PERSPECTIVE

NEWSLETTER OF PERSPECTIVE

A GROUP OF ARCHITECTURAL PRACTICES
WORKING TOGETHER IN EUROPE & ABROAD

WWW.PERSPECTIVE-ARCHITECTURALGROUP.COM

2022
WINTER

FOCUS TOPIC: ARCHITECTURAL DESIGN IN BIM ENVIRONMENT

PERSPECTIVE Members have extensive experience in working in BIM, providing the role of BIM Manager for design stages and ensuring there is a consistent and clearly understood approach to the use of BIM on our projects.

From our experience, the use of BIM has many benefits – but ultimately the critical success is the enhancement of the quality of the design and construction of the completed building. This is achieved not only through improved build quality, which is managed using thorough coordination processes at design stage, but also arising from the less tangible benefits of production of early visualisations for the benefit of the end-user and particularly post-handover, in terms of Facilities Management (FM), providing ability to review future maintenance regimes. The ability to use early models to test building performance and implement iterative enhancement to the building is hugely beneficial for the performance and ongoing operational aspects of the building after occupation.

Across our Practice teams within PERSPECTIVE we have in-depth experience in using multiple software programmes not just for the production of the design and construction information (Revit) and coordination tools (Navisworks, Revizto) but also software programmes to review acoustics, daylighting, thermal fabric, programme preparation (4D sequence) and visualisations (Nscape). For example, Perspective Ireland used Therm and WuFi software to analyse key junctions to ensure Building Regulation compliance with condensation risk analysis on recent healthcare projects. This review of the key junctions directly informs the construction approach – with an emphasis on robust detailing.

Each of the PERSPECTIVE Members has a BIM Practice Manager, who leads the Design Team approach to BIM and will develop the key workflows and protocol documents for use during the development of the construction information. He/She will liaise with the Works Contractor's Information Manager to agree protocols for the use of the CDE and also the requirements for the capability assessments for the supply chain, and use of BIM for coordination during construction stages.

Each Practice has experienced BIM Coordinators who have responsibility for ensuring the implementation of the adopted protocols are in place for the projects we are leading, and who liaise with the BIM coordinators in other design disciplines to ensure a consistent approach is in place. They develop the approach to use of BIM as part of the RDD process and allow BIM to be used to demonstrate a coordinated approach to design development.

The design development process of a project will ensure that services can be integrated into the design, providing ease of ongoing operation and maintenance which can be reviewed in 3D with the FM team. We have good experience of using Navisworks to allow not just the numerical clash detection process be completed, but a visual review of the external plant spaces, access and each room to ensure the construction and services are correctly coordinated and verify the brief compliance for each space. ADB software is used on all healthcare projects to ensure brief compliance.

Design models are used throughout the RDD process to develop a federated model comprising of architectural, structural and MEP model. The works contractor coordinates subcontractor input including establishing capability assessment at procurement stage. The CDE will be setup and managed by the information manager working to Works Co. who will manage access rights for the CDE.

Each design team member will be required to ensure the model is developed in accordance with PAS 1192 standards, including the level of development to include the necessary COBie data and Classification. Each subcontractor will be subsequently required to include the information required for the development of the Asset Information Model (AIM), with the PERSPECTIVE architect liaising with the FM provider to ensure the correct data is included to allow the ongoing FM input to keep the model current and capture any modifications.

Approach to Coordination of the Design

As BIM Manager we establish protocols to be used on each project including the process for design coordination and clash resolution using Navisworks.

If an Employer's Information Requirements (EIR) is not provided by our clients, we can assist to develop templates for all Project Documentation related to BIM, including OIR, AIR, EIR, BEP, MPDT, TIDP, MIDP, Protocols.

Room loaded layouts are populated using Activity Database (ADB) software which provides a robust way of ensuring brief compliance. FM input is sought when appropriate, to consider ongoing maintenance access and consideration of the life cycle of any plant. Computer visualisations are provided of key areas to assist with end-user sign-off for layouts and materials. Renders direct from Revit can be provided or enhanced using NScape or 3D Studio Max.

