100mm minimum, but in this case, concrete slabs or bricks bedded in sand must be placed between the electricity cables/ducts and the conflicting service. ESB to cross underneath except where necessary due to of depth of other service. Whenever possible cross at right angles to minimise extent of areas of close proximity to other service. Place red strip accurately over ESB ducts.
MV & LV Mains	Large infrastructure e.g. large high pressure gas mains, large main drainage sewers and large high pressure waterpipes (where cabling is done in conjunction with or subsequent to such works).	600mm lateral clearance is recommended. Actual clearance should be agreed in writing.	100mm minimum, but in this case, concrete slabs or bricks bedded in sand must be placed between the electricity cables/ducts and the conflicting service. ESB to cross above except where necessary due to of depth of other service. Whenever possible cross at right angles to minimise extent of areas of close proximity to other service. Place red strip accurately over ESB ducts.
MV & LV Mains	HV cables i.e. 38kV, 110kV & 220kV cables.	Minimum clearance is dictated by risks of considerable derating of both MV/LV and HV cables. Minimum clearance for avoiding derating should be 2m or more. If less than 2m then for 38kV and 110kV cables consult Underground Networks Section, AM. For Eirgrid cable consult the Transmission System Operator.	For parallel runs: If clearance is less than 2m for more than 2m length of parallel run, then for 38/110kV cables, see Section 3.3 of this manual or consult, ESBN representative. For crossings: Maintain **200mm** min. vertical clearance. Consult the Sections listed above if the number of MV cables exceeds two cables. See Section 3..3.12
MV & LV Mains	MV & LV Mains Cable	**Case 1: In Same Trench** **75mm min.** separation, both horizontally and vertically, edge to edge between adjacent ducts if there are **not** more than 2 layers of ducts with max. of 2 ducts per layer ***OR*** if the number of ducts **exceeds two** in any horizontal layer, minimum. separation both horizontally and vertically edge to edge must be **150mm** **Case 2: New Trench** If new trench is being dug parallel to existing cables min separation should be **150mm**. This requires use of a "Safe System of Work for Digging". Risk of collapse of existing trench must be considered and protected against as necessary in each case. See Section 1.4.7. & Section 1.4.8.7 for protection of any exposed cables/ducts.	

Appendix 4. 10-20kV Ducting & Cable installation (+ Fibre Cable)

The following flow chart is the project process for a non-contestable 10-20kV & communication ducting and cables. This process is aimed at how ESB Networks and the IPP interact and the roles ESB Networks have.



Cable Installation

Appendix 5. Quick Reference Guide

Quick Reference Guide for 10/20kV Ducting

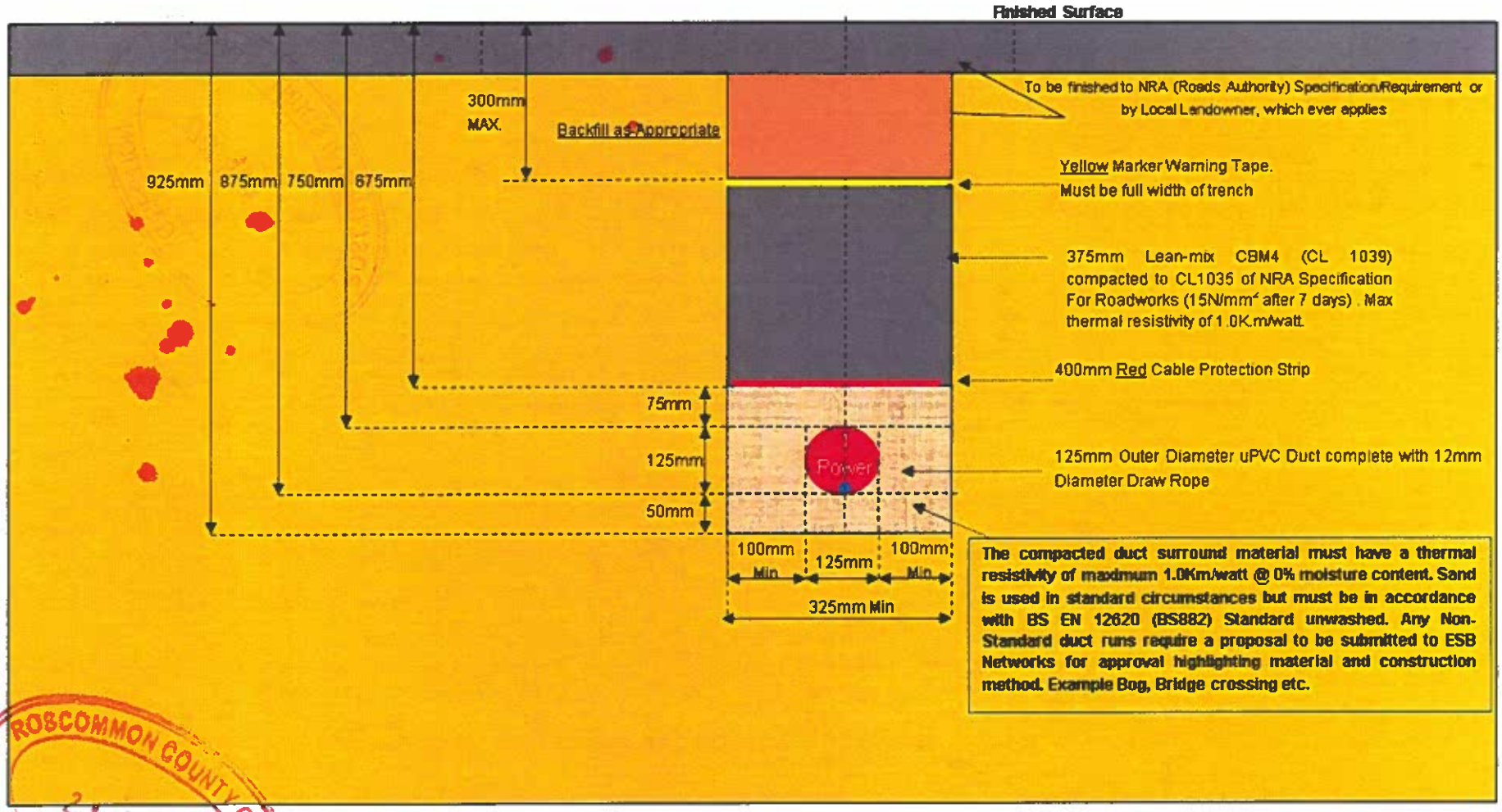
This document is only a quick reference guide and it must be read in conjunction with ESB Networks 'Specification for the Installation of MV Ducts'.

Link for approved suppliers

http://www.esb.ie/esbnetworks/en/download_documents/builders_developers/approved_material.jsp

1.0: Trench Layout 10/20kV Ducting – **One Power Duct** (Roadway)

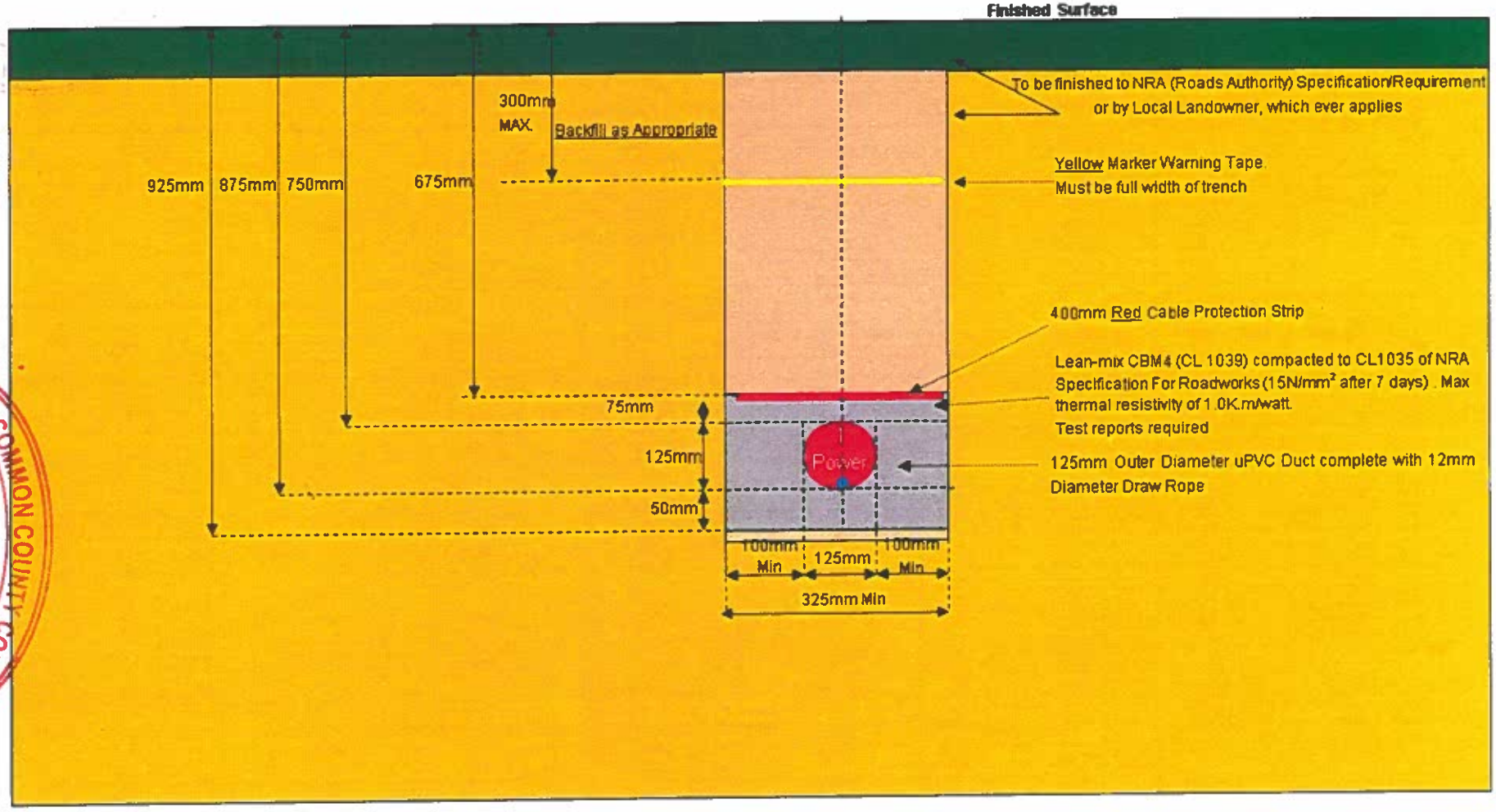
Drawing Not To Scale



1.1: Trench Layout 10/20kV Ducting – **One Power Duct** (Grassed Area)

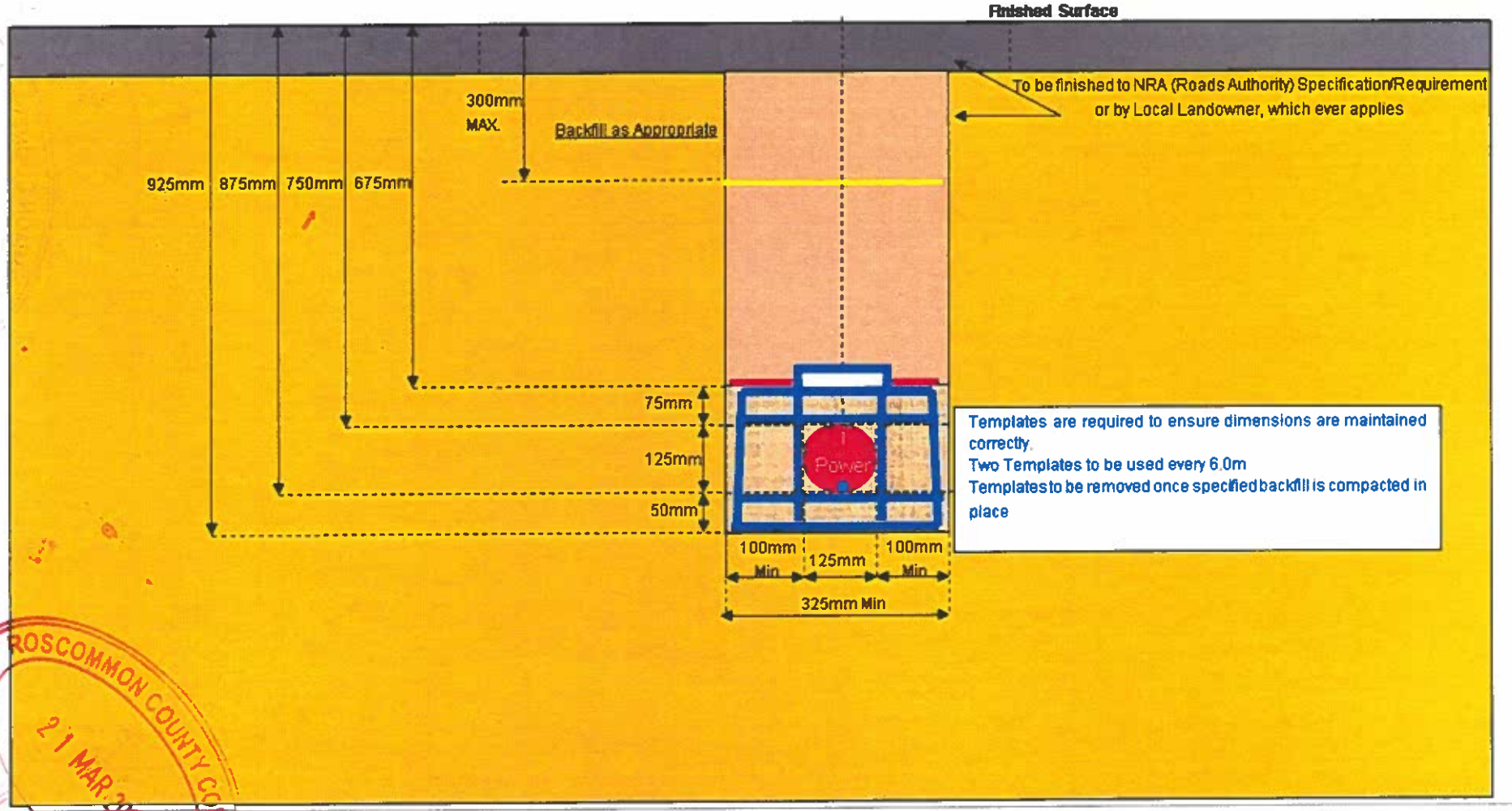
Permanent Reinstatement in Private Property, Public Open Space Grassed Areas , Grass Verges, Medians and other Grassed Areas

Drawing Not To Scale



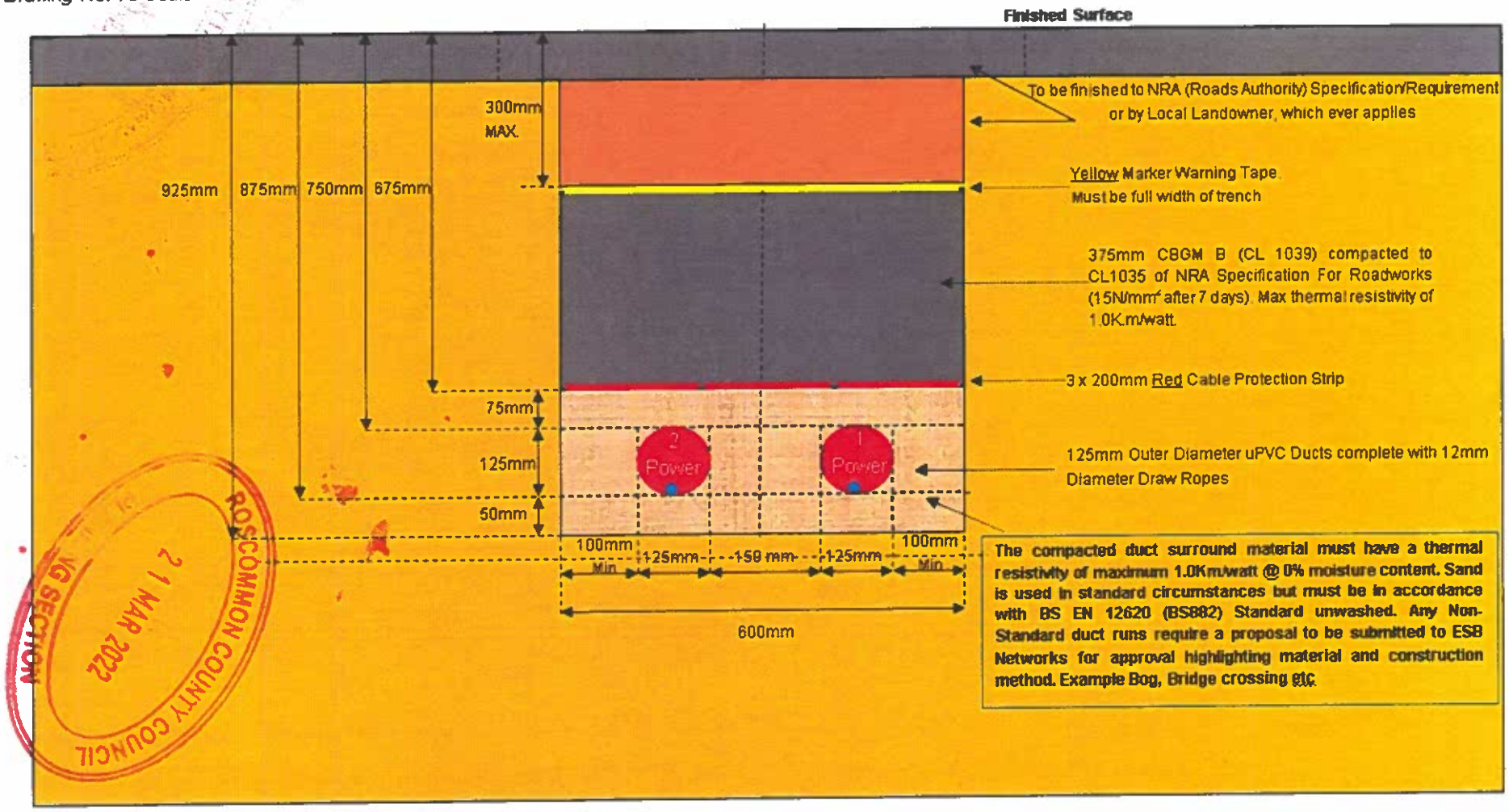
1.2: Trench Layout 10/20kV Ducting – **One Power Duct** (Template)

Drawing Not To Scale



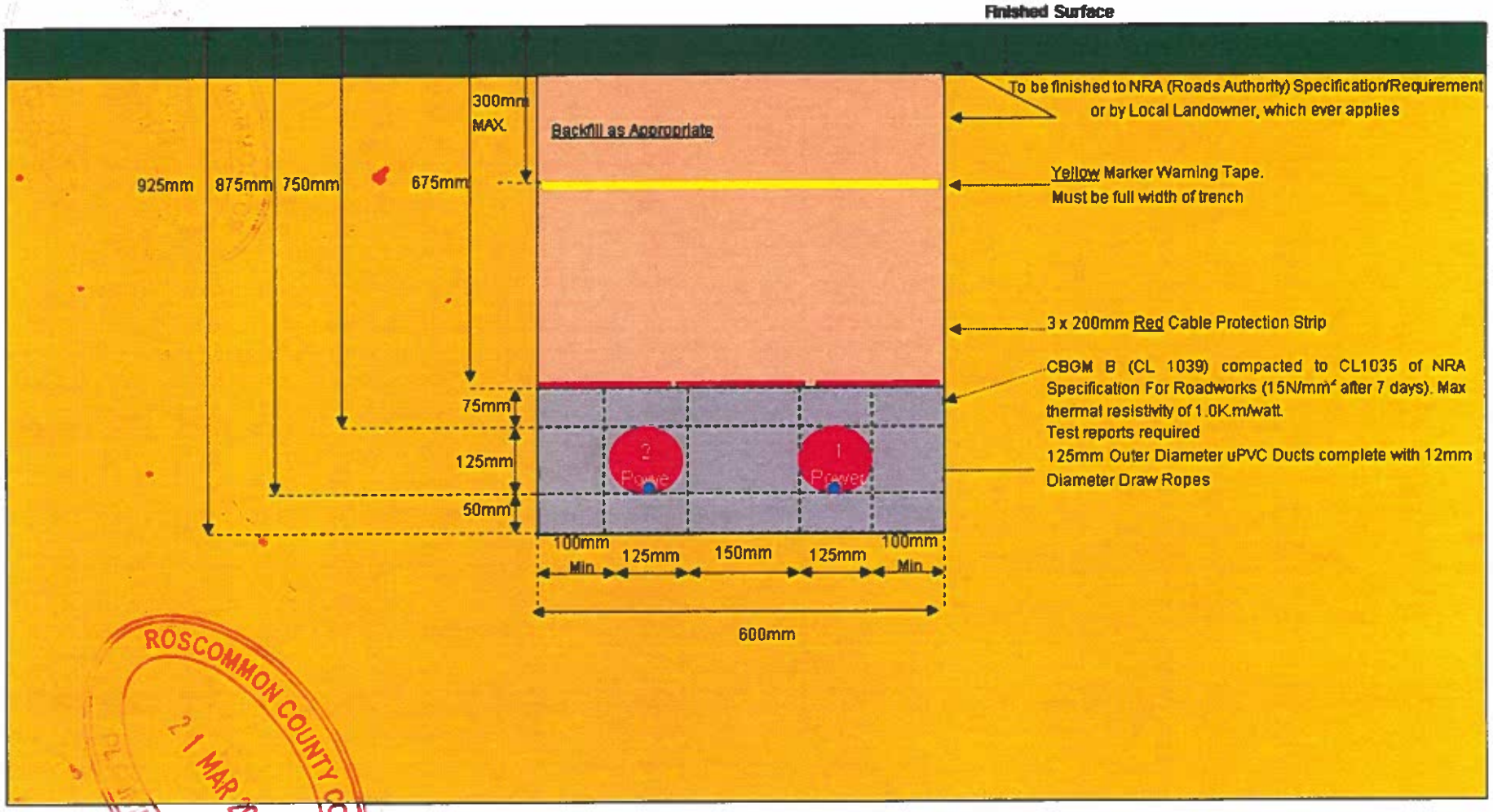
1.3: Trench Layout 10/20kV Ducting – **2 Power Ducts** (Roadway)

