INNOVATIVE ACTIONS 2025

FCC Construcción

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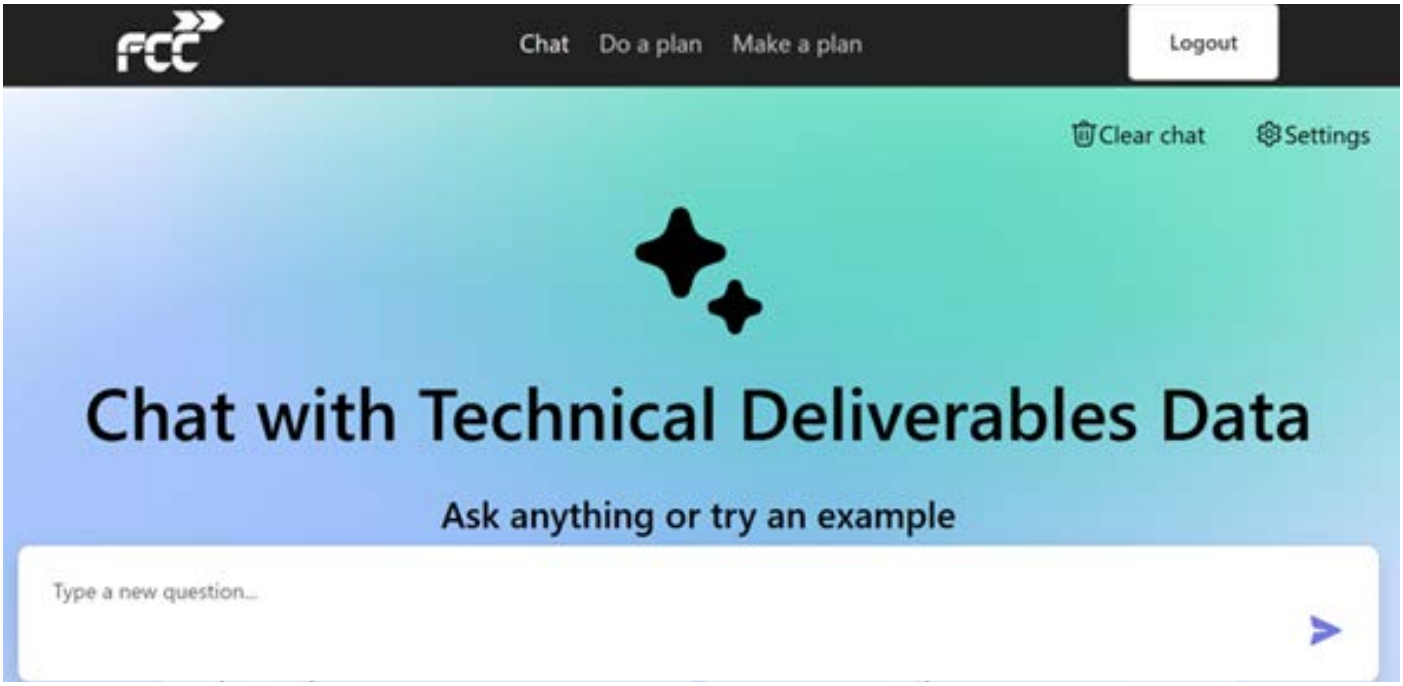
During 2025, innovative actions have been carried out with the aim of improving certain work processes.

The R&D&I Department would like to acknowledge and highlight the importance of some of these actions and the effort made by the teams involved in them. Their contribution has been fundamental in promoting a culture of continuous improvement within the organization, optimizing work processes and encouraging innovation.

Sustainability and Innovation Directorate

(National R&D&I Department)

Application of Generative AI in Bidding Processes



Title of the Action

Application of In-House Generative AI for Drafting Bid Documents

Related Work Centers

Department of International Studies

Summary of the Innovation:

Digitization of the forms provided by the supplier.