Approach to Construction

We have had a very positive experience in using BIM during the construction phase of projects where models are continually used to verify coordination with subcontractor input. Typically, Navisworks is used for this process, however Revizto was also used recently on the National Children's Hospital in Ireland, which assisted in being able to coordinate mark-ups of 2D dwfs drawings. This project is featured in more detail later in the Newsletter.

Architectural and technological staff develop BIM models / run clash-detection checks and bring the Level 2 models to a point where the contractors (& subcontractors) can take over control from this point on to completion. BIM models will be updated during construction stage to provide an AIM which will be integrated with the buildings FM requirements upon completion. The construction contractor's procurement team ensures that the subcontractor is familiar and has the capability to align with the implemented BIM protocols. Services are coordinated and clear delineation of any groups for equipment provided.

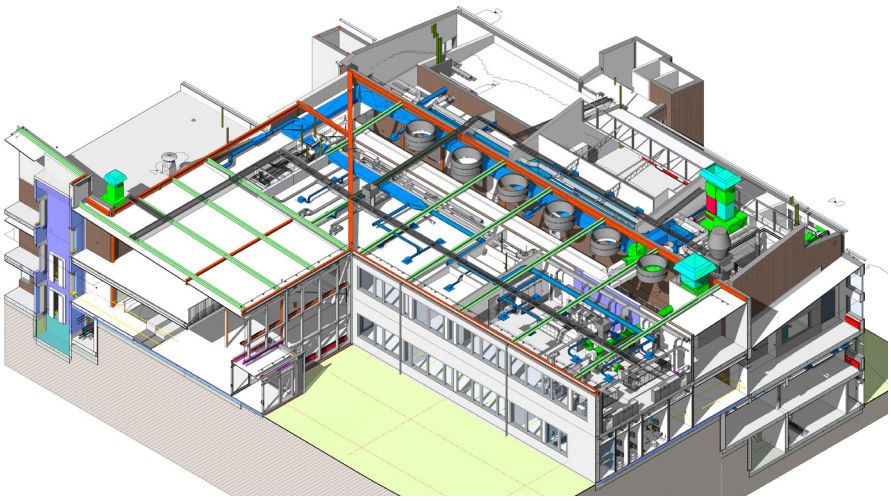


Image: Kvarnberget school in Stockholm, Sweden

DE NIEUWE DOKKEN
Ghent, Belgium

Designed by: PSP Antwerp
Client: Schipperskaai Development
Area: 23 150 m²
Execution: 2017-2020

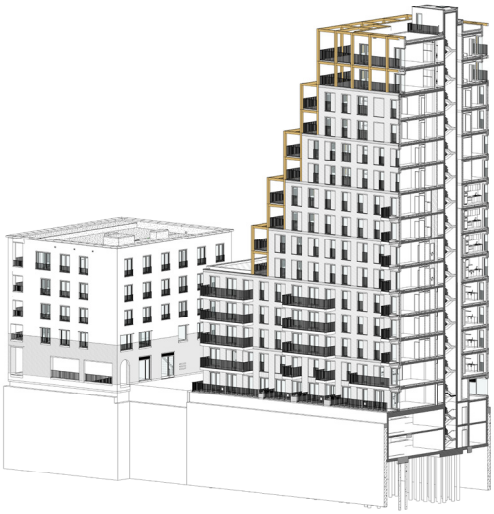
Pespective Antwerp is a multi-disciplinary office focused on collaboration, working with BIM and Revit corresponds with our DNA.

BIM is used as a common digital tool within all our services for developing projects. A methodology is worked out to the level of building specifications and bills of quantities. Our BIM-team follows the latest new developments within the BIM environment. This allows us to constantly adjust our BIM processes. Over the years we became a strong BIM partner in various projects for all its services.