Drawing Not To Scale



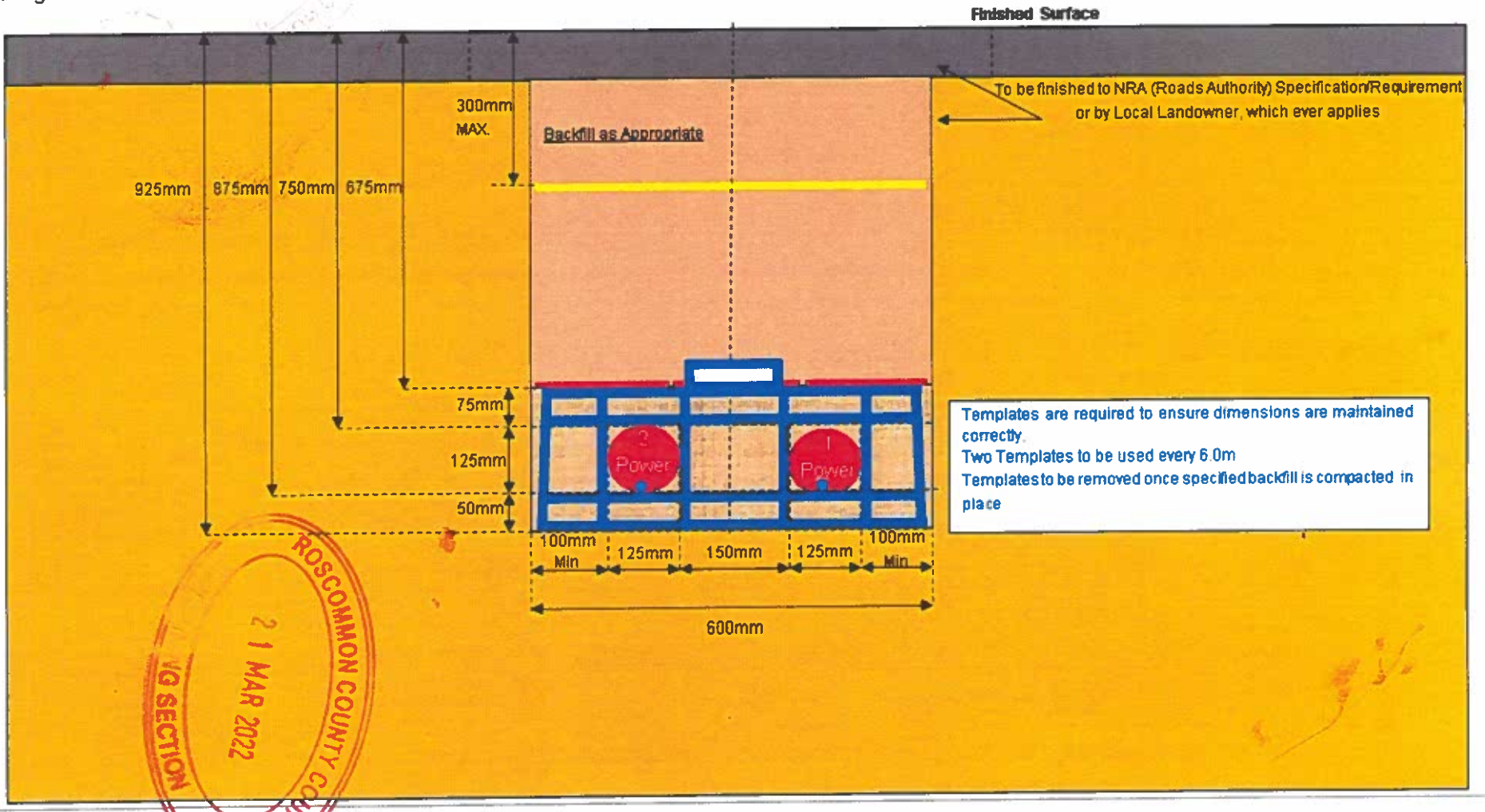
1.4: Trench Layout 10/20kV Ducting – **2 Power Ducts** (Grassed Area)

Drawing Not To Scale ***Permanent Reinstatement in Private Property, Public Open Space Grassed Areas , Grass Verges, Medians and other Grassed Areas***



1.5: Trench Layout 10/20kV Ducting – **2 Power Ducts** (Template)

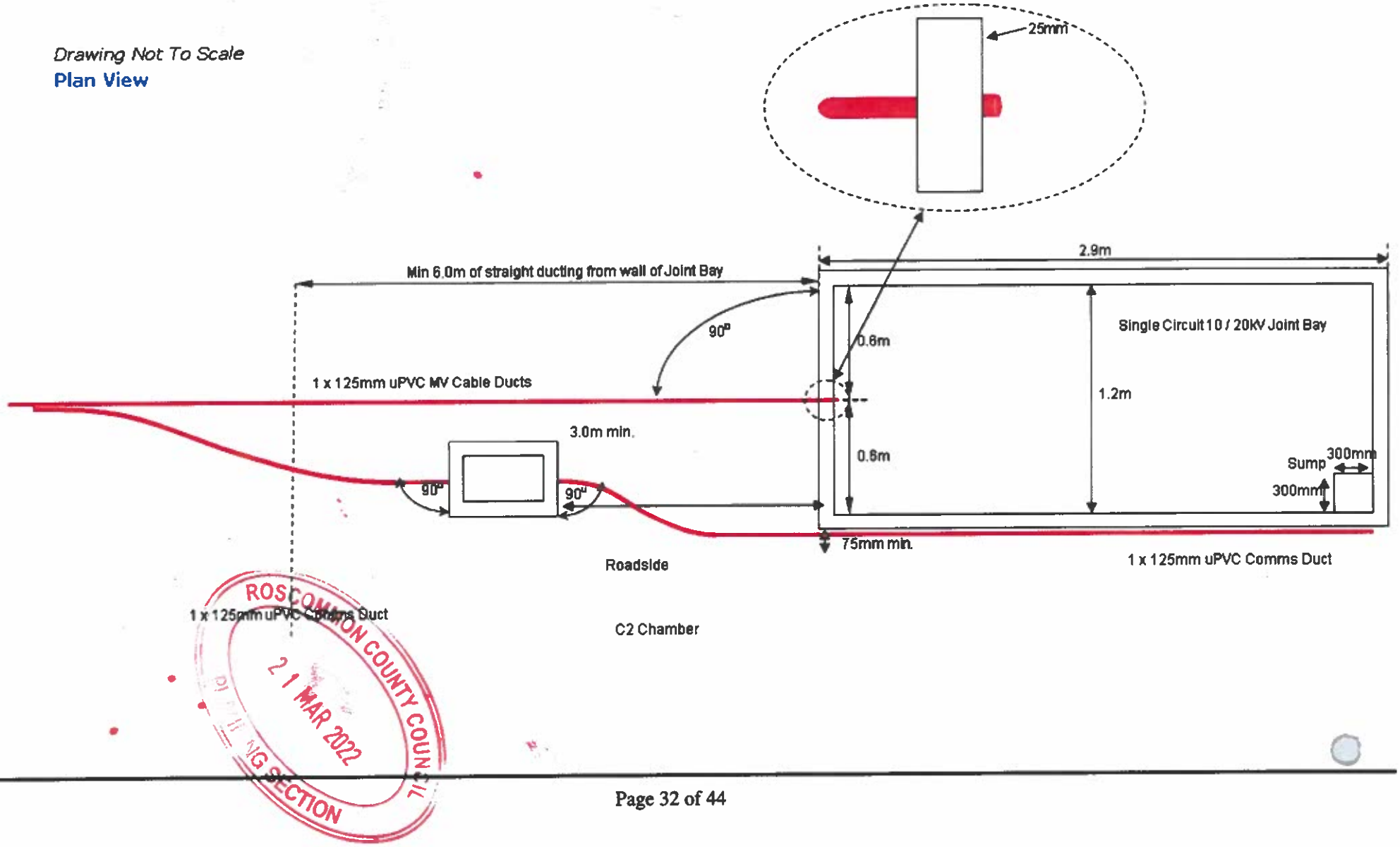
Drawing Not To Scale



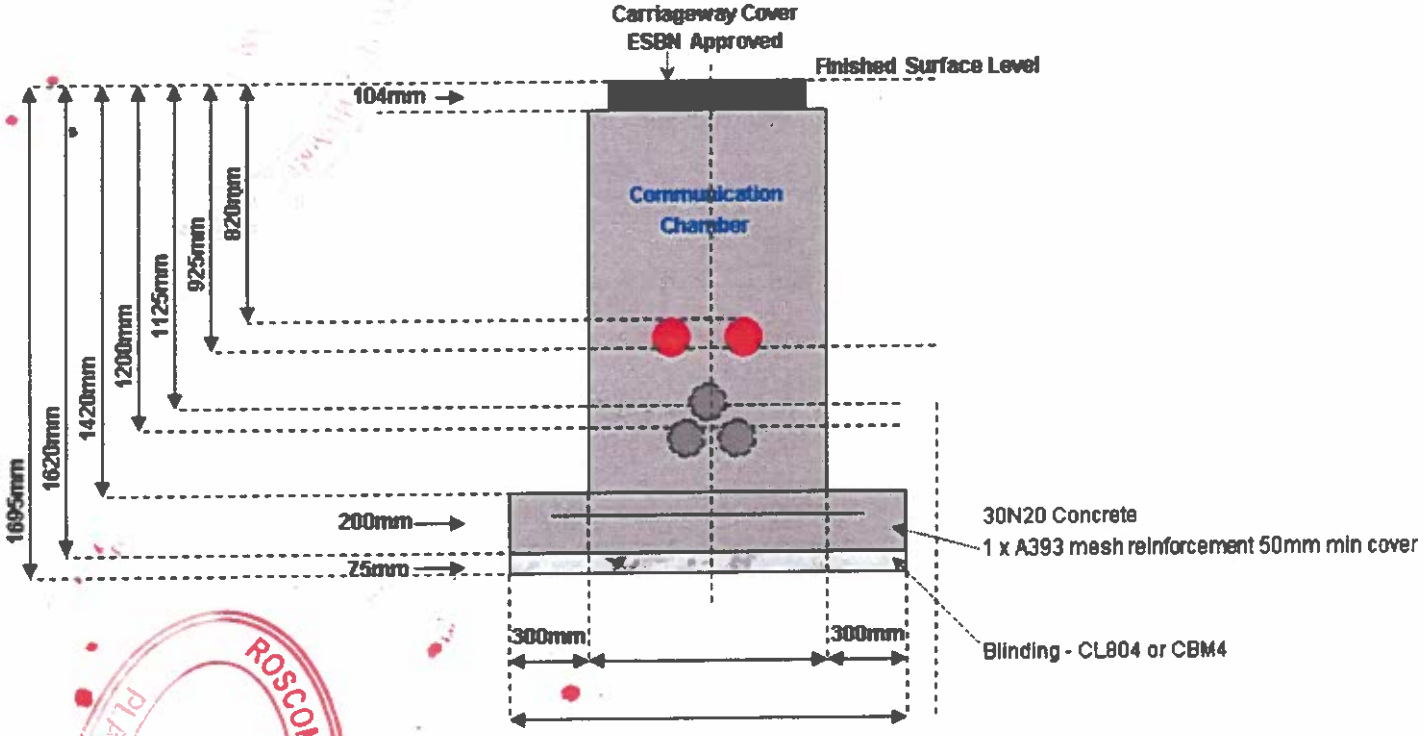
1.6: Joint Bay Layout 10/20kV Ducting – **One Power Duct**

Drawing Not To Scale

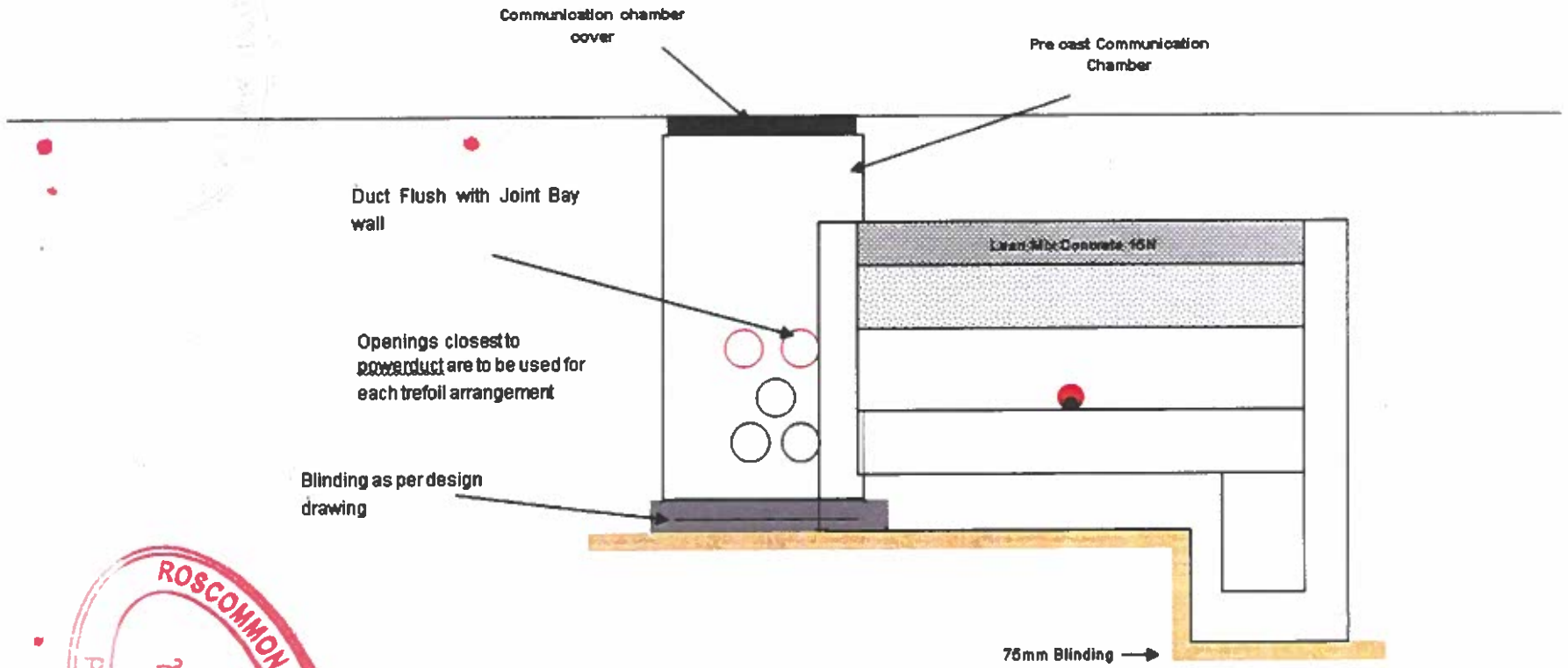
Plan View



1.7: Joint Bay Layout 10/20kV Ducting – **Communication Chamber**

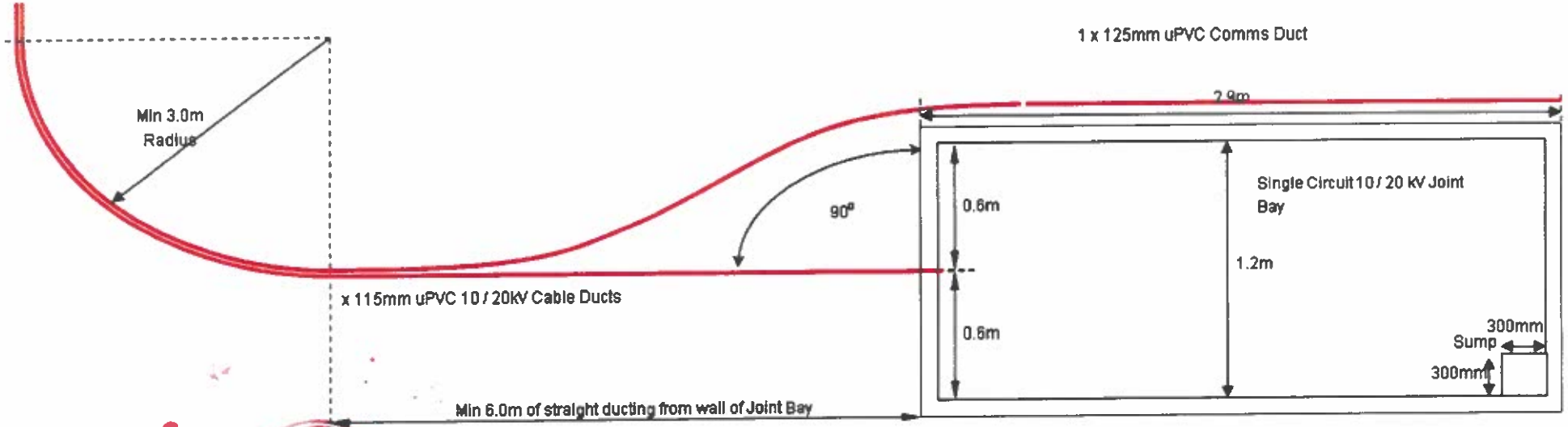


1.8: Joint Bay Layout 10/20kV Ducting – **One Power Duct**



1.9: Joint Bay Layout 10/20kV Ducting – **One Power Duct**

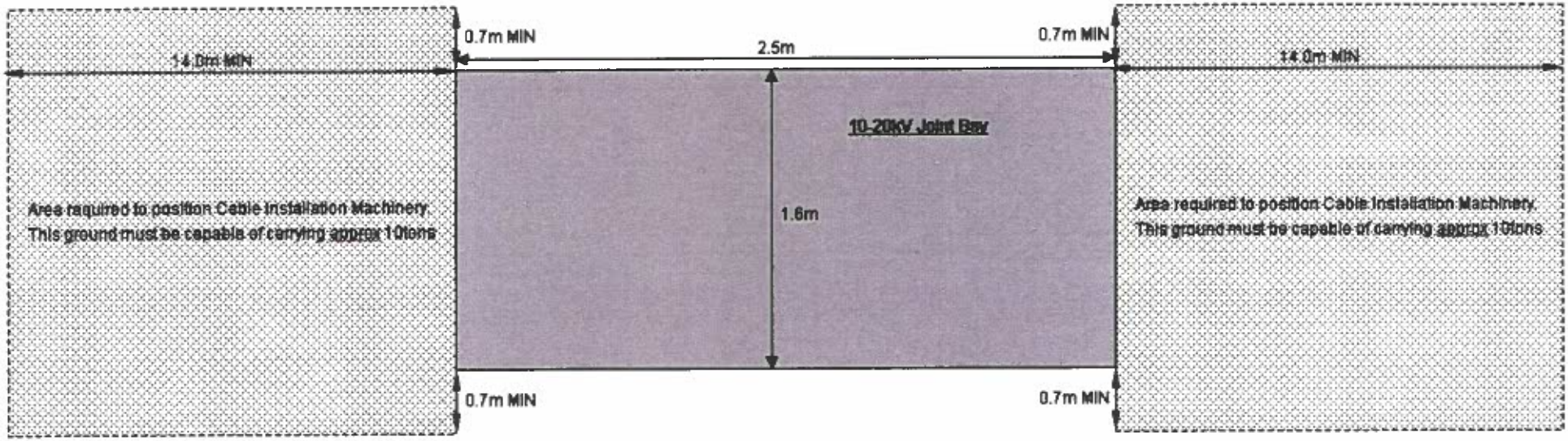
Drawing Not To Scale



1.10: Required Ground & Surface for MV Cable Installation

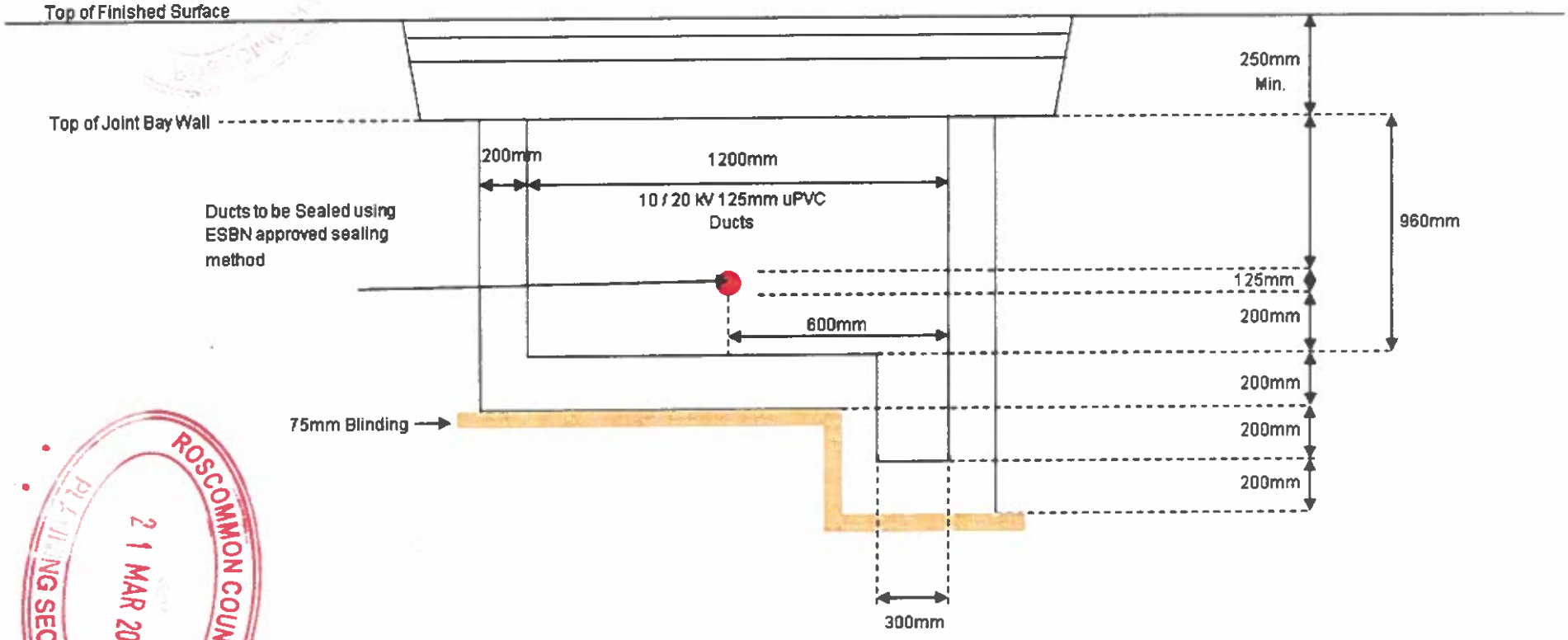
Drawing Not To Scale

Please note that this temporary surface 'Area' either side of the Joint Bays, strengthened to carry cable laying machinery , shown in plan elevation below , may need to be removed /replanted reinstated after cable installation, this must be assessed on a case by case basis



1.11 10 / 20 kV Single Circuit Joint Bay

End View Drawing Not To Scale

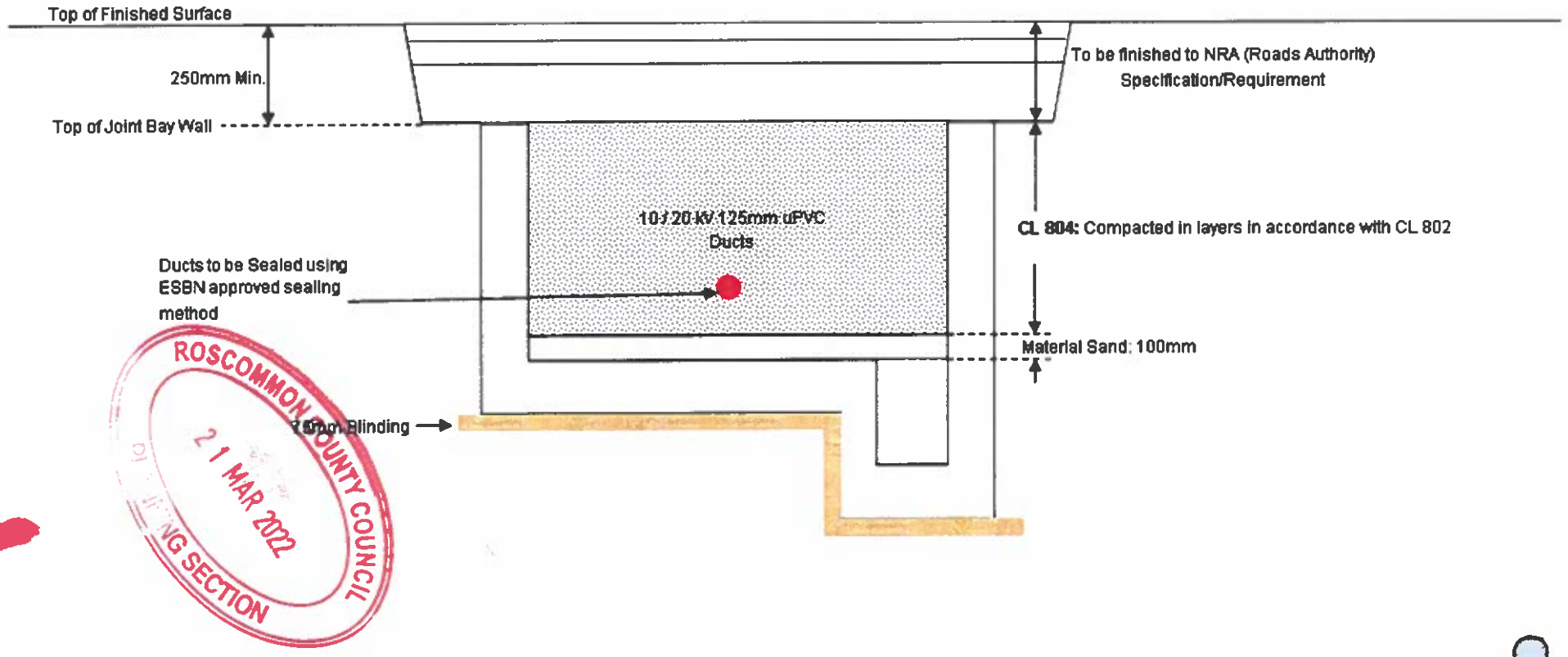


1.12 : 10 / 20 kV Single Circuit Joint Bay

Backfilling of Joint Bay with no 10 / 20 kV Power Cables in place

ESB Networks require a copy of the agreement between the IPP and the Roads Authority stating how the road is to be completed.