A generative artificial intelligence tool has been developed to support the preparation of technical documentation for bidding processes. This solution enables the generation of structured drafts based on internal information and past experience, improving the consistency and quality of the documents.

Its use has been integrated into the team's daily workflow, facilitating content structuring, the generation of technical proposals, and the leveraging of existing corporate knowledge

Important conclusions from this action include:

- Reduced time spent preparing documents.
- Improved quality and consistency of proposals.
- Reuse of internal knowledge.
- Integration into standard bidding processes.

Implementation of Digital Tools on the Construction Site – Reus Station

Title of the Action

Implementation of Digital Tools on Construction Sites

Related Work Centers

New Reus-Bellissens Station

Summary of the Innovation:

A digital environment based on collaborative tools and centralized information has been implemented on-site.

The use of digital platforms has made it possible to manage documentation, incidents, and models in real time, improving coordination among stakeholders and ensuring the traceability of information throughout the project.

Important conclusions from this action include:

- Improved coordination among teams.
- Fewer errors due to outdated documentation.
- Increased oversight of construction work.
- Consolidation of the digital model during construction.

Digital Transformation on the Construction Site – Virgen del Rocío University Hospital

Title of the Action

Digital Transformation on Construction Sites Using BIM

Related Work Centers

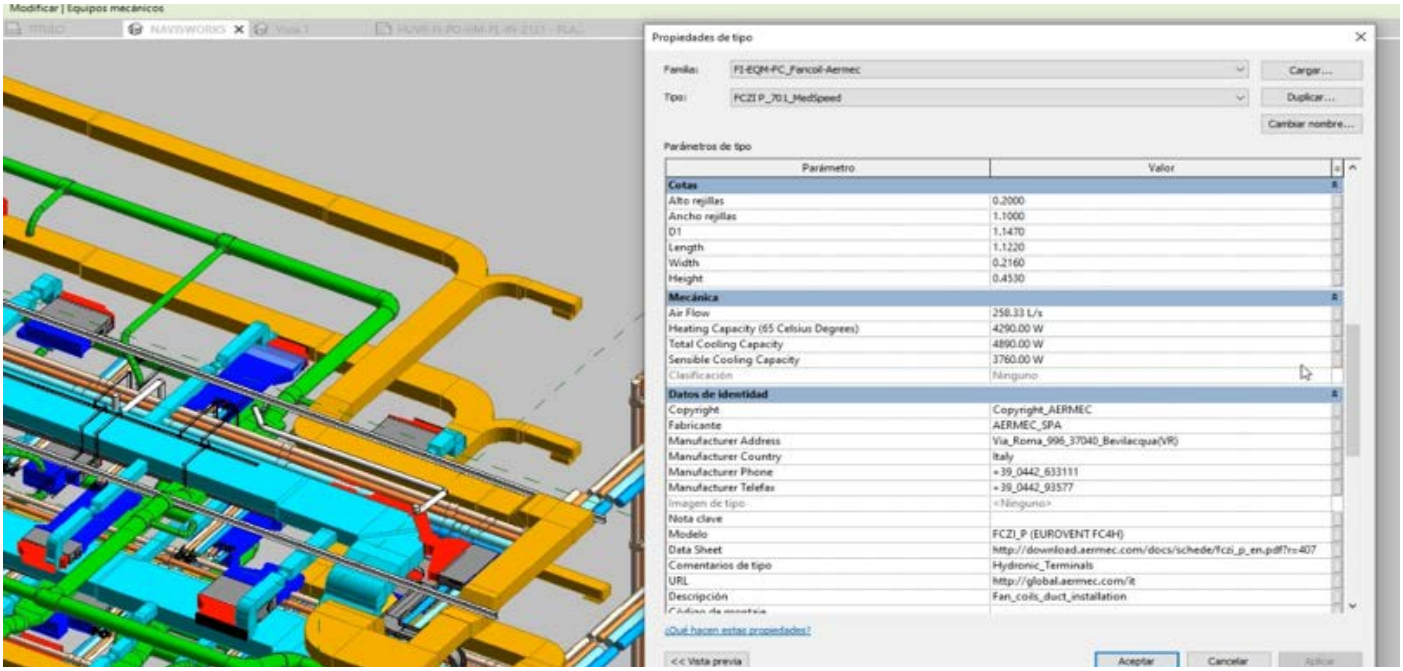
Virgen del Rocío University Hospital

Summary of the Innovation:

