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Foreword by Harry Meighan, Chairman of Roughan & O'Donovan

Welcome to the ROD Summer 2021 Newsletter. We hope that you are all continuing to keep safe and are looking forward to a wider re-opening of society in your home country and internationally.

While ROD staff largely continue to work remotely outside of the three offices, it is somewhat gratifying to see that the ground floor offices in Sandyford are being put to good use during the enforced absence. Gemma Rothwell's article on p22 details how our offices were used as a venue hosting the clients' teams for Virtual Oral Hearings on the Foynes to Limerick Road (including Adare Bypass) scheme and the N67 / N85 Inner Relief Road (Blake's Corner) Ennistymon project. The article also notes the innovative use of technology by Seamus MacGearailt in presenting his lead evidence for the Foynes application.

This summer newsletter highlights several other instances of exciting, unique, and innovative work and projects being undertaken at this time in ROD, and the contributions we are making to the National Development Plan, the targeted national strategic outcomes in the NPF, and the vision for a future Ireland in the programme for government. Articles on p11, 29 and 38 highlight the ongoing work on the eMOS programme for TII to: - upgrade the Motorway Operations Control Centre at Dublin Tunnel to a best international practice facility; facilitate the implementation of variable speed limits on the M50; and to develop a network wide intelligent management system solution that will receive and process information from the roadside ITS units on the network, assisting the operators' decision making and response. On p13, Kieran O'Riordan and Laura Fernadez outline their participation in a Europengineers' task group undertaking a 'circularity in construction' case study on a Renzo Piano designed building in Guyancourt, outside Paris. The task group's study will be presented at the IABSE Congress in Ghent this September. Patrick O'Shea's article on p25 references the work by our environmental team on the Dodder Greenway project for South Dublin County Council, which included the development of a bat-friendly lighting system that sets a new standard for greenway lighting in Ireland. On p34, Richard Spencer reports on the development of virtual tools for public consultation on the N61 Ballymurray to Knockroghery project and the use of data analytics that will enable future virtual consultation to be tailored to enhance engagement with stakeholders.

ROD-IS articles on p40 and p41 report on the friction model developed for TII on the Network Safety Assessment project. which can be used as a predictive tool to instruct maintenance interventions, and the work we are doing for PIARC to develop countermeasures and technologies to reduce the incidence of bridge and tunnel strikes by oversized vehicles. Not to be outdone by the other disciplines in ROD, on p44 Paul Mitchell reports on the independent technical study undertaken by our Bridges Group for Jons Civil Engineering Ltd on the longest span precast W-beams used in Ireland on the current N22 Baile Bhuirne to Macroom Road Development.

As we go to 'print' with this edition of our newsletter, we are able to report that the Government has recently approved the commencement of construction on the N5 Ballaghaderreen to Scramoge road scheme. Roadbridge Ltd has been contracted by Roscommon County Council to undertake the main construction works. The letter of acceptance of the Roadbridge Ltd tender was issued on 16th June and the time for completion is 36 months. ROD-AECOM has been providing technical consultancy services to Roscommon County Council for the project since July 2014. Initially, our team led by Jim Thorpe and Barry Corrigan provided planning and environmental services through to approval of the scheme by An Bord Pleanála in January 2019. Subsequent to that approval and following a new tender process, we were appointed in June 2019 to provide Phase 5, 6 and 7 services, advancing a design-build construction contract through to the point of commencement. The scheme is aligned with / supports several of the National Strategic Outcomes in the National Planning Framework including Compact Growth, Enhanced Regional Accessibility, Strengthened Rural Economies and Communities, Sustainable Mobility, Enhanced Amenities and Heritage, and Access to Quality Childcare, Education and Health Services. We now look forward to the construction stage where we are contracted to provide technical review, works monitoring and contract administration services.

Finally, we are pleased to report the appointment of 7 new Associates in the company since 1st June. These are: - Andrew Thomson in our Buildings Group; Christian Smith & Peter King (Safety Manager) in Bridges; Frances O'Kelly (Sustainability Manager) in our Environmental Group; John Bell (Quality Manager) in Transportation; John Collins (Bridges) in the UK office; and Paul Kissane in Geotechnics. We congratulate them on their appointments and wish them every success in their new positions.





Making Engineering an inviting field for women



Gemma Rothwell, Environmental Scientist

I developed a love of science and the natural environment during my school years and followed my passion through to college, studying Environmental and Earth Systems Sciences at University College Cork [UCC]. I decided to specialise in environmental science, graduating with a BSc in 2016. I considered applying for a Masters in engineering, but when I was offered a graduate environmental scientist role at ROD, I decided to dive straight into industry.

Working as an environmental scientist within a civil engineering consultancy has taught me a lot, not least because of the sheer range of projects I have been involved in - from urban developments and greenways through to motorways and urban bypasses. I have greatly developed my knowledge of civil engineering and road design in particular over the past four years. I acted as environmental coordinator on the Foynes to Limerick Road (including Adare Bypass) project, which was recently progressed through Oral Hearing. Through the development of the Environmental Impact Assessment Report [EIAR] and Natura Impact Statement [NIS], I gained an in-depth knowledge of the complexities involved in designing major infrastructure schemes, including finding design solutions to meet the needs of the receiving environment across the full length of the proposed development.

Leading the coordination of the EIAR for the Trinity Wharf Development in Wexford – my home town - was a particular highlight. The proposed mixed-use development, granted approval by An Bord Pleanála in April 2020, will see the regeneration of a derelict, brownfield site along the Wexford quay front. The site has great potential as an economic hub, and I am looking forward to seeing how it will benefit the town in the years to come.

To increase female participation in engineering, I think it is important that teachers and parents encourage children at primary level to explore the "how and why of how things happen" by incorporating practical elements into classes and playtime. At secondary level, schools, particularly all-girls schools, should offer a broad range of subject choices, including physics and technical drawing, so students' future career options are not limited. I would also encourage young women starting out in their careers to be confident, focus on their interests, promote their strengths and work on their weaknesses, even if it means stepping out of their comfort zone to do so.



Enrica Calandro, Graduate Engineer

I am a graduate of the University of Messina in Italy where I studied civil engineering. As a Masters student, I specialised in structural engineering and the seismic protection of structures and transport facilities in particular. I graduated in March 2018 and subsequently joined ROD's graduate development programme.

My first big project in ROD was working as a member of the geotechnical team on the Great Yarmouth Third River Crossing in Norfolk. It taught me that to be good at this job you have to be smart, enjoy the process of discovery and, above all, be prepared to prove yourself on every project.

During my studies, I mainly focused on design, but I have recently had the opportunity to look at the management of a project in more detail. With greater and wider project experience, it is an area that I could see myself gravitating towards.

I would advise any young woman starting out on a career in engineering to try out different areas of engineering to find the one that suits you best - graduate development programmes are designed for this specific purpose. Get to know the colleagues who will help you if you have a problem and share their knowledge and experience with you. Be ready for the challenges that will inevitably come your way - big and small!



Anne Grego, CAD and BIM Technician

I grew up in Switzerland where, at the age of 15, I decided to pursue an apprenticeship as a CAD technician. While my parents were concerned that I was narrowing my career options too soon, they understood that civil engineering

had always appealed to me and, thankfully, supported my

Being the only woman in my class didn't hold me back, and I completed my four-year apprenticeship in three years! After graduating, I decided to take a gap-year before continuing my studies, spending the first six months working and the following six months travelling. It was during this time that I first visited Ireland. One year later, I decided to move to Dublin, setting myself the challenge of working in a professional environment through a language I had largely taught myself.

I have been working with ROD for almost three years, and I am currently undertaking a BSc in Building Information Modelling [BIM] at TUD, after which I hope to complete a two-year postgraduate diploma in Collaborative BIM.

My advice for parents and teachers is to encourage their daughters' and students' passions and support them in the pursuit of their goals. The more we reinforce the message that every individual. regardless of gender, possesses skills and qualities of value to society, and balance this with the right support and guidance, the more young women will pursue careers in engineering.



Two ROD projects shortlisted for **ACEI Engineering Excellence Awards**

Article by Roberta Keaney



Cyclist at the Royal Canal Premium cyle route

Two ROD projects feature in this year's Association of Consulting Engineers of Ireland [ACEI] Engineering Excellence Awards shortlist. The Motorway Operations Control Centre has been shortlisted in the 'Project of the Year' category and the Royal Canal Premium Cycle Route Phase 2 project in the 'Civil' category.

The first nomination recognises the motorway operations control centre as a project that will support TII in safeguarding the safety, resilience and sustainability of our road network. It is described elsewhere in this newsletter.

The nomination of Royal Canal Premium Cycle Route Phase 2 in the Civil category recognises the National Transport Authority and Dublin City Council's work in imaginatively repurposing a brownfield site and an underused section of the Royal Canal to deliver a critical piece of walking and cycling infrastructure for Dublin.

The project is part of the Royal Canal Greenway, a 26km offroad cycling and walking route from Dublin City Centre at North Wall Quay to Maynooth, and the Galway to Dublin Cycle Route, a dedicated coast-to-coast cycleway linking Dublin to Galway and stretching 270km across the country. The project posed several challenges for the design team, including the constrained nature of the site, sensitive location, presence of active railway lines requiring the scheme to span over and below existing railway infrastructure and an historic boundary wall running along the linear park. ROD was involved in the full project lifecycle from inception through to completion, including undertaking the options selection report in conjunction with the council in 2012, and helping secure Part VIII planning approval for the scheme in 2015.

The award winners will be announced on Friday 17 September



As our colleague, Carol Flanagan, prepares to retire, she looks back on her sixteen years with ROD, the friends she has made, the skills she has developed, and the fond memories she will take with her on her next adventure

I joined ROD as accounts payable manager in June 2005. I still remember my first day and being made to feel very important as I was brought around to each department and introduced to all the staff. Everyone was so welcoming. My first month in the accounts department was something of a baptism of fire as I only had one week for a handover with my predecessor and month-end was fast approaching!

As time passed, my role evolved, and I took on additional responsibilities, including acting as purchasing manager and - for a time - employee representative. The latter role was one I particularly enjoyed, as it gave me the chance to bring matters of interest to the team forward for consideration by management. Wearing various hats at ROD has been good for me – it has helped keep my mind active and challenged and, of course, learning new skills has always been something I have valued.

My biggest challenge came last year when the COVID-19 pandemic forced all my work to move online. The speed at which I made the adjustment to remote working is something I am very proud of!

When I retire this June, I will carry great memories of the laughs and tears I have shared with my friends in ROD. Some of my

fondest memories are connected with my recently-retired colleague, Marion Reidy. Marion established the company charity day in aid of the Irish Hospice, and I used to help her to arrange the annual bake sale. It was great fun, and everyone was always very generous with their donations. I also enjoyed the company race nights, where I would count the results with ROD's Office Manager, Michelle Harvey, and present the prizes to the lucky staff members.

I am going to miss all of my colleagues, particularly our Financial Controller, Ciarán Downes, who has been a great help to me over the years, and Assistant Accountant, Dorothy Murphy, whose chats during the coffee breaks and lunchtimes I have always enjoyed. And, to the newest member of our team, Elaine Byrne, I wish every success.

Being the oldest staff member in ROD – and the first person to reach retirement age while still working – are big achievements for me. My daughters Debbie and Catherine tell me they are so proud of me and the work ethic I have instilled in them. I am grandmother to four beautiful granddaughters, Kate, Faye, Ava, and Ella, and I am looking forward to seeing more of them in my retirement. I also plan to take up painting to keep me busy. It is the start of a new chapter in my life; the years have passed in a heartbeat!



Enabling Works for CNUs by PPP

Article by Sean Kennedy, Stephen Maher and Stephen Shortall



St. Finbarr's Hospital Image credit: MCA Architects

In last winter's edition of the ROD newsletter, we reported that enabling works contracts were being undertaken to provide access roads and site services for two new Community Nursing Units [CNUs] in Ardee, Co. Louth and Clonmel, Co. Tipperary. Both contracts have now been completed.

Midleton, Co. Cork

An enabling works contract for a CNU in Midleton, Co. Cork has also recently been completed. Works included the delivery of several new service connections to the site, including foul and storm drainage, a new watermain and several new mechanical and electrical [M&E] services. Some existing services were diverted, including a combined sewer and watermain serving the currently occupied buildings on site. As the site was relatively constrained, the use of trench boxes was required at one section of the dig to ensure the works did not undermine neighbouring buildings.

St Finbarr's Hospital, Cork City

An enabling works contract is currently underway at St Finbarr's Hospital, Cork City. Several new services will be delivered to the site, including storm and foul drainage, a new watermain and various M&E services. The project includes new car parking for the CNU and the existing hospital campus. As part of the works, a petrol interceptor and attenuation tank are being constructed to manage surface water effluent associated with the additional car parking. To overcome significant level differences on the site, several new retaining walls will be constructed.

Merlin Park Hospital in Galway

In early 2021, an enabling works package was issued for a new 60-bed CNU on the grounds of Merlin Park Hospital in Galway. The package includes demolition of ancillary buildings within the proposed site and diversion of a watermain and surface water and foul sewers. The works will allow the main contractor to work on site without impacting existing campus services and are expected to progress to detailed design this summer.