The 'De Nieuwe Dokken' project is a sustainable mixed residential development located on the Schipperskaai in Ghent, part of the former harbour area very near to the historic city center.

This development comprises a total of 400 homes of different typologies, including an underground parking, green spaces, commercial spaces, offices and supporting facilities. The entire development will have a sustainability score of +93 and holds a Breeam Excellent certificate.

This project is fully developed in Revit/BIM software. The BIM platform is optimally used as a digital collaboration tool for all the disciplines and actors throughout the design and construction process. The spatial coordination of architecture, structure and MEP, the optimization of construction performance, cost estimates and sharing with technicians and contractors is applied in a thorough manner for this project. During the construction process, the BIM model is also used for customer support and the individual buyer's choices for future residents.



REFURBISHMENT OF A XVIth CENTURY PALACE IN CACERES

Palacio de Godoy, Cáceres, Spain

Designed by: PSP Madrid
Client: Scipion Real Estate
Area: 5 500 m²
Execution: 2022

B/SV Arquitectos is working in the full refurbishment of an XVIth Century Palace in Cáceres , Spain, to convert it into a 5* Hotel.

The existing building, known as Palacio de Godoy, is a Renaissance-style building located in the monumental area of the city of Cáceres. Its construction was ordered in 1548 by Don Francisco de Godoy Aldana, a Spanish military man who accompanied Francisco Pizarro in the conquest of Peru and who as a consequence amassed a great fortune.

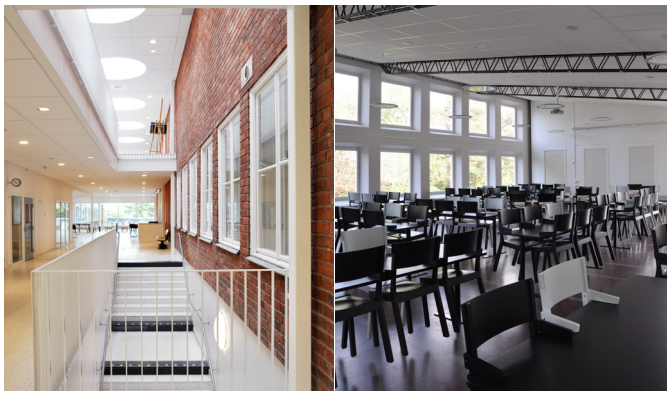
The intervention will include not only the full refurbishment of the historical building, but also the construction of two new wings and the recuperation of a garden that will be opened to the city. The palace is built around a two stories high patio, that will be covered with a new skylight. This new indoor space remains as the central core of the hotel,with the main living areas on the ground floor and providing access to the Hotel rooms on the first floor

The hotel will have 72 rooms, living areas ,bar , restaurant and an independent space for venues, as well as two swimming-pools ,and a spa. The Hotel total area will be 5500 m2. Construction works will begin on site in March 2022.

A NEW LAYER ADDED TO AN OLD SCHOOL

Kvarnberget secondary school, Stockholm, Sweden

Designed by: PSP Stockholm
Client: Kvarnberget school
Area: 12 000 m²
Execution: 2018 (construction)



Farstavikens skola - Kvarnberget is a secondary school operated by Värmdö municipality, east of Stockholm. The listed school buildings were originally constructed in the 1950s, with additions and remodeling of the buildings, HVAC and electrical systems made in the 1970s and 1980s.