The BIM methodology has been implemented throughout all phases of the project, generating a digital model that has improved coordination among disciplines and optimized construction.

The use of detailed models has facilitated the prefabrication of components, reduced interferences, and increased efficiency on-site.

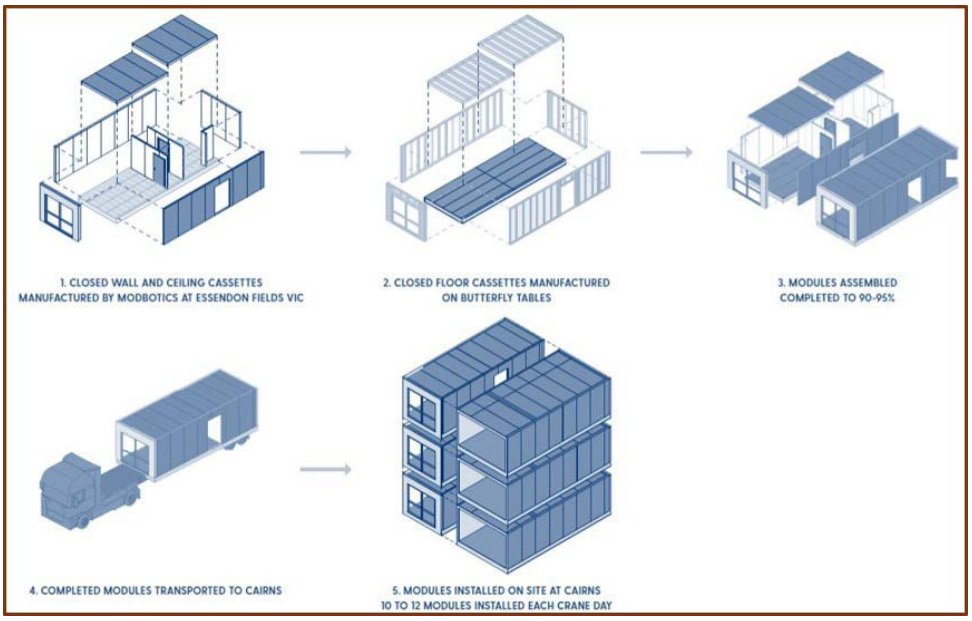
This project can be easily replicated for other construction projects (tested processes are already being applied to two new projects: the Puertollano Hospital and the Hospital Clínic in Valencia).



Important conclusions from this action include:

- Improved coordination across disciplines.
- Reduction in construction errors.
- Optimization of timelines and resources.
- Integration between design and execution.

From Design to Delivery: The Power of BIM. Implementation and Quality Control at FCC Australia



Title of the Action

BIM Implementation and Quality Control in a Social Housing Project

Related Work Centers

Cairns Social and Affordable Housing Project

Summary of the Innovation:

A comprehensive implementation of the BIM methodology has been developed for a project with no initial digitization requirements, integrating design, construction, and quality control into a common digital environment.