Drawing Not To Scale

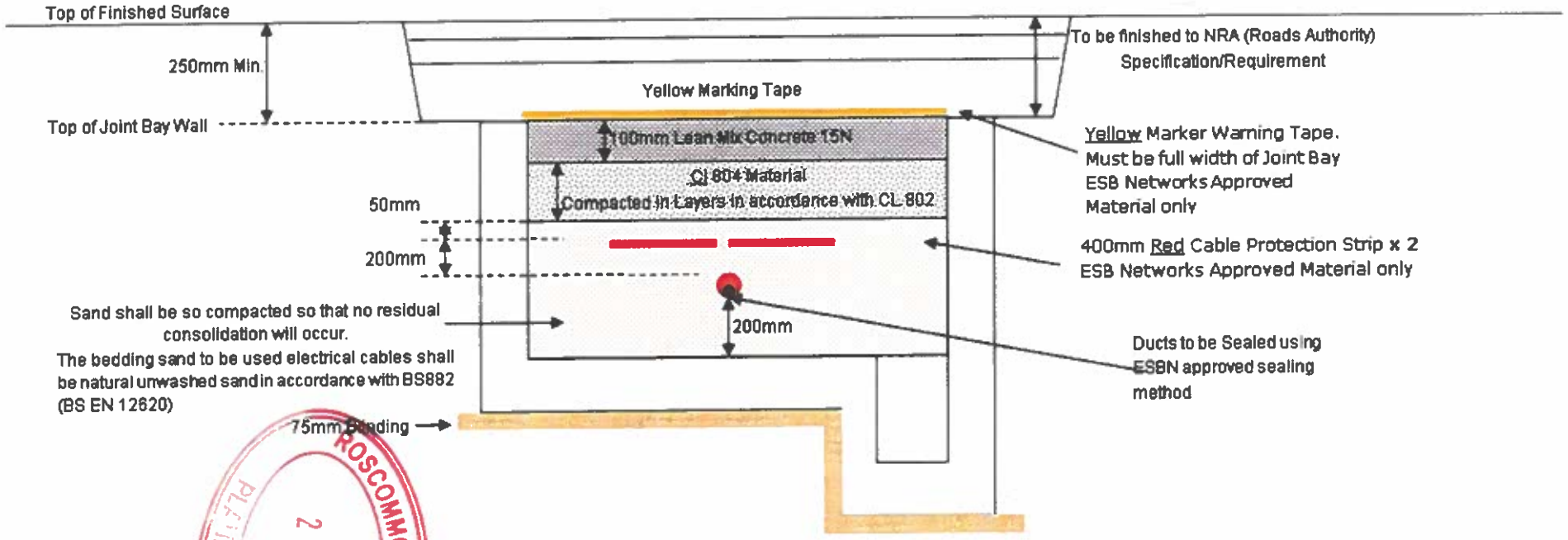


1.13: 38kV Single Circuit Joint Bay

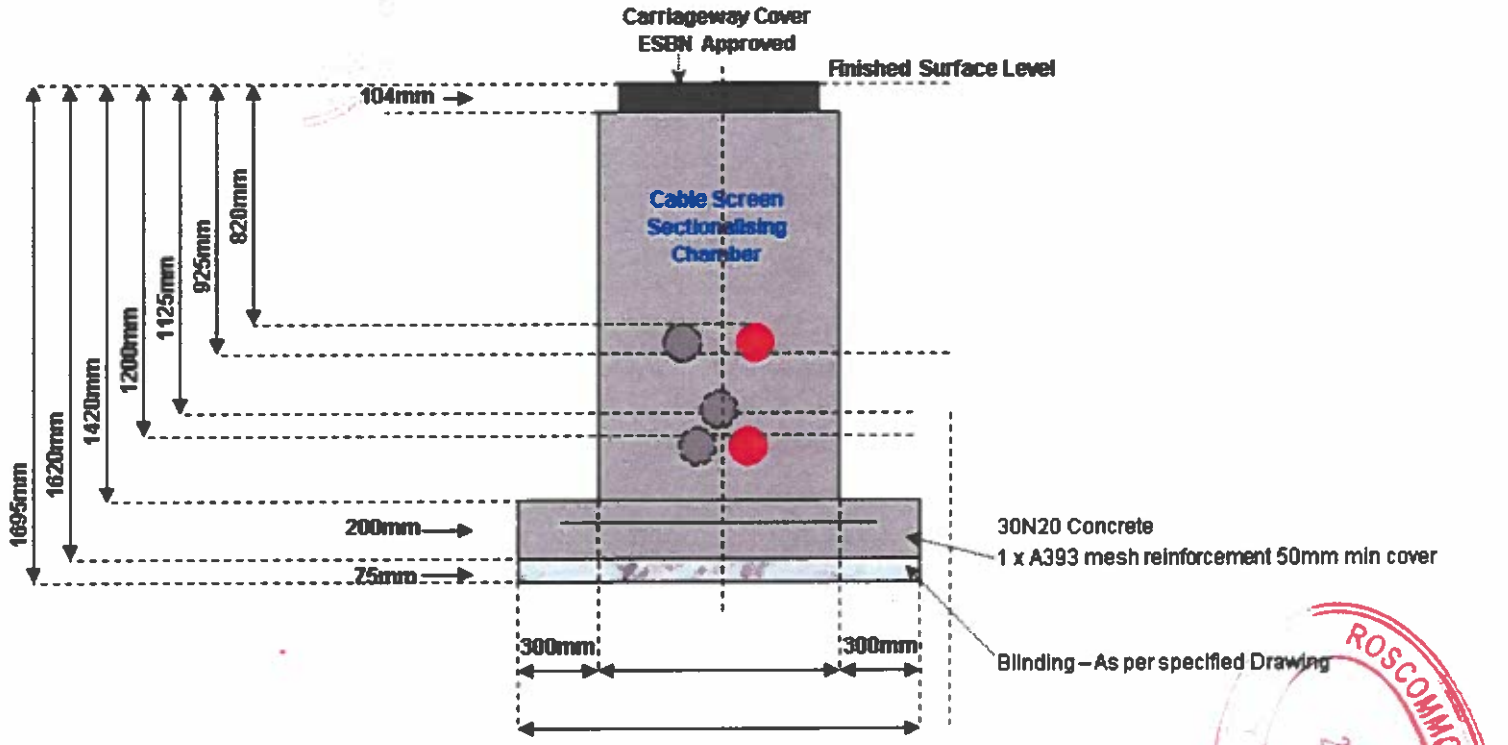
Backfilling of Joint Bay with 10 / 20 kV Power cables in place

ESB Networks require a copy of the agreement between the IPP and the Roads Authority stating how the road is to be completed.

Joint Bay End view Drawing Not To Scale



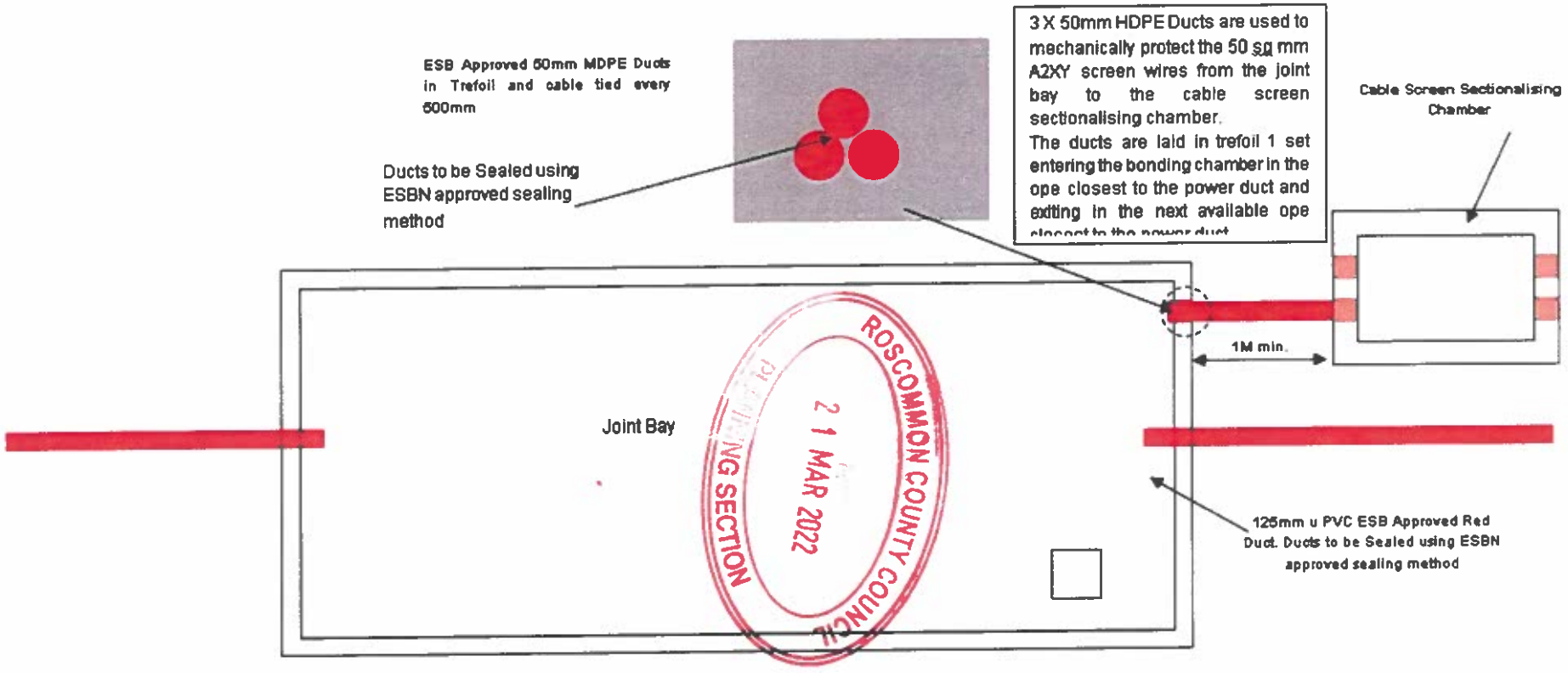
1.14: Joint Bay Layout 10/20kV Ducting – **Cable Screen Sectionalising Chamber**



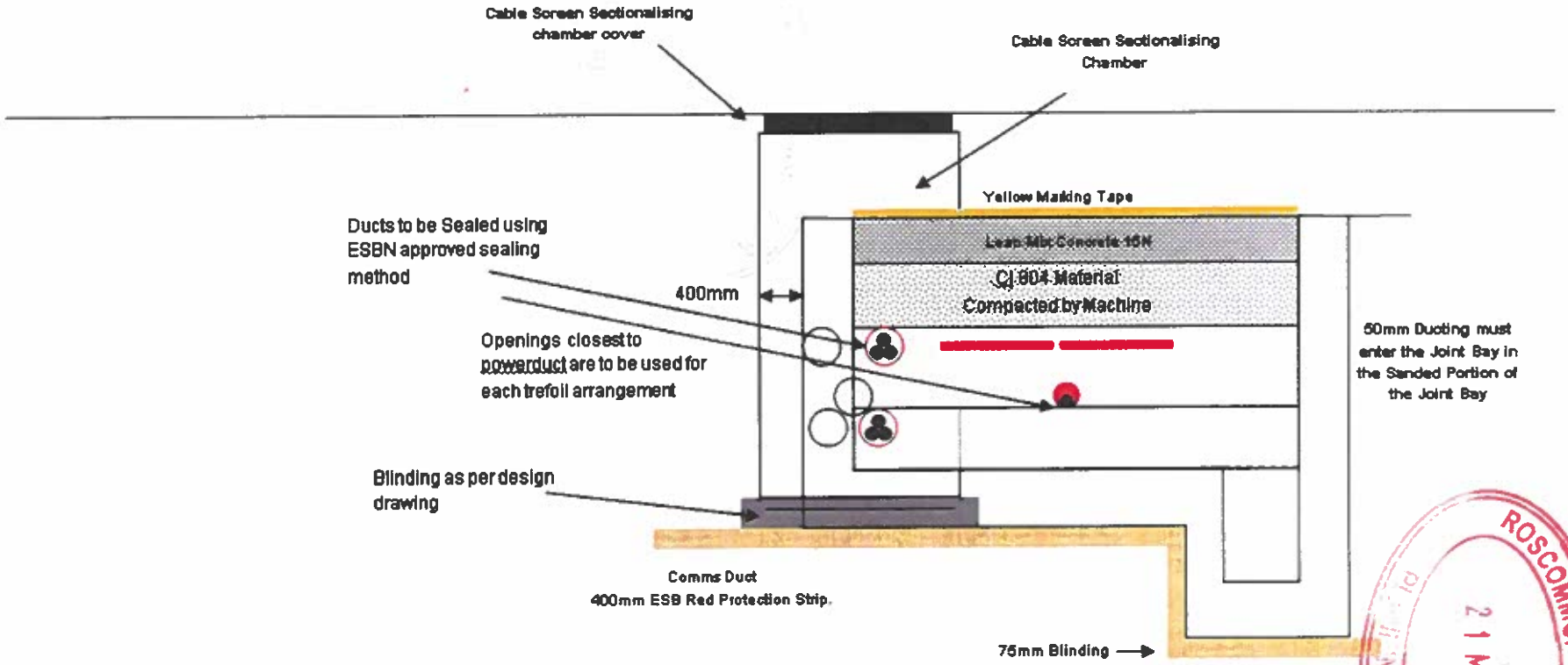
1.15: Cable Screen Sectionalising Chamber Layout 10/20kV Ducting – **One Power Duct**

Drawing Not To Scale

Plan View Joint Bay



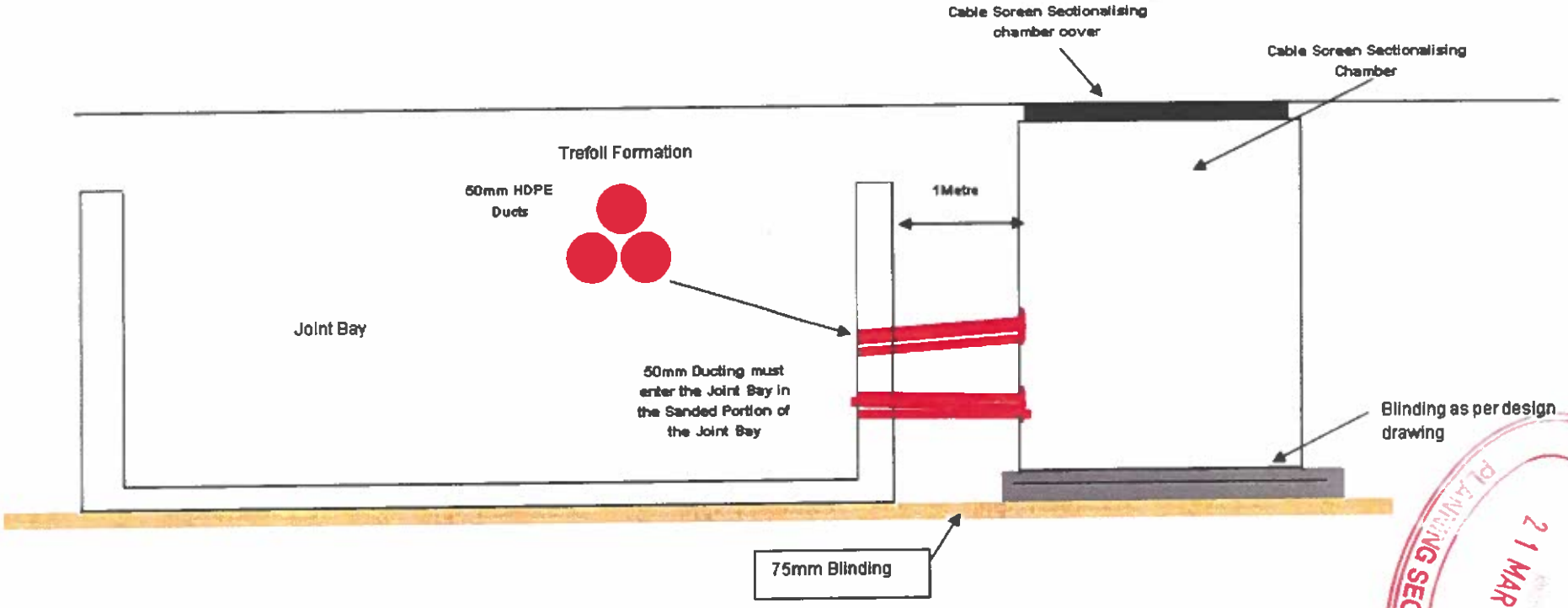
1.16: Joint Bay and Cable Screen Sectionalising Chamber



1.17: Joint Bay and Cable Screen Sectionalising Chamber

Drawing Not To Scale

Side View

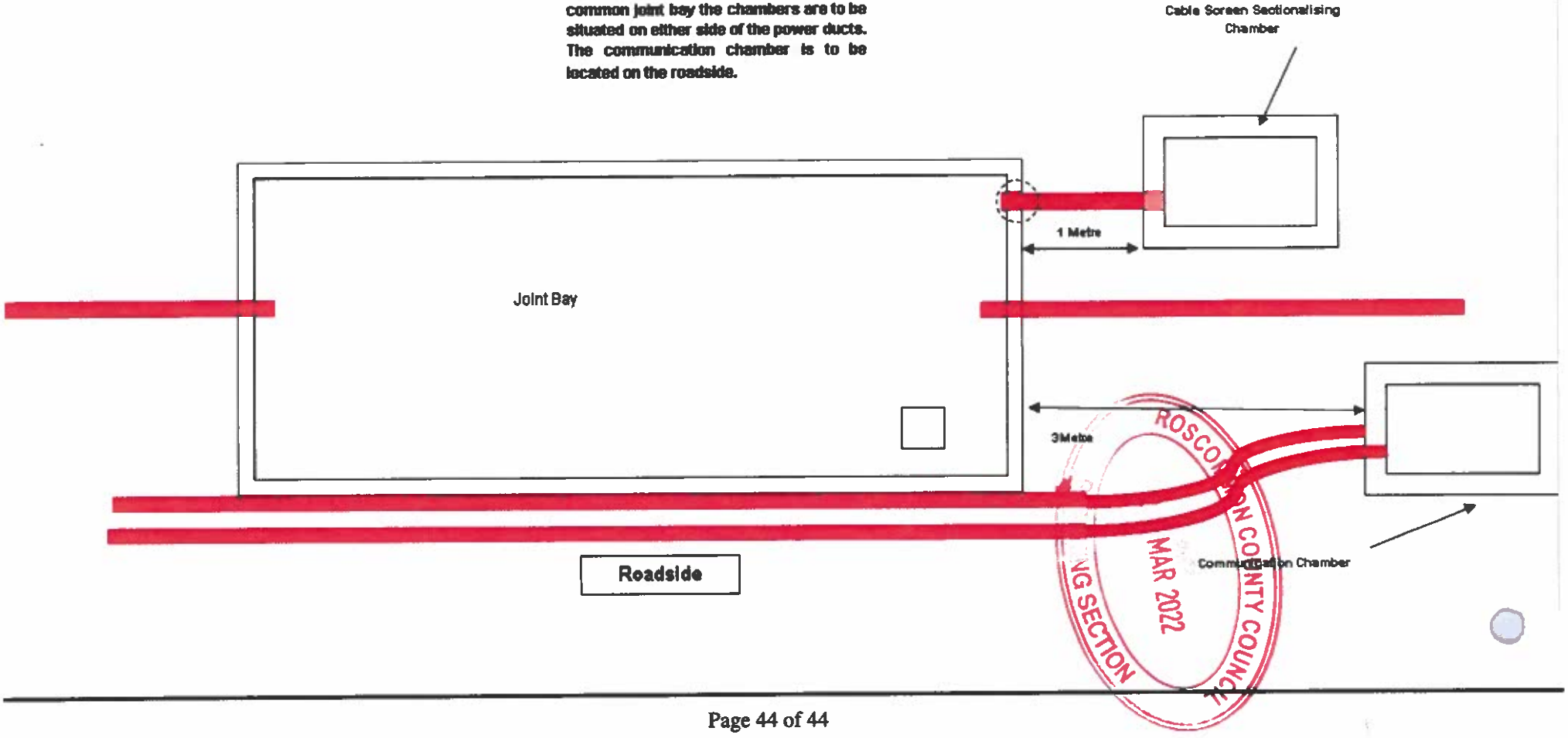


1.18: Joint Bay: Cable Screen Sectionalising Chamber and Communication Chamber

Drawing Not To Scale

Plan View

When a communications cable chamber and a Cable screen sectionalising chamber are to be constructed at a common joint bay the chambers are to be situated on either side of the power ducts. The communication chamber is to be located on the roadside.



NETWORKS

Specification Number:	**18153**
Title:	**Functional Specification for the Installation of 20KV Underground Power Cables for Contestable Projects**
Revision Number:	**0**
Issue Date:	**December 2013**
Latest Review Date:	**December 2018**

(ESB Specifications are subject to change, this specification version shall only be used for the purpose/project for which it was issued by ESB to you)

Approved for Issue: **Specifications Manager**
ESB Networks

History of Revisions

Rev No	Date	Revision Content
0	2013	New Document

Note:

This specification will be reviewed at minimum before the Latest Review Date, but may also be reviewed in the interim. Consequently the "Latest Review Date" does not indicate that this particular version of the Specification is current. Accordingly, only the version of the specification issued by ESB to the user for the particular purpose/project should be used.

ESB Technical Specification Approval

Title	**Functional Specification for the Installation of 20kV Underground Power Cables for Contestable Projects**
Specification revision number & date	Doculive Spec. No. : 18153 Rev: 0 Date: December 2013 Consultant Reference No.: PG___-____-___-___ Rev: Date:
Produced by:	ESB Networks
Contract Conditions Reviewed:	

Eirgrid

Department: N/A

Accepted::

Date:

ROSCOMMON COUNTY COUNCIL
21 MAR 2022
PLANNING SECTION

ESB Networks:

Department:	**Asset Management**
Approved :	**Asset Manager, Underground Networks**
Date:	**December 2013**

Table of Contents

1.0 Scope

This document specifies the requirements for the supply, installation, jointing, testing and commissioning of **20kV Underground Power Cables and Accessories and Associated Communications Cables** in fully ducted systems for connection to the ESB Networks Distribution System.

The materials used and construction methods employed shall comply with the requirements of

1. This specification and also
2. Specification Number 18149 – General Specification for Contestably Built Underground Networks
3. Specification Number 18152 – Functional Specification for the Installation of Ducts and Ancillary Structures for 20kV Underground Power Cables and Associated Communications Cables for Contestable Projects
4. The individual ESB Networks **material** Specifications for ducting and cable materials and components and all ancillary structures

2.0 Design Review

Details of the proposed cable and associated jointing, termination and installation materials shall be submitted to ESB Networks for review.