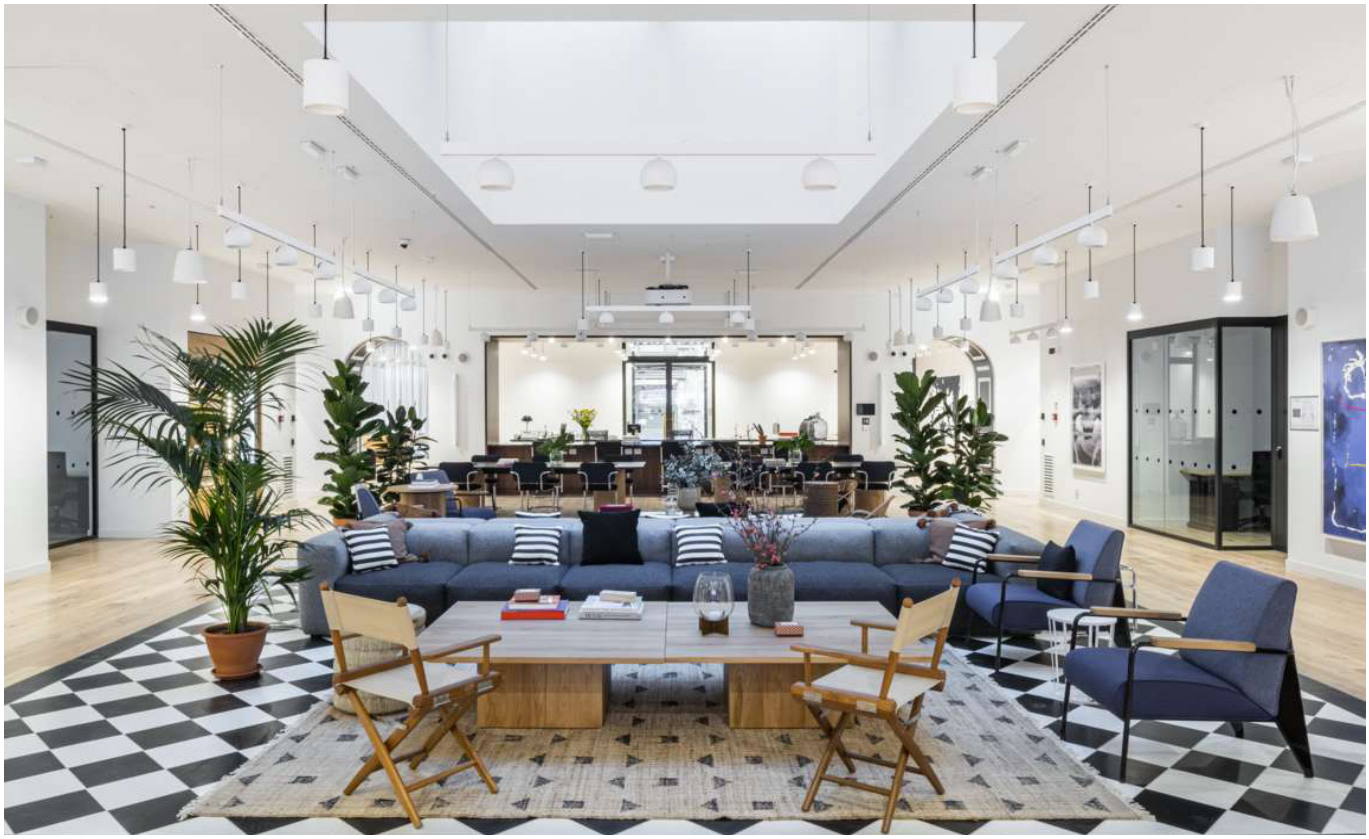
In 2014 Ahlqvist & Almqvist Arkitekter started program work for additions and remodeling of the school. By reorganizing existing buildings of 8 000 m2 and adding 4 000 m2 of floor space a doubling of the student capacity was achieved. At the same time the facilities were modernized to better suit current pedagogic standards while integrating new mechanical and electrical/IT services into existing systems and spaces.

The building design was carried out, heavily relying on Ahlqvist & Almqvist as BIM coordinators, working with engineering disciplines to document both the original and additional buildings and the (somewhat convoluted) technical systems, of which there was scarce documentation. Additional construction and systems could then be added to the model, along with information on building phases, as the construction took place over a three-year period, while the school was in use. The construction was divided in 3 phases. Construction was completed 2018.

Ahlqvist & Almqvist Arkitekter was also responsible architects for the interior design.