Letterkenny, Co. Donegal

In April 2021, the HSE instructed the design team for a new 110bed CNU in Letterkenny, Co. Donegal, to commence detailed design. The building was originally part of a larger bundle of CNUs currently at the preferred tenderer stage for delivery via a PPP arrangement. ROD has been engaged to provide full civil and structural engineering services for the scheme. Our design partners are MCA Architects, Semple & McKillop Ltd. (M&E), FCC Fire Cert Ltd, ORS (PSDP) and AECOM (QS). We are looking forward to progressing the scheme to tender in late 2021.

All six schemes form part of the HSE's CNU by Public Private Partnership [PPP] project, which will deliver a total of eleven new CNUs across Ireland.



Letterkenny CNU - Image credit: MCA Architects



Letterkenny CNU - Image credit: MCA Architects



110-Bed CNU in Letterkenny progresses to Detailed Design

Article by Stephen Maher





Image credit: MCA Architects

In September 2020, planning permission was granted for a new 110-bed community nursing unit in Letterkenny, Co. Donegal. The building was originally part of a larger bundle of CNUs currently at the preferred tenderer stage for delivery via a PPP arrangement. In April 2021, however, the HSE instructed the design team to commence detailed design. ROD has been engaged to provide full civil and structural engineering services for the scheme. Our design partners are MCA Architects, Semple & McKillop Ltd. (M&E), FCC Fire Cert Ltd, ORS (PSDP) and AECOM (QS).

The proposed part three-storey, part two-storey building comprises a combination of long and short-stay beds. The structural solution will adopt a mixture of reinforced concrete

columns, beams and slab construction, and hollowcore slabs. Where structural elements are stacked, load bearing blockwork construction will be used, with reinforced concrete solutions adopted for more complex stepped elements of the building.

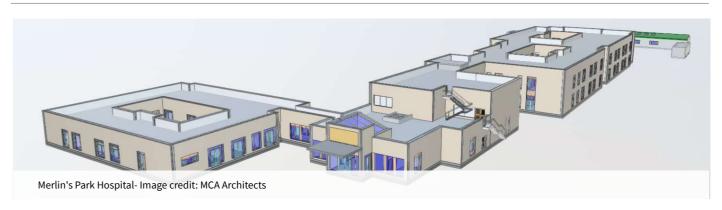
The site's topography (12m level difference from north to south) combined with the shallow rock level throughout presents a challenge to the project team, particularly in terms of access and drainage. During the pre-planning stage, there was significant engagement with the local authority regarding traffic issues on the Kilmacrennan Road and surface water drainage. Stakeholders, including Irish Water, were also consulted.

ROD is looking forward to progressing the scheme to tender in



Planning granted for 60-bed CNU at **Galway's Merlin Park Hospital**

Article by Séan Kennedy



Planning permission has been granted for a new 60-bed community nursing unit on the grounds of Merlin Park Hospital in Galway. The proposed development consists of a two-storey building and includes a 10-bed dementia-specific unit and associated residential facilities. ROD is providing civil and structural engineering services for the development. The other members of the project team include MCA Architects and Semple & McKillop (M&E).

The design team faced several design constraints when developing the proposed solution, including:

- protected woodland to the north of the site;
- an existing building to the south of the site;
- limited available space on the site; and
- existing services in the area.

The Dublin Road, which bounds the south of the campus and provides a direct link to Galway city centre, added to the complexity to the scheme.

During the planning process, the design team engaged with Galway City Council to mitigate the adverse effects of the development on the existing hospital campus, surrounding residents and road users. To manage the challenge presented by high traffic volumes on the Dublin Road during the morning and afternoon peak times, ROD's transportation team completed network and junction analyses, producing both a Transportation Assessment and a Mobility Management Plan [MMP] to accompany the planning submission.

ROD also prepared an Enabling Works Package that issued in early 2021. The package includes demolition of ancillary buildings within the proposed site and diversion of a watermain and surface water and foul sewers. These works will allow the later main contractor to work on site without impacting existing

ROD is looking forward to progressing the development to detailed design this summer.



60-Bed CNU at Heather House in **Cork City moves forward**

Article by Stephen Maher

In November 2020, the Health Service Executive [HSE] engaged MMD Construction to deliver a rapid-build residential healthcare facility at Heather House on St Mary's Health Campus in Cork City. ROD is acting as MMD's structural and civil designer for the Design & Build contract. This is in parallel to our role as the HSE's Technical Advisor on the scheme and is being advanced by a separate internal team. Our design partners are MCA Architects, Semple & McKillop Ltd. (M&E), FCC Fire Cert Ltd, and RPS (PSDP).

The building is being expedited as part of the HSE's emergency Covid-19 works. It will be similar in structure and layout to the HSE's CNU specimen model - part two-storey and part three-storey rectangular building; with a central

courtyard and 'doubly-loaded' circulatory corridor servicing rooms either side of the corridor. ROD adopted the outcome of studies undertaken as part of the CNU by PPP project to deliver a Preliminary Stage 1 Report, which was used by the HSE South to secure funding for the project.

Due to the congested nature of the existing underground services on the campus, several services diversions will be required. For example, a reinforced concrete structural solution was required to construct the new building over the large concrete service trench crossing the site. Ancillary site works form part of the project scope, including an extension to the existing vehicular access road and additional car parking spaces.



First Phase of St Teresa's Gardens **Regeneration complete**



ROD is pleased to report that the first phase of the St Teresa's Gardens Regeneration Project on Donore Avenue reached completion in February 2021. Built in the early 1950s, St Teresa's Gardens is one of the oldest social housing complexes in Dublin. The regeneration of the 346-unit complex forms part of Dublin City Council's plans to develop new 'urban guarters' in the inner city, with O'Devaney Gardens and Dolphin House also being rebuilt and renovated.

With a construction value of approximately €20m, the first phase of the regeneration project comprises 56 housing units, with two blocks of three and five-story apartments. ROD, as Employer's Representative [ER] on the scheme, led the administration of the public works contract on the council's behalf and acted as the main point of contact for the main contractor, Purcell Construction Ltd. Our responsibility was to ensure the project was fully compliant with the requirements of the public works contracts and to deliver a high quality solution and clear cost control for our client. The discovery of contaminated land on-site provided a significant test for the project team during construction, but the designers developed a solution to allow the majority of this material to be dealt with

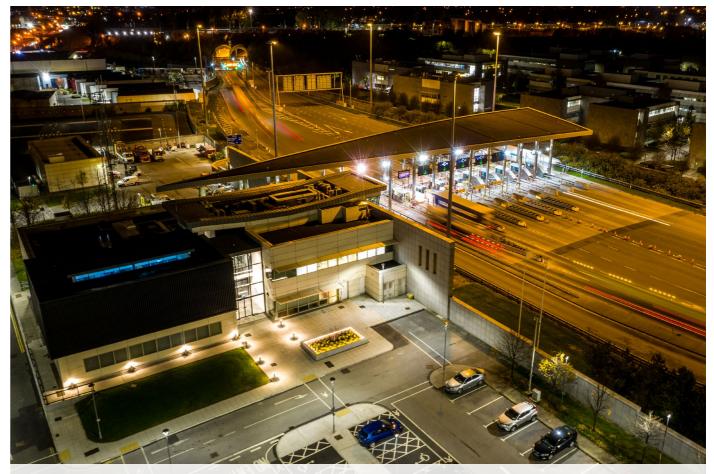
in-situ, thus avoiding the additional challenges and costs associated with removal off-site. No dispute proceedings arose in respect of any of the ER's determinations on this project.

Construction began in December 2018, and despite the challenges presented by the COVID-19 pandemic over the past year, the first former resident, Kris Taylor, was presented with the keys to her new home last February. Speaking at the presentation, the Minister for Housing, Local Government and Heritage, Daragh O'Brien TD said: "This project, the latest phase of the transformation of the area, has seen significant investment by the Department, and I am delighted to be here today to see Kris and indeed other people from the local community moving into their new homes. It is clear to see that these high-quality homes will continue to foster the strong sense of community for generations to come." Brendan Kenny, Deputy Chief Executive of Dublin City Council added: "The aim of the [city wide regeneration] programme is to replace ageing flat complexes with more and better quality homes. The Minister is a very strong advocate for this programme, and I believe we are truly on the cusp of a new era of regeneration."



The Motorway Operations Control Centre

Article by Andrew Thomson and Ciaran McIntyre



View from drone of the MOCC

Transport Infrastructure Ireland's [TII] new Motorway Operations Control Centre is the beating heart of its motorway network operations in Ireland. Located next to the Dublin Tunnel and overlooking the Toll Plaza, the control centre monitors and manages more than 1,200 kilometres of motorways and dual carriageways across Ireland. The control centre was developed by extending and refurbishing the existing M50 Dublin Tunnel Control Building. The two-storey extension to the building was designed to modernise and future-proof the environment within which TII manages the motorway network. It incorporates a new control room, incident management room, server room, meeting rooms and offices.

The works were undertaken in two separate phases, with the new extension being completed prior to the refurbishment of the older part of the building. The principal feature of the first phase extension is the 18m long x 12m wide column free control room at first floor level. The contractor demobilised for five months to allow for the transfer of motorway and tunnel operations to the new control room before commencing Phase 2. This latter phase was completed in December 2020.

The project team comprised ROD-AECOM, MCA Architects and John Paul Construction.

Background

The motorway operations control centre project is one of three schemes within TII's enhancing Motorway Operations Services [eMOS] programme, which will increase the use of cutting edge Intelligent Transport Systems (ITS) technology, including implementing variable speed limits and lane control signals on the M50. The other two schemes within eMOS are the Network Intelligence Management System and the M50 Traffic Flow Optimisation project.

When complete, eMOS will enable control centre operators to:

- react to real-time events on the network:
- set reduced speed limits on variable speed limit
- close lanes in response to incidents;
- co-ordinate activities with emergency responders to safely clear incidents from the road; and
- keep road users informed about driving conditions on the national road network.



New Control room in the MOCC

Approach

The control centre project was delivered as a Level 2 BIM project, with a fully federated Building Information Model used to integrate the fabric and internal systems of the extension with the existing Dublin Tunnel Building. From an early stage of the design development process, the model was used to coordinate the design across the architectural, structural and M&E teams.

The project team developed a detailed model of the existing building based on available As Built records. The model was then checked by undertaking exploratory opening-up works, with a particular focus on circulation routes between the existing building and the extension. Any discrepancies were noted and the model updated. The model was then expanded to include the proposed extension, which helped to determine where the services could tie into the existing systems. During construction, the model was provided to the contractor to be updated to a fully 'as-built' federated model and asset register. It was subsequently provided to the centre operator, Egis Road and Tunnel Operation Ireland [ERTO]. It will be used by ERTO as a key maintenance tool during the operational life of the building. The as-built model will be used to feed information back to the building facilities management software to ensure that correct and proper maintenance procedures are followed.

During the construction stage, the project team discovered clashes in some locations that, due to the 24 hour operational nature of the building, had not been possible to investigate prior to starting the project. The combined model had to be updated and used to quickly resolve these issues in the design office, which had the benefit of minimising delays on site.

Operations

The design of the upgrade and extension is centred around the new control room, a state-of-the-art facility equipped with the latest technology to allow real-time monitoring of the motorway network. Motorway and tunnel operators sit side-by-side in the main control room, monitoring the M50 motorway and its approaches, the Dublin Tunnel and the Jack Lynch Tunnel in Cork. In all, more than 65 million journeys a year are monitored and managed in the control centre.

A 3m-high, 15m-wide, 4.2-million-pixel video wall displays real-time feeds from the motorway CCTV camera network. The video wall gives operators visibility of the entire M50, 24 hours a day, seven days a week. It allows operators to spot developing incidents, enlarge views of incidents as they occur, and study CCTV images in detail before making decisions.



Separated from the main control room by a full height glass panel is an Incident Management Room, equipped with four screens for the display of selected CCTV footage. It gives staff a clear view of the control room and its main displays, and serves as the location for coordinating the response to major incidents on the road network. When an incident occurs, operators coordinate with the emergency services to safely clear the network, close lanes, post advice to overhead variable message signs and work to reduce the risk of secondary incidents.

In addition to the main extension works, the existing large atrium was reconfigured. A two-storey lightweight structure was incorporated within the double height space to provide much needed additional meeting rooms, offices and a modernised server room. These meeting rooms and offices are connected to the new control room through a link walkway spanning across the atrium at first floor level. To give the control room its own identity in the expanded building, it appears as a distinct black box slightly overhanging the white elevations below. The control room exterior is clad in polyester powder-coated fins that continue uninterrupted over the large south-facing window. The fins provide solar shading from direct sunlight into the control room, extending the amount of time throughout the day that a direct visual link to the outside can be maintained. Natural light also floods through the large clerestory windows, just below roof level. This connection to the external environment was important for the well-being of motorway and tunnel operators, who spend a significant amount of time looking at screens.

Challenges

The key constraint for the project team was ensuring the 24 hour

operation of the tunnel and motorway operations housed within the existing building remained operational at all times during the works. The restricted nature of the site and the extensive array of existing underground services under and close to the extension footprint added further complexity. The foundations had to avoid the existing data cable routes because it was impossible, due to the operations of the building, to divert these. The piling installation was designed to be a minimum of 1m away from these cables, with cantilevered ground beams employed to support the superstructure as required. To overcome these challenges, extensive pre-construction surveys were undertaken and a steel-framed construction with precast concrete floors, structurally independent but with ties to the existing building, was adopted to provide a seamless, integrated facility. ROD-AECOM also worked closely with all stakeholders, including TII and ERTO to manage the project with minimal disruption to current operations during construction.