3.0 Materials

The materials supplied and used shall comply with the following ESB Materials Specifications:

Spec Number	Material
16112	Lubricant for pulling Cable into Ducts
16120	Supply and Delivery of 52kV, 24kV and LV Polymeric Insulation Cable
16140	Link and Lug Connectors for 40kV, 20kV, 10kV and LV Underground Cables
16379	MV Heatshrink, Coldshrink and Premoulded Cable Accessories

4.0 Cable Handling

Care and attention is required in this area as any mishandling of cable drums could lead to damage of cable and injury to installers or members of the public. Proper practices of transportation, loading, unloading and storage on site shall be used.

4.1 *Transportation*

Drums shall be delivered to site by a drum trailer or on a truck fitted with a hydraulic crane.

4.2 *Loading / Unloading*

To avoid serious injury to personnel and damage to cable drums, an appropriately sized axle shall be used for lifting along with a spreader bar to prevent the lifting chains damaging the drum and crushing the cable. Appropriately rated proprietary lifting hooks that fit into and lock onto the axle hole can also be used. The chains and all associated lifting equipment shall be rated to lift the gross weight of the drums, with an appropriate factor of safety.

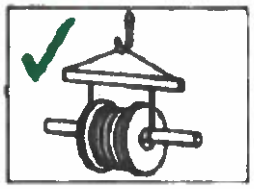


Figure 1 Drum trailer axle and spreader bar for safe damage free cable drum lifting.

4.3 Storage

All cable ends shall be sealed to stop the ingress of water and future deterioration of cable. Cables drums shall be stored on hard even surfaces to prevent the flanges from sinking into the ground, thereby causing all the drum weight to rest on the cable with resultant damage due to cable compression and penetration by sharp objects.

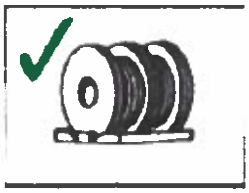


Figure 2 Storage of cables.

4.4 Pre Pulling Inspection

Prior to cable pulling the complete outer coils of the cable shall be inspected for any mechanical damage by rotating the drum and visually observing for any bumps/perforations or any other sign of damage. All damaged sections found shall be cut off and scrapped. This inspection shall take place for all cable drums before cable is pulled in. This measure will reduce the incidence of sheath faults which can be very costly and time consuming to locate and rectify at a later stage when the cable is installed along the ducted route.

5.0 Cable Installation

5.1 Cleaning and Proving and Pre-Lubrication of Ducts

Each duct shall be cleaned and proven prior to pulling in the cable winch rope by pulling the appropriate size of ESB Networks approved duct brush and mandrel through each duct. The direction of duct cleaning and duct proving shall be in the direction of the planned cable pull.

Following the cleaning and proving of the entire duct run, all power ducts shall be pre-lubricated during the operation of pulling back of the winch rope from the winch end. The lubricant (recommended quantity 10 litres per 100m of duct or as recommended by the manufacturer) shall be placed in the duct at the winch end and a suitably robust sponge securely attached to the winch rope to spread the lubricant uniformly over the entire length of the duct.

Duct Cleaning – Use of Approved Brushes

Only approved brushes, with the ESB Networks material code specified below, shall be used to ensure that any dirt or debris within ducts is transported out of the ducts rather than being merely loosened up and left within the duct. The approved suppliers of the brushes for normal and directional drilling 125mm O.D size duct are given on the ESB website.

Brushes shall be cleaned regularly using a powered water hose.

Duct Proving – Mandrel

Duct proving shall be achieved by pulling a mandrel through the duct in the direction of the planned cable pull. The proving equipment shall conform to the details and dimensions in the table below:

Type and Size of Duct	Mandrel ESBN Material code	Brush ESBN Material code	Sonde	Sponge Diameter and Length 300mm
125mm uPVC SDR 17.6 For normal trenching	8783229	8783254	required	125mm
125mm HDPE for SDR 11.0 for Directional Drilling	8783228	8783250	required	125mm

All new mandrels shall be stamped with their size and the corresponding duct size to which they are applicable.

Duct Sponge

A sponge shall be used to remove excess water and pre-lubricate the duct prior to cable pulling.

Duct Proving – General

ESB Networks reserves the right to witness the duct proving tests.

ESB Networks approved duct brushes, mandrels and sponges are designed to provide thorough cleaning of the duct and a tight fit. The minimum rope size used shall be 12mm polypropylene. Cleaning and proving shall be carried out using a winch which has a calibrated dynamometer and printout. Pulling tension shall not exceed 1 Ton (10kN). The results shall be submitted to ESB Networks for review, using the Duct proving Sheet.

Following the duct proving process, approved waterproof rubber bungs shall be fitted to prevent ingress of water, sand or other debris getting into them. The ducts shall then be left roped in preparation for cable pulling.

Use of a Transmitter (Sonde)

A Sonde shall be connected close to the mandrel or brush to help locate a blockage quickly. It can be purchased for specific use with a C.A.T. or other precise cable location instruments, equipped with a Sonde detector.

Duct Lubrication Materials

Only ESB Networks approved lubricants which are proven not to damage the cable insulations semi-conductive layers and outer sheath shall be used. Petroleum based oils or greases shall not be used for power cables.

The list of approved suppliers for the above items is available from the following ESB Networks web site address:

http://www.esb.ie/esbnetworks/en/download_documents/builders_developers/approved_material.jsp

5.2 Cleanliness

All Joint Bays and Lubrication points shall be free from stones sand, grit, etc.

5.3 Duct Lubrication During Cable Pulling

Ducts and cables shall be thoroughly lubricated for all cable pulls.

ESB Networks approved Lubricant shall be used at a rate of 20 litres per 100 metres of duct as follows:

1. Pre lubricate ducts with 10 litres per 100m from winch end as mentioned in Section 5.1
2. Apply additional lubricant at a rate of 10 litres per 100 metres run at duct entry and,
3. Insert 20 litres of lubricant in advance of all major bends .

Lubrication points shall be installed in cable runs in close proximity to areas of high bend concentration. Optimised positions shall be chosen, e.g. on the crest of steep incline for maximum lubricant dispersion on the route. Lubrication points shall be properly sealed after the cable is pulled in.

Where the manufacturer of the cable recommends an alternative and specific cable pulling lubricant, such lubricant shall not be used without the prior agreement of ESB Networks.

5.4 Supervision

The cable installation works shall be continuously supervised by competent persons. Quality control checks shall be carried out throughout the cable pulling and jointing phases in addition to the pre commissioning checks.

5.5 *Cable Installation into Ducts*

The following equipment shall be used for the installation of cable into ducting

- Bell mouth installed for entry and exit positions
- Rollers to support cable entering and exiting duct
- The following as specified by the cable manufacturer

  - Cable pulling stocking

  - Cable pulling eye
- Swivel with torque relief
- Winch with force measurement facility and print out facility
- Mandrel
- Brush
- Sponge
- Sonde

Cable rollers shall be used at duct entry and exit positions to guide the cable from the drum into the duct and to prevent abrasion/ripping of the cable via contact with the trench bottom and sides and also to prevent the cable picking up debris before entry into the duct.

Appendix 1 details the set up for cable pulling.

5.6 *Cable Pulling*

Cable pulling shall be preceded by calculation of the pulling and sidewall forces for each cable pulling section based on the as laid duct installation. When bends are present in a duct run, the cable drum shall be positioned at the end closest to where most of the bends lay and the winch shall be positioned at the end furthest from the bends.

This method reduces

- The tensile and side wall forces on the cable.
- The likelihood of the winch rope sawing through or burning through the ducts at bend positions.
- The pulling forces and wear and tear on the winch and the winch rope.

See Appendix 3 for details on drum and winch set up on a route with a high bend concentration.

Cable pulling tensions shall be monitored and recorded during installation. The values obtained form the winch printout shall be attached to the Cable

Installation Certificate and electronically presented to ESBN representative. The values shall also be within the cable manufacturers specification.

All cables shall be sealed and adequately supported after cable pulling.

5.7 Cable Jointing

Cable jointing shall be carried out by suitably trained and experienced cable jointers and in accordance with manufacturers instructions. Experience and training records for proposed cable jointing personnel shall be submitted to ESB Networks for review.

5.7.1 Phase Sectionalising Joint

Phase sectionalising joints shall be installed at joint bays to facilitate cable joint dismantling and reassembly at joint bays which are no greater than 2km apart.

5.7.2 Cable Sheath Sectionalising Joints

Cable sheath sectionalising joints shall be installed at joint bays to facilitate cable sheath testing at joint bays which are no greater than 1 km apart.

5.7.3 Sealing of cable ducts

Cable ducts shall be sealed using an ESB Networks approved method after completion of the cable joint. Details of the sealing method shall be submitted to ESB Networks for review.

5.7.4 Mechanical Protection of Overground Cables at Cable-end Pole Positions

All above ground cables shall be protected at cable end pole positions, by using two 1.75m galvanised steel cable guards, overlapped by 100mm, to give a protected height above ground of 3.3 m. The lower cable guard shall be embedded 100mm into the ground.

6.0 Cable Testing

All cables shall be electrically tested immediately after each pull is complete. All cables shall be tested again prior to any jointing activity to ensure that sheath fault location difficulties are minimised. Terminations shall not be connected to switchgear during tests.

The following list of tests shall be carried out after cable pulling and before and after cable jointing on each cable section:

1. Measure Insulation resistance, phase to screen and phase to phase
2. Check continuity of all phase and screen conductors
3. Check phasing of conductors
4. Check phase clearances and phase to earth clearances
5. Sheath test cables (A 5kV calibrated Insulation resistance test kit shall be used for this purpose)
6. Partial discharge test @1.7Uo at 50 Hz or 0.1Hz or other ESB Networks approved frequency and time duration. Partial discharge tests shall be carried out on the cable on jointed sections of length not exceeding 10kms. These tests shall be carried out in conjunction with ESB Networks prior to the commissioning of the completed cable circuit. Test result acceptability will be determined by ESB Networks.

If the sheath test results do not meet values in Appendix 5 Table 28 then jointing work of further sections shall not commence, based on results the cable shall be repaired or replaced and retested or passed by ESB Networks.

After each section of cable is jointed to an adjoining section the tests are to be repeated to verify compliance with test values as in Table 28 Appendix 5.

All test information shall be recorded and available for inspection and shall also be included in the 'As-Built' documentation.

Partial discharge tests shall be carried out on the cable on jointed sections of length not exceeding 10kms. These tests shall be carried out in conjunction with ESB Networks prior to the commissioning of the completed cable circuit. Test result acceptability will be determined by ESB Networks.

All cables shall be sealed / capped after cable testing.

7.0 Cable Reinstatement

The bedding sand used around electric cables joints shall be natural unwashed sand in accordance with BS EN 16120 (BS882). The grading, when determined in accordance with BS812, Section 103.1, shall comply with grading limit C in Table 4 of BS 882 -1992 (shown below) or the grading curve shown below.

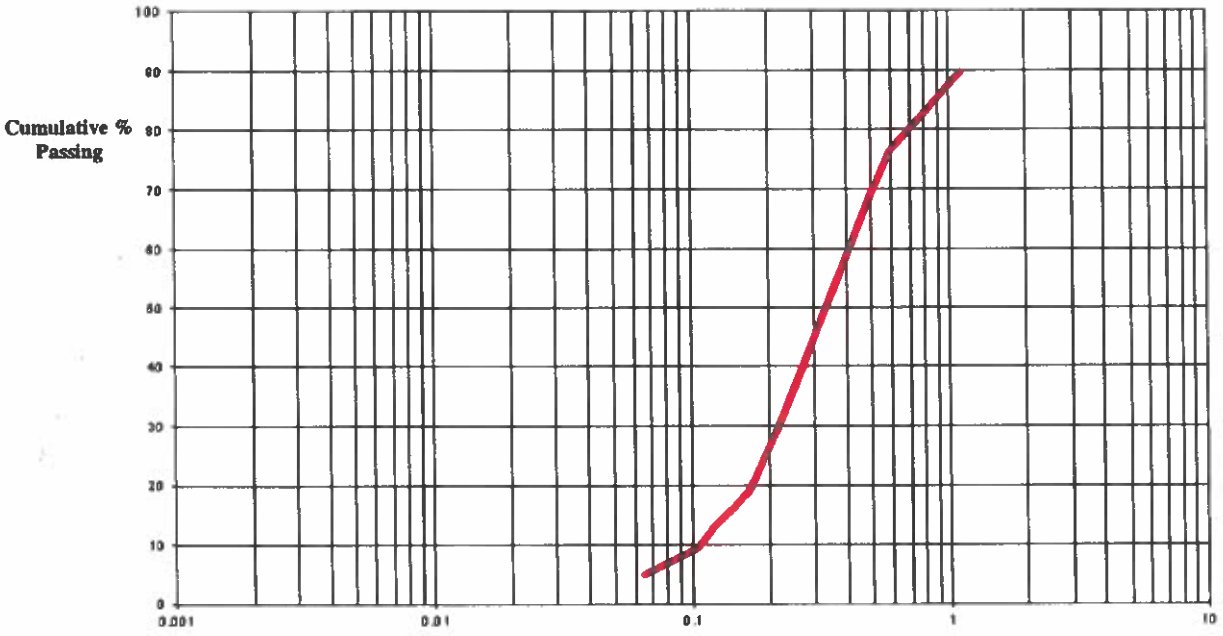
The sand shall have a maximum resistivity of 2.5 K.m/watt at 0% moisture content. Test sheets confirming the thermal properties shall be available for on-site inspection and shall be submitted with the 'as-built' documentation.

The sand shall be manually compacted around the cable and joints.

Pea gravel and foam concrete shall not be used for cable surround materials.

BS882 Sieve Size	3/16"	1/8"	7	14	25	52	100
% Passing weight	95	89	84	75	54	18	1.6

Thermal Sand Grading Curve



Appendices

Appendix 1 Set Up for Cable Pulling

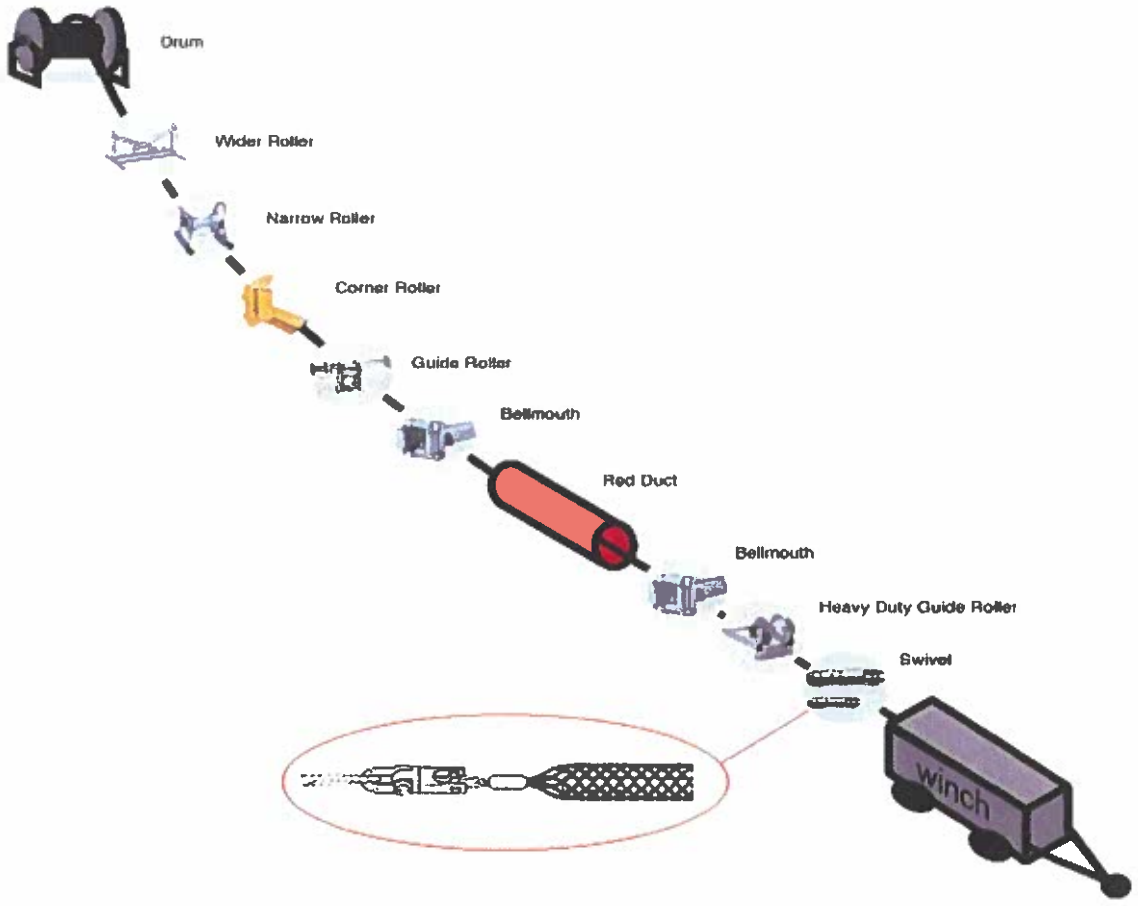
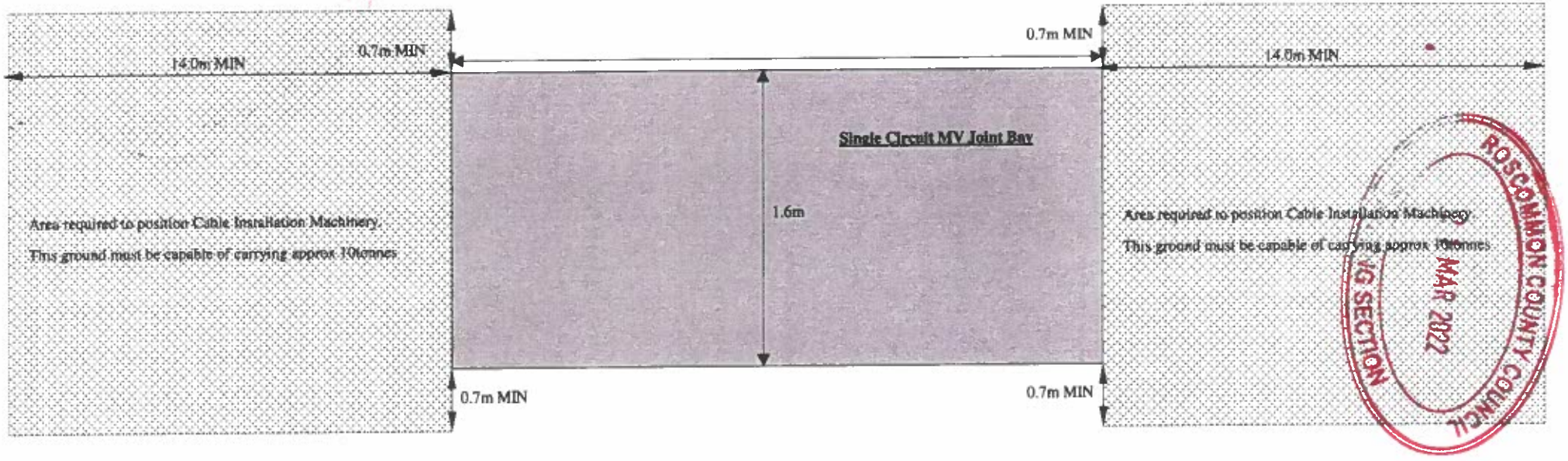


Fig 11B - Set up for Swivel, Brush, Mandrel and Sonde for Duct proving and Cleaning

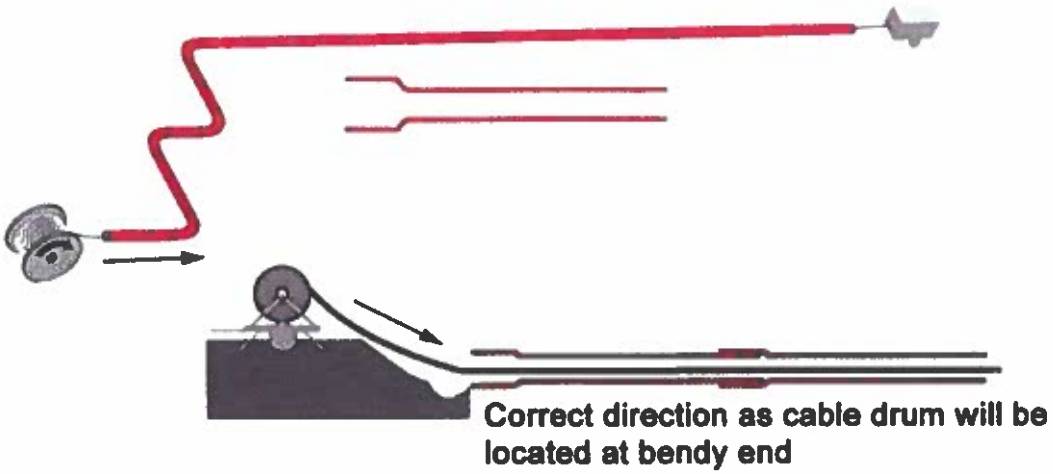
Appendix 2 Required Ground and Surface for MV Cable Installation at Joint Bay positions

Drawing Not To Scale

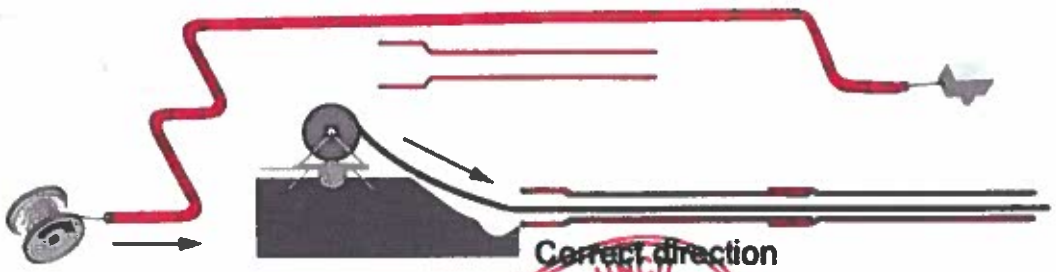
Please note that this 'Area' either side of the Joint Bays may need to be removed after cable installation, this must be assessed case by case



Appendix 3. Drum and Winch Set up on Bendy route



More bends at one end than the other

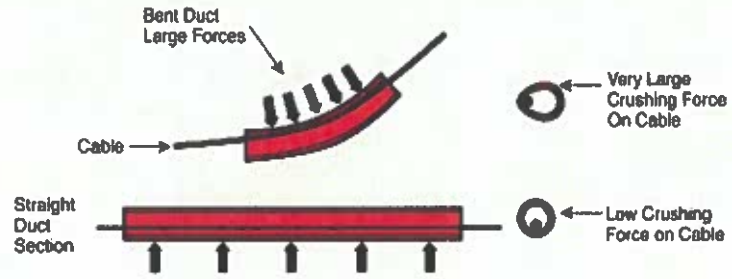


Appendix 4. Cable Side Wall Forces

Fig.22 COMPARISON OF LARGE FORCES AT DUCT BEND POSITIONS COMPARED TO STRAIGHT SECTIONS OF DUCT

Duct Section	Duct forces on that duct section		
	Side-Wall Crush	Tensile Shear	Abrasion
	Low x1	Low x1	Low x1
	High x500 times	High x500 times	High x500 times

Fig.23 MINIMISING CRUSHING SIDE WALL FORCES ON CABLES DURING PULLING



Minimise these crushing side wall forces by:

- Good lubrication of both duct and cable
- Place drum near section of route with most bends - place winch furthest away
- Reduce length of pull if doing this eliminates a number of bends at winch position
- Take due care at the duct exit position, which is the last "bend" on every duct pull (see fig 17)
- Ensure that the winch rope does not exit the duct at sharp angle by excavating a minimum 3m of ground beyond the duct end. (see fig 18)

Appendix 5. Pre Commissioning Standards

ESB NETWORKS CABLE PRE COMMISSIONING STANDARDS FOR MV CABLES

Commissioning Policy for all new XLPE MV cable circuits is to:

1. Measure insulation resistance (phase to earth with cable screen earthed)
2. Sheath test, measure insulation resistance between the metallic cable screen (disconnected from earth) and earth
3. Check continuity of phase conductors
4. Check phasing
5. Check inter-phase clearances and phase to earth clearances

See Table 28 below for Commissioning Test Standards.
All tests to be preformed using calibrated test equipment.
All testing on MV cables must be carried out using a 5kV insulation Resistance tester.

