

**ACEI Design Excellence Awards 2017
Nomination Form**

Category (1) Mechanical & Electrical (M & E) Project
Category (2) Innovation Project (all disciplines)
Category (3) Overseas Project (all disciplines)

Company Details

Contact Name: John Nolan
Firm: Fehily Timoney and Company
Address: Core House, Pouladuff Road, Cork, T12 D773
Tel: 021 4964133 **Email:** john.nolan@ftco.ie

Categories/Groups:

Project Category: M & E Innovation Overseas

Project Group:

Small project (under €2.5m) **Medium project** (€2.5m - €10m) **Large project** (over €10m)

Project Information:

Name of Project: Kilgallioch Windfarm

Location: South Ayrshire, Scotland

Commencement date: October 2014 **Completion Date:** November 2016

Client: Farrans Construction, 99 Kingsway, Dunmurry, Belfast BT17 9NU

Contact: David Parr, Procurement Director Tel: 0044 28 9055 1300

Design Team:

Architect Not Applicable

Contact Email: _____ - _____ Tel: _____ - _____

Contractor Farrans Construction

Contact Email: DParr@farrans.com Tel: 0044 28 9055 1300

Authorisation to contact above: Yes No

Project Details:

(1) Provide a brief outline of the project (Max 200 words):

Fehily Timoney & Company (FT) has recently completed the detailed design of Kilgallioch Wind Farm in South Ayrshire, Scotland, a project with a capital cost of £300 million. Following a tender competition for which FT optimised the preliminary design, a Design and Build contract (£42 million) was awarded to Farrans Construction in June 2015 with FT acting as detailed designer for the project. The two-year project involves the design and construction of 65km of access road to serve turbine delivery vehicles and maintenance access, large quantities of steel reinforcement and concrete for the construction of 96 turbine bases. The impressive job also includes 400km of HV cabling, construction of an 800m² control building and 410 hectares of tree clearance. The site covers an area of approximately 33km².

FTs brief comprised:

- the design of 96 turbines bases requiring 45,000m³ of reinforced concrete;
- alignment design of 65km of internal road in challenging ground conditions;
- design of crane hard standings and blade laydown areas for each turbine;
- sustainable drainage design for access roads, bases and hard standings;
- design of environmental mitigation;
- design of culverts and bridges structures; and
- design for the extraction of 1.2 million tonnes of rock from six on-site quarries.

<198 words>



**(2) Provide a statement regarding why this project might be considered award winning:
(Max 300 words):**

The detailed design of this project was wholly undertaken in Ireland in FTs Cork office with geotechnical input from sub-consultant AGECE from their Carlow office. The project has already been the subject of national and international awards including:

- Winner in the Large Scale Infrastructure category at the Annual Scottish Power Supplier Awards (September 2016)
- Supplier of Energy Related Services' finalist in 2016 Iberdrola Supplier of the Year Awards (held in Madrid) (December 2016)

Scale and Complexity

The design and construction of this project was a major feat considering the works site spanned an area of 33km² and consisted of forestry and open moorland. The remoteness and the sheer size of the site necessitated the dividing of the overall project into multiple 'mini-projects' in the form of arrays. As each array required differing design inputs at any one time, scrupulous programming of design outputs and associated resource management was an essential element throughout the design process.

Communication on site was a significant challenge as mobile phone connectivity was undependable and site staff could sometimes be over an hours travel time away from an area that required inspection. The terrain was often rough with variable ground conditions which created significant challenges in developing an alignment design that allowed for the safe passage of turbine delivery vehicles while minimizing earthworks and the associated environmental impacts.



Environmental Sensitivity

The vast windfarm site lies within an environmentally sensitive area of Scotland and contains watercourse catchments in proximity to the Bladnoch SAC, water supplies, the presence of water voles and other sensitivities. Working with our environmental team, FT developed access track and drainage designs that ensured protection of existing natural watercourses, reduction of runoff rates and minimization of suspended solids in all flows. The designs were fully approved by the Scottish Environment Protection Agency (SEPA).

<300 words>

(3) Provide further details of the project such as: design elements / procedures; complexities involved; innovation aspects; site management and supervision; health & safety issues; project cost controls and any other relevant information (Max 500 words):

Design Elements & Procedure

In addition to the design of the elements listed above, FT had extensive input to:

- meeting the requirements of CDM Regulations;
- meeting the requirements of all the planning conditions for approval by the local planning authority and their advisors; and
- liaison with third parties including South Ayrshire Council, Dumfries & Galloway Council, Scottish Environment Protection Agency, the Galloway Fisheries Trust, and the highways authorities.

At the outset of the project, FT prepared Design Basis Statements (DBS) for the various elements of design which set out the procedures, design parameters and standards to be adopted. The DBS documents formed part of the Contractors Quality Plan and governed the design development and its approval. FT were also heavily involved in programme coordination and construction phasing as the design process was very much integral to the construction programme.



Innovation

The detailed design of the turbine foundations provided for a number of innovative solutions to be modelled for each turbine type to optimise construction time, cut and fill quantities and volumes of concrete and steel. Given the remoteness of the base locations and the number of bases, it was imperative for the success of the project to develop optimal solutions.

The 65km of access roads within the site were designed with a fine balance between gradient and earthworks impact all in accordance with the turbine supplier's requirements. In difficult circumstances, FT developed novel solutions including micro-siting hardstandings and rerouting access from alternative arrays.

There were 32 principal watercourse crossings within the site of which 28 required registration with SEPA under the Controlled Activity Regulations (CAR). One of the SEPA CAR crossings involves the crossing of the Tarf Water with a pedestrian bridge, adjacent to the existing vehicular bridge crossing the Tarf Water. Following hydraulic modelling FT developed an alternative pedestrian and equestrian bridge solution to the approval of the Client and SEPA.



Supervision & Health & Safety

FT had full time geotechnical supervision provided to site though sub-consultant Agec and visiting supervision by design office staff. Specific procedures were adopted to set requirements for on-site inspections and associated approval of turbine base foundations. FTs in-house Health & Safety expert provided ongoing advice to the contractor throughout the project so that design and construction activities complied in all respects with the provisions of the CDM Regulations. In the award of the Annual Scottish Power Supplier Award referenced above the judges had specific praise for health and safety performance on this project.

Following completion of design in August 2016 and completion of construction of the first array in December 2016, the first eight turbines were energised and the site began to export electricity to the National Grid. All 96 turbines are due to be energised over the next three months as the team continues to commission and finish the final turbine erections. When fully energized, the 239MW wind farm will have the capacity to power over 130,000 homes with renewable energy making it the third largest onshore windfarm in the UK.

<500 words>

Entries should highlight where possible the particular influence or benefit the project engineering design has on society and the wider environment.

Please confirm by electronic or written signature that:

- (a) The supplied text may be used in any marketing material issued in connection with the awards.
- (b) Agreement has been received from the client and other stakeholders that the project can be inspected by the adjudicator and provide contact details as requested above for the relevant person to be contacted in this regard.

Signed:  _____

Firm: Fehily Timoney & Company

Entry details:

Note: Applicants are encouraged to review the Awards Regulations and Procedures before submitting nominations.

Send the completed entry form and supporting photos / images altogether in **one PDF document** (one pdf document per project nomination) by email to: info@acei.ie with a subject line: ACEI Design Awards 2017.

Note: Closing date for receipt of nomination forms: 17:00, Monday 16th January 2017

Enquiries: ACEI office info@acei.ie 01 6425588