CO-WORKING SPACES
Milan, Italy

Designed by: PSP Milan
Client: WeWork
Area: 9 000 m²
Execution: 2020



Former headquarters refurbishment - interior renovation

WeWork is a global leader in flexible space and co working services. Former headquarters of one of the oldest banks in Milan, 9 Via Mazzini has seen its 7,700 m², spread over 8 floors, completely refurbished. The renovation of the building's interior was challenging: to bring contemporary nuances yet conserving historical features.

The balanced combination of these two languages can be experienced throughout the building. The layered façade and the original signage, for example, have been kept as existing to keep all the authenticity, while the ground floor façade was fully opened up to allow good visibility from frequented street, thus ensuring a good presence for WeWork in Milan.

The design as well has been thought out to create inspiring, comfortable and collaborative spaces. The central ground floor lounge, naturally lighted by the skylight, evokes milanese patios. Hidden at the center of the building, this space offers a peaceful, calm, and green space, away from the liveliness of the city. The other spaces glorify the historic heritage of the building, using its original materials and old bank aesthetics.

The entire project was executed by PSP Italy in BIM, Revit Architecture, with continuous collaboration between all the actors of the process in BIM360.

CHILDREN'S HEALTH IRELAND (CHI)

Blanchardstown & Tallaght, Dublin, Ireland

Designed by: PSP Dublin & HLM
Client: National Paediatric Hospital
Area: 5,100 m² + 5,650 m²
Execution: 2019-2021

Paediatric Outpatients & Urgent Care Centres
Connolly Hospital Blanchardstown & Tallaght University Hospital Dublin

PSP Representative in Ireland recently completed new paediatric outpatient and urgent care centres at Connolly Hospital Blanchardstown and Tallaght University Hospital, in Dublin - in cooperation with our strategic alliance partner HLM Architects. The new buildings include Urgent Care, Outpatients, Imaging, Dental care and CSAU departments, and their completion is a major milestone in the new national children's hospital project, the most significant investment in healthcare ever undertaken by the Irish State. The new buildings are child-centred, world-class facilities that will support innovation and excellence in paediatric healthcare, and create an environment that is supportive of children, young people, their families, and the hospital's staff.

This is a complex multi-site development and the facilities at Connolly and Tallaght were delivered in parallel with the main new Children's Hospital at St James Hospital in Dublin city Centre – with a shared approach to design, procurement and BIM coordination. Delivered to BIM Level 2 standard, PSP Dublin Architects were BIM Manager for the design stages, and led the coordination process of the architectural, structural and MEP federated models. We set out the BIM deliverables required from tenderers, monitored it's use during construction and verified the AIM upon completion.

From the outset of these projects, BIM was at the forefront of decision making throughout the process. Both buildings involved heavily serviced zones, with interface and connection back to existing buildings. The BIM data has been utilised not just to unlock particular congestion areas of servicing, but also to inform decision making on many other aspects including room layouts, definining departments & numbering, equipment quantities, flow of people, materiality, colour choice, graphics coordination.

The BIM data used ranged from quantities, geometry, point cloud surveys, COBie and much more. The development of both buildings on site was heavily assisted through the use of BIM, integrating point cloud survey scans, identifying discrepancies with existing structure and services, and agreeing solutions which could then be captured in the BIM models to progress on site.

The models now offer a true reflection of these integrated buildings and the complex infrastructure developed and constructed, which will allow clear picture for FM teams as they manage the facilities. To complement these models, continuous Soft Landings workshops were held with the end users and client, to ensure that the information handover was efficient and understood in advance of handover. This has proven to be very beneficial, as it offered a chance for end users to engage with the contractors and understand how systems would and could work.