ROD and Europengineers exploring circularity in construction

Article by Kieran O'Riordan and Laura Fernandez



In 2020, we attended a design sprint on the theme of circularity in construction in Paris on behalf of ROD. The three-day event was organised by Europengineers and hosted by Setec, one of France's largest engineering consultancies. It was attended by representatives from several Europengineers member companies, including Basler & Hofmann, Buro Happold, Hydea, Aronsohn Consulting Engineers, Schüßler-Plan and Salfo.

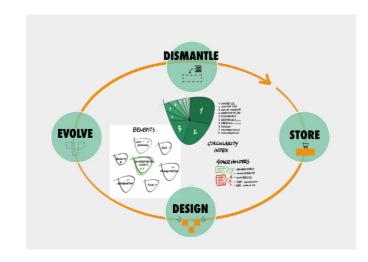
Europengineers is a network of independent
European Consultants and Engineers providing a
comprehensive range of services throughout the
world. Countries represented include France,
Greece, Italy, Ireland, Portugal, Spain, Switzerland,
The Netherlands and the UK.

We were presented with a case study of the Thomson factory in Guyancourt, which was scheduled for demolition. Designed by architect Renzo Piano, whose other notable works include the Pompidou Centre in Paris, and constructed between 1988 and 1990, the building was typical of the high-tech movement in architecture at that time. It is formed by a steel frame superstructure laid in a 7.2m x 14.4m grid of modular bays and features a distinctive curved roof profile to maximise the amount of natural light.

The group of engineers, architects and project managers was split into 4 teams and given the task of exploring how the components could be reused before appraising each idea in terms of architectural and engineering detailing, structural feasibility, insurance, marketing, and circularity potential. We

used the process followed for the Thomson factory to derive a methodology which could be used to evaluate circularity on other projects. The methodology summarised the key ideas and findings from the three day workshop, with the learning outcomes summarised on a poster for ease of dissemination.

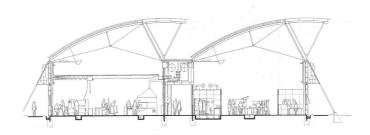
The workshop underscored for us the importance of thinking about reuse and disassembly when designing new buildings. Key considerations at the design stage should include standardisation of structural member sizes and lengths, repetition of structural arrangement (modularity), the type of connections (welded vs. bolted) and potential future use (versatility). It is interesting that the steps taken by the Renzo Piano team in 1988 to use a modular grid offered better possibilities for the design sprint teams in 2020, over thirty years later!



The workshop also helped us appreciate that defining a building's circularity index is complicated by the many quantitative and qualitative factors influencing it, including the avoidance of CO2 consumption or embodied carbon, life cycle assessment [LCA] index, ease of transportation and storage, material treatment prior to reuse, reassembly, shape (standard or non-standard) and the condition of a component.

In a linear economy, raw materials are extracted from the earth, used and discarded: "take-makewaste". In the circular economy, raw materials are never depleted. This economy can be structured so that there is a positive coupling between economic growth and the growth of natural resources.

Following this, we reflected on the various levers, barriers and difficulties that were identified during the design sprint which could restrict the adoption of circularity in construction as well as the interesting variety in how to tackle it. We documented these in an article 'Exploring circularity: Europengineers on Piano'



which has been accepted for the International Association for Bridge and Structural Engineering (IABSE) Congress on Structural Engineering for Future Societal Needs in September.

The adoption of circularity in construction is developing at different rates in different countries and some joined-up thinking is needed to tackle the issues that circular economy principles are trying to address. The design sprint team has reassembled, and we are now developing a Sustainability Europengineers Database which Europengineers members can use to share information and discuss this topic. We hope to have a prototype ready for the IABSE Congress.





Sustainability Month at ROD

The month of May marked ROD's annual celebration of all things sustainable. Our team arranged and presented a series of virtual lunchtime presentations on topics including climate change, energy and biodiversity. Several team members shared stories about the ways they have found to live more sustainably, and links to relevant conferences, podcasts and information sources were circulated to all staff.

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The lunchtime presentations comprised:

- The 17 UN Sustainable Development Goals: Ireland's Progress presented by Environmental Scientist, Victoria da Silva Pereira
- Overview of the Climate Action & Low Carbon **Development (Amendment) Bill 2021** presented by Principal Spatial Planner, Frances O'Kelly
- The future of the energy industry and tips for homes presented by Senior Environmental Consultant, Claire Cable
- Living shoreline versus hard engineering solutions: A Case Study of Jacksonville Zoo, Florida presented by Senior Hydrogeologist, Brian Dugan
- Action towards biodiversity net gain challenges

and opportunities presented by Senior Ecologist, Patrick O'Shea and Ecologist, Kate Moore

- **Overview of the Landmark Supreme Court** Judgement in Climate Case Ireland presented by Environmental Scientist, Yana Bersunukayeva
- A review of ROD's Environmental Management **Systems** presented by Director, Joe Kelly

The team also ran a series of sustainability-focused competitions during the month, which dovetailed nicely with National Biodiversity Week (15 – 23 May). Designed to test our knowledge of native flowers, birds, invertebrates and mammals, the competitions provided lots of fun and helped raise €500 for a range of worthy causes, including Birdwatch Ireland and Crann-Trees for Ireland.

The team's hard work in developing an engaging, informative programme of activities with sustainability as the core component was rewarded with well-attended presentations and strong participation in the competitions. Our sustainability champions' good example will help ensure that we continue to promote and apply sustainable practices within our company and our lifestyles. Roll on next year!



Top Tips for Sustainability

1. Cut down on single-use plastics

Cut down on using things like cling-film, freezer bags and tin-foil and replace them with a better alternative - reusable bags. Reusable non-toxic storage bags can be boiled, frozen, refrigerated and baked. They are also safe to put in the dishwasher and microwave - and overall much better for the planet!

2. Invest in palm-oil free products

As we all know, Palm oil has been and continues to be a major driver of deforestation of some of the world's most biodiverse forests, destroying the habitat of already endangered species like the Orangutan, pygmy elephant and Sumatran rhino. Try switching to palm-oil free products such as palm-oil free soaps, shampoos and facewashes. These options can be purchased online and are a great alternative.

3. Give growing vegetables a go

Try growing your own vegetables such as courgettes, tomatoes, peppers, carrots, lettuce, garlic, brocolli and onions. There are great resources online for getting seeds and information on how to grow and care for food plants.

4. Invest in a plastic catcher for your washing

There are plastic catchers available that will catch all of the loose synthetic microfibres that come loose in the wash and would normally make their way into our rivers, lakes, and oceans.

5. Make sustainable choices in purchases

Buy from brands that have a sustainability policy using recycled polyester at worst and sustainable cotton. Also try not to buy plastic toys - wood, metal or recycled plastic only.



Biodiversity Quiz



Question 1

Which Irish animal was newly credited this year with controlling the spread of grey squirrels?

Question 2

What animal is this?

Ouestion 3

What species of butterfly is this?

Question 4

Dandelions close their flowers in the rain. True or

Question 5

What native Irish animal is thriving in the Dublin Airport long-term carparks?

Ouestion 6

Where in Ireland can wallabies be found?

Sopranos are one kind of which tiny Irish bats?

Question 8

What species of whale is this?

Question 9

What is the name of this plant?

Quiz answers on bottom of page 47





Work Progresses on Midleton's Water Rock Residential Development



ROD has been commissioned to undertake the water and infrastructure design works for two large residential development projects at Water Rock in Midleton, Co. Cork. Set in a prime location north west of Midleton and adjacent to the railway line to Cork, the development has been identified as key to ensuring the sustainable future expansion and consolidation of the Cork Metropolitan Area. ROD's environmental team is currently completing an Environmental Impact Assessment Report (EIAR) and Site-Specific Flood Risk Assessment (SSFRA) for the designated lands. The townland, 'Water Rock', takes its name from a cave/sinkhole at a prominent limestone outcrop immediately west of the development site, and the lands within the vicinity of the development are underlain by a complex network of hydrogeological features.

Hydrogeological and geotechnical surveys are currently being progressed to aid in determining surface water/groundwater interactions. These include continuous flow gauging, groundwater level logging and dye tracer testing to determine groundwater conduit flow paths. The tracer testing has been positive, confirming previously unsubstantiated connections

between sinkholes and springs within the locality. Groundwater levels have been identified as a significant contributor to flooding in the area, and the surveys undertaken will form the basis of the SSFRA hydrological assessment in conjunction with watercourse flow estimation.

When the hydrological analysis is complete, the development lands will be subject to a detailed hydraulic assessment. A topographical survey of the Water Rock Stream and its tributaries has already been completed, which will allow for the construction of a hydraulic model that considers surface water/groundwater interactions and overland flow paths. Completion of the assessments described above will be crucial to sustainably integrating the proposed development within the existing hydrological and hydrogeological environment.

ROD is also providing civil, structural and traffic engineering advice to the design teams, as well as providing ecological assessment services. Our partners on both projects, which are being managed by Emaoifrob, include Van Dijk Architects, CSR Land Planning and Design and KPMG Future Analytics.



Glenabo Stream Feasibility Study



ROD was appointed in September 2020 by Avondhu Blackwater Partnership, on behalf of Fermoy Forum, to undertake a study of the ecology, hydrology and related aspects of the Glenabo Stream and its catchment. The aim of the study is to inform proposals for the enhancement or restoration of the stream, which is located just outside Fermoy in Co. Cork.

Glenabo Stream is a minor tributary of the (Munster) River Blackwater and is known to support otters, brown trout and potentially other fish species, such as salmon, lampreys and eels. With the exception of a small number of crossings, it does not appear to be highly modified and is classed as a "good-status" waterbody. Any pollution appears to be mainly agricultural while there is no indication of significant flooding along the stream. Several notable birds can be found along its length, including Dipper and grey wagtail. The stream flows through a steep valley with considerable riparian vegetation. It is likely to support significant numbers of bats, and potential roost sites have been identified. The Blackwater River (Cork/ Waterford) Special Area of Conservation [SAC] is one of several national and international sites for nature conservation located within the catchment and surrounding area.

Phase 1

In December 2020, ROD delivered the Phase 1 Scoping Report, comprising a Desk Study that established the baseline conditions in the catchment in respect of ecology, hydrology and other issues related to the health of the aquatic environment. It involved consultation with the National Parks and Wildlife Service [NPWS], Inland Fisheries Ireland [IFI] and the Local Authority Waters Programme [LAWPRO] Community Water Officer. Local and national organisations with specific interests in biodiversity and water management were also consulted. The report identified several significant pressures and threats to the

ecological and hydrological integrity of the catchment, including:

- Invasive alien species, such as Japanese knotweed and American Mink;
- Water quality issues, including diffuse pollution from agriculture; and
- Hydromorphological issues, such as poorly designed stream crossings.

Phase 2 of the study will address the gaps identified in the review of the baseline data and involves undertaking more detailed investigations of the aquatic and terrestrial ecology of the stream and its catchment and identifying drainage outfalls to watercourses, including land drains. Fieldwork, which began last January, will help define both the baseline conditions and the pressures/threats to be addressed with greater accuracy, as well as elaborating on the potential enhancement and restorative interventions. Specific tasks include an ecological walkover survey, freshwater invertebrate and fish sampling, and a river hydromorphological assessment.

Phase 2 will consider and compare the potential implications of various enhancement and restorative interventions for biodiversity, water quality, residents, landowners, and the wider community. It will also consider the constraints and costs associated with their planning and implementation. Our work will involve further, more in-depth consultation with stakeholders, including convening a public symposium to explore the proposed interventions (in a format compliant with the prevailing public health advice). It is envisaged that this work will eventually feed into a wider project for sustainable living in the catchment and surrounding area.



Climate Action Bill 2021

Article by Frances O'Kelly



Background

In 2015, Ireland introduced the first framework piece of climate change legislation, the Climate Action and Low Carbon **Development Act 2015.** The Act provides for the establishment of a national framework aimed at achieving a low-carbon, climate-resilient, and environmentally sustainable economy by 2050 (referred to in the Act as the "national transition objective").

The Climate Acton and Low Carbon Development (Amendment) Bill 2021 (hereafter referred to as the "Climate Bill" or "Bill") will amend the 2015 Act: the "Principal Act". The Bill is currently undergoing pre-legislative scrutiny and is due to be finalised by the end of 2021. Its purpose is to strengthen the statutory framework for more effective governance of the State's climate objectives and to realise the national, EU and international climate goals, including meeting our legally binding obligations in the near and long-term. It proposes to strengthen the "National Climate Objective", on a statutory basis, with a commitment that, "The State shall, so as to reduce the extent of further global warming, pursue and achieve, by no later than the end of the year 2050, the transition to a climate resilient, biodiversity rich, environmentally sustainable and climate neutral economy." The text in bold represents the additions made by the Bill. The key amendment here is the introduction of the words "and achieve" by the hard end date of 2050.