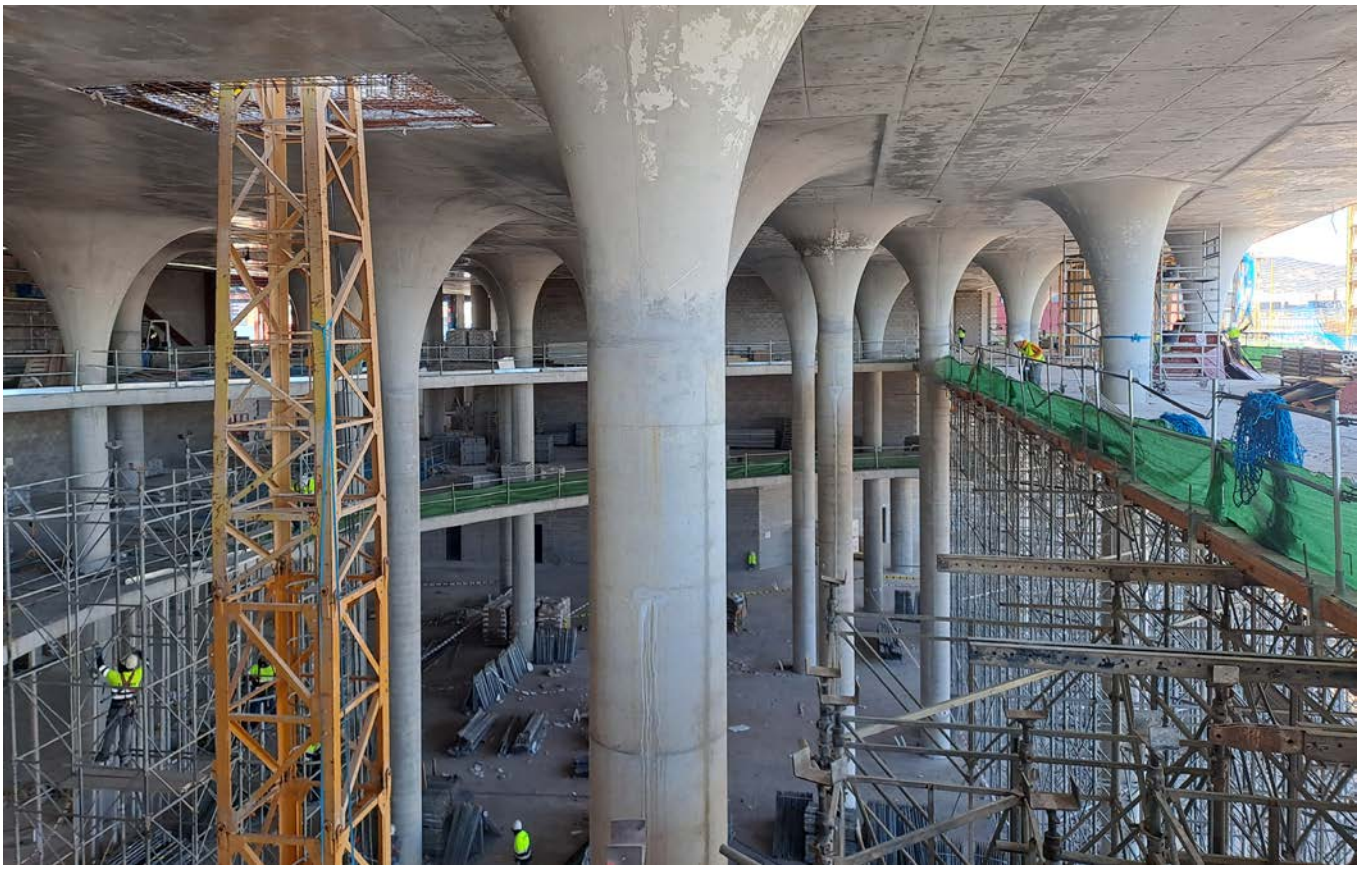
Automated document management workflows and collaborative platforms have been implemented, enabling the management of large volumes of information, improving traceability, and facilitating coordination among teams.