BIM TOOLS ON THE EXAMPLE OF DUBLIN HEALTH CENTER PROJECT

The design tools used included:

- **Revit** for all design and construction information, including existing buildings.
- **Navisworks** used to analyse the federated model, including clash detection review.
- Early **mass models** were used to review the impact of the new building on daylighting to the existing buildings.
- **BIM 360 Glue** used for collaboration of design information.
- **IES** reviewing the energy performance of the building, and ensure the target BER rating of A2 was achieved.
- **ADB software** was used to prepare all C-sheets.

The quality assurance / control tools used included:

- **BIM 360 Field** used to capture site observations, providing a clear audit trail to close out any issues that arose, giving confidence to all parties that issues raised were being addressed.

In terms of programming and coordination works during Design Development considerations following tools were needed:

- BIM 360 as the CDE to ensure a clear management of information at design coordination and construction stages.
- User group engagement workshops including end-users reviewed materials being proposed for the building. A **full life cycle cost analysis** for 50-year period undertaken, which included ongoing maintenance and replacement costs. This engagement directly informed the selection of a number of materials

Construction Witnessing / Testing + Snags coordination included:

- **Revizto** used to track any issues identified in 2D dwf outputs, coordinating with the BIM.
- Technical submittals which required shop drawings, were prepared using the federated model to demonstrate the coordination of the works at this stage.
- **QR codes** were used for room identification to assist in completion of the works, including closing out snags.
- AIM was provided at handover, this was verified by PSP Dublin Architects prior to being issued to the client and their FM management team. This ensured that all asset tags were complete in line with the Employer's Information Requirements (EIR)

Whole Life Considerations:

Service life

- Life Cycle Cost analysis was undertaken at design stage to inform the selection of materials, with the benefit of having end-user input and considered ongoing maintenance and replacement practicalities when the building would be occupied.
- A schedule of maintainable assets was established, and a preventative maintenance schedule prepared. Supplier and manufacturer input and the provision of warranties for was considered for each system and major component. This informed design decisions such as ensuring there was designed access to all items of plant, including the ventilation systems without the need for specialist equipment.
- All plant with the exception of medical gas, which required bottled delivery, was designed to be at roof level with both stair and access available.
- replacement, decommissioning and disposal of assets was considered during the life cycle cost analysis and when considering replacement, the BIM model was used to demonstrate available access.

BIM AS A UNIQUE TOOL IN ARCHITECTURAL DESIGN

BIM is both the present and the future. Furthermore, BIM is the AEC industry standard.
In some countries the use of BIM is more widespread than in others, yet according to the European Regulation, the use of BIM in licensing and official delivery processes, will become mandatory in each and every country, hence becoming a reality in each and every design practice. The front runners to achieve this BIM transition, will get a clear advantage over the remainder.

BIM in Portugal

Clearly the BIM growth in Portugal is not keeping the same pace as its global growth, in part, mainly due to the lack of specific formation in the field, inasmuch as there are little initiatives towards implementing BIM, and this clearly affects the capacity of the newly graduated students to identifying the markets' needs and which tools are best to use in Design. Consequently, there is a lack of offer of qualified manpower mastering BIM methodology.
On the other hand, the non-mandatory aspect of the BIM utilization by official entities, clearly slows down the evolution in Portugal. In other countries where the use of BIM is more implemented, the methodology is not optional, but rather mandatory.

Despite BIM's non-mandatory nature in Portugal, NLA is focused on its implementation due to the multiple advantages that it brings, particularly on the project precision, the building quality, the worksite speed and preparation advantage, as well as during the building lifecycle.