Sheath Faults on MV cables <u>will not</u> be accepted by ESB Networks.

Table 28 – Commissioning Test – Standards for MV Cable

Route km	Screen to earth Minimum Values		Core to Earth Minimum Values	
Km	Giga Ohms	Micro Amps	Giga Ohm	Micro Amps
0.25	2	2.5	8	0.62
0.5	1	5	4	1.25
	Mega Ohms		Mega Ohms	
0.5-1	500	10	2000	2
2	250	20	1000	5
3	170	29	666	7
4	130	38	500	10
5	100	50	400	12
6	83	60	333	15
7	71	70	286	17
8	62	80	250	20
9	55	90	222	22
10	50	100	200	25
11	45	111	182	27
12	41	122	167	30
13	38	131	154	32
14	36	139	143	35
15	33	151	133	37
16	31	161	125	40
17	29	172	118	42
18	27	185	111	45
19	26	192	105	47

NB: Above values refer to cables only – not to cables connected to OH lines or other apparatus which would reduce the values considerably.

Wet, damp weather and dirty leads or cable ends can also reduce the values considerably.

Large differences between insulation values for different phases should be noted and investigated as such differences can be an indication of cable damage or deterioration

Clearances Metal to Metal/Metal to Screen

Voltage	Indoor	Outdoor
MV	300mm	**300mm**

MV Cable Pre Commissioning Test Report

To Be Completed for Each Separate Cable Section

Location of Cable Section: _____

City/Town/Townland

Connection From: END 1 _____

To: END 2 _____

Length & Type of Cable: _____

INSULATION TEST

Note: Where the connection consists of underground cable to an overhead line, the jumpers, (point of interconnection) should be removed and separate insulation tests carried out on the line and on the cable.

Cable Insulation Test Screen must be earthed for this test.	Insulation Test Reading *See Table 28 for values specific to particular cable length*	Remarks Fail/Pass
R phase to Earth		
S phase to earth		
T phase to Earth		
Insulation Test* Voltage & duration of test = 5kV for 2 minutes or time for stable reading	State: Calibration Date of Instrument	
Weather Conditions Coastal /Inland	State: Dry or Wet	

INSULATION TEST: **PASS** **YES** ☐ **NO** ☐

OVERALL

Comments

_____

_____

ROSCOMMON COUNTY COUNCIL 21 MAR 2022 ...G SECTION

CABLE SHEATH TEST

Test the cable sheath insulation of each cable length prior to jointing. Use a calibrated 5kV Cable Sheath Test instrument. Cable screens must be disconnected at both ends from earth. Test all screens together or individually.

Insulation Resistance Tester Type & Calibration Date of Instrument	**Overall Screen Resistance to Earth**(Mega Ohms) **In accordance with Table 28**	**Test Time**** (minutes)	**Length** (metres)	**Resistance Value** (Mega Ohms)
				R = **S =** **T =**

* Insulation Tester Voltage 5kV (**Note:** 1kV Insulation resistance Tester is inadequate – it will not breakdown sheath spark gap.)

** Test time minimum 2 Minutes (or longer to obtain stable or increasing reading)

SHEATH TEST: PASS YES ☐ NO ☐

ROSCOMMON COUNTY COUNCIL 21 MAR 2022 PLANNING SECTION

(See Table 28 for Pass values of screen insulation resistance to earth for lengths 0 -20km long)

Comments _____

PHASING/CONTINUITY **R S T**

Test Point _____ (Station//Pole) ___ ___ ___

Remote Point _____ (Station//Pole) ___ ___ ___

GENERAL INSPECTION

	Yes/No.	**End 1**	**End 2**
Are clearances both from live parts to live parts & live to earth parts adequate?			
Is all structural steelwork earthed?			
Are lightning arrestors earthed?			
Are cable screen wires earthed?			

Is cable trench backfilled?			
Is cable trench reinstated?			
Are all joint bays and lubrication points reinstated ?			
Is cable adequately clamped/supported?			
Are pole /mast vertical cable guards in place?			
Are cable anti –climbing guards fully fitted in place?			
Are sheath disconnect vault covers in place?			
List of items requiring attention before cable may be put into commission			
Outstanding work on site, other than that on the cable, which must be completed before cable may be put into commission e.g. labelling, phase identification, anti-climbing screens etc.			

ROSCOMMON COUNTY COUNCIL 21 MAR 2022 PLANNING SECTION

Signed: _____ **Date:** _____

Appendix 6. Cable Installation Certificate for MV Cable

CONTRACTOR NAME: **PROJECT NAME:** **LOCATION:**

	Description/Location	Date	Length of Pull	Cable size	Winch Serial No.	Max Pulling Force Recorded (kgf)	Volume of Lubricant Used	Was Cable Sealed	Was Pull witnessed by ESB N Civil Inspector		Person in Charge (signature)
							Litres	Yes	Yes	No	
Pull 1											
Pull 2											
Pull 3											
Pull 4											
Pull 5											
Pull 6											

ROSCOMMON COUNTY COUNCIL
21 MAR 2022
NG SECTION

We certify that the information supplied in the Table above is accurate and that all cable pulls for this project are included.

Signed: _____ *Acting for* _____ *Date:* _____

(Person in Charge of Cable Installation)

Counter Signed: _____ *Acting for* _____ *Date:* _____

(Main Contractor's Management Representative

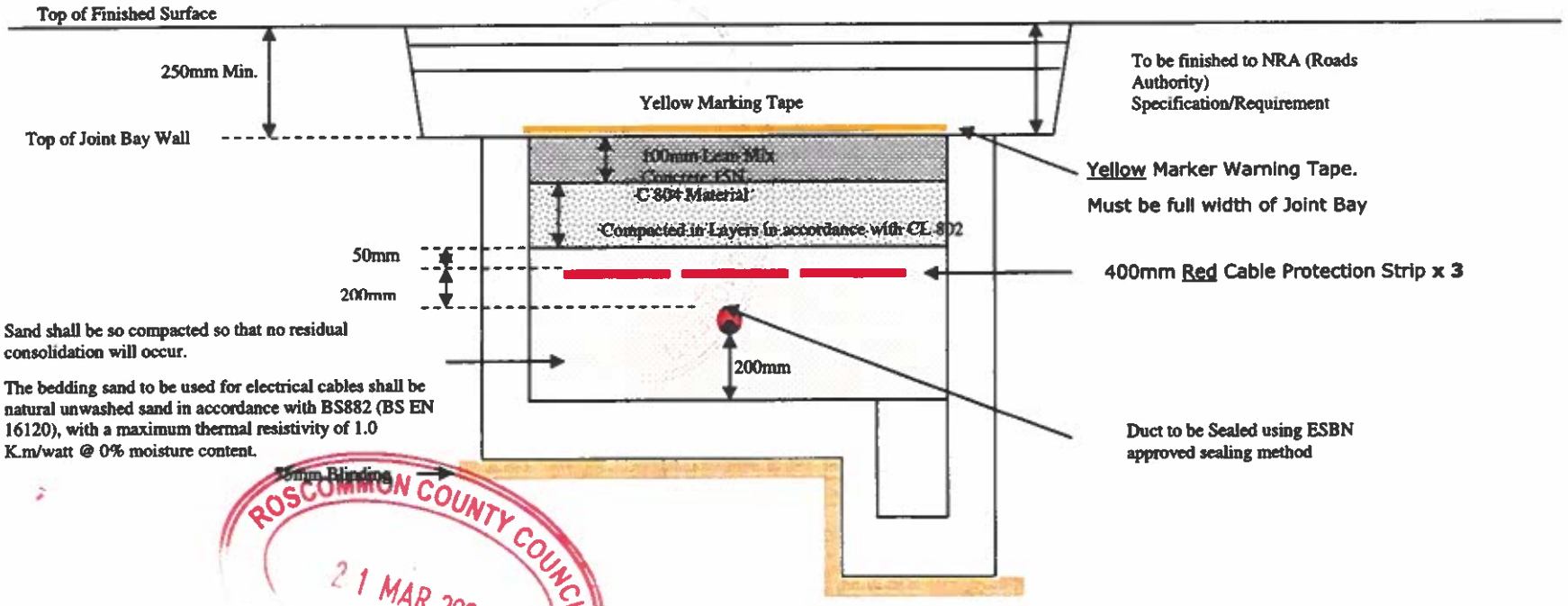
ESB Networks Inspector: _____ _____ *Acting for:* _____ *Date:* _____

Appendix 7. Joint Bay Backfill

Backfilling of Joint Bay with MV Power cables in place

ESB Networks require a copy of the agreement between the IPP and the Roads Authority stating how the road is to be completed.

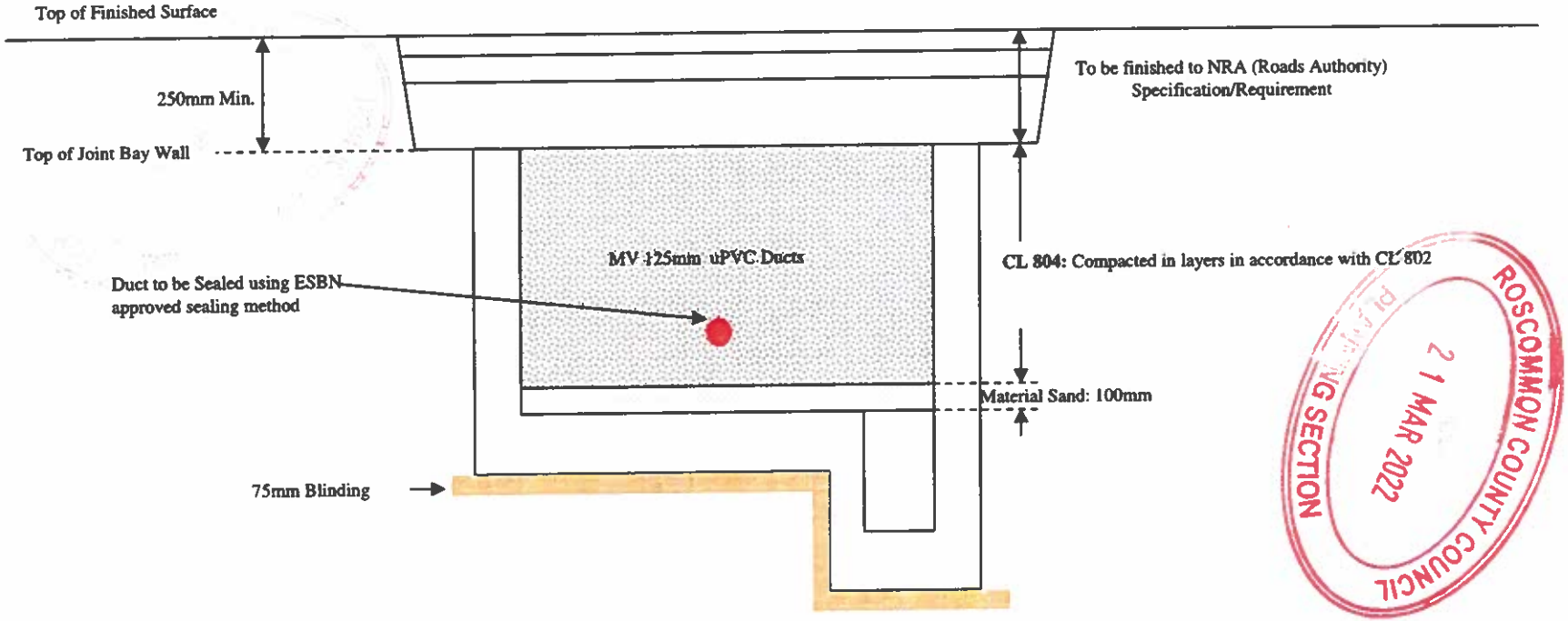
Drawing Not To Scale



Backfilling of Joint Bay with **no** MV Power Cables in place

ESB Networks require a copy of the agreement between the IPP and the Roads Authority stating how the road is to be completed

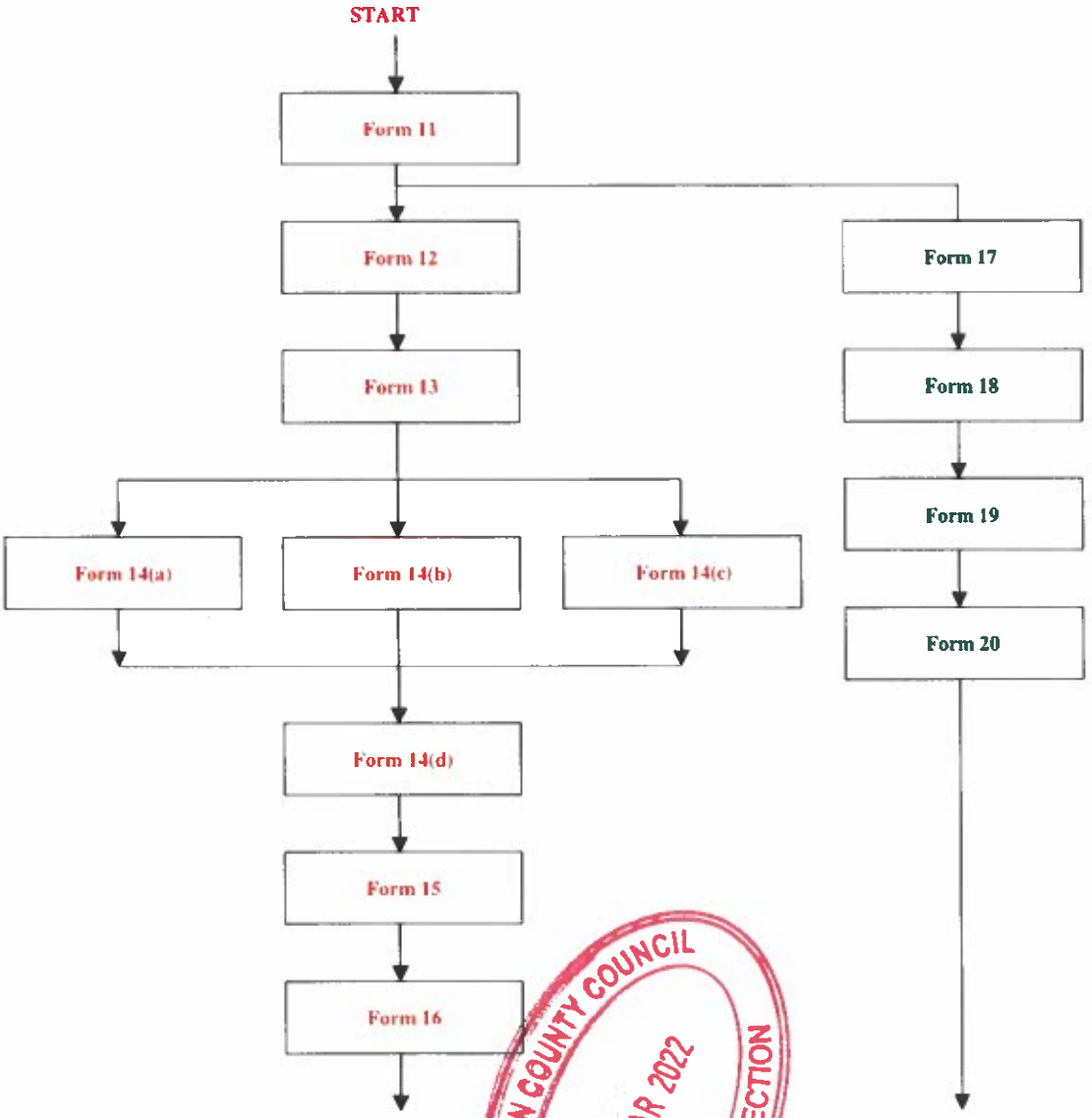
Drawing Not To Scale



Appendix 8. MV Cable installation (+ Fibre Cable)

The following flow chart is the project process for a non-contestable MV and Communication ducting and cables. This process is aimed at how ESB Networks and the IPP interact and the roles ESB Networks have.

MV Cable Installation



NETWORKS

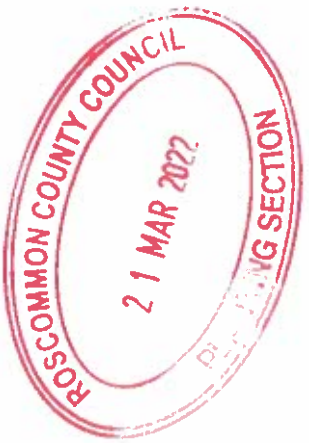
Specification Number:	**18153**
Title:	**Functional Specification for the Installation of 20KV Underground Power Cables for Contestable Projects**
Revision Number:	**0**
Issue Date:	**December 2013**
Latest Review Date:	**December 2018** (ESB Specifications are subject to change, this specification version shall only be used for the purpose/project for which it was issued by ESB to you)
Approved for Issue:	**Specifications Manager ESB Networks**

History of Revisions

Rev No	Date	Revision Content
0	2013	New Document

Note:

This specification will be reviewed at minimum before the Latest Review Date, but may also be reviewed in the interim. Consequently the "Latest Review Date" does not indicate that this particular version of the Specification is current. Accordingly, only the version of the specification issued by ESB to the user for the particular purpose/project should be used.



ESB Technical Specification Approval

Title	**Functional Specification for the Installation of 20kV Underground Power Cables for Contestable Projects**
Specification revision number & date	Doculive Spec. No. : 18153 Rev: 0 Date: December 2013 Consultant Reference No.: PG___-____-___-___ Rev: Date:
Produced by:	ESB Networks
Contract Conditions Reviewed:	

Eirgrid

Department: N/A

Accepted::

Date:

ROSCOMMON COUNTY COUNCIL
21 MAR 2022
PLANNING SECTION

ESB Networks:

Department:	**Asset Management**
Approved :	**Asset Manager, Underground Networks**
Date:	**December 2013**

Table of Contents

1.0 Scope

This document specifies the requirements for the supply, installation, jointing, testing and commissioning of **20kV Underground Power Cables and Accessories and Associated Communications Cables** in fully ducted systems for connection to the ESB Networks Distribution System.

The materials used and construction methods employed shall comply with the requirements of

1. This specification and also
2. Specification Number 18149 – General Specification for Contestably Built Underground Networks
3. Specification Number 18152 – Functional Specification for the Installation of Ducts and Ancillary Structures for 20kV Underground Power Cables and Associated Communications Cables for Contestable Projects
4. The individual ESB Networks **material** Specifications for ducting and cable materials and components and all ancillary structures

2.0 Design Review

Details of the proposed cable and associated jointing, termination and installation materials shall be submitted to ESB Networks for review.

3.0 Materials

The materials supplied and used shall comply with the following ESB Materials Specifications:

Spec Number	Material
16112	Lubricant for pulling Cable into Ducts
16120	Supply and Delivery of 52kV, 24kV and LV Polymeric Insulation Cable
16140	Link and Lug Connectors for 40kV, 20kV, 10kV and LV Underground Cables
16379	MV Heatshrink, Coldshrink and Premoulded Cable Accessories

4.0 Cable Handling

Care and attention is required in this area as any mishandling of cable drums could lead to damage of cable and injury to installers or members of the public. Proper practices of transportation, loading, unloading and storage on site shall be used.

4.1 *Transportation*

Drums shall be delivered to site by a drum trailer or on a truck fitted with a hydraulic crane.

4.2 *Loading / Unloading*

To avoid serious injury to personnel and damage to cable drums, an appropriately sized axle shall be used for lifting along with a spreader bar to prevent the lifting chains damaging the drum and crushing the cable. Appropriately rated proprietary lifting hooks that fit into and lock onto the axle hole can also be used. The chains and all associated lifting equipment shall be rated to lift the gross weight of the drums, with an appropriate factor of safety.

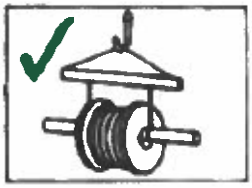


Figure 1 Drum trailer axle and spreader bar for safe damage free cable drum lifting.

4.3 Storage

All cable ends shall be sealed to stop the ingress of water and future deterioration of cable. Cables drums shall be stored on hard even surfaces to prevent the flanges from sinking into the ground, thereby causing all the drum weight to rest on the cable with resultant damage due to cable compression and penetration by sharp objects.

Figure 2 Storage of cables.

4.4 Pre Pulling Inspection

Prior to cable pulling the complete outer coils of the cable shall be inspected for any mechanical damage by rotating the drum and visually observing for any bumps/perforations or any other sign of damage. All damaged sections found shall be cut off and scrapped. This inspection shall take place for all cable drums before cable is pulled in. This measure will reduce the incidence of sheath faults which can be very costly and time consuming to locate and rectify at a later stage when the cable is installed along the ducted route.

5.0 Cable Installation

5.1 Cleaning and Proving and Pre-Lubrication of Ducts

Each duct shall be cleaned and proven prior to pulling in the cable winch rope by pulling the appropriate size of ESB Networks approved duct brush and mandrel through each duct. The direction of duct cleaning and duct proving shall be in the direction of the planned cable pull.

Following the cleaning and proving of the entire duct run, all power ducts shall be pre-lubricated during the operation of pulling back of the winch rope from the winch end. The lubricant (recommended quantity 10 litres per 100m of duct or as recommended by the manufacturer) shall be placed in the duct at the winch end and a suitably robust sponge securely attached to the winch rope to spread the lubricant uniformly over the entire length of the duct.

Duct Cleaning – Use of Approved Brushes

Only approved brushes, with the ESB Networks material code specified below, shall be used to ensure that any dirt or debris within ducts is transported out of the ducts rather than being merely loosened up and left within the duct. The approved suppliers of the brushes for normal and directional drilling 125mm O.D size duct are given on the ESB website.

Brushes shall be cleaned regularly using a powered water hose.

Duct Proving – Mandrel

Duct proving shall be achieved by pulling a mandrel through the duct in the direction of the planned cable pull. The proving equipment shall conform to the details and dimensions in the table below:

Type and Size of Duct	Mandrel ESBN Material code	Brush ESBN Material code	Sonde	Sponge Diameter and Length 300mm
125mm uPVC SDR 17.6 For normal trenching	8783229	8783254	required	125mm
125mm HDPE for SDR 11.0 for Directional Drilling	8783228	8783250	required	125mm

All new mandrels shall be stamped with their size and the corresponding duct size to which they are applicable.

Duct Sponge

A sponge shall be used to remove excess water and pre-lubricate the duct prior to cable pulling.

Duct Proving – General

ESB Networks reserves the right to witness the duct proving tests.

ESB Networks approved duct brushes, mandrels and sponges are designed to provide thorough cleaning of the duct and a tight fit. The minimum rope size used shall be 12mm polypropylene. Cleaning and proving shall be carried out using a winch which has a calibrated dynamometer and printout. Pulling tension shall not exceed 1 Ton (10kN). The results shall be submitted to ESB Networks for review, using the Duct proving Sheet.

Following the duct proving process, approved waterproof rubber bungs shall be fitted to prevent ingress of water, sand or other debris getting into them. The ducts shall then be left roped in preparation for cable pulling.

Use of a Transmitter (Sonde)

A Sonde shall be connected close to the mandrel or brush to help locate a blockage quickly. It can be purchased for specific use with a C.A.T. or other precise cable location instruments, equipped with a Sonde detector.