The Bill will support Ireland's transition to net zero and achieve a climate neutral economy by no later than 2050. It defines a climate neutral economy as "a sustainable economy and society where greenhouse gas emissions are balanced or exceeded by the removal of greenhouse gases,", (which will allow for carbon offsets, for example through conserving peat bogs or planting forestry). The provisions of the Bill can be split into long-term and short-term targets, to include the following key elements:

Long-term targets 2050:

- Climate neutrality/net zero emission by 2050; and
- National Long-term Climate Action Strategy (every five years over a 30-year period).

Short-term targets

Total reduction of 51% emissions over the period to 2030

- Carbon budgets: It will embed the process of carbon budgeting into law. The Government will be required to adopt a series of economy-wide five-year carbon budgets, including sectoral targets for each relevant sector, on a rolling 15-year basis, starting in 2021.
 - The first two five-year carbon budgets should equate to a total reduction of 51% emissions over the period to 2030, in line with the Programme for Government commitment:
 - · Carbon budgets and all plans must be consistent with the Paris Agreement and other international agreements; and
 - · If a carbon budget emission ceiling is exceeded, all exceeded emissions will be carried forward to the next budget period, which will be reduced accordingly.
- Climate Action Plan [CAP]: Requires the preparation of a new CAP to supersede the existing 2019 plan. The CAP will detail the actions required of each sector and will be updated annually.

National Long Term Climate Action Strategy will be prepared every five years.

Sectoral Emissions Ceilings

• Government Ministers will be responsible for achieving the legally binding targets for their own sectoral area. with each Minister accounting for their performance towards sectoral targets and actions before an Oireachtas committee each year.

Climate Change Advisory Council [CCAC]:

- Strengthens the role of the CCAC by tasking it with proposing carbon budgets to the Minister;
- Expands the CCAC from eleven to fourteen members;
- Provides that future appointments to the CCAC reflect a broader range of relevant expertise and gender

Local Authorities and policy will be required to:

- Prepare CAPs which will include both mitigation and adaptation measures;
- CAPs will be updated every five years; and
- Local Authority Development Plans must align with their respective CAPs.
- Public bodies will be obliged to perform their functions in a manner consistent with national climate plans and strategies, and contribute to furthering the achievement of the national climate objective.
- Other key principles embedded in the Bill include just transition, climate justice and protection and restoration of **biodiversity** which will be matters to which the Government and the Minister for the Environment, Climate and Communications are required to have regard to when preparing the plans and frameworks that are required by the
- Public participation provisions are strengthened, with the Bill providing that the Minister will consult with the public on each of the relevant plans, strategies, and carbon budgets.

On 2 February 2021, Government approval was given to draft amendments to the Petroleum and Other Minerals Development Act 1960. The amendments are designed to give statutory effect to ending the issuing of new licences for the exploration and extraction of gas. This commitment will be provided for in legislation at the committee stage of the Climate Action and Low Carbon Development (Amendment) Bill 2021. If enacted, this will represent a significant sea change in terms of supporting environmentalists' calls to 'Keep it in the ground' and support the decarbonisation of the economy.



Despite a commitment in the Programme for Government that the Bill would include a ban on the sale of new petrol and diesel cars from 2030, the revised Bill does not provide for it. This is possibly due to the requirements of EU law that requires draft provisions in legislation to be notified to the European Commission in advance of its entry into force. However, the decarbonisation of the economy by 2050 at the latest remains a target.

Meeting targets

While Ireland has historically failed to meet its annual emissions reduction targets, the Climate Bill should provide the necessary framework to steer a more meaningful course of action. The financial penalties will be substantial but the impacts for future generations and biodiversity will be immeasurable.

According to the Environmental Protection Agency (EPA), the next 12 years are critical. Climate forecasts for the next century in Ireland indicate:

- changes in wind speeds and storm tracks;
- increased likelihood of river and coastal flooding;
- changes in distribution of plant and animal species;
- changes in the timing of lifecycle events of native species;
- water stress for crops;
- pressure on water supply;
- adverse impacts on water quality; and
- negative impacts on human health and wellbeing.

These changes will impact every sector of our society. Early research undertaken by the Environmental Protection Agency [EPA] and the Sustainable Energy Authority of Ireland [SEAI] show that even with the extensive Covid-19 restrictions imposed in Ireland over the past 14 months, greenhouse gas emissions reduced by only 5.9% in 2020.



Opportunities

The concept of what is 'achievable' has changed dramatically since COVID-19, and it is important that we capitalise on these learnings to deliver the required climate savings. We have shown during Covid that we can respond to the science if we accept that there is an emergency. Unfortunately, there is no vaccine the planet can take, but we have the solutions and science already, yet the question remains: are we, as a society, ready to take action?

The Bill, once passed, will support the development of innovative and sustainable solutions, many of which will be in the engineering and planning domain. The Bill will provide the roadmap to where we need to go, but ultimately, every sector of society in Ireland has a part to play in ensuring we meet the unprecedented challenge of net zero emissions by 2050, so we can avoid the catastrophic impacts of rising global temperatures.



Foynes to Limerick Road (including Adare Bypass) Virtual Oral Hearing

Article by Gemma Rothwel



Set-up for Virtual Oral Hearing

The COVID-19 pandemic has triggered a shift in everything from how we live to how we work. For many businesses, it prompted a rethink of not just resilience and security, productivity and costefficiency, but also sustainability and wellbeing. While some found the sudden need to react to be a daunting challenge, others were ready to adapt and innovate. Over the past twelve months, ROD's capacity for creative thinking and operational dexterity has been tested on several projects across a variety of sectors. One example that required unusual working practices arose in facilitating the Oral Hearing for the Foynes to Limerick Road (including Adare Bypass) project.

Limerick City and County Council submitted the Strategic Infrastructure Development [SID] application for the proposed road development, including the Environmental Impact Assessment Report, the Natura Impact Statement and the Compulsory Purchase Order [CPO] to An Bord Pleanála in December 2019. Following this, further information was submitted in September 2020 on request from the Board. The proposed development will form part of the TEN-T Core road network from Limerick to Foynes Port and, with the improvement of the N21 route between Adare and Rathkeale, by means of a bypass of Adare, will also provide part of the TEN-T Comprehensive road network.

In late December 2020, An Bord Pleanála issued notification to the applicant and all other parties that the Oral Hearing for the project would be held virtually, beginning on 8th February 2021. Traditionally, an Oral Hearing is held in a public venue within the locality of the project, generally a hotel, with An Bord Pleanála, the Applicant, objectors and members of the public (observers) in attendance. In the newly adapted format, An Bord Pleanála issued the attendees with an invitation, via Microsoft Teams, to the online proceedings, which it organised and managed from its offices in Dublin. Members of the public were notified and, where requested, a meeting invitation was issued by the Board offering them the same level of visibility and participation as they would have experienced at an in-person event.

As the consultant, ROD-AECOM was faced with the challenge of securing a venue that would allow the Oral Hearing to proceed satisfactorily while safeguarding the health and safety of the team, both internal and external. Due to the Level 5 Covid-19 restrictions in place in Ireland last February, most hotels and conference facilities were unavailable. ROD therefore undertook to adapt a floor of our head office in Sandyford for use as a virtual venue for the Oral Hearing. This involved rearranging the furniture to allow the required team



to be seated around the evidence table whilst ensuring that all public health requirements, including social distancing, were strictly maintained. We also enlisted the help of technical event specialists AVC to provide the audio and visual assistance necessary to ensure the Oral Hearing ran smoothly. Separate "green-room" facilities were also provided for those not directly participating in the hearing at any given time.

The Hearing lasted nine days in total, with the Applicant, Limerick City and County Council, its senior counsel and solicitor accommodated in our offices for the duration. The core design team members from ROD-AECOM were also present in the offices, together with the environmental specialists who were involved in preparing the Environmental Impact Assessment Report and the Natura Impact Statement. While the majority of the team members attended in person, others presented their evidence virtually via Microsoft Teams or provided assistance to the backroom team online.

The Oral Hearing ran according to plan, with participants welcomed and accommodated by the Inspector for the Board. Only minor technical glitches were experienced throughout and these were dealt with expeditiously. The main benefit of hosting the Applicant team in our offices meant that we had guaranteed connectivity through our company Wi-Fi linked to our high-capacity broadband connection, and easy access to printing facilities and additional desk space, as required. The virtual nature of the hearing also allowed us to manage our team of specialists efficiently, and we were in a position to call on them to respond to a query only when required. Overall, the virtual format was perceived to have provided many benefits in terms of time, travel and paper use savings in particular, as all the documents were made available for the general public to view online on the project website.

In addition to the novelty of a virtual oral hearing, our lead witness, ROD-AECOM Project Director, Seamus Mac Gearailt, used an innovative display tool to show the proposed development as an overlay on Google Earth (using a kmz file format).

This enabled him to provide a helicopter style fly-over of the entire 35 km long route and guide the Inspector and the other participants to the relevant location under discussion. Where appropriate, a ground level image could be pulled up from Google Streetview or direct distance measurements could be made between receptors and various elements of the proposed development such as the boundary fence, the earthworks footprint or the road edge. This facility was enthusiastically welcomed by both the Inspector and the third parties as it enabled everyone to clearly understand the location and context in question during the discussions. It also demonstrated the willingness of the Applicant to assist the other participants to fully engage in the hearing process so that they could contribute to best effect.

The same arrangements were used with similar success for the subsequent N67 / N85 Inner Relief Road (Blake's Corner) Ennistymon project CPO Oral Hearing for Clare County Council.





Royal Canal Premium Cycle Route -Phase 4 Phibsborough to Ashtown



ROD-AECOM was appointed by Dublin City Council to provide engineering and environmental consultancy services for the Royal Canal Premium Cycle Route - Phase 4 between Phibsborough and Ashtown. The objective of the scheme is to provide a premium cycle and pedestrian facility with environmental enhancements along the route. The scheme begins at Cross Guns Bridge at Phibsborough Road and continues along the northern bank of the Royal Canal for approximately 4.3km, ending in the village centre at Ashtown. The existing towpath of the canal is currently being used for both access and amenity purposes by both pedestrians and cyclists.

The usage of the canal has increased through the Covid-19 pandemic, as more people have learnt to better appreciate the amenity value of the canal corridor. This has necessitated a review of the original towpath upgrade design, and a new and more ambitious scheme is now envisaged. This will involve widening of the towpath through setting back boundaries and narrowing sections of the canal. It is also planned to replace the underpass under the Maynooth Line Railway in the second phase of the project to provide a continuous wide route along the full length of the canal.

In parallel with the design team's activities, ROD's Environmental Team is undertaking an Ecological Impact Assessment (EcIA) of the project. Ecological surveying is currently underway, including surveys of protected mammals, invertebrates, aquatic plants and invasive species. Our ecologists are also engaging with our engineers and our planning and landscape specialists, Brady Shipman Martin, to develop a landscaping design that will restore and enhance the ecological corridor along the route. Work will include re-establishing the canal bank habitat to provide foraging resources and shelter for a range of pollinators, birds and mammals. This will be achieved through the construction and planting of native wildflower, hedgerow and tree species along the length of the scheme. Alien invasive species will be removed, and continuous linear habitats will be created. In addition, sand martin boxes and other artificial features for other fauna will be integrated. Lighting will be bat friendly, based on the recent installation on the Dodder Greenway. When complete, it is intended the project will result in a significant net gain for biodiversity, notwithstanding the unavoidable increase in pedestrian and cycle usage of the facility.

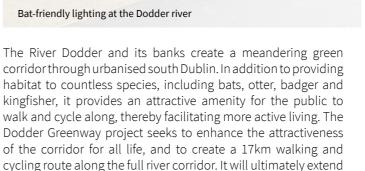


The Dodder Greenway: Setting the Standard for Bat Friendly Lighting on Greenways

Article by Patrick O'Shea



foothills of the Dublin Mountains.



ROD has been involved in the development of the Dodder Greenway project from its inception, preparing the Feasibility Study for the project on behalf of South Dublin County Council [SDCC] and the National Transport Authority [NTA] in January 2013. The strategy for the construction of the greenway sought to maximise the use of the existing network of built surfaces, footpaths and footbridges and highlighted the need for careful consideration of the environmental constraints along and within the river at all stages.

from Grand Canal Dock in Dublin City to Bohernabreena in the

In 2014, ROD was engaged by SDCC to provide planning and environmental consultancy services for the Part VIII applications for the greenway throughout the three affected Local Authority jurisdictions - SDCC, Dublin City Council and Dún Laoghaire-Rathdown County Council. In preparing the Ecological Impact Assessment (EcIA) that accompanied the planning application for the SDCC section, our ecologists surveyed the greenway corridor for rare and protected plants and animals, invasive species and habitats. Of particular concern was the potential impact of public lighting on light-sensitive bat species. To collect baseline data on the distribution of bats along the greenway, transects were walked using bat detectors that can identify, record and georeference bat calls. Thermal imaging and a radio telemetry study were also undertaken. The radio telemetry study involved trapping bats and fitting them with tiny radio transmitters designed to track them to their roosts.

In October 2017, SDCC granted planning permission for its section of the greenway. In 2019, ROD was engaged to undertake



5m tall lighting at the Dodder river

a pre-construction survey and provide construction stage ecological monitoring for the project. The second phase of the SDCC greenway is nearing completion having seen the installation of three bridges, 2.6km of improved paths and 750 metres of new paths.

