# Michael Punch & Partners

Revit® Structure
Revit® Architecture
Revit® MEP

# Revit® Software Integrates Partners in Beacon South Quarter Project

One of Ireland's most successful multi-disciplinary engineering firms, Michael Punch & Partners was founded in 1973. Today the practice combines civil and structural engineering and has undertaken major projects from infrastructure and marine contracts through education, sports and leisure to commercial and housing developments and specialist restoration projects. It has won numerous design and technical awards over the years. With a staff of over 120 and Dublin, Cork and Limerick offices, MPP is also one of Ireland's largest indigenous practices.

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**Tim Murnane**
Regional Director, Michael Punch & Partners

One of the firm's major recent projects was the €450 million Beacon South Quarter development in Sandyford, Co. Dublin, one of the largest mixed use developments ever undertaken in Ireland. The MPP design team commenced its use of Revit® software from Autodesk on the blocks referred to by the developer as B2 and B3, with a capital investment of €40 million and €15 million respectively. B2 consists of a three level car parking basement, retail ground floor and seven residential storeys. The B3 building is a nine-storey office development. Both buildings were commenced in 2007 and completed on schedule in 2008, B2 in February and B3 in December.

The MPP team chose Revit® Structure from Autodesk because of the scale of the projects and the fast-track method of construction. "We had identified for some time the possible benefits of a fully coordinated three-dimensional model," explained Tim Murnane, regional director in MPP. "We knew that with Revit we could integrate the structural engineering, architectural and mechanical and electrical services in the overall model because there are product versions for each discipline. In fact our client Landmark Developments mandated 3D modelling because they understood the value it could bring to every stage of the project."

In fact the role played by Landmark Developments was instrumental in the success of the process. The company's management understood that BIM [Building Information Modelling] and Revit represent a 21st century way of working. Smart systems contribute all the way from design concept and marketing through to the most detailed aspects of the construction process. In that context, the only remaining issue was the choice of product and both the project architects Traynor O'Toole and MPP were already Autodesk users. The architects were in fact already using Revit and MPP began its use of Revit for the first time in August 2007 on this project.

With the major partners already Revit users, others such as M&E consultants Ethos Engineering quickly came on board. Other project collaborators, such as the quantity surveyors, were willing and able to work with the system. "Essentially, the principal collaboration channel was very easy to use. We simply had a hosted Web site with secure access

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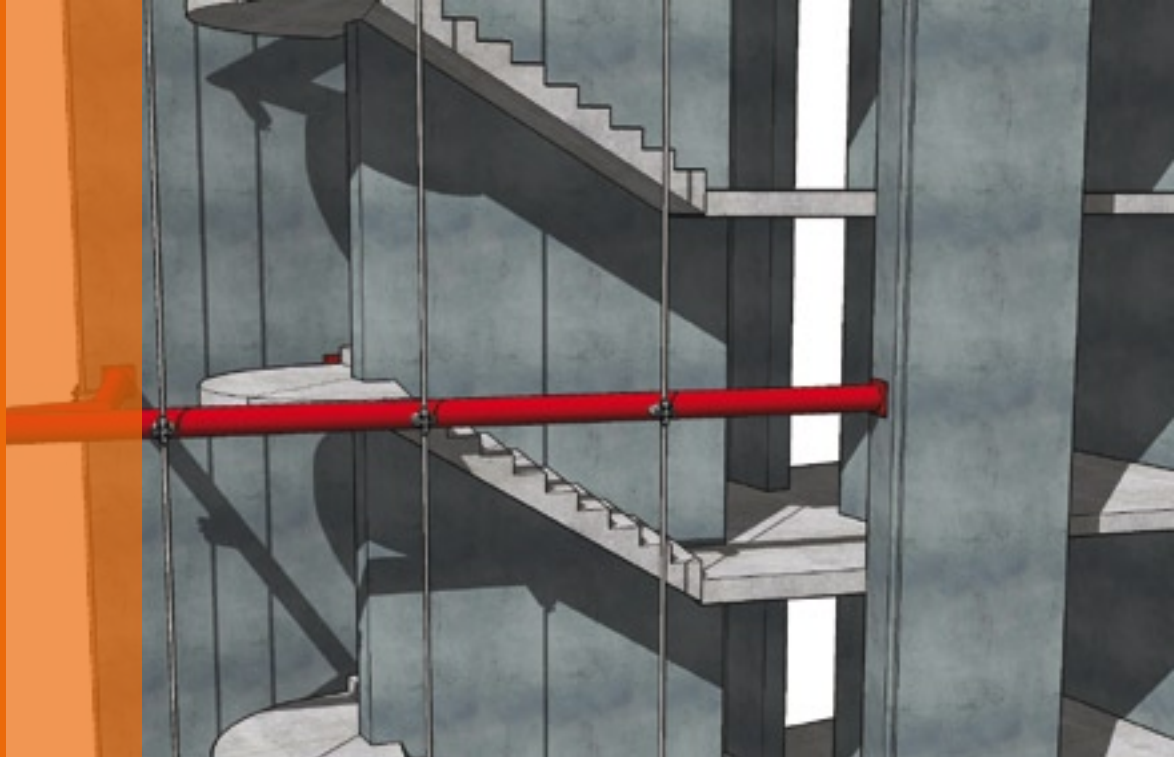

for all authorised users. Everyone could view the 3D model and the specific aspects for which they had responsibility or input."