Duct Lubrication Materials

Only ESB Networks approved lubricants which are proven not to damage the cable insulations semi-conductive layers and outer sheath shall be used. Petroleum based oils or greases shall not be used for power cables.

The list of approved suppliers for the above items is available from the following ESB Networks web site address:

http://www.esb.ie/esbnetworks/en/download_documents/builders_developers/approved_material.jsp

5.2 *Cleanliness*

All Joint Bays and Lubrication points shall be free from stones sand, grit, etc.

5.3 *Duct Lubrication During Cable Pulling*

Ducts and cables shall be thoroughly lubricated for all cable pulls.

ESB Networks approved Lubricant shall be used at a rate of 20 litres per 100 metres of duct as follows:

1. Pre lubricate ducts with 10 litres per 100m from winch end as mentioned in Section 5.1
2. Apply additional lubricant at a rate of 10 litres per 100 metres run at duct entry and,
3. Insert 20 litres of lubricant in advance of all major bends .

Lubrication points shall be installed in cable runs in close proximity to areas of high bend concentration. Optimised positions shall be chosen, e.g. on the crest of steep incline for maximum lubricant dispersion on the route. Lubrication points shall be properly sealed after the cable is pulled in.

Where the manufacturer of the cable recommends an alternative and specific cable pulling lubricant, such lubricant shall not be used without the prior agreement of ESB Networks.

5.4 *Supervision*

The cable installation works shall be continuously supervised by competent persons. Quality control checks shall be carried out throughout the cable pulling and jointing phases in addition to the pre commissioning checks.

5.5 *Cable Installation into Ducts*

The following equipment shall be used for the installation of cable into ducting

- Bell mouth installed for entry and exit positions
- Rollers to support cable entering and exiting duct
- The following as specified by the cable manufacturer

  - Cable pulling stocking

  - Cable pulling eye
- Swivel with torque relief
- Winch with force measurement facility and print out facility
- Mandrel
- Brush
- Sponge
- Sonde

Cable rollers shall be used at duct entry and exit positions to guide the cable from the drum into the duct and to prevent abrasion/ripping of the cable via contact with the trench bottom and sides and also to prevent the cable picking up debris before entry into the duct.

Appendix 1 details the set up for cable pulling.

5.6 *Cable Pulling*

Cable pulling shall be preceded by calculation of the pulling and sidewall forces for each cable pulling section based on the as laid duct installation. When bends are present in a duct run, the cable drum shall be positioned at the end closest to where most of the bends lay and the winch shall be positioned at the end furthest from the bends.

This method reduces

- The tensile and side wall forces on the cable.
- The likelihood of the winch rope sawing through or burning through the ducts at bend positions.
- The pulling forces and wear and tear on the winch and the winch rope.

See Appendix 3 for details on drum and winch set up on a route with a high bend concentration.

Cable pulling tensions shall be monitored and recorded during installation. The values obtained form the winch printout shall be attached to the Cable

Installation Certificate and electronically presented to ESBN representative. The values shall also be within the cable manufacturers specification.

All cables shall be sealed and adequately supported after cable pulling.

5.7 *Cable Jointing*

Cable jointing shall be carried out by suitably trained and experienced cable jointers and in accordance with manufacturers instructions. Experience and training records for proposed cable jointing personnel shall be submitted to ESB Networks for review.

5.7.1 Phase Sectionalising Joint

Phase sectionalising joints shall be installed at joint bays to facilitate cable joint dismantling and reassembly at joint bays which are no greater than 2km apart.

5.7.2 Cable Sheath Sectionalising Joints

Cable sheath sectionalising joints shall be installed at joint bays to facilitate cable sheath testing at joint bays which are no greater than 1 km apart.

5.7.3 Sealing of cable ducts

Cable ducts shall be sealed using an ESB Networks approved method after completion of the cable joint. Details of the sealing method shall be submitted to ESB Networks for review.

5.7.4 Mechanical Protection of Overground Cables at Cable-end Pole Positions

All above ground cables shall be protected at cable end pole positions, by using two 1.75m galvanised steel cable guards, overlapped by 100mm, to give a protected height above ground of 3.3 m. The lower cable guard shall be embedded 100mm into the ground.

6.0 Cable Testing

All cables shall be electrically tested immediately after each pull is complete. All cables shall be tested again prior to any jointing activity to ensure that sheath fault location difficulties are minimised. Terminations shall not be connected to switchgear during tests.

The following list of tests shall be carried out after cable pulling and before and after cable jointing on each cable section:

1. Measure Insulation resistance, phase to screen and phase to phase
2. Check continuity of all phase and screen conductors
3. Check phasing of conductors
4. Check phase clearances and phase to earth clearances
5. Sheath test cables (A 5kV calibrated Insulation resistance test kit shall be used for this purpose)
6. Partial discharge test @1.7Uo at 50 Hz or 0.1Hz or other ESB Networks approved frequency and time duration. Partial discharge tests shall be carried out on the cable on jointed sections of length not exceeding 10kms. These tests shall be carried out in conjunction with ESB Networks prior to the commissioning of the completed cable circuit. Test result acceptability will be determined by ESB Networks.

If the sheath test results do not meet values in Appendix 5 Table 28 then jointing work of further sections shall not commence, based on results the cable shall be repaired or replaced and retested or passed by ESB Networks.

After each section of cable is jointed to an adjoining section the tests are to be repeated to verify compliance with test values as in Table 28 Appendix 5.

All test information shall be recorded and available for inspection and shall also be included in the 'As-Built' documentation.

Partial discharge tests shall be carried out on the cable on jointed sections of length not exceeding 10kms. These tests shall be carried out in conjunction with ESB Networks prior to the commissioning of the completed cable circuit. Test result acceptability will be determined by ESB Networks.

All cables shall be sealed / capped after cable testing.

7.0 Cable Reinstatement

The bedding sand used around electric cables joints shall be natural unwashed sand in accordance with BS EN 16120 (BS882). The grading, when determined in accordance with BS812, Section 103.1, shall comply with grading limit C in Table 4 of BS 882 -1992 (shown below) or the grading curve shown below.

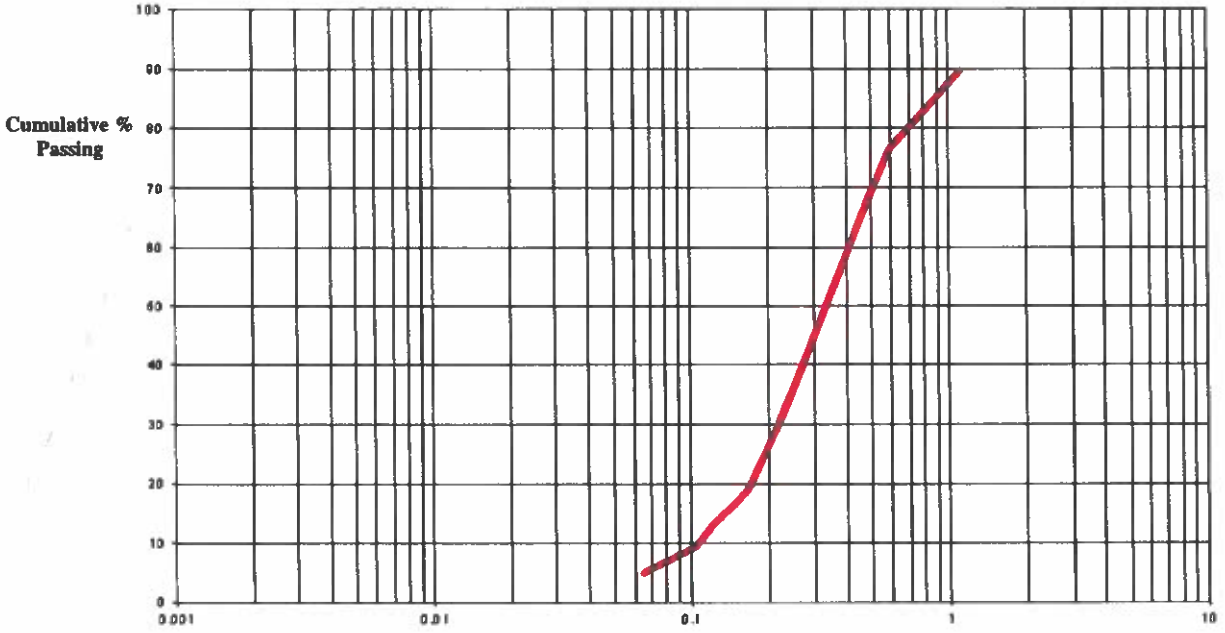
The sand shall have a maximum resistivity of 2.5 K.m/watt at 0% moisture content. Test sheets confirming the thermal properties shall be available for on-site inspection and shall be submitted with the 'as-built' documentation.

The sand shall be manually compacted around the cable and joints.

Pea gravel and foam concrete shall not be used for cable surround materials.

BS882 Sieve Size	3/16"	1/8"	7	14	25	52	100
% Passing weight	95	89	84	75	54	18	1.6

Thermal Sand Grading Curve



Appendices

Appendix 1 Set Up for Cable Pulling

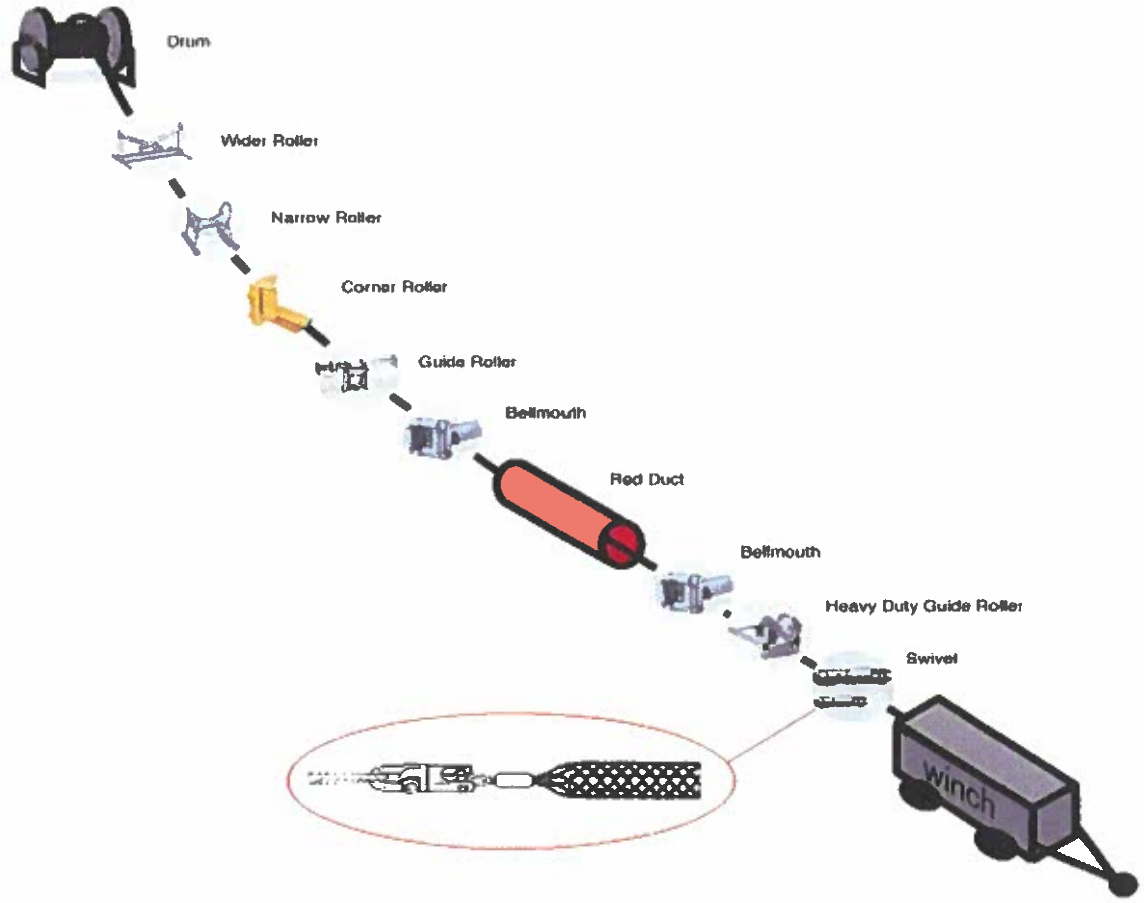
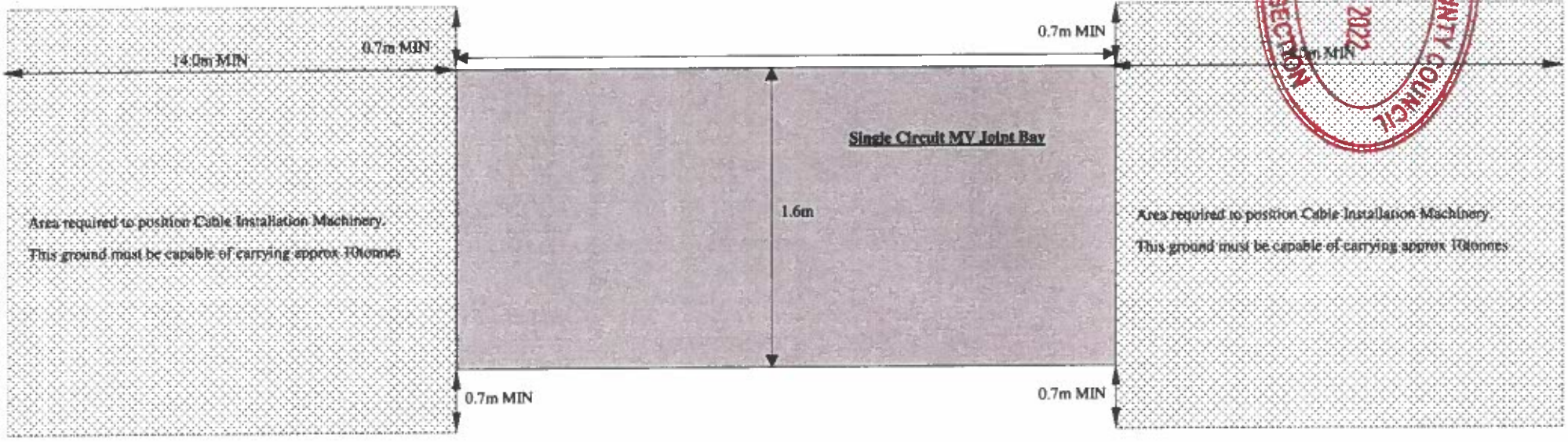


Fig 11B - Set up for Swivel, Brush, Mandrel and Sonde for Duct proving and Cleaning

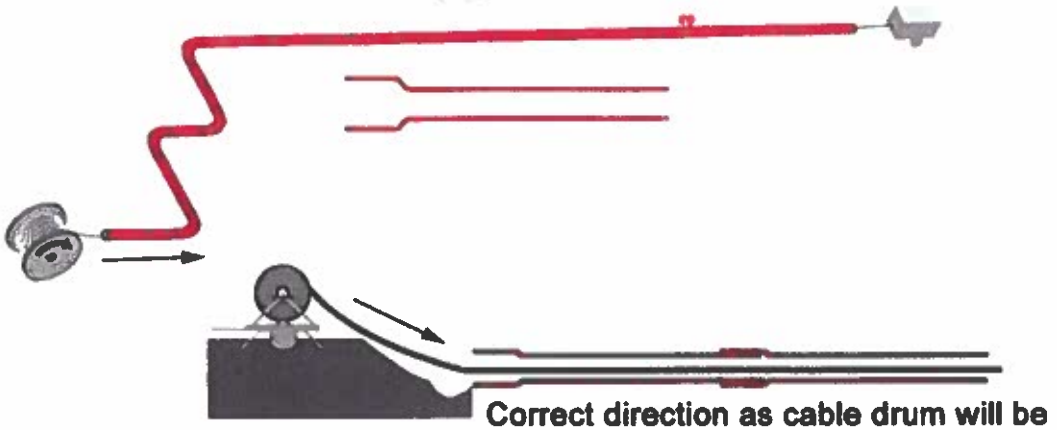
Appendix 2 Required Ground and Surface for MV Cable Installation at Joint Bay positions

Drawing Not To Scale

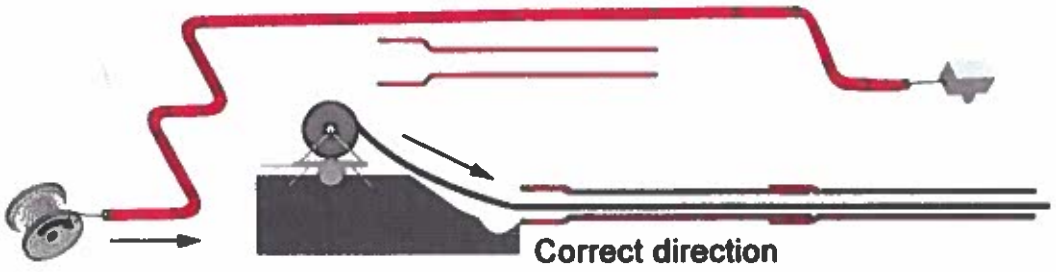
Please note that this 'Area' either side of the Joint Bays may need to be removed after cable installation, this must be assessed case by case



Appendix 3. Drum and Winch Set up on Bendy route

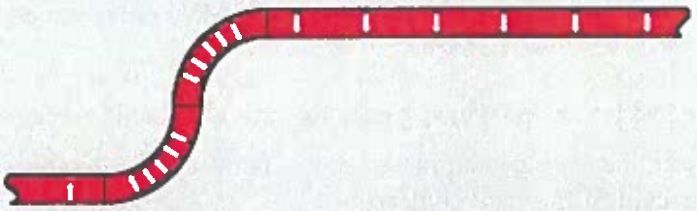


More bends at one end than the other



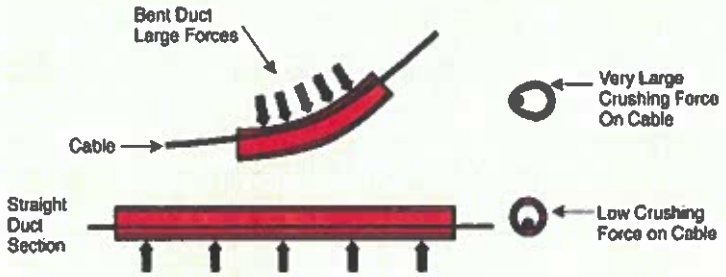
Appendix 4. Cable Side Wall Forces

Fig.22 COMPARISON OF LARGE FORCES AT DUCT BEND POSITIONS COMPARED TO STRAIGHT SECTIONS OF DUCT



Duct Section	Duct forces on that duct section		
	Side-Wall Crush	Tensile Shear	Abrasion
	Low x1	Low x1	Low x1
	High x500 times	High x500 times	High x500 times

Fig.23 MINIMISING CRUSHING SIDE WALL FORCES ON CABLES DURING PULLING



Minimise these crushing side wall forces by:

- Good lubrication of both duct and cable
- Place drum near section of route with most bends - place winch furthest away
- Reduce length of pull if doing this eliminates a number of bends at winch position
- Take due care at the duct exit position, which is the last "bend" on every duct pull (see fig 17)
- Ensure that the winch rope does not exit the duct at sharp angle by excavating a minimum 3m of ground beyond the duct end. (see fig 18)

Appendix 5. Pre Commissioning Standards

ESB NETWORKS CABLE PRE COMMISSIONING STANDARDS FOR MV CABLES

Commissioning Policy for all new XLPE MV cable circuits is to:

1. Measure insulation resistance (phase to earth with cable screen earthed)
2. Sheath test, measure insulation resistance between the metallic cable screen (disconnected from earth) and earth
3. Check continuity of phase conductors
4. Check phasing
5. Check inter-phase clearances and phase to earth clearances

See Table 28 below for Commissioning Test Standards.
All tests to be preformed using calibrated test equipment.
All testing on MV cables must be carried out using a 5kV insulation Resistance tester.

Sheath Faults on MV cables will not be accepted by ESB Networks.

Table 28 – Commissioning Test – Standards for MV Cable

Route km	Screen to earth Minimum Values		Core to Earth Minimum Values	
Km	Giga Ohms	Micro Amps	Giga Ohm	Micro Amps
0.25	2	2.5	8	0.62
0.5	1	5	4	1.25
	Mega Ohms		Mega Ohms	
0.5-1	500	10	2000	2
2	250	20	1000	5
3	170	29	666	7
4	130	38	500	10
5	100	50	400	12
6	83	60	333	15
7	71	70	286	17
8	62	80	250	20
9	55	90	222	22
10	50	100	200	25
11	45	111	182	27
12	41	122	167	30
13	38	131	154	32
14	36	139	143	35
15	33	151	133	37
16	31	161	125	40
17	29	172	118	42
18	27	185	111	45
19	26	192	105	47

NB: Above values refer to cables only – not to cables connected to OH lines or other apparatus which would reduce the values considerably.

Wet, damp weather and dirty leads or cable ends can also reduce the values considerably.

Large differences between insulation values for different phases should be noted and investigated as such differences can be an indication of cable damage or deterioration

Clearances Metal to Metal/Metal to Screen

Voltage	Indoor	Outdoor
MV	300mm	**300mm**

MV Cable Pre Commissioning Test Report

To Be Completed for Each Separate Cable Section

Location of Cable Section: _____

City/Town/Townland

Connection From: END 1 _____

To: END 2 _____

Length & Type of Cable: _____

INSULATION TEST

Note: Where the connection consists of underground cable to an overhead line, the jumpers, (point of interconnection) should be removed and separate insulation tests carried out on the line and on the cable.

Cable Insulation Test Screen must be earthed for this test.	Insulation Test Reading *See Table 28 for values specific to particular cable length*	Remarks Fail/Pass
R phase to Earth		
S phase to earth		
T phase to Earth		
Insulation Test* Voltage & duration of test = 5kV for 2 minutes or time for stable reading	State: Calibration Date of Instrument	
Weather Conditions Coastal /Inland	State: Dry or Wet	

ROSCOMMON COUNTY COUNCIL 21 MAR 2022 SECTION

INSULATION TEST: **PASS** **YES** ☐ **NO** ☐

OVERALL

Comments

_____

CABLE SHEATH TEST

Test the cable sheath insulation of each cable length prior to jointing. Use a calibrated 5kV Cable Sheath Test instrument. Cable screens must be disconnected at both ends from earth. Test all screens together or individually.

Insulation Resistance TesterType & Calibration Date of Instrument	**Overall Screen Resistance to Earth**(Mega Ohms) **In accordance with Table 28**	**Test Time**** (minutes)	**Length** (metres)	**Resistance Value** (Mega Ohms)
				R = **S =** **T =**

* Insulation Tester Voltage 5kV (**Note:** 1kV Insulation resistance Tester is inadequate – it will not breakdown sheath spark gap.)

** Test time minimum 2 Minutes (or longer to obtain stable or increasing reading)

SHEATH TEST: PASS YES ☐ NO ☐

(See Table 28 for Pass values of screen insulation resistance to earth for lengths 0 -20km long)

Comments _____

PHASING/CONTINUITY **R S T**

Test Point _____ (Station//Pole) ___ ___ ___

Remote Point _____ (Station//Pole) ___ ___ ___

GENERAL INSPECTION

	Yes/No.	**End 1**	**End 2**
Are clearances both from live parts to live parts & live to earth parts adequate?			
Is all structural steelwork earthed?			
Are lightning arrestors earthed?			
Are cable screen wires earthed?			

Is cable trench backfilled?			
Is cable trench reinstated?			
Are all joint bays and lubrication points reinstated ?			
Is cable adequately clamped/supported?			
Are pole /mast vertical cable guards in place?			
Are cable anti –climbing guards fully fitted in place?			
Are sheath disconnect vault covers in place?			
List of items requiring attention before cable may be put into commission			
Outstanding work on site, other than that on the cable, which must be completed before cable may be put into commission e.g. labelling, phase identification, anti-climbing screens etc.			