Public lighting along the greenway has been a complex issue, with the safety of greenway users having to be balanced against the impacts on biodiversity of introducing artificial lighting to previously unlit areas. To avoid adverse impacts on bats, in particular the light sensitive Daubenton's Bat, the design agreed between SDCC and the National Parks and Wildlife Service [NPWS] involves significant deviations from public lighting guidelines (which are typically drafted with

The LED light units allow for horizontal cut off, i.e. minimal lighting spill outside the intended area for illumination, and complete and precise control of colour and brightness. The lighting is designed to average 5 lux meaning that, even when switched on at night, its 'warm-white' colour will reduce impacts on wildlife. In general, the luminaires will be mounted on six-metre poles, however, at the footbridges and in the highly sensitive Bushy Park, handrail lighting and lowlevel bollards will be provided instead.

The lights will be programmed to switch on between 07:00 and 19:00 year-round. In effect, this means there will be no full-time lighting between March and October and, in the winter months, full-time lighting will be provided during the key commuting times. Between 19:00 and 07:00, the lights will be operated on a motion sensor basis that switches the lights on for a set period of time when a person is detected in the vicinity and completely off otherwise. The lights will be linked to provide a lit corridor ahead of walkers and cyclists to avoid creating a heightened sense of insecurity associated with local spot-lighting. The Dodder Greenway bat-friendly lighting system is on a par with the most advanced in Europe and sets a new standard for greenway lighting in Ireland.



Trinity Wharf Development awarded €18.5m in State funding

Article by Gemma Rothwell

ENVIRONMENTAL



The Government has announced funding of €18.5 million for Wexford's Trinity Wharf Development, under 'Call 2' of the Urban Regeneration and Development Fund [URDF]. The project will see the redevelopment of a 5.5 hectare brownfield site on Wexford's quayside into an attractive mixed-use urban quarter

set in high-quality public realm.

Announcing the funding for the project, Minister for Housing, Local Government and Heritage, Darragh O'Brien TD, said "The Trinity Wharf development, with its plans for retail, cultural, hotel and commercial development, can enhance Wexford as a location in which to live, work and visit." The investment will ensure that key enabling/development works necessary to underpin the proposed development are in place, including:

- . A new access road, automated railway level crossing and Trinity Street junction works;
- Public realm works to prepare an initial three sites for private sector development;
- A pedestrian boardwalk integrating Trinity Wharf with the town's existing quay front promenade and linking the site to Wexford town centre;
- A marina providing facilities for leisure craft activities and marine tourism; and
- Site surfacing, services, and hard and soft landscaping to prepare the remaining sites for private sector development.

ROD provided engineering design services for the works in conjunction with Scott Tallon Walker Architects and Wexford County Council, as well as preparing an Environmental Impact Assessment Report, Natura Impact Statement, Traffic and Transportation report and an Engineering Design Statement for the project. It received approval from An Bord Pleanála in February 2020.



View of the development from Wexford Quays



ROD appointed to two landmark Dublin City Centre developments

Article by Deirdre Net



ROD has been appointed by Hibernia REIT to provide urban realm and traffic engineering services on its two new landmark developments at Clanwilliam Court and Harcourt Street in Dublin city centre. This follows our successful collaboration on the Windmill Quarter in Dublin's south docklands, where ROD designed significant public realm enhancement works, transforming Windmill Lane into a welcoming, tree-lined social space, at no cost to Dublin City Council. Similar interventions are proposed at the two new developments.

Clanwilliam Court

Following various earlier planning permissions secured at Clanwilliam Court and Marine House at the junction of Mount Street Lower and the Grand Canal, a new design team has been appointed to create a comprehensive campus-style redevelopment proposal. ROD's design partners on the project include C.F. Moller and MCA Architects, Brady Shipman Martin (planning), Rogerson Reddan (QS), Ramboll (M&E), CORA (civil and structural), Maurice Johnson & Partners (fire), and Ashview (PSDP). Working with CF Moller, ROD will devise and design a transformative public realm around the building, giving due consideration to Dublin City Council's strict requirements for such interventions. We will also be providing full transport engineering services for the planning process. The planning application is expected to be submitted later this year.

Harcourt Street

ROD's second commission is on the Harcourt Square redevelopment scheme at the Dublin Metropolitan Region Garda Headquarters on Harcourt Street. With planning permission secured for a major new 25,000sqm office complex on the site, ROD has been engaged to design, oversee and manage the delivery of public realm enhancements around the site. This will require extensive interfacing with traffic, public transport, and Luas infrastructure. We are looking forward to the challenge and to working with our design partners HJ Lyons Architects, CS Consulting (civil and structural), OCSC (M&E), Linesight (QS), Lafferty (PM), Maurice Johnson & Partners (fire), Ashview (PSDP) and Cameo (landscape architects).

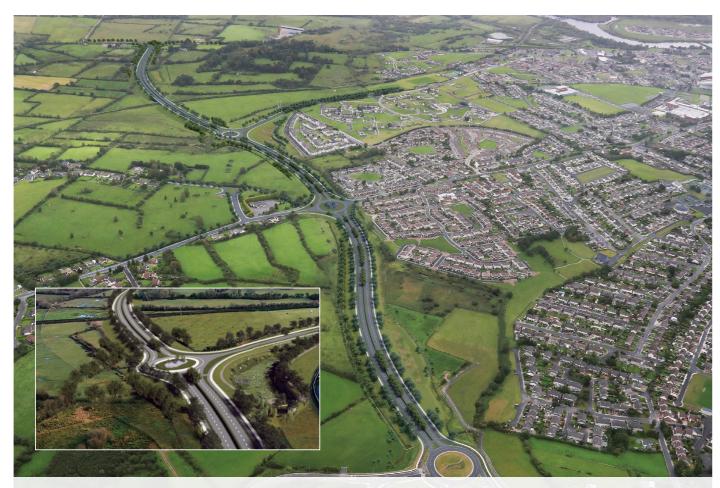


Harcourt Street - CGI Images courtesy of Rendercare



Construction Contract Awarded for Coonagh to Knockalisheen Distributor Road

Article by Emily Alfred



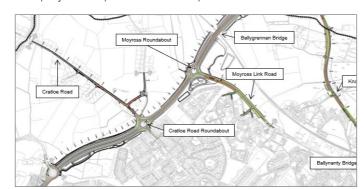
Aerial view photos by Tom Coakley, Barrow Coakley Photo& Video

The contract for the construction of the Coonagh to Knockalisheen Distributor Road scheme has been awarded to Roadbridge Ltd. The proposed road development consists of a new 2.6km high quality dual carriageway with cycleways and footways on each side. The scheme is located on the north western outskirts of Limerick City and will link the Coonagh Roundabout on the N18 with the Knockalisheen Road close to the Limerick/Clare county boundary. It includes upgrades to existing carriageways, two new road over railway bridges, three new roundabouts and two traffic signal controlled junctions.

ROD, in partnership with MRG Consulting Engineers, brought the scheme from initial constraints study through route selection and preliminary design to planning, detailed design and tender. We are now supporting Limerick City and County Council in providing site supervision and contract administration during construction, close out and review (TII Phases 6-7).

Speaking at the contract signing, Seamus Hanrahan, Director of Capital Investment, Limerick City and County Council said: "The commencement of the main contract is very welcome as it will dramatically improve connectivity on the northside of Limerick city and increase accessibility to a range of retail, education and employment services. This project has received strong wide-ranging support and its delivery is a cornerstone of the regeneration of Moyross."

The project is expected to be completed in the winter of 2023.





M50 Traffic Flow Optimisation - Update

Article by Nicholas McCann



Gantries in operation on the M50

In August 2020, Dynniq was awarded the M50 Traffic Flow Optimisation (MTFO) ITS Deployment contract. The contract award marked a significant milestone for TII and ROD-AECOM and followed three years of planning, as well as the successful delivery of several advance works contracts to upgrade civil infrastructure along the M50.

The deployment of equipment to support the managed rollout of variable speed limits on the M50 is to be completed across six sections of the M50 over a two-year period. The installation of overhead signs along the first of these sections is currently nearing completion, with these signs set to 'go live' during the summer months



Setting up gantries on the M50



Keith Hughes from ROD working on M50 Motorway

To date, 98 Lane Control Signals [LCS] and 14 Pictogram Variable Message Signs [VMS] have been installed on the motorway between Junctions 3 (M1) and 6 (N3), with works ongoing to cable and configure the signs ahead of on-site testing.

To minimise disruption to traffic on the M50, the signs are mounted onto gantries as part of a programme of nightworks. Once the signs are installed on the gantries, they are connected to the power and fibre infrastructure in advance of site acceptance testing. Prior to going live, the equipment must undergo extensive testing to confirm its functionality, test messages to be displayed, and end-to-end connectivity between the roadside and TII's Motorway Operations Control Centre at the Dublin Tunnel.





Construction advances on the N5 Westport to Turlough Road Project

Article by Luke Duffy



A portion of the N5 mainline earthworks, as well as the Islandeady Road Overbridge under construction, with Croagh Patrick in the westerly background. Photos by John Duggan, photographer.

Work is continuing apace on the construction of the N5 Westport to Turlough Design & Build road project in Co. Mayo. The contract was awarded to Wills Bam Joint Venture in October 2019, and construction works began on site in the spring of 2020. ROD's current responsibilities include contract administration and monitoring of the construction works, having previously managed the planning and design phases.

The project is being funded by TII and delivered by Mayo County Council, whose Chief Executive, Peter Hynes, described it as "one that will completely transform the landscape of Mayo." The proposed road development consists of 20km of new Type 2 dual carriageway, starting east of Castlebar, bypassing the town to its south, and continuing to Westport. In addition, 2.8km of new Type 2 single carriageway with parallel pedestrian and cycle facilities will form a northern bypass of Westport, connecting to the first 2.5km section of the N59 Westport to Mulranny Type 3 single carriageway.

Key features include:

• two grade-separated junctions with the busy N60

- and N84 roads;
- six roundabouts;
- twenty-two bridges;
- a piled embankment; and
- a large number of culverts.

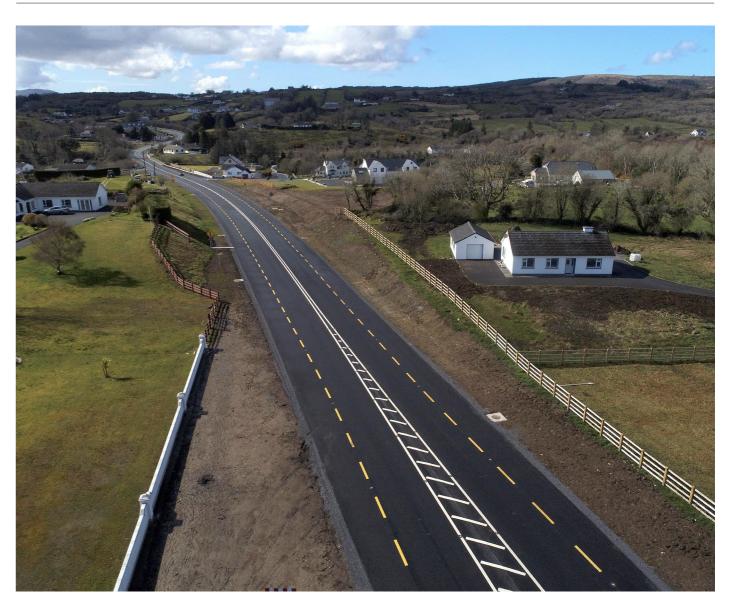
While the project is primarily being constructed in a greenfield setting, the new mainline crosses existing road, rail and drainage infrastructure at multiple locations. This requires the construction of fifteen bridges, including two railway bridges across the Dublin-Westport line, and the installation of more than 10 large culverts. Drainage works are in the early stages of construction and piling for an embankment in soft ground near Westport is about to begin.

The project is expected to be completed by the final quarter of 2022. It will provide a major boost to business activities in Castlebar and Westport while also serving to further enhance west Mayo's vibrant tourism industry, particularly around Westport.



N56 Drumbeigh to Inver Road scheme opens to the public

Article by Gerard Ward



The N56 Drumbeigh to Inver Road Scheme was successfully completed in early 2021, significantly enhancing the accessibility of south west Donegal and improving road safety. ROD provided consulting engineering services for the contract administration, construction supervision and handover stages of the scheme to Donegal County Council. The project comprised the construction of 2.4km of Type 1 single carriageway, including both online realignment and offline construction, with five at-grade junctions along the route. It tied into the recently completed N56 Mountcharles to Drumbeigh Road scheme, for which ROD had provided the same construction stage services.

Work began on site in August 2019, with Wills Bros Ltd. as the contractor. Works included site clearance; fencing; safety

barriers; drainage and service ducts; diversion of watermains and other utilities; accommodation works; landscaping and environmental mitigation measures.

The project team faced several challenges, including:

- adverse ground conditions comprising deep peat excavation:
- ground contaminated with invasive species;
- extensive existing utilities traversing the site; and
- multiple traffic management phases required to facilitate the construction of the works.

The spirit of cooperation between ROD's site team and the contractor during the course of the contract paid dividends for the client, and the works were completed to a high standard throughout.