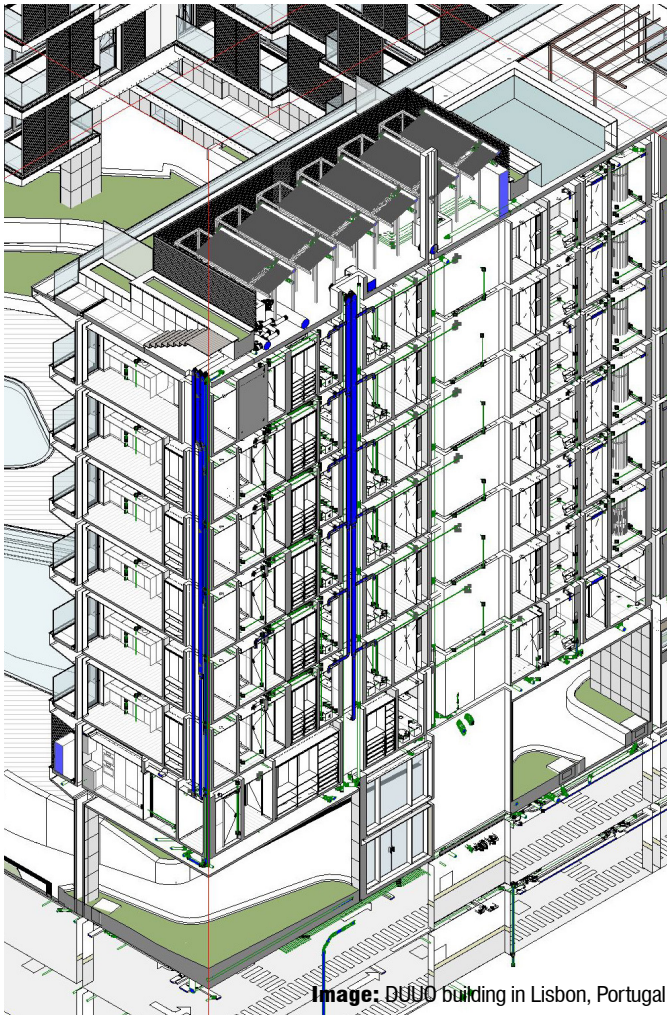


Image: DUUO building in Lisbon, Portugal

Image: DUUO-building in Lisbon, Portugal

BIM in PSP Lisbon

BIM is clearly the future, and is gradually changing the entire industry, not only on architecture and engineering fields, but also and more importantly on the construction field. This sector will be the one with more changes, due to the fact, that the BIM process leads to a better construction planning, encourages the use of modular and pre-made parts, which favors the reduction of the works' timeline and the local team size. Moreover, the material sent to the construction site will only be the strictly necessary, due to the model' accurate measurements, hence reducing the waste and consequently the construction cost, and its area taken by the construction site.

With that in mind, we have defined a strategy, using specific procedures and standards, that allow for a better productivity and crossed operations between teams. Our production process uses BIM from early concept stages to construction completion, with all the detailing and quantification processes in between, working mainly in LOD 300, according to the project needs and agreement by the client. Our teams have at their disposal a broad range of softwares: with Revit as the main design tool, used for modeling the project; Civil 3D used for modeling the terrains and more complex accessibilities; Dynamo for visual coding; Navisworks for coordination of models and discipline projects; Arquimedes and OpenBIM Quantities for cost estimates.

For sharing models the team uses 360 Docs cloud platform, Where all versions of different disciplines are stored and shared.

Navisworks, and BIM Colab Cloud are the tools used for project coordination and project revision., This last platform centralizes all the "issues" published by the multiple teams, and allows for the creations, follow-up and closing of the stated "issues", which leads to a clear and unique workflow. The client can also have access to both platforms, and stay up to date with the project development, in real time.

IMATRA ELECTRICITY SUBSTATION

Imatra, Finland

Designed by: PSP Helsinki
Client: Fingrid Oyj
Area: 965 m^2
Execution: 2017-2020

The project is composed of an electricity substation building and five transmission towers and terminals, extending over two tributaries of the river Vuoksi in the city of Imatra in Eastern Finland. The design and development of the new facilities required special care due to their proximity to the Imatrankoski rapids, a conservation site, and a national landscape as decreed by the Ministry of the Environment. The historical significance of the area was why our client pursued an exceptional substation facility.

The design of the new transmission structures also seeks balance with the surrounding built and natural landscape. Except for one tall tower, they are lower in height than the surrounding treetops.