The Revit model and design and collaboration process began with the architects, Tim Murnane explained, followed closely by the MPP team in designing and specifying the structural elements. "It was an iterative process, which is of course the way in which all of the different disciplines play their part in a project and any interactions and inevitable conflicts of design detail are ironed out. But it was also a live process, which is where the power, comprehensiveness and flexibility of Revit software really showed its value."

The three primary design disciplines of architecture, structural engineering and M&E were fully integrated with each partner firm using the appropriate specialist suite (Revit® Architecture, Revit Structure and Revit® MEP) to contribute to the master model. This gave the project team clear version control, inconsistency highlighting and clash detection. The overall design, specification and day-to-day collaboration was streamlined and all of the project partners gained in accuracy and clarity, Murnane says, combined with greatly increased levels of productivity for. "It was, effectively, the engine that brought the whole project in on time."

From the initial architectural design concepts onwards, the visualisation power of Revit became an important element in the project. "It was valuable to the client, for example, because the clarity of the presentations and features such as 'walk through' simulation greatly helped decision making. Later, visuals became an important part of the sales process. The larger potential commercial tenants, for instance, could start to plan and specify their own fit-out well in advance of even the primary construction."

Like most users of 3D in design, Tim Murnane points out that smart visuals enable even experienced professionals to understand all aspects of a design more clearly and more quickly. "We are all trained on and accustomed to reading 2D plans but there will always be a better understanding of the relationships between the various elements when you have the 3D spatial visualisation. It works very well also with specialist sub-contractors. They may actively use only 2D working drawings but the 3D visualisation enables them to grasp the overall design rapidly and often helps eliminate possible areas of misunderstanding."

Visualisation was of great assistance in working with the local authority planners, Murnane recalls: "Heavy traffic in the Sandyford quarter is a notorious problem and the chosen solution for the Beacon project was to extend the site hoarding for a couple of metres beyond the perimeter and onto the footpath and roadway. With a combination of Revit visualisation and a live animated 3D model simulating the traffic patterns, the client and project team were able to persuade the planners that channelling the segregated construction traffic one way through the site itself would actually improve public traffic flows compared to any alternative."

One broad and massively important area of capability using Revit software is the ease of working with third party specialist software. "In our own case, for example, we did the structural design and geometry in Revit Structure and were then able to push the solution through structural analysis packages such as RAM Steel (Bentley)."

"We should not forget also that Revit works very well and transparently with AutoCAD, used by so many professional specialists in the construction sector, so exchanging information and sometimes revision details was very straightforward throughout the project. We worked easily together through the web site and Revit model with sub-contractors such as those supplying lighting, glazing, HVAC systems and many others. They could take off and work with 2D cut sections as they required and to a high degree of accuracy and detail.

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"Then the Revit system allowed all elements of the model to be synchronised, showing up any discrepancies immediately. Clash detection, especially between structure and services in the early design stages, was invaluable from our point of view. This is simply said but it is highly valuable because it absolutely minimises errors that only show up on-site later and can cause a lot of grief. Quite simply, the process cuts out most of what is usually regarded as an inevitable proportion of waste in large projects."

The firm of Michael Punch & Partners is absolutely committed to 3D design and project control in the future and appreciates fully the potential value of Building Information Modelling for all parties in the construction sector, Tim Murnane declares. "On the Beacon project, we actually worked in parallel on block B3 using 2D AutoCAD, principally because we were in the early stages of familiarising our engineers and technicians with Revit. But 3D modelling and BIM is clearly the design path of the future and there is no turning back. So we are in fact actively promoting the concept these days. The only drawback is that all of the major partners in any project need to buy into it and be able to wield it, which may take a little while yet. Yet there is certainly a persuasive view that the current downturn will force everyone in the sector to focus on the productivity and other significant advantages 3D modelling offers."

The Beacon South Quarter project team :
Client – Landmark Developments,
Architects – Traynor O'Toole,
Structural Engineers – Michael Punch & Partners,
Mechanical and Electrical Engineers – Ethos Engineering, Main Contractor – Laing O'Rourke.

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