Construction gets underway on N56 Letterilly to Kilraine Road scheme



In January 2021, construction began on the N56 Letterilly to Kilraine Road scheme in Co. Donegal. The project comprises 4.1km of Type 3 single carriageway. ROD has been engaged by Donegal County Council to provide construction and handover stage consulting engineering services for the scheme, for which Wills Bros Ltd. has been appointed as the main contractor.

The project is similar in nature to the N56 Cloghbolie to Boyoughter Road scheme, for which ROD previously provided construction stage services. Completed in 2012, it involved the construction of 3.5km of Type 3 single carriageway and a 650m temporary floating road over peat. The knowledge and experience ROD gained on the Cloghbolie scheme proved beneficial when our project team on the N56 Letterilly scheme undertook a review of the contractor's proposed 1.5km temporary floating road diversion alongside the existing road. Our feedback ensured a robust design was achieved, thereby removing the need for a significant temporary diversion of traffic during the construction of the mainline alignment.

ROD's project team is being led by Patrick Grennan as Employer's Representative, with Gerard Ward acting as Senior Resident Engineer on site. Gerard and his team are currently overseeing the construction of the temporary floating road over peat; excavation and replacement of unacceptable material for off-line construction; and the installation of pre-cast concrete culverts. ROD's Principal Geotechnical Engineer, Dr. Paul Kissane, visited the site team to advise on the implementation of an inspection and monitoring regime in advance of the construction of 2.5km of surcharged embankment over soft ground.

The scheme involves construction close to and within the West of Adara/Maas Road Special Area of Conservation [SAC] and the Owenea catchment where fresh water pearl mussels have been recorded. As Ecological Clerk of Works, Owen O'Keefe visited the site and carried out audits of the contractor's environmental mitigation measures to ensure compliance with planning conditions. The construction works are due to be completed in the second quarter of 2022.



N60 Balla to Claremorris Realignment at Heathlawn

Article by Ed Warren

ROD-AECOM was recently appointed by Mayo County Council to deliver engineering services (TII phases 5, 6 and 7) for the N60 Balla to Claremorris Realignment at Heathlawn in County Mayo. The commission includes detailed design, procurement, contract administration and site supervision services. It is one of several major transport infrastructure schemes in the west of Ireland for which ROD is currently delivering engineering services. The others include the N5 Westport to Turlough Road, N5 Ballaghaderreen to Scramoge Road, N26 Realignment at Cloongullane and N61 Ballymurray to Knockcroghery Road. All of the schemes will enhance accessibility and boost economic activity in the north west

The N60 road runs east-west, linking the towns of Roscommon,

Castlerea, Ballyhaunis, Claremorris, Balla and Castlebar. The proposed works at Heathlawn require the upgrade of 3.6km of the existing N60 National Secondary road between Balla and Claremorris to Type 2 single carriageway with an offline cycleway. The project will enhance the safety of road users by improving the substandard cross section and alignment of the existing N60 road. The provision of cycleway facilities along the length of the scheme provide a safe and attractive facility for these users, in turn inciting greater mobility and physical activity.

The western end of the scheme is adjacent to the Balla Turlough candidate Special Area of Conservation (cSAC) and proposed Natural Heritage Area (pNHA). Avoidance, Management and/or Mitigation measures will therefore be required during construction to protect the integrity of this environmentally sensitive area.



TII appoints ROD as service provider for MCAAS-2 Region West commission

TII has appointed ROD as the Motorway Contracts Audit and Administration Services [MCAAS] provider for the MCAAS-2 Region West commission. This is one of three separate such packages nationwide and includes 291km of national road maintained by Colas Roadbridge (under the Motorway Maintenance and Renewal Contract [MMaRC] Network B contract) and 148km of national road maintained under Public Private Partnership [PPP] contracts.

Under this commission, ROD will provide network audit, contract administration and advisory services to TII for the MMaRC and PPP operations and maintenance contracts within the region. The commission is for a five-year base term with scope for a further two years of extension.

ROD's appointment to the MCAAS-2 Region West commission represents a significant achievement for us. It is not only an important addition to our asset management portfolio, but it also provides opportunities to realise synergies with our ongoing services for TII on the enhancing Motorway Operations Services (eMOS) and the Risk-based Geometric Design (Ribgeom) commissions, as well as our research work on the CEDR Interlink project 'Asset Management using BIM'. We look forward to working with TII and the maintaining organisations over the next five to

A team of regionally based resident engineering staff has been assigned to the project, which will be coordinated from our head office by Ed Warren, Technical Director.



Phase 2 Option Selection on N61 Ballymurray to Knockcroghery Road nears Completion

Article by Richard Spence



In February 2019, ROD-AECOM was appointed to develop the N61 Ballymurray to Knockcroghery road project from feasibility through to statutory consent, in compliance with Transport Infrastructure Ireland's PMG , PAG and CMM and DPER's CAF requirements. The contract provided a welcome opportunity for us to continue our association with Roscommon National Regional Roads Office (NRRO) and build on the success of the N5 Ballaghaderreen to Scramoge Road project.

The N61 is a major north-south arterial route through County Roscommon linking the regional centres of Athlone and Sligo and providing greater connectivity to the N6/M6 Dublin-Galway motorway, N5 and N4 national primary routes. The existing N61 between Ballymurray and Knockcroghery is substandard in terms of horizontal and vertical alignment, cross-section and sightlines, and includes a high number of junctions and direct / field accesses. In addition, there are two at-grade level crossings between the N61 and the Dublin to Westport/Ballina railway line, posing a hazard to both road and rail users.

The project is nearing completion of the Option Selection stage. Consultation with land and property owners and other interested parties has formed a key part of this stage, and their local knowledge has greatly assisted the project team to develop appropriate design options and to reach an emerging preferred route corridor. Due to COVID-19 pandemic restrictions, it was not possible to present the Emerging Preferred Route Corridor to the public at a traditional, in-person consultation event. ROD-AECOM therefore developed an alternative consultation experience that allowed stakeholders and the general public to view the

relevant maps and project information and share their opinions with the project team through a virtual consultation space. The Virtual Consultation Room also included an interactive map facility to allow users to enter their Eircode into the system and to zoom into that precise location, giving them a more immediate insight into how the proposed development could affect them.

The public consultation event was hosted on the project website **www.N61roscommon.ie** from the 14th December 2020 to the 29th January 2021. During the month of January, members of the public were invited to arrange online or telephone meetings with the project team via an online booking system or telephone. The project team feedback indicates that the public was more open in expressing views and/or concerns about the scheme on the telephone and online than at a traditional consultation event. Furthermore, while a 30-minute time slot was provided for each meeting, the meetings regularly exceeded an hour, giving the public greater access to the design team than would have been the case at a traditional consultation event.

From the design team's perspective, the virtual consultation system allowed us to reach a wider audience than a traditional consultation event would have, and provided us with valuable performance metrics to judge which areas of the consultation worked well and which could be improved. For example, google analytics allowed us to review online traffic in the consultation room, from which we could see that over 500 unique users visited the consultation room while it was live on the project website. The analytics further indicated that the interactive mapping was the most viewed page within the consultation room, closely followed by the route maps of the emerging preferred route corridor. This information will enable us to tailor future virtual consultation events to enhance the experience of users and further improve public interaction with our design teams.



A6 Castledawson to Randalstown (R2C) Now Fully Opened

Article by Martin Brown



From left to right: Patrick Casey (Arup), Marc Jones, Nichola Mallon, Martin Brown

ROD, with our design joint venture partner ARUP and Client Graham Farrans Joint Venture, has now witnessed completion and opening of the flagship £189m scheme to upgrade the A6 from Castledawson to Randalstown. This is ROD's second completed major infrastructure project in Northern Ireland and follows the successful delivery of the £25m A2 Shore Road Improvement Scheme, which opened in 2015.

The A6 R2C scheme is part of the important North Western Transport Corridor, connecting Belfast and the North West via Toome, Maghera and Dungiven. The scheme includes the upgrade of 15 kilometres of the A6 North Western Transport Corridor between Randalstown and Castledawson. Having commenced construction in June 2017, the final works to remove the remaining cones and temporary traffic management arrangements were completed at the end of May 2021 and the entire road is now open to traffic. This was the result of successful teamwork by all involved through seasonal constraints and the Covid Pandemic.

Infrastructure Minister Nichola Mallon congratulated Project Director Marc Jones and Project Manager Martin Brown for all their hard work as she opened the completed scheme. ROD is delighted to have contributed to the successful delivery of this project as it has significant benefits for this region of Northern Ireland including:

- Facilitating inward investment;
- Improving integration and bringing regional balance;
- Reducing social isolation and linking people to an expanded range of information, services and opportunity; and
- Delivering long term benefits to road users and the local community through reduced journey times and improved road safety.

ROD is currently designing the next phase of the A6 improvements from Dungiven to Drumahoe northwest of Castledawson for the Sacyr-Wills-Somague Joint Venture [SWS]. That scheme commenced construction in 2018 and is due for completion next year



New Emergency Crossover Barrier installed at the M50 West Link Bridges

Article by Eoin O'Cathair



In late 2020, Transport Infrastructure Ireland [TII] approached ROD for assistance in retrofitting an emergency carriageway crossover on the southern approach to the West Link Bridges. There is an existing crossover barrier on the northern approach to the bridges, but there is no equivalent provision on the southern approach. The temporary reduction in traffic volumes on the M50 during the Covid19 pandemic provided an opportunity to undertake such complex works in the M50 median, but required an accelerated design and implementation programme.

Emergency carriageway crossovers provide essential traffic relief during major incidents, as well as facilitating essential maintenance works, when necessary. When required, one bridge can be closed and these barriers opened to allow two lanes of traffic run in each direction on the other bridge under traffic management. This would mean at the West Link that one of the two bridges would revert to the layout in place prior to the provision of the second bridge in the early 2000s. ROD, in conjunction with TII, reviewed the constraints to the installation of such a crossover on site. These included:

- proximity of M50 Junction 7 (N4) to the West Link Bridges, which leaves little space to provide a crossover facility in between; and
- presence of a pedestrian bridge pier and gantry leg along the same stretch of motorway which, in turn, requires a wide median, approximately 8m between parallel concrete barriers.

The option of providing a crossover south of Junction 7 was explored but rejected due to the wider regional traffic impacts if Junction 7 were to close due to works on the mainline.

After much consideration, an innovative solution involving the installation of the opening barrier on a skew was identified. While our review of standards and equivalent situations internationally did not yield an example of a similar installation elsewhere, we found no reason why it could not be done here. We engaged with TII's Standards Department, who agreed that a departure from standards would be unnecessary if all other design criteria were satisfied. Fortunately, the length available between the public lighting columns lighting the West Link Bridges and the gantry leg nearest the bridge was just enough to allow the installation of the opening barrier at a less than 20 degree skew to oncoming traffic. One advantage of the layout is that satisfying the geometric requirement in one direction automatically satisfies the same requirement in the opposite direction. The skew also requires a wide length of opening to facilitate two lanes of traffic through at a time, but we succeeded in identifying an acceptable barrier type to allow this.

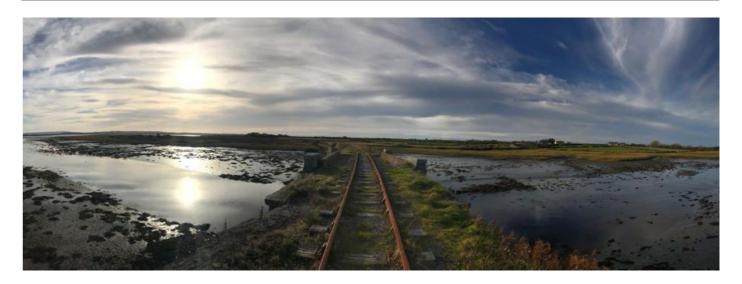
The width of the median at this point meant the removal of the two concrete barriers on each side introduced the risk of nearly 10m additional width worth of surface water spilling onto the southbound carriageway. To avoid this, we introduced linear drainage along the line of the previous safety barrier. This required the provision of approximately 200m of enhanced drainage connection to the nearest functional manhole.

The works were undertaken by Jons Civil Engineering for M50 Concessions Limited in May 2021, and were installed with minimal disruption to live traffic. While we hope the need to deploy our crossover solution is minimal, we are pleased to have devised an imaginative solution to this difficult geometric challenge.



ROD appointed to progress the West Clare Greenway

Article by Eoin O'Cathain



ROD is delighted to have been appointed to progress the option selection, design and assessment phases of the first section of the West Clare Greenway between Kilrush and Kilkee via Moyasta. The potential to develop an iconic and attractive facility for tourists and locals in the region, while also enhancing the amenity and functionality of the route as an ecological corridor, is huge. The commission will add greatly to our portfolio of prominent national greenways , which includes the Galway to Dublin Greenway and the Rosslare to Waterford City Greenway. It also provides a welcome opportunity for us to build on our strong relationship with Clare County Council.

The West Clare Railway gained fame and infamy through Percy French's 1902 song *Are ye right there Michael*. While the lyrics recall the storied unreliability of the rail service, they have also helped build momentum for its reinstatement as a greenway.





Clare County Council has done great work to garner public support for the project, and it recently featured on RTÉ's *larnród Enda* TV series, where former Taoiseach Enda Kenny explored the routes, histories and characters of six of Ireland's abandoned railways.