ROSCOMMON COUNTY COUNCIL 21 MAR 2022 G SECTION

Signed: _____ **Date:** _____

Appendix 6. Cable Installation Certificate for MV Cable

CONTRACTOR NAME: **PROJECT NAME:** **LOCATION:**

	Description/Location	Date	Length of Pull	Cable size	Winch Serial No.	Max Pulling Force Recorded (kgf)	Volume of Lubricant Used	Was Cable Sealed	Was Pull witnessed by ESB N Civil Inspector		Person in Charge (signature)
							Litres	Yes	Yes	No	
Pull 1											
Pull 2											
Pull 3											
Pull 4											
Pull 5											
Pull 6											

We certify that the information supplied in the Table above is accurate and that all cable pulls for this project are included.

Signed: _____ *Acting for* _____ *Date:* _____

(Person in Charge of Cable Installation)

Counter Signed: _____ *Acting for* _____ *Date:* _____

(Main Contractor's Management Representative

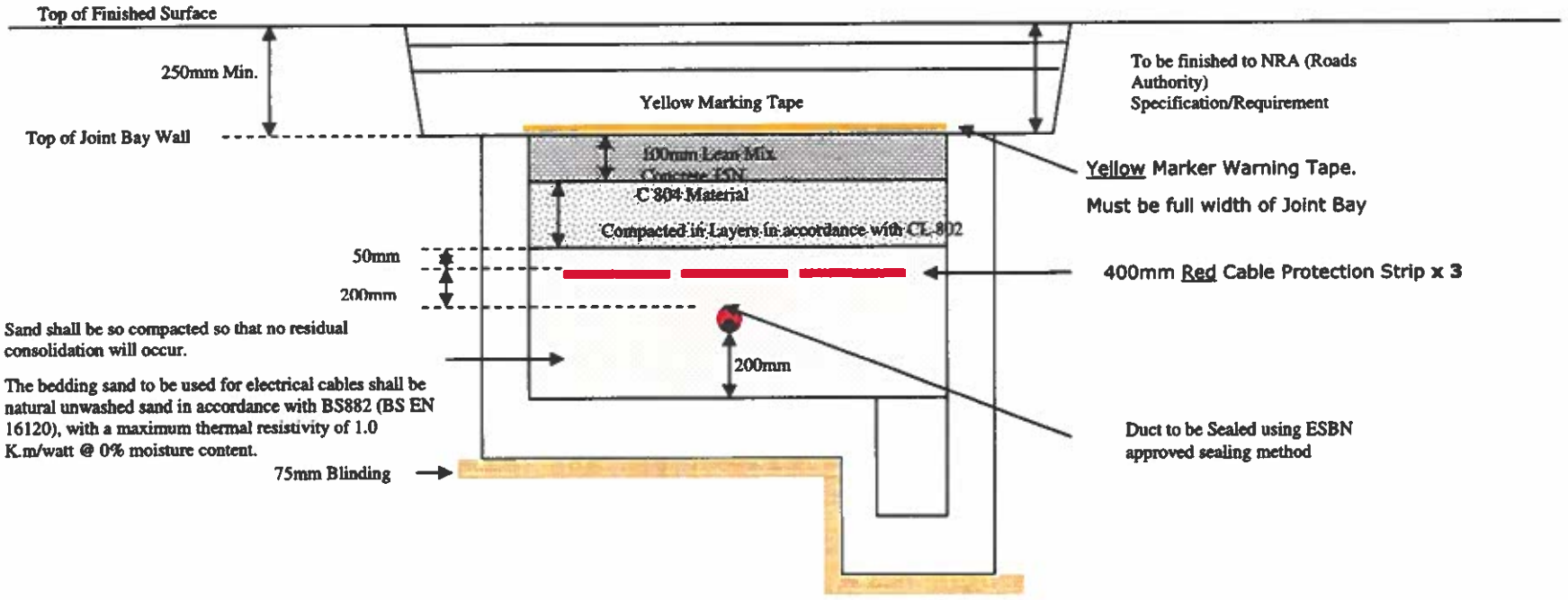
ESB Networks Inspector: _____ _____ *Acting for:* _____ *Date:* _____

Appendix 7. Joint Bay Backfill

Backfilling of Joint Bay with MV Power cables in place

ESB Networks require a copy of the agreement between the IPP and the Roads Authority stating how the road is to be completed.

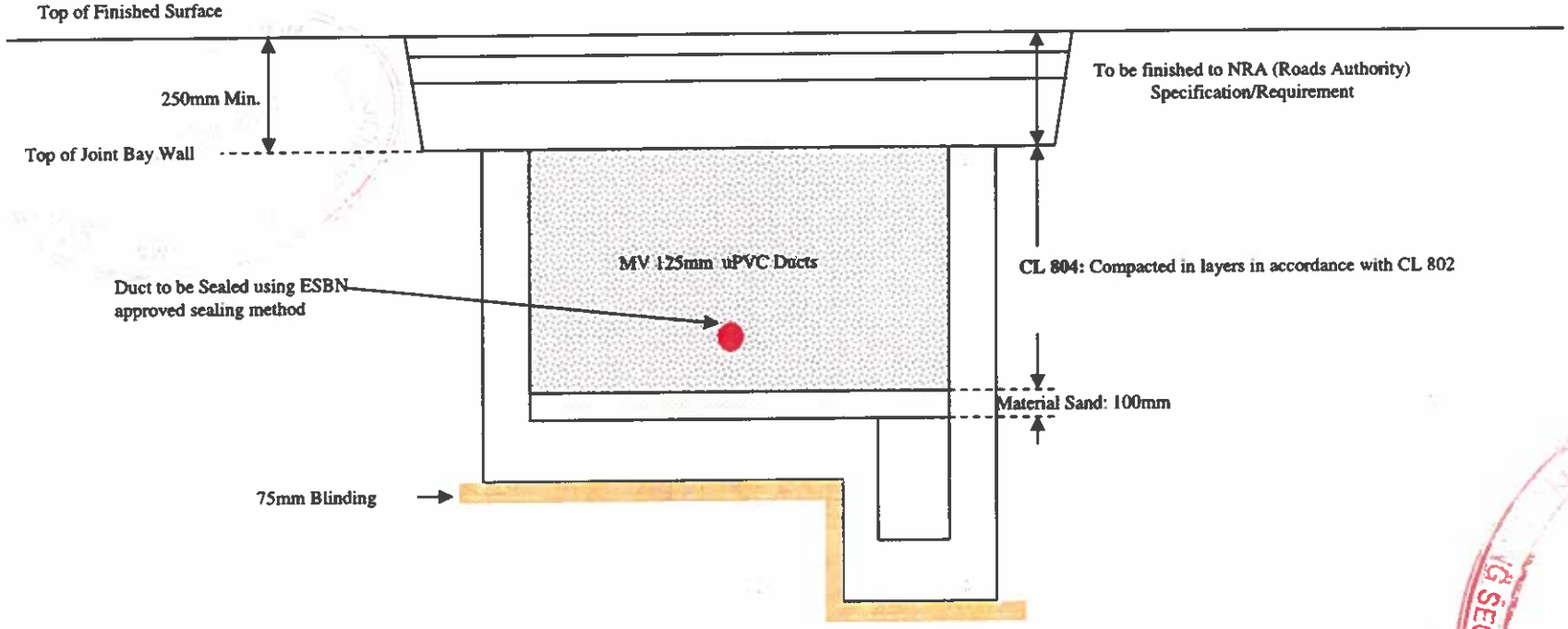
Drawing Not To Scale



Backfilling of Joint Bay with no MV Power Cables in place

ESB Networks require a copy of the agreement between the IPP and the Roads Authority stating how the road is to be completed

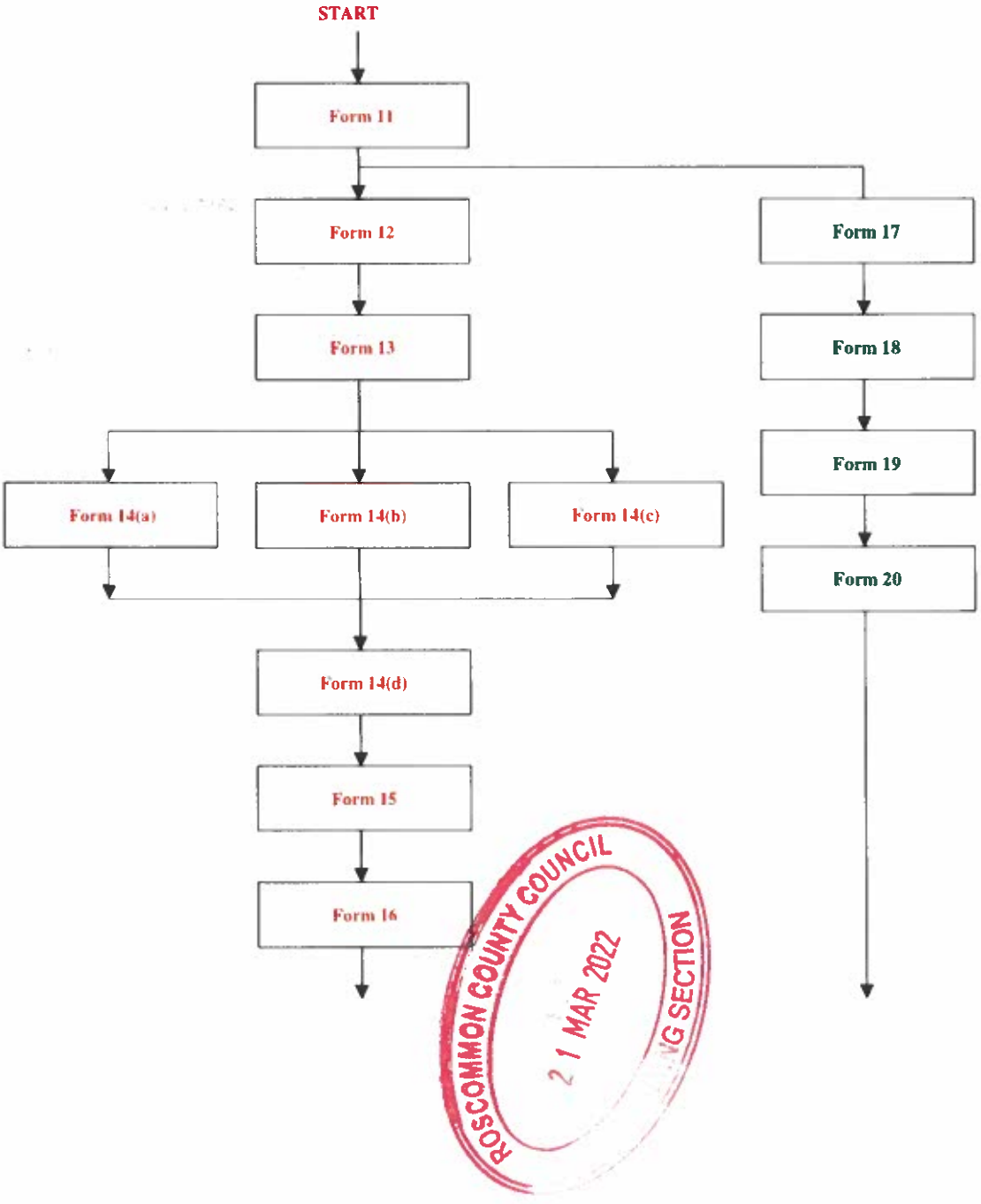
Drawing Not To Scale



Appendix 8. MV Cable installation (+ Fibre Cable)

The following flow chart is the project process for a non-contestable MV and Communication ducting and cables. This process is aimed at how ESB Networks and the IPP interact and the roles ESB Networks have.

MV Cable Installation



LKenny / LMurray / BCoughlan

Comhairle Contae
Ros Comáin
Roscommon
County Council

Recipient: ~~Hearing~~
Register no: 1
RPS 02 OCT 2017
Project no:
File Ref
PM:

Date: 29/09/2017
Ref: PD/17/295

Elgin Energy Services Ltd.,
134-135 Baggot Street Lower,
Dublin 2.

RE: **Permission for development at a site within the townland of Rathleg, Castlerea, Co. Roscommon. The application is for a 10 year planning permission. The development will consist of A Solar Farm with an export capacity of approximately 4.2 MVA comprising Photovoltaic Panels on ground mounted frames, an enclosed single storey ESB Terminal Station, a single storey switchgear enclosure with storage contained, 4 No. single storey inverter stations, ducting & underground electrical cabling, perimeter fencing mounted CCTV cameras, provision of new access to public road as well as internal access track, and all associated site development and landscaping works. Rathleg, Castlerea, Co. Roscommon.**

ROSCOMMON COUNTY COUNCIL
21 MAR 2022
PLANNING SECTION

A Chara,

I attach herewith Final Grant of Planning Permission for the above development.

Please note that you are obliged to comply with all conditions attached to the Final Grant of Planning Permission in full.

In particular, you are obliged to give at least two weeks' notice in writing to the Planning Authority, of the date on which you intend to commence development.

You should also note that certain conditions of the Planning Permission may require that submissions are made to, and/or agreed with the Planning Authority before the commencement of any works pursuant to the planning permission. Failure to comply with these requirements before commencing development may render the development unauthorised and result in Enforcement Proceedings under the Planning and Development Acts.

Please note there is a separate requirement under the Building Control Act and Regulations to give formal notice of the commencement of development and, in order to comply with this you can log onto http://www.localgov.ie/en/link-type/bcms in order to complete the online assessment.

In accordance with Article 20 of the Planning and Development Regulations 2001 (as amended), you are obliged to remove the site notice following notification of Decision.

Mise le meas

Administrative Officer

CC: **RPS Group,**
West Pier Business Campus,
Dun Laoghaire,
Co. Dublin.

Aras an Chontae, Roscommon, F42 VR98
T 090 6637100 F 090 6625599 E customerservice@roscommoncoco.ie
W roscommon.ie RoscommonCountyCouncil @roscommoncoco

LCDC

Oifig Fiontair Áitiúil
Local Enterprise Office

ROSCOMMON COUNTY COUNCIL

PLANNING AND DEVELOPMENT ACTS 2000 (as amended)

NOTIFICATION OF *FINAL GRANT OF PERMISSION*

Planning Register Ref. **PD/17/295**

TO:
Elgin Energy Services Ltd.,
134-135 Baggot Street Lower,
Dublin 2.

Application Receipt Date: 30/06/2017

Application by or on behalf of: Elgin Energy Services Ltd, 134-135 Baggot Street Lower, Dublin 2.

PERMISSION for:

Development at a site within the townland of Rathleg, Castlerea, Co. Roscommon. The application is for a 10 year planning permission. The development will consist of A Solar Farm with an export capacity of approximately 4.2 MVA comprising Photovoltaic Panels on ground mounted frames, an enclosed single storey ESB Terminal Station, a single storey switchgear enclosure with storage contained, 4 No. single storey inverter stations, ducting & underground electrical cabling, perimeter fencing mounted CCTV cameras, provision of new access to public road as well as internal access track, and all associated site development and landscaping works at Rathleg, Castlerea, Co. Roscommon.

Subject to the 24 conditions set out in the Schedule attached.

Note: It is important to read and understand fully the conditions attached to this permission as set out in the attached schedule. All the conditions set out must be strictly complied with, otherwise the work will be unauthorised.

ROSCOMMON COUNTY COUNCIL
21 MAR 2022
PLANNING SECTION

SIGNED: _____
Administrative Officer

DATE: 29th **September 20017.**

SCHEDULE OF CONDITIONS IMPOSED BY THE PLANNING AUTHORITY

P & D Ref. No:	**PD/17/295**
Applicant:	**Elgin Energy Services Ltd.**
Description:	**Development at a site within the townland of Rathleg, Castlerea, Co. Roscommon. The application is for a 10 year planning permission. The development will consist of a Solar Farm with an export capacity of approximately 4.2 MVA comprising Photovoltaic Panels on ground mounted frames, an enclosed single storey ESB Terminal Station, a single storey switchgear enclosure with storage contained, 4 No. single storey inverter stations, ducting & underground electrical cabling, perimeter fencing mounted CCTV cameras, provision of new access to public road as well as internal access track, and all associated site development and landscaping works at Rathleg townland, Castlerea, Co. Roscommon.**

1. The development shall be carried out and operated strictly in accordance with the plans and particulars submitted on the 30th June 2017, except where conditions hereunder specify otherwise.

   Reason: In the interests of clarity.

2. The period during which the development hereby permitted may be carried out shall be 10 years from the date of the final grant of permission.

   Reason: Having regard to the nature of the proposed development, the Planning Authority considers it appropriate to specify a period of validity of this permission in excess of five years.

3. This permission shall not be construed as any form of consent or agreement to a connection to the national grid or to the routing or nature of any such connection.

   Reason: In the interests of clarity.

4. Prior to commencing operations on the site, a traffic management plan for the construction and decommissioning phases of the proposed development shall be agreed in writing with the Planning Authority. Such a plan shall consider minimising disruption to the public road, and damage and reparation of same, if arising, resulting from the construction operations on these lands. The overarching consideration of such a plan shall concentrate on public safety, in particular, passing movements may need to be managed and local residents notified during the construction phase.

   In addition, a haul route shall be agreed in writing with the Planning Authority prior to commencement of any operations. All traffic movements shall thereafter be undertaken in accordance with the agreed measures. The applicant/developer shall liaise with the Municipal District Office during the construction works.

   Reason: In the interests of orderly development and traffic safety.

5. a) Sight lines as annotated on the site layout plan submitted on the 30th June 2017, shall be maintained free from visual obstructions at all times. Re-growth within the sightlines shall be cleared by the developer as required.

MP

SCHEDULE OF CONDITIONS IMPOSED BY THE PLANNING AUTHORITY

P & D Ref. No:	**PD/17/295**
Applicant:	**Elgin Energy Services Ltd.**
Description:	**Development at a site within the townland of Rathleg, Castlerea, Co. Roscommon. The application is for a 10 year planning permission. The development will consist of a Solar Farm with an export capacity of approximately 4.2 MVA comprising Photovoltaic Panels on ground mounted frames, an enclosed single storey ESB Terminal Station, a single storey switchgear enclosure with storage contained, 4 No. single storey inverter stations, ducting & underground electrical cabling, perimeter fencing mounted CCTV cameras, provision of new access to public road as well as internal access track, and all associated site development and landscaping works at Rathleg townland, Castlerea, Co. Roscommon.**

b) The widened section of roadway at the permitted entrance shall be brought to the existing level of the public road with 804 and sealed with double surface dressing to the satisfaction of the Planning Authority.

c) Any existing drainage channels shall be culverted as required to accommodate construction of entrances and associated road widening with size of pipe to be agreed with the Municipal District Co-ordinator prior to commencement of development.

d) The access to serve the development shall be formed in its entirety and available for use prior to the commencement of any other element of the development.

Reason: In the interests of traffic safety.

6. Prior to the commencement of development, a Construction Management Plan shall be submitted for the written agreement of the Planning Authority. This plan shall provide details of intended construction practice for the development, including:

(a) Details of site security fencing and hoardings.
(b) Details of the timing and routing of construction traffic to and from the construction site and associated directional signage, to include proposals to facilitate the delivery of abnormal loads to the site.
(c) Measures to obviate queuing of construction traffic on the adjoining road network.
(d) Measures to prevent spillage or deposit of clay, rubble or other debris on the public road network.
(e) Details of appropriate mitigations measures for noise, dust and vibration, and monitoring of such levels.
(f) Containment of all construction-related fuel and oil within specially constructed bunds to ensure that fuel spillages are fully contained, such bunds shall be roofed to exclude rain water.
(g) Details of on-site re-fuelling arrangements, including the use of drip trays.
(h) Details of how it is proposed to manage excavated soil.
(i) Means to ensure that surface water run-off is controlled such that no deleterious levels of silt and other pollutants enter local surface water drains or watercourses.
(j) All additional measures outlined in Section 5.3 of the Town Planning and Environmental Report submitted on the 30th June 2017.

MP

SCHEDULE OF CONDITIONS IMPOSED BY THE PLANNING AUTHORITY

P & D Ref. No:	**PD/17/295**
Applicant:	**Elgin Energy Services Ltd.**
Description:	**Development at a site within the townland of Rathleg, Castlerea, Co. Roscommon. The application is for a 10 year planning permission. The development will consist of a Solar Farm with an export capacity of approximately 4.2 MVA comprising Photovoltaic Panels on ground mounted frames, an enclosed single storey ESB Terminal Station, a single storey switchgear enclosure with storage contained, 4 No. single storey inverter stations, ducting & underground electrical cabling, perimeter fencing mounted CCTV cameras, provision of new access to public road as well as internal access track, and all associated site development and landscaping works at Rathleg townland, Castlerea, Co. Roscommon.**

All work shall thereafter be undertaken in accordance with the agreed Plan. A record of daily checks that the works are being undertaken in accordance with the Construction Management Plan shall be kept for inspection by the Planning Authority.

Reason: In the interests of environmental protection, amenities, public health and safety.

7. Prior to commencement of development, a Waste Management Plan for all waste materials associated with the permitted development, including the material from any trench excavation required if underground ESB connection is proposed, shall be submitted for the written agreement of the Planning Authority.

   In addition, all waste generated during the operation of the permitted development shall be removed by an approved/permitted waste collector.

   Reason: In the interests of the reduction and best practice management of waste from the permitted development.

8. During the construction phase working hours on site shall be strictly limited to 8am to 6pm on weekdays and 8am to 2pm on Saturdays with no work permitted on Sundays and Public Holidays, unless prior written approval is received from the Planning Authority, with the latter only being considered in exceptional circumstances.

   Reason: In the interest of proper planning and development and residential amenity.

9. All temporary elements and facilities needed for the construction phase shall be removed from the site within six months of the commissioning of the Solar Array.

   Reason: In the interests of orderly development and public health.

10. The permitted development shall be carried out in accordance with the details outlined in the Cultural Heritage Assessment and Archaeological Assessment Reports, submitted on the 30th June 2017, including all mitigation and monitoring measures outlined, and shall include the relocation of fence lines and screen planting to the northwest, northeast and southeast of the Recorded Monument, RO027-001, to ensure that they are at least 60m from the external perimeter of the Recorded Monument. A revised site layout to show same should be submitted for the written agreement of the Planning Authority prior to commencement of development.

    Archaeological monitoring shall be carried out as follows:

SCHEDULE OF CONDITIONS IMPOSED BY THE PLANNING AUTHORITY

P & D Ref. No:	**PD/17/295**
Applicant:	**Elgin Energy Services Ltd.**
Description:	**Development at a site within the townland of Rathleg, Castlerea, Co. Roscommon. The application is for a 10 year planning permission. The development will consist of a Solar Farm with an export capacity of approximately 4.2 MVA comprising Photovoltaic Panels on ground mounted frames, an enclosed single storey ESB Terminal Station, a single storey switchgear enclosure with storage contained, 4 No. single storey inverter stations, ducting & underground electrical cabling, perimeter fencing mounted CCTV cameras, provision of new access to public road as well as internal access track, and all associated site development and landscaping works at Rathleg townland, Castlerea, Co. Roscommon.**

- The developer shall employ a qualified archaeologist to monitor all excavations on the site including groundworks for the substation, inverter/transformer stations, temporary construction compound, cabling ducts and access tracks associated with the development. Groundworks associated with the removal of damaged piles or of large rocks to facilitate piling should also be monitored archaeologically.
- A monitoring report of the archaeological monitoring shall be prepared including photographs of the area before, during and after monitoring has taken place, as well as detailed photographs of specific areas, as required.
- A key plan, clearly showing the location and direction from which the photographs were taken shall be included in the monitoring report (An annotated site location map will suffice for this purpose).
- Should archaeological materials be found during the course of monitoring, the archaeologist shall have work on the site stopped, pending a decision as to how best to deal with the archaeology. The developer shall be prepared to be advised by the Department of Culture, Heritage and the Gaeltacht with regard to any necessary mitigation action (e.g. preservation in situ or excavation) and should facilitate the archaeologist in recording any material found.
- The developer shall furnish the Planning Authority and the Department of Culture, Heritage and the Gaeltacht with the monitoring report describing the results of the monitoring.