The new substation building has a concrete frame and double-skin facades. The outermost facade layer consists of hand-made long bricks laid in a zigzag profile, a motif which the building shares with the triangular steel profiles of the new powerline towers and terminals. The top of the masonry wall consists of a porous lattice pattern that lets light and air pass through. The inner layer of the double facade consists of in-situ and prefabricated concrete walls cut by a continuous strip window set behind the brick lattice.

The different parts of the substation facility extend over two tributaries of the Vuoksi river. The main design challenge was to form a coherent whole that fits in the iconic setting. The design breaks apart aspects of the built context and reassembles them in a new abstracted form. The derived design language gives a unified identity to the new project and places it in the context.

The design process was carried out as a BIM project. Perspective Helsinki used Autodesk Revit in the design of the building, the site and power line structures. BIM Management was also carried out by PSP Helsinki, using Autodesk Navisworks for model coordination, collision checking and more. A significant part of the project presentation to the authorities and public were made using the Enscape live rendering add-on for Revit.

Co-operation between different design disciplines and our client, the main operator Fingrid was excellent. As a result, Imatra Electricity Substation has been awarded multiple design awards, including a Highly Commended distinction in the Dezeen Awards 2021.

MARINA ROYALE
Darłowo, Poland

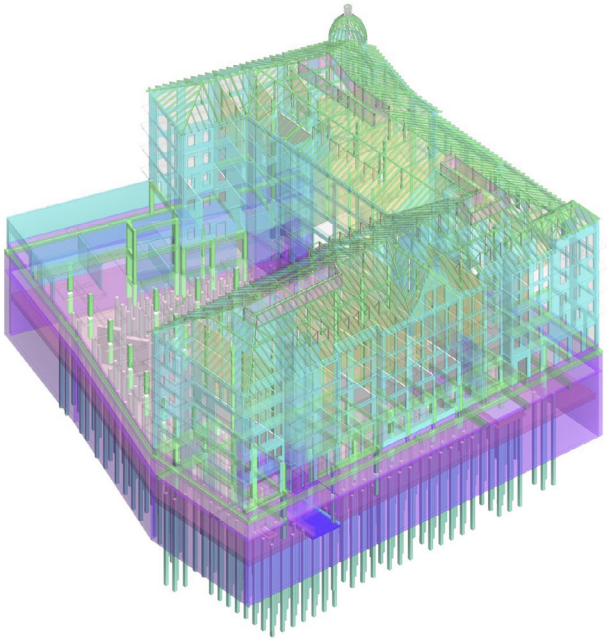
Designed by: PSP Poznan & Arcas Bałtyk
Client: POC Partners
Area: 17 000 m² +21 000 m²
Execution: construction in progress

Marina Royale is a complex of high-standard apartment buildings in Darłówko Zachodnie, located along the planned promenade on the very seashore, at the entrance to the Darłowo port. It will ultimately consist of three buildings, the first of which has already been completed and in use, the second is at an advanced stage of construction, and the third is at the stage of an early building permit design. The whole development comprises ca. 320 apartments (ca. 70 in 1st phase, 105 in 2nd phase and ca. 150 in 3rd phase), accompanied by restaurants, swimming pools, spa and fitness, a conference area and other commercial services.

The author of the architectural concept and building permit design for the entire investment is Arcas Bałtyk, whereas Perspective Poznan has been entrusted with the development of structure and all technical installations at all design stages, as well as tender and execution design of architecture for the second and third building of the complex. For

building no. 2, Perspective Poznan has also developed a conceptual and executive design for the interiors of the common areas as well as the spa, fitness and kid's play zones.

The construction and executive design of Perspective Poznan was created in a 3D environment, including BIM software - all disciplines were modeled in Revit; the design of the reinforcement of structural elements was created in Allplan, and the mechanical ventilation installations in Ventpack. This approach allowed for the correct spatial coordination in the building and also allowed to obtain full building data for the tender documentation.



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