This first section of the route to be redeveloped runs between Kilrush and Kilkee, where some sections of the original corridor are still intact, but others have been broken by development or erosion. At ROD, we consider the latter locations as less of an obstacle and more of an opportunity to vary the user experience, and we value the prospect of meandering through the scenery of the wider West Clare landscape. We are looking forward to our explorations over the coming period, and we hope that a sensitive and attractive design will see the early realisation of this project and help Michael to finally reach his destination. And if it's right, now Michael, he just might.

Engineers Week 2021



To mark Engineers Week 2021, four members of ROD's enhancing Motorway Operations Services programme [eMOS] team shared their experience of working on one of the most innovative transportation projects in Ireland today.

Keith Hughes, Senior ITS Engineer

My role on eMOS is focused on ensuring that all new and existing Intelligent Transport Systems [ITS] equipment installed on the M50 motorway, including lane control signals and variable message signs, integrates with the new **Network Intelligence** and Management System [NIMS]. NIMS is an overarching, adaptive system that receives information from multiple roadside traffic monitoring devices, allowing operators to set signs on the M50 and provide a more integrated road management service to road users. The NIMS system will be based in the Motorway Operations Control Centre on East Wall Road.

I am also working with the M50 Traffic Flow Optimisation site team, which is responsible for upgrading existing infrastructure, such as overhead gantries, to the highest industry standards and erecting any additional infrastructure required to support the installation of overhead electronic signage. I provide support to the team in a variety of areas, including electrical power distribution and public lighting, and ensure communication diversion plans are set in place before civil works commence on

For me, the most exciting aspect of the eMOS programme is the merging of roadside technology with social media as a data source, all working together on one system. I have worked in the ITS sector for 13 years, but I am amazed at the vast amount of work, energy and collaboration the eMOS team has invested in the programme to date. It is something to admire!

Dr. Ciaran Carey, Research Engineer

I have been involved in every stage of the eMOS programme - from helping to specify what is required from contractors and evaluating tenders through to testing different products and considering how they will be used in an operational environment. My current focus is on integration across the various strands of the eMOS programme including, for example, making sure the new equipment installed on the M50 can report faults to TII's existing systems and NIMS. I am also involved in the Cooperative Intelligent Transport Systems [C-ITS] pilot project TII is undertaking in conjunction with several EU countries and delivering through eMOS. Pilot participants will exchange messages with NIMS via roadside units currently being installed on the M50.

Prior to joining the eMOS team, I oversaw the day-to-day management of TII's ITS Equipment Maintenance Contract, which involved ensuring contractor and equipment performance was in line with specified service levels for example. I came into the team, therefore, with a good understanding of the equipment deployed on the M50 and the IT systems they interface with. In relation to the C-ITS pilot, my previous experience working on similar EU-funded research projects for RODIS has been beneficial.

While I'm not one for role models per se, it is hard not to be impressed by the array of top engineers working on the eMOS programme, and I try to fold some of the approaches my colleagues adopt into my own work practices.

Patrick Kelleher, Design Engineer

I have been working on the eMOS programme since project setup in 2017. My early involvement focused on establishing the Motorway Operations Control Centre project. I subsequently took a prominent role in the delivery of the enabling works for the M50 Traffic Flow Optimisation project, where I was tasked with undertaking condition surveys of existing roadside civil infrastructure along the M50. The surveys informed the development of several civil, structural and ITS contract packages, for which I was involved in the design, contract document development, site supervision and contract management. As the project evolved and began the transition from construction stage to equipment deployment and operations, my role migrated into the eMOS operations team, where I have been able to use my knowledge of the M50 to determine how it should operate and be managed when the variable speed limits and lane control signals are switched on.

The eMOS programme is challenging because of its dynamic nature - it comprises multiple sub-projects that include civil/structural, ITS, software and operational elements, all interdependent. The level of interface and integration across these projects necessitates engagement across multiple disciplines, with subject matter experts encouraging me to use my broad understanding of engineering principles to maintain oversight of the overarching programme.

My involvement in the eMOS programme's multiple sub-projects has given me a deeper understanding and appreciation of the works undertaken by multiple engineering disciplines outside of my core knowledge base in the civil / structural area. The experience has helped to broaden my skills and has improved my approach to working and communicating with the team.

Cliona Rogan, Graduate Engineer

I studied Civil, Structural and Environmental Engineering at Trinity College Dublin [TCD] before undertaking a Masters degree - also in TCD - specialising in transportation engineering. I joined ROD as a graduate engineer in 2018, and as a member of the transportation team, I worked on traffic impact analysis for several large-scale projects, as well as the drainage design for the A6 Randalstown to Castledawson ECI in Northern Ireland.

My work on eMOS involves determining how the M50 motorway should operate with the new ITS technology being introduced, creating user-friendly ways to interrogate realtime traffic data, reporting on the current state of traffic on the M50 to identify problems on the network, and assisting senior engineers with design work and decision-making.

When I joined the ITS team, I was already proficient in GIS and CAD software, and I understood the importance of achieving the expectations of both the client and the public when delivering a project. That said, as a transportation project, eMOS is completely different to anything I have worked on before. In addition to the new and interesting concepts and challenges it presents on a daily basis, eMOS has given me a broader view of civil engineering and a better understanding of the challenges involved in delivering large-scale projects.

For me, the most innovative part of the eMOS project is the use of data analytics to manipulate and understand the traffic flow on the M50. This project is just touching the surface of the possibilities that ITS has to offer in terms of improving the entire transportation network here in Ireland. I'm excited to see what's in store next.





ROD-IS News Update

Articles by Mark Tucker and Lorcan Connolly



Network Safety Assessment

As part of the Network Safety Assessment project commissioned by TII, ROD-IS developed several models to provide information on the level of friction demand required by vehicles on the Irish national road networkand to compare this demand against the underlying friction supply provided by the asphalt surface. A novel friction model comparing friction supply and demand, and a vehicle model examining vehicle stability on road segments under various driving and underlying friction conditions, were developed. The models produced two measures of road fricton: the friction residual and the rollover residual; The friction residual represents the difference between the Investigatory Level and the friction demand where higher values represent a lower risk of the vehicle sliding. The rollover residual is a measure of the vehicle's susceptibility to 'rolling over' and is the difference between the rollover supply and demand. The higher the rollover residual, the greater the lateral stability of the vehicle on the road.

The Safety Performance Functions derived demonstrated the strong correlation between these variables and the observed occurrence of collisions on the network. The friction model developed could potentially be used as a predictive and

prescriptive tool to assist TII in determining the most appropriate mitigation measures for certain sections of road where surface friction may be an issue. ROD-IS is continuing to collaborate with TII and Pavement Management Solutions Ltd. [PMS] in developing the friction model with a view to applying it on several selected case study sites across the network.

Monitoring of retaining walls on the Luas Green line

ROD-IS is currently involved in the assessment and management of several historic retaining walls on sections of the Luas Green line. The Phibsborough Luas stop between Cabra Road and North Circular Road is constructed within the former Midlands Great Western Railway corridor. It consists of a deep cutting supported by masonry retaining walls up to 9.0 metres high. Prior to the extension of the Luas Green line to Broombridge, ROD was involved in the initial assessment of the walls, which required a monitoring and maintenance regime.

As part of the current commission, ROD-IS designed, specified and inspected a remote monitoring system consisting of a series of tilt meters, accelerometers, piezometers and still imaging cameras at the site. DATUM Monitoring Ireland installed the system and is providing maintenance and online hosting of data. As part of our ongoing structural engineering services, ROD-IS is



Walls under inspection on the Luas Green line

undertaking monthly inspections of both the walls and the monitoring system, and is reporting on their condition to TII.

Discussions are ongoing with TII and the Luas operator, Transdev, to develop a protocol to respond to alerts from the monitoring system. ROD has prior experience of this on projects including North Wall Avenue, which required live monitoring of the Luas rails while pipe-jacking was ongoing beneath. ROD-IS is also performing a monthly analysis of the structural monitoring data, evaluating key statistics, alerting records / causes and making recommendations regarding the suitability of the system for ongoing risk avoidance. Working alongside ROD's geotechnical team and using a combination of historical information, numerical modelling and output from the monitoring data, ROD-IS is evaluating the risk of fines washout through the newly cleared weep holes in the retaining walls.

Embankment retaining walls on the Luas Green line

ROD-IS recently commenced a second similar commission along the Luas Green line between Beechwood and Charlemont, this time working for the operator - Transdev. This section of the Luas is supported on the old Harcourt Street railway embankment. The embankment itself is supported on masonry retaining walls of varying geometry. An inspection and assessment in accordance with the TII Design Manual for Roads and Bridges is currently being undertaken with a view to making recommendations for the future maintenance and management of the embankment retaining walls.

PIARC Special Project

ROD-IS was recently awarded the -World Road Association (PIARC) Special Project on "Bridges and tunnels strikes by oversize vehicles". PIARC initiated its special projects to enable it to respond to emerging issues and priorities identified by its members separate to its usual four-year projects cycle managed by its Technical Committee.

Bridge and tunnel strikes by oversize vehicles are a threat to both the safety of road users and the operation of highway and rail infrastructure. These incidents cause injuries and fatalities, secondary crashes, significant damage to infrastructure, traffic delays, rerouting of traffic to remove trucks and repair damage, and economic costs related to response and recovery efforts. In the most severe cases, bridges can fail, resulting in serious injuries or fatalities and costly economic / quality of life impacts until the associated road can be reopened to traffic. In the United States, bridge strikes are the second greatest causes of bridge failures.

The objective of this study is to examine proven countermeasures, practices and technologies to reduce the incidence of oversize vehicles striking bridges and tunnels and to identify effective processes for accurately reporting and tracking bridge strike occurrences. The study will promote successful technologies, approaches and mitigation strategies to address bridge and tunnel strikes and will ensure information transfer to other countries. This will include lessons learned from around the world on deploying and operating various countermeasures, practices and technologies. ROD-IS will utilise data gathered through a review of available literature, surveys and interviews with key stakeholders to conduct a cost-benefit analysis of the various mitigation methods addressed. The project will specifically identify different practices and technologies that can be deployed in countries in different wealth categories.



The CEDR funded DIRIZON project has been completed, and the project outputs and dissemination materials are now available to view on the project website: https://www.dirizon-cedr.com/.



ROD/H&H Join Design Team for First Opening Road Bridge Over River Clyde

Article by Tony Dempsey

The crossing is the centrepiece of a major infrastructure project to transform the Clyde waterfront.



Visual concept designs of the new River Clyde bridge. Produced by Kettle Collective in collaboration with SWECO.

ROD and Hardesty & Hanover [H&H] are collaborating to provide comprehensive movable bridge engineering design services for the first opening road bridge over the River Clyde in Renfrewshire, Scotland. The project marks another significant win for our two firms, who have established a strong reputation for undertaking designs of competitive, constructible, kinetic structures in the UK and Ireland. The 184m double cable-stayed swing bridge, connecting Renfrew to Clydebank and Yoker, will carry vehicles, cyclists, and pedestrians.

The Clyde crossing is the centerpiece of the Clyde Waterfront and Renfrew Riverside (CWRR) project, which will transform the waterfront, connect communities on both sides of the river, improve access to jobs, education, hospitals, and leisure pursuits, and create new connections into Scotland's

manufacturing innovation district AMIDS. The design-build project is being led by construction and civil engineering company, GRAHAM, with Hollandia Infra, lemants, Ramboll, Amey, Hycom Engineering, and Fairfield Control Systems amongst the other members of the project team.

The geometry of this elegant and structurally efficient swing bridge allows for cyclist and pedestrian-friendly gradients on the bridge while also providing a significant navigational opening. The 12.3m wide bridge deck contains two carriageways and two pedestrian footpaths. The double swing bridge is 130m pivot to pivot with an asymmetric or "bobtail" arrangement of 65m forward span and 27m back span. The steel superstructures spans are gear-driven, hydraulically powered, and open at a 110° angle. The pivots feature 6.7m-diameter slewing bearings. The forward steel superstructure is supported by cable-stays anchored to steel pylons and a counterweighted back span.



Paul Skelton, PE, H&H's Principal-in-Charge of the firm's international projects said, "Our well honed partnership with ROD is emblematic of our approach to designing complex kinetic structures. Our structural, mechanical, and electrical/controls specialists design collaboratively to ensure that the bridge and its machinery function as one. This will bring to life an elegant and unique bridge that offers pedestrians

and cyclists a less-steep journey across the Clyde while also

providing a significant opening for marine traffic."

ROD's Tony Dempsey commented,

"We have been collaborating with H&H for the past 15 years, and we are delighted to be working with Paul and the team again on this our latest success. It continues our established relationship in the UK and Ireland."

Planning consent has already been obtained. Detailed design and construction are scheduled to start this Spring and take three years to complete.



Eirspan Gantry and High Mast Principal Inspections

Article by Peter King

In July 2020, ROD was appointed by Transport Infrastructure Ireland [TII] to carry out Principal Inspections on every road gantry and high mast on the Irish national road network. This was a sizeable undertaking given the total number of structures across the national road network is just shy of one thousand, with the majority located on motorways.