ACC features such as submissions, reviews, issues, stamps, and automations have been utilized. Workato has been used to automate document workflows, ensuring traceability and reducing manual effort by synchronizing ACC with SharePoint and archiving final documents

Important conclusions from this action include:

- BIM implementation without an initial requirement.
- Improved document control.
- Process automation.
- Increased operational efficiency.

Testing Concrete Strength Using the Maturity Method



Title of the Action

Testing Concrete Strength Using the Maturity Method

Related Work Centers

UTE FIRA PAVELLÓ ZERO

Summary of the Innovation:

Monitoring concrete strength using the maturity method, as applied in the expansion of the Fira de Barcelona complex, represents an improvement over the traditional systems used on construction sites.

In a project with a high degree of structural complexity, sensors were installed inside the concrete during the setting process, allowing for continuous monitoring of the temperature and tracking its evolution under real-world conditions.

Based on a preliminary calibration using test specimens, a curve is obtained that relates the thermal history to the resistance achieved, allowing for a more accurate estimation of the appropriate time to proceed with construction.

This approach facilitates the adjustment of construction schedules and reduces the risks associated

with premature or overly conservative decisions, thereby improving control over the construction process.

Important conclusions from this action include:

- Optimization of timelines.
- Reduction of execution risks.
- Greater reliability of oversight.
- Improvement of the construction process.

Construction of the Ataque South Well Using the RD Pile-Wall System

Title of the Action

Well construction using the RD Pile-Wall system

Related Work Centers

Montcada UTE

Summary of the Innovation:

During the construction of the southern access shaft for the tunnel, an alternative construction solution was implemented to replace the traditional diaphragm walls built using a hydro-cutter, due to space constraints at the construction site.

The solution adopted involved the use of steel piles with tongue-and-groove metal casings using RD Pile-Wall technology, which allows for the creation of a continuous, watertight curtain. The system uses controlled-pressure air drilling and reverse circulation, integrating the metal sleeves as a structural component of the retaining wall itself.

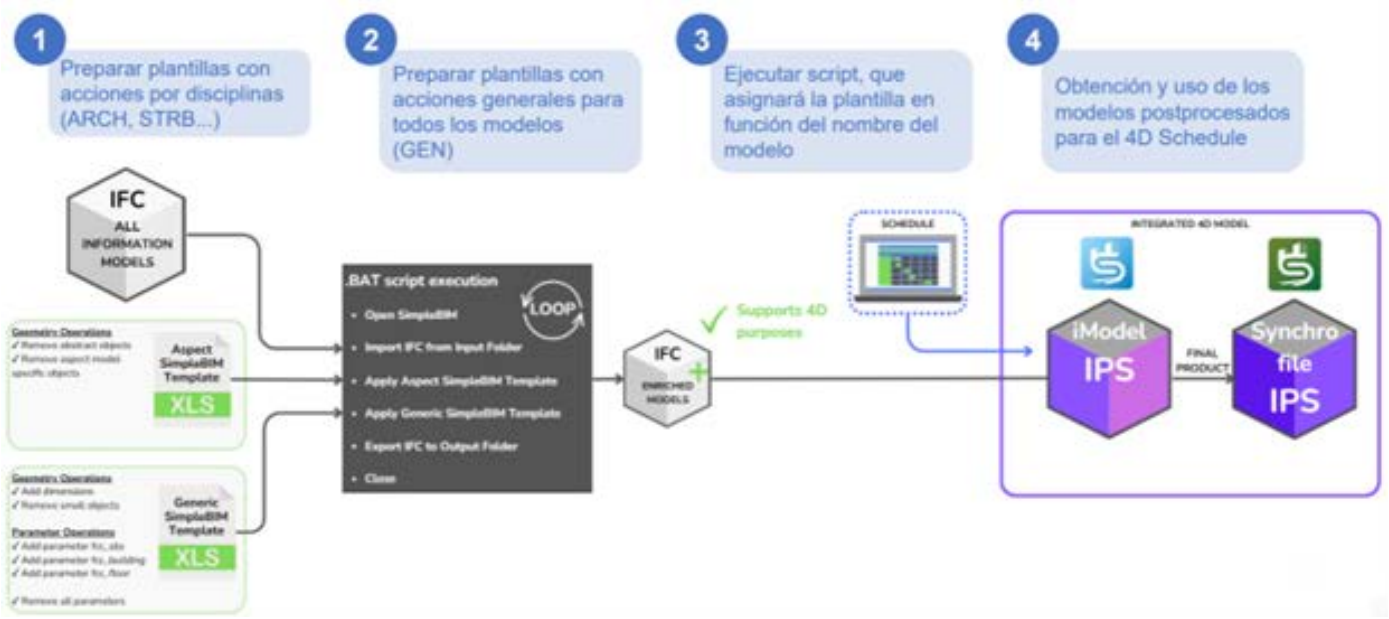
This solution has proven particularly well-suited to the site's geotechnical conditions, ensuring the system's stability and watertightness while reducing the footprint and the need for auxiliary equipment on-site.