ROSCOMMON COUNTY COUNCIL 21 MAR 2022 G SECTION

Reason: In the interests of preserving items of archaeological significance effected by the development.

11. Existing field boundaries, including trees and hedgerows, shall be maintained and supplemented in accordance with details submitted.

In addition, all proposed landscaping and planting shall take place in the first planting season following commencement of development. In addition to the Landscape Plan submitted to the Planning Authority on the 30th June 2017, a supplementary landscaping plan shall be submitted for the written agreement of the Planning Authority prior to the commencement of development, to include full details of all tree species.

MP

SCHEDULE OF CONDITIONS IMPOSED BY THE PLANNING AUTHORITY

P & D Ref. No:	**PD/17/295**
Applicant:	**Elgin Energy Services Ltd.**
Description:	**Development at a site within the townland of Rathleg, Castlerea, Co. Roscommon. The application is for a 10 year planning permission. The development will consist of a Solar Farm with an export capacity of approximately 4.2 MVA comprising Photovoltaic Panels on ground mounted frames, an enclosed single storey ESB Terminal Station, a single storey switchgear enclosure with storage contained, 4 No. single storey inverter stations, ducting & underground electrical cabling, perimeter fencing mounted CCTV cameras, provision of new access to public road as well as internal access track, and all associated site development and landscaping works at Rathleg townland, Castlerea, Co. Roscommon.**

The landscaping and screening shall thereafter be undertaken in accordance with the agreed plan. The landscaping shall be maintained at regular intervals. Any trees or hedgerows that are removed, die or become seriously damaged or diseased within five years from planting shall be replaced within the next planting season by trees or hedging of similar size and species, unless otherwise agreed in writing with the Planning Authority.

Reason: in the interests of the visual amenity of the area.

12. The container, inverters, and fencing shall be dark green in colour. The external walls of the proposed substation shall be finished in neutral colour such as grey or off-white.

Reason: In the interests of the visual amenity of the area.

13. No artificial lighting shall be installed or operated on site, unless authorised by a prior grant of planning permission.

Reason: In the interests of visual and residential amenity.

14. CCTV cameras shall be fixed and angled to face into the site and shall not be directed towards nearby residential property.

Reason: In the interests of the amenities of the area.

15. Fencing shall be erected such that its bottom edge is no less than 150mm from ground level.

Reason: to allow wildlife to continue to have access to and through the site.

16. Cables within the site shall be located underground.

Reason: in the interests of visual amenity.

17. All surface water run-off from the overall development, including clean rainwater from the roofs and hard surfaces, shall be collected and disposed of within the site to specifically designed soakpits/drains. In particular, no such water run-off shall be allowed to flow onto the public road or adjoining properties.

Reason: In the interests of orderly development and public safety.

MP

SCHEDULE OF CONDITIONS IMPOSED BY THE PLANNING AUTHORITY

P & D Ref. No:	**PD/17/295**
Applicant:	**Elgin Energy Services Ltd.**
Description:	**Development at a site within the townland of Rathleg, Castlerea, Co. Roscommon. The application is for a 10 year planning permission. The development will consist of a Solar Farm with an export capacity of approximately 4.2 MVA comprising Photovoltaic Panels on ground mounted frames, an enclosed single storey ESB Terminal Station, a single storey switchgear enclosure with storage contained, 4 No. single storey inverter stations, ducting & underground electrical cabling, perimeter fencing mounted CCTV cameras, provision of new access to public road as well as internal access track, and all associated site development and landscaping works at Rathleg townland, Castlerea, Co. Roscommon.**

18. The developer shall maintain the public road free of debris and other materials generated by on-site activity relating to this construction process and permitted development. Should such an occurrence arise, the developer shall be responsible for addressing the issue as soon as it arises at their expense and to the satisfaction of the Planning Authority.

Reason: In the interests of maintaining the integrity of the public road network and in the interests of public safety.

19. Sound pressure levels generated by the permitted development when measured at any dwelling in the vicinity of the site existing at the date of this order shall not exceed 55dbA Leq. between the hours of 8am and 6pm, and shall not exceed 45dbA Leq outside of these hours.

Reason: To prevent injury to amenity and public health.

20. (a) Prior to commencement of development, a detailed site restoration plan, including a timescale for its implementation shall be submitted to, and agreed in writing with, the Planning Authority.

(b) In addition, on full or partial decommissioning of the solar array, or if the solar array ceases operation for a period of more than one year, the site shall be restored and structures removed in accordance with the agreed plan within three months of decommissioning/cessation, to the written satisfaction of the Planning Authority.

(c) With regard to the decommissioning of the site:

- The solar array and related ancillary structures shall be decommissioned and the lands reinstated in accordance with the written agreement of the Planning Authority, prior to the end of the 30 year permitted period, unless within that time a new permission is obtained from the Planning Authority to operate outside that period.

- The developer shall inform the Planning Authority in writing within three months of the proposed decommissioning of the solar array and related ancillary structures and shall submit detailed proposals for the decommissioning of same and ancillary components, together with a land reinstatement programme.

Reason: to ensure the satisfactory reinstatement of the site on full or partial cessation of the permitted development.

ROSCOMMON COUNTY COUNCIL 21 MAR 2022 SECTION

SCHEDULE OF CONDITIONS IMPOSED BY THE PLANNING AUTHORITY

P & D Ref. No:	**PD/17/295**
Applicant:	**Elgin Energy Services Ltd.**
Description:	**Development at a site within the townland of Rathleg, Castlerea, Co. Roscommon. The application is for a 10 year planning permission. The development will consist of a Solar Farm with an export capacity of approximately 4.2 MVA comprising Photovoltaic Panels on ground mounted frames, an enclosed single storey ESB Terminal Station, a single storey switchgear enclosure with storage contained, 4 No. single storey inverter stations, ducting & underground electrical cabling, perimeter fencing mounted CCTV cameras, provision of new access to public road as well as internal access track, and all associated site development and landscaping works at Rathleg townland, Castlerea, Co. Roscommon.**

21. Ten years before decommissioning, the developer/occupier of the site shall lodge with the Planning Authority an agreed cash deposit or bond of an insurance company, in the sum of €25,200, to secure the satisfactory reinstatement of the site (in accordance with the requirements of Condition No. 20 of this permission) coupled with an agreement empowering the Planning Authority to apply such security or part thereof to secure satisfactory reinstatement of the site.

    Reason: To ensure satisfactory reinstatement.

22. Prior to the commencement of development (or within such other timeframe as may be agreed with the Planning Authority) a development contribution in the sum of **€25,200** (updated at the time of payment in accordance with changes in the Wholesale Price Index – Building and Construction (Capital Goods), published by the Central Statistics Office) shall be paid to Roscommon County Council as a contribution towards the expenditure that was incurred or is proposed by the Local Authority in respect of providing public infrastructure and services. Payment of this contribution is subject to the provisions of the adopted Development Contribution Scheme 2014.

    Reason: It is considered reasonable that the developer should contribute towards the expenditure that is proposed to be incurred by the Council in respect of the provision of public infrastructure and services.

23. The date of commissioning of the development shall be notified to and established, in writing with the Planning Authority prior to any commercial use of the development. The permission shall be for a period of 30 years from the date of the commissioning of the solar array.

    Reason: In order to allow the Planning Authority to review the operation of the solar array in light of the circumstances prevailing at that time.

24. The developer shall give the Planning Authority two weeks' notice in writing of intent to commence development of the site.

    Reason: In the interests of orderly development.

END

L Kenny / L Murray / B Coughlan

Comhairle Contae
Ros Comáin
Roscommon
County Council

Recipient: [illegible] COMMON COUNTY
Register no: 1
RPS 02 OCT 2017
Project
File Ref
PM.
ROSCOMMON COUNTY COUNCIL
21 MAR 2022
PLANNING SECTION

Date: 29/09/2017
Ref: PD/17/295

Elgin Energy Services Ltd.,
134-135 Baggot Street Lower,
Dublin 2.

RE: **Permission for development at a site within the townland of Rathleg, Castlerea, Co. Roscommon. The application is for a 10 year planning permission. The development will consist of A Solar Farm with an export capacity of approximately 4.2 MVA comprising Photovoltaic Panels on ground mounted frames, an enclosed single storey ESB Terminal Station, a single storey switchgear enclosure with storage contained, 4 No. single storey inverter stations, ducting & underground electrical cabling, perimeter fencing mounted CCTV cameras, provision of new access to public road as well as internal access track, and all associated site development and landscaping works. Rathleg, Castlerea, Co. Roscommon.**

A Chara,

I attach herewith Final Grant of Planning Permission for the above development.

Please note that you are obliged to comply with all conditions attached to the Final Grant of Planning Permission in full.

In particular, you are obliged to give at least two weeks' notice in writing to the Planning Authority, of the date on which you intend to commence development.

You should also note that certain conditions of the Planning Permission may require that submissions are made to, and/or agreed with the Planning Authority before the commencement of any works pursuant to the planning permission. Failure to comply with these requirements before commencing development may render the development unauthorised and result in Enforcement Proceedings under the Planning and Development Acts.

Please note there is a separate requirement under the Building Control Act and Regulations to give formal notice of the commencement of development and, in order to comply with this you can log onto http://www.localgov.ie/en/link-type/bcms in order to complete the online assessment.

In accordance with Article 20 of the Planning and Development Regulations 2001 (as amended), you are obliged to remove the site notice following notification of Decision.

Mise le meas

Administrative Officer

CC: **RPS Group,**
West Pier Business Campus,
Dun Laoghaire,
Co. Dublin.

Áras an Chontae, Roscommon, F42 VR98
T 090 6637100 F 090 6625599 E customerservice@roscommoncoco.ie
W roscommon.ie RoscommonCountyCouncil @roscommoncoco

LCDC

Oifig Fiontair Áitiúil
Local Enterprise Office

SCHEDULE OF CONDITIONS IMPOSED BY THE PLANNING AUTHORITY

P & D Ref. No:	**PD/17/295**
Applicant:	**Elgin Energy Services Ltd.**
Description:	**Development at a site within the townland of Rathleg, Castlerea, Co. Roscommon. The application is for a 10 year planning permission. The development will consist of a Solar Farm with an export capacity of approximately 4.2 MVA comprising Photovoltaic Panels on ground mounted frames, an enclosed single storey ESB Terminal Station, a single storey switchgear enclosure with storage contained, 4 No. single storey inverter stations, ducting & underground electrical cabling, perimeter fencing mounted CCTV cameras, provision of new access to public road as well as internal access track, and all associated site development and landscaping works at Rathleg townland, Castlerea, Co. Roscommon.**

b) The widened section of roadway at the permitted entrance shall be brought to the existing level of the public road with 804 and sealed with double surface dressing to the satisfaction of the Planning Authority.

c) Any existing drainage channels shall be culverted as required to accommodate construction of entrances and associated road widening with size of pipe to be agreed with the Municipal District Co-ordinator prior to commencement of development.

d) The access to serve the development shall be formed in its entirety and available for use prior to the commencement of any other element of the development.

Reason: In the interests of traffic safety.

6. Prior to the commencement of development, a Construction Management Plan shall be submitted for the written agreement of the Planning Authority. This plan shall provide details of intended construction practice for the development, including:

   (a) Details of site security fencing and hoardings.
   (b) Details of the timing and routing of construction traffic to and from the construction site and associated directional signage, to include proposals to facilitate the delivery of abnormal loads to the site.
   (c) Measures to obviate queuing of construction traffic on the adjoining road network.
   (d) Measures to prevent spillage or deposit of clay, rubble or other debris on the public road network.
   (e) Details of appropriate mitigations measures for noise, dust and vibration, and monitoring of such levels.
   (f) Containment of all construction-related fuel and oil within specially constructed bunds to ensure that fuel spillages are fully contained, such bunds shall be roofed to exclude rain water.
   (g) Details of on-site re-fuelling arrangements, including the use of drip trays.
   (h) Details of how it is proposed to manage excavated soil.
   (i) Means to ensure that surface water run-off is controlled such that no deleterious levels of silt and other pollutants enter local surface water drains or watercourses.
   (j) All additional measures outlined in Section 5.3 of the Town Planning and Environmental Report submitted on the 30th June 2017.

ROSCOMMON COUNTY COUNCIL 21 MAR 2022 SECTION

MP

SCHEDULE OF CONDITIONS IMPOSED BY THE PLANNING AUTHORITY

P & D Ref. No:	**PD/17/295**
Applicant:	**Elgin Energy Services Ltd.**
Description:	**Development at a site within the townland of Rathleg, Castlerea, Co. Roscommon. The application is for a 10 year planning permission. The development will consist of a Solar Farm with an export capacity of approximately 4.2 MVA comprising Photovoltaic Panels on ground mounted frames, an enclosed single storey ESB Terminal Station, a single storey switchgear enclosure with storage contained, 4 No. single storey inverter stations, ducting & underground electrical cabling, perimeter fencing mounted CCTV cameras, provision of new access to public road as well as internal access track, and all associated site development and landscaping works at Rathleg townland, Castlerea, Co. Roscommon.**

All work shall thereafter be undertaken in accordance with the agreed Plan. A record of daily checks that the works are being undertaken in accordance with the Construction Management Plan shall be kept for inspection by the Planning Authority.

Reason: In the interests of environmental protection, amenities, public health and safety.

7. Prior to commencement of development, a Waste Management Plan for all waste materials associated with the permitted development, including the material from any trench excavation required if underground ESB connection is proposed, shall be submitted for the written agreement of the Planning Authority.

   In addition, all waste generated during the operation of the permitted development shall be removed by an approved/permitted waste collector.

   Reason: In the interests of the reduction and best practice management of waste from the permitted development.

8. During the construction phase working hours on site shall be strictly limited to 8am to 6pm on weekdays and 8am to 2pm on Saturdays with no work permitted on Sundays and Public Holidays, unless prior written approval is received from the Planning Authority, with the latter only being considered in exceptional circumstances.

   Reason: In the interest of proper planning and development and residential amenity.

9. All temporary elements and facilities needed for the construction phase shall be removed from the site within six months of the commissioning of the Solar Array.

   Reason: In the interests of orderly development and public health.

10. The permitted development shall be carried out in accordance with the details outlined in the Cultural Heritage Assessment and Archaeological Assessment Reports, submitted on the 30th June 2017, including all mitigation and monitoring measures outlined, and shall include the relocation of fence lines and screen planting to the northwest, northeast and southeast of the Recorded Monument, RO027-001, to ensure that they are at least 60m from the external perimeter of the Recorded Monument. A revised site layout to show same should be submitted for the written agreement of the Planning Authority prior to commencement of development.

    Archaeological monitoring shall be carried out as follows:

SCHEDULE OF CONDITIONS IMPOSED BY THE PLANNING AUTHORITY

P & D Ref. No:	**PD/17/295**
Applicant:	**Elgin Energy Services Ltd.**
Description:	**Development at a site within the townland of Rathleg, Castlerea, Co. Roscommon. The application is for a 10 year planning permission. The development will consist of a Solar Farm with an export capacity of approximately 4.2 MVA comprising Photovoltaic Panels on ground mounted frames, an enclosed single storey ESB Terminal Station, a single storey switchgear enclosure with storage contained, 4 No. single storey inverter stations, ducting & underground electrical cabling, perimeter fencing mounted CCTV cameras, provision of new access to public road as well as internal access track, and all associated site development and landscaping works at Rathleg townland, Castlerea, Co. Roscommon.**

- The developer shall employ a qualified archaeologist to monitor all excavations on the site including groundworks for the substation, inverter/transformer stations, temporary construction compound, cabling ducts and access tracks associated with the development. Groundworks associated with the removal of damaged piles or of large rocks to facilitate piling should also be monitored archaeologically.
- A monitoring report of the archaeological monitoring shall be prepared including photographs of the area before, during and after monitoring has taken place, as well as detailed photographs of specific areas, as required.
- A key plan, clearly showing the location and direction from which the photographs were taken shall be included in the monitoring report (An annotated site location map will suffice for this purpose).
- Should archaeological materials be found during the course of monitoring, the archaeologist shall have work on the site stopped, pending a decision as to how best to deal with the archaeology. The developer shall be prepared to be advised by the Department of Culture, Heritage and the Gaeltacht with regard to any necessary mitigation action (e.g. preservation in situ or excavation) and should facilitate the archaeologist in recording any material found.
- The developer shall furnish the Planning Authority and the Department of Culture, Heritage and the Gaeltacht with the monitoring report describing the results of the monitoring.

Reason: In the interests of preserving items of archaeological significance effected by the development.

11. Existing field boundaries, including trees and hedgerows, shall be maintained and supplemented in accordance with details submitted.

In addition, all proposed landscaping and planting shall take place in the first planting season following commencement of development. In addition to the Landscape Plan submitted to the Planning Authority on the 30th June 2017, a supplementary landscaping plan shall be submitted for the written agreement of the Planning Authority prior to the commencement of development, to include full details of all tree species.

ROSCOMMON COUNTY COUNCIL 21 MAR 2022 PLANNING SECTION

SCHEDULE OF CONDITIONS IMPOSED BY THE PLANNING AUTHORITY

P & D Ref. No:	**PD/17/295**
Applicant:	**Elgin Energy Services Ltd.**
Description:	**Development at a site within the townland of Rathleg, Castlerea, Co. Roscommon. The application is for a 10 year planning permission. The development will consist of a Solar Farm with an export capacity of approximately 4.2 MVA comprising Photovoltaic Panels on ground mounted frames, an enclosed single storey ESB Terminal Station, a single storey switchgear enclosure with storage contained, 4 No. single storey inverter stations, ducting & underground electrical cabling, perimeter fencing mounted CCTV cameras, provision of new access to public road as well as internal access track, and all associated site development and landscaping works at Rathleg townland, Castlerea, Co. Roscommon.**

The landscaping and screening shall thereafter be undertaken in accordance with the agreed plan. The landscaping shall be maintained at regular intervals. Any trees or hedgerows that are removed, die or become seriously damaged or diseased within five years from planting shall be replaced within the next planting season by trees or hedging of similar size and species, unless otherwise agreed in writing with the Planning Authority.

Reason: in the interests of the visual amenity of the area.

12. The container, inverters, and fencing shall be dark green in colour. The external walls of the proposed substation shall be finished in neutral colour such as grey or off-white.

Reason: In the interests of the visual amenity of the area.

13. No artificial lighting shall be installed or operated on site, unless authorised by a prior grant of planning permission.

Reason: In the interests of visual and residential amenity.

14. CCTV cameras shall be fixed and angled to face into the site and shall not be directed towards nearby residential property.

Reason: In the interests of the amenities of the area.

15. Fencing shall be erected such that its bottom edge is no less than 150mm from ground level.

Reason: to allow wildlife to continue to have access to and through the site.

16. Cables within the site shall be located underground.

Reason: in the interests of visual amenity.

17. All surface water run-off from the overall development, including clean rainwater from the roofs and hard surfaces, shall be collected and disposed of within the site to specifically designed soakpits/drains. In particular, no such water run-off shall be allowed to flow onto the public road or adjoining properties.

Reason: In the interests of orderly development and public safety.

SCHEDULE OF CONDITIONS IMPOSED BY THE PLANNING AUTHORITY

P & D Ref. No:	**PD/17/295**
Applicant:	**Elgin Energy Services Ltd.**
Description:	**Development at a site within the townland of Rathleg, Castlerea, Co. Roscommon. The application is for a 10 year planning permission. The development will consist of a Solar Farm with an export capacity of approximately 4.2 MVA comprising Photovoltaic Panels on ground mounted frames, an enclosed single storey ESB Terminal Station, a single storey switchgear enclosure with storage contained, 4 No. single storey inverter stations, ducting & underground electrical cabling, perimeter fencing mounted CCTV cameras, provision of new access to public road as well as internal access track, and all associated site development and landscaping works at Rathleg townland, Castlerea, Co. Roscommon.**

18. The developer shall maintain the public road free of debris and other materials generated by on-site activity relating to this construction process and permitted development. Should such an occurrence arise, the developer shall be responsible for addressing the issue as soon as it arises at their expense and to the satisfaction of the Planning Authority.

Reason: In the interests of maintaining the integrity of the public road network and in the interests of public safety.

19. Sound pressure levels generated by the permitted development when measured at any dwelling in the vicinity of the site existing at the date of this order shall not exceed 55dbA Leq. between the hours of 8am and 6pm, and shall not exceed 45dbA Leq outside of these hours.

Reason: To prevent injury to amenity and public health.

20. (a) Prior to commencement of development, a detailed site restoration plan, including a timescale for its implementation shall be submitted to, and agreed in writing with, the Planning Authority.

(b) In addition, on full or partial decommissioning of the solar array, or if the solar array ceases operation for a period of more than one year, the site shall be restored and structures removed in accordance with the agreed plan within three months of decommissioning/cessation, to the written satisfaction of the Planning Authority.

(c) With regard to the decommissioning of the site:

- The solar array and related ancillary structures shall be decommissioned and the lands reinstated in accordance with the written agreement of the Planning Authority, prior to the end of the 30 year permitted period, unless within that time a new permission is obtained from the Planning Authority to operate outside that period.

- The developer shall inform the Planning Authority in writing within three months of the proposed decommissioning of the solar array and related ancillary structures and shall submit detailed proposals for the decommissioning of same and ancillary components, together with a land reinstatement programme.

Reason: to ensure the satisfactory reinstatement of the site on full or partial cessation of the permitted development.

MP

SCHEDULE OF CONDITIONS IMPOSED BY THE PLANNING AUTHORITY

P & D Ref. No:	**PD/17/295**
Applicant:	**Elgin Energy Services Ltd.**
Description:	**Development at a site within the townland of Rathleg, Castlerea, Co. Roscommon. The application is for a 10 year planning permission. The development will consist of a Solar Farm with an export capacity of approximately 4.2 MVA comprising Photovoltaic Panels on ground mounted frames, an enclosed single storey ESB Terminal Station, a single storey switchgear enclosure with storage contained, 4 No. single storey inverter stations, ducting & underground electrical cabling, perimeter fencing mounted CCTV cameras, provision of new access to public road as well as internal access track, and all associated site development and landscaping works at Rathleg townland, Castlerea, Co. Roscommon.**

21. Ten years before decommissioning, the developer/occupier of the site shall lodge with the Planning Authority an agreed cash deposit or bond of an insurance company, in the sum of €25,200, to secure the satisfactory reinstatement of the site (in accordance with the requirements of Condition No. 20 of this permission) coupled with an agreement empowering the Planning Authority to apply such security or part thereof to secure satisfactory reinstatement of the site.

Reason: To ensure satisfactory reinstatement.

22. Prior to the commencement of development (or within such other timeframe as may be agreed with the Planning Authority) a development contribution in the sum of **€25,200** (updated at the time of payment in accordance with changes in the Wholesale Price Index – Building and Construction (Capital Goods), published by the Central Statistics Office) shall be paid to Roscommon County Council as a contribution towards the expenditure that was incurred or is proposed by the Local Authority in respect of providing public infrastructure and services. Payment of this contribution is subject to the provisions of the adopted Development Contribution Scheme 2014.

Reason: It is considered reasonable that the developer should contribute towards the expenditure that is proposed to be incurred by the Council in respect of the provision of public infrastructure and services.

23. The date of commissioning of the development shall be notified to and established, in writing with the Planning Authority prior to any commercial use of the development. The permission shall be for a period of 30 years from the date of the commissioning of the solar array.

Reason: In order to allow the Planning Authority to review the operation of the solar array in light of the circumstances prevailing at that time.

24. The developer shall give the Planning Authority two weeks' notice in writing of intent to commence development of the site.

Reason: In the interests of orderly development.

END

ROSCOMMON COUNTY COUNCIL 1 MAR 2022

MP