The complexity of the commission lay in the requirement to inspect the gantries at close range – necessitating the use of mobile access platforms and associated traffic management. The majority of the inspections were undertaken on winter nights, and some larger gantries required four separate motorway lane closures to complete an inspection. ROD, with the assistance of the motorway maintenance contractors, deployed three separate inspection teams to different sections of the road network. This allowed all of the inspections to be completed by April 2021 - within the contract programme.

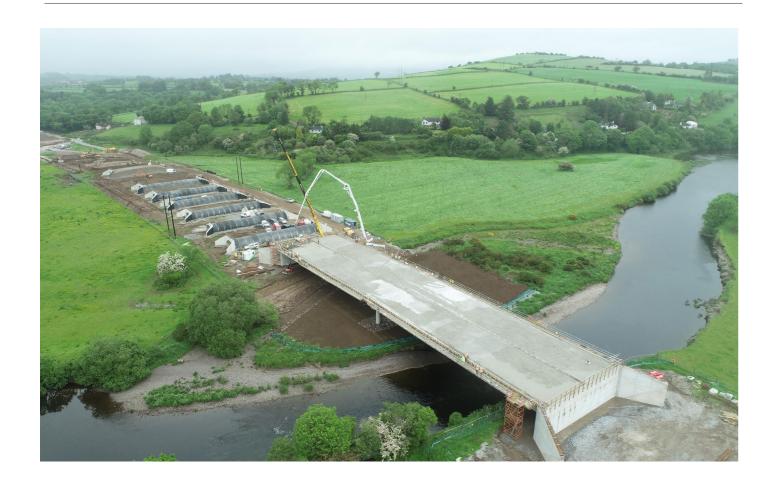
A second part of the commission involved the extension of the **Eirspan Inventory and Principal Inspection Manuals** to incorporate gantry and high mast structures. A complete overhaul of both manuals was required to incorporate the new structure types. Close liaison with TII's bridge managers was crucial in ensuring that the revision process produced a comprehensive set of documents to inform and track future maintenance regimes.





ROD undertakes Independent Study of longest pre-stressed precast bridge beams used in Ireland

Article by Paul Mitchell



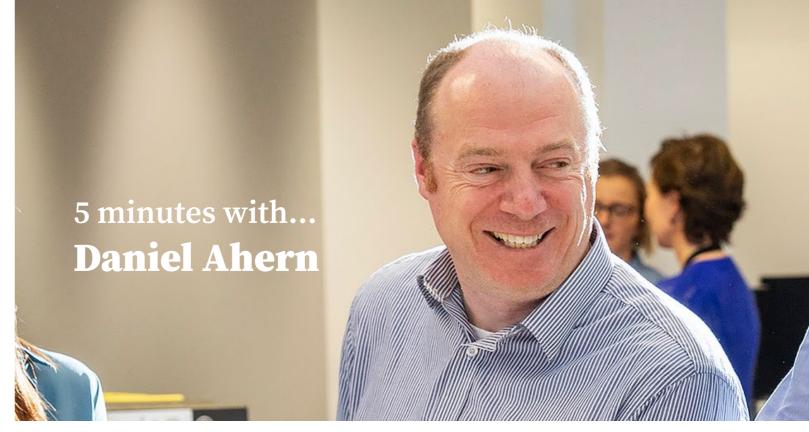
ROD was commissioned by Jons Civil Engineering John Cradock JV Ltd. to undertake an independent technical study of the detailed design of the S26 Laney Riverbridge and S28 Sullane Riverbridge, both part of the N22 Macroom Bypass Design and Build Scheme project in Co. Cork.

The design proposed for these bridges included W19 beam spans longer than any previously constructed W-Beam bridges in Ireland. Indeed, the proposed beams would be greater in span length than those considered in the original 'W-Beam Technical Study' authored by ROD in 2006 and used industry-wide in Ireland. Following consultation with Transport Infrastructure Ireland (TII), it was therefore determined that a project specific W-Beam technical study of both bridges was required.

In addition to traditional 3D grillage models, ROD developed a 3D solid element model of the superstructure to examine

effects more commonly associated with the design of multicellular box decks for W-Beams in beam and slab bridge deck designs. Our aim was to determine whether these effects could be significant for the W-Beams proposed. Local stresses due to transverse bending were extracted and combined with the global stresses. Special consideration was given to the critical torsional shear, flexural shear, and longitudinal shear stresses in the webs at various vulnerable cross-sections.

Following rigorous analysis, ROD confirmed that the use of W-19 precast prestressed beams was feasible at N22 bridges S26 and S28. However, some modifications were required to the original designed shear link provision due to transverse bending in the webs not captured in the traditional grillage models and excessive longitudinal stressing at points of geometric change in the precast W-Beams. The bridges are currently under construction.



Describe yourself in three words

Positive, energetic and witty.

Where are you from and where did you study?

I grew up in New Ross, Co. Wexford, but I now live in a seaside village on the beautiful Hook Peninsula in the "Model County". I studied at IT Carlow, IT Sligo, the University of Bolton, and the University of Salford.

What is your role in ROD?

I am a senior CAD technician with the buildings team; however, I am currently on secondment to the transportation team.

How did you get into CAD?

Growing up, I always enjoyed art and drawing, but it was only when I went to college that I studied technical drawing. As a young student, I undertook some work experience at an engineering company and spent time in a drawing office, learning computers and using CAD. I knew then that it was the career for me.

How did you come to join ROD?

I worked with AECOM prior to joining ROD, and I was involved in several of the companies' joint venture projects – I was even seconded to ROD's head office in Sandyford for a time! After I had interviewed for my job at ROD and accepted the position, I had a chat over a pint with Harry Meighan one evening. I remember telling him that I already knew both Seamus MacGearailt and Eoin Ó Catháin. His reply was classic: "And you still wanted to join us?"

What has been your standout achievement at ROD?

I have been involved in many interesting projects at ROD, but my proudest achievement is sending out the social committee's 'Song of the day' all staff email gach lá (every day). Ever since I was a kid, I've been into music, so it's wonderful to receive new song requests from the team every week, experience new music genres and reveal the musical tastes of the people in the company. Keep sending me the requests!

Who is your partner in crime at ROD?

My old lunch buddy and neighbour in the buildings team, Mr Marian Blaj. He's trying to help me change the world!

During the COVID-19 lockdowns, did you do anything new, creative or special?

Tá mé ag foghlaim Gaeilge (I am learning Irish) and lots of new songs on my guitar and bodhrán. I've also been cleaning up trash from the local beaches in Wexford, growing vegetables/ flowers in my garden and fixing bikes.

What makes you proud to be Irish?

Having travelled far and wide, I truly appriciate the incredible Irish landscape. It's a stunningly beautiful country to live in, full of history, pride in our sport, music, culture, and arts. And, I can't forget to mention the black and white pints, which always help to bring the craic out in us! Tá carachtar iontach ag muintir na hÉireann (The Irish people have great character).

Do you have any hobbies to help you unwind?

Some of my hobbies wind me up, including road cycling, mountain biking and playing sport. Painting, photography, playing and listening to music and holistic therapies, including yoga and meditation, help me to unwind.

What type of work environment do you prefer?

I am really enjoying working from my home by the sea in rural Wexford, but I also appreciate the occasions when I've been back meeting my colleagues in the Sandyford office. It's a time of great change in the world, and I hope many lessons are learned from it.

What do you think is in store for you in the future?

I am lucky to have already achieved many of my life goals, but there are a few outstanding that I have the potential to reach still! So, I hope to continue learning and achieving, please God.

New Recruits 2021



Gary Selby, IT Manager

Gary joined ROD as IT Manager in April. Before taking up this role, he spent 24 years in the education sector, working with University College Dublin, Smurfit Business School and the Irish Management Institute. Gary studied Information Technology in Trinity College Dublin and is currently completing a Masters in Business Studies at University College Cork. He is a keen golfer and enjoys refereeing his son's soccer matches and spending time with his family.



Ezzeldin Zoromba, Graduate Engineer

Ezzeldin joined ROD as a graduate engineer last October. He spent his first six-month rotation with our water team, where he worked on a variety of projects, including the A6 Dungiven to Drumahoe dualling scheme in Northern Ireland and the Dodder Public Transport Bridge in Dublin. Ezzeldin is a graduate of Politecnico di Milano, where he earned an MSc in Civil Engineering in 2020. He wrote his thesis on the design and simulation of shake table tests for dissipative steel-concrete composite buildings. In his spare time, Ezzeldin enjoys running and swimming.



Michael Wall, Structural Technician

Michael joined ROD as a structural technician last November. He is currently working with our buildings team on a community nursing home project in Cork, Heather House. Michael has 20 years' experience in structural draughting, mainly reinforcement detailing (CADS RC) and General Arrangement layouts and detailing (AutoCAD and Revit). He holds a BEngTech in Structural Engineering and a Postgraduate Diploma in Collaborative BIM from Technological University Dublin [TUD]. In his spare time, Michael coaches kids at his local GAA club. He also enjoys cycling.



Sarah Buggy, Graphic Designer

Sarah joined ROD as a graphic designer last August. She is a graduate of Dún Laoghaire Institute of Art, Design and Technology where she studied visual communication design. Her design expertise extends from branding, motion and print to photography and website design. In her spare time, Sarah enjoys cycling, cooking, travelling and spending time with friends.



Emmanuel **Vincent Philip** Transportation Team

Emmanuel joined ROD as a graduate engineer last November. He is currently working with our transportation team on the Clontarf to City Centre Project. Emmanuel undertook a BE in Civil Engineering at Acharya Institute in India. After successfully completing internships as a site engineer in both India and Dubai, he graduated and moved to Dublin to undertake an ME in Sustainable Infrastructure at TUD in 2019. In his spare time, Emmanuel enjoys watching football, gaming and stock trading.



Parth Shah Transportation Team

Parth joined ROD's graduate development programme last October. He is currently working with our transportation team on the enhancing Motorway Operation Services [eMOS] project in Dublin. Parth holds a BE in Civil Engineering from SSASIT, Surat in India, an MTech in Geomatics from CEPT University, Ahmedabad in India and an MSc in Transportation Engineering from Trinity College Dublin. Prior to joining ROD, Parth spent a year working as a GIS analyst. In his spare time, Parth enjoys travelling, hiking, table tennis and cricket.



Mayur Chopde Transportation Team

Mayur joined ROD's transportation team as a design engineer last November. Since then, he has been involved in the both the Clontarf to City Centre Project and BusConnects. Prior to joining ROD, Mayur spent several years with WSP in India, where he gained experience working on international highway design and traffic engineering projects. His expertise in the geometric design of urban and rural highways, junctions and roundabouts from the preliminary to the detailed design phase. He is also experienced in all stages of road asset management systems development. Mayur's interests include travelling, mountain trekking and spending time with friends and family.



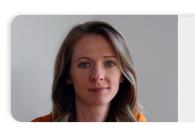
Yasmin Hayes, Environmental Team

Yasmin joined ROD as a graduate environmental consultant last May. She studied environmental management at TUD and graduated with a first class honours degree in 2020. Yasmin will be working on Environmental Impact Assessments for infrastructure projects. In her spare time, Yasmin enjoys being out in nature, travelling, photography and cooking.



Gerard Kiely, Civil Engineer

Gerard is a civil engineer with a lifelong passion for bridge engineering and construction. He began his career working with main contractors on long-span cable-supported structures in Abu Dhabi, Norway and Scotland. Prior to joining ROD, he ran a small UK contracting consultancy providing a range of bridge engineering services, including temporary works design, tender consultancy and prequalification, constructability reports, permanent works design and principal inspections. With two small children to entertain, Gerard does not get much time for hobbies, but he enjoys running, fishing and the occasional round of golf.



Emily Alfred, Senior Resident Engineer

Emily joined ROD as a Senior Resident Engineer in late 2020. She is currently working on the Coonagh to Knockalisheen Distributor Road scheme in Limerick. Prior to joining ROD, Emily spent 10 years in the UK, during which time she worked for Transport Scotland on several major infrastructure projects, most notably the Queensferry Crossing - the longest three-tower cable-stayed bridge in the world. Emily is a graduate of Galway-Mayo Institute of Technology [GMIT] and Edinburgh Napier University. She holds a Masters degree in Civil and Transportation Engineering. A keen chess player, Emily captained the Irish women's team at the Chess Olympiad in Russia in 2010.



Rachel Heaphy Graduate Ecologist

Rachel joined ROD as a graduate ecologist last May. She is currently working with our environmental team on the DART+ West project. Rachel earned an MRes (Master of Research) in Primate Biology, Behaviour and Conservation from the University of Roehampton in 2020. Prior to joining ROD, she worked on the Curlew Conservation Programme for the National Parks & Wildlife Service (NPWS). Her hobbies and interests include hiking, yoga, reading and watching movies.



Gavin Taylor, ROD student placement

Gavin joined ROD's student placement programme last May. He is currently working with our buildings and bridges teams. Gavin is a student at Trinity College Dublin (TCD), where he is studying Civil, Structural and Environmental Engineering. A member of the TCD Christian Union Society committee, Gavin is passionate about youth work and volunteers regularly with youth organisations. His other interests include reading, guitar, tabletop games and Ultimate Frisbee.

Quiz answers Q1: Pine Marten Q2: Irish Stoat Q3: Common Blue Q4: True Q5: Irish Hare Q6: Lambay Island Q7: Pipistrelles Q8: Humpback Whale Q9: Bee Orchid



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