Important conclusions from this action include:

- Adaptability to space-constrained conditions.
- Reduction in auxiliary resources.

- High structural reliability.
- Applicability in complex environments.

BIM Post-Processing for 4D Planning



Title of the Action

Post-processing of BIM models in IFC format for 4D planning

Related Work Centers

Pallas Reactor Project

Summary of the Innovation:

During the project, BIM models were received in IFC format that presented significant limitations, such as large file sizes, a lack of useful information for planning, and difficulties in managing a large number of models.

To address these limitations, a post-processing workflow was developed using specific tools that allow the models to be adapted to the needs of 4D planning. Key actions included simplifying the geometry, incorporating parameters, and structuring the information.

Additionally, model processing was automated using templates and repetitive processes organized by discipline, which enabled the efficient management of a large volume of information.

This approach has improved the quality of the models and facilitated their use in planning, optimizing analysis and decision-making on-site.

Important conclusions from this action include:

- Improved use of IFC models.

- Process automation.
- Error reduction.
- Planning optimization.

Automatic detection of changes on-site using point clouds

Title of the Action

Automatic Change Detection Using Point Clouds

Related Work Centers

UTE Tenerife

Summary of the Innovation:

Since 2021, photogrammetric drone flights have been conducted periodically to monitor the progress of the construction project.

Starting in 2024, an automated change detection system has been implemented, based on the analysis of the point clouds generated during these flights, allowing for the precise identification of differences between flights.

The results are presented as georeferenced images or models that clearly show the excavation and dumping areas, even distinguishing the magnitude of material movements. This enables agile monitoring of the project's progress and the detection of any deviations from the plan.

Furthermore, using this information incurs virtually no additional cost, as it leverages data that is already available, making it easy for the construction team to review the data from the various flights conducted.

Important conclusions from this action include:

- Improved construction site management.
- Early detection of issues.
- Low implementation cost.
- Decision-making support.

FCCiLUX: Innovation in Light Distribution Maps

Title of the Action

FCCiLUX – Streetlight Optimization

Related Work Centers

FCC Industrial

Summary of the Innovation:

The FCCiLUX project was developed as a solution aimed at improving the management and planning of street lighting through the use of geographic information systems.

It is an integrated tool that generates light distribution maps based on real data from streetlights, facilitating the analysis of light intensity at every point in the environment.

This approach makes it possible to evaluate different design scenarios and optimize lighting layout, thereby improving energy efficiency and safety in urban spaces.

Important conclusions from this action include:

- Reduced energy consumption.
- Improved lighting design.
- Cost optimization.
- Support for technical decisions.

SCIIS System Implementation

Title of the Action

SCIIS System Implementation

Related Work Centers

Department of Quality and the Environment

Summary of the Innovation:

SCIIS is a system designed to ensure the quality, reliability, and traceability of the sustainability information generated by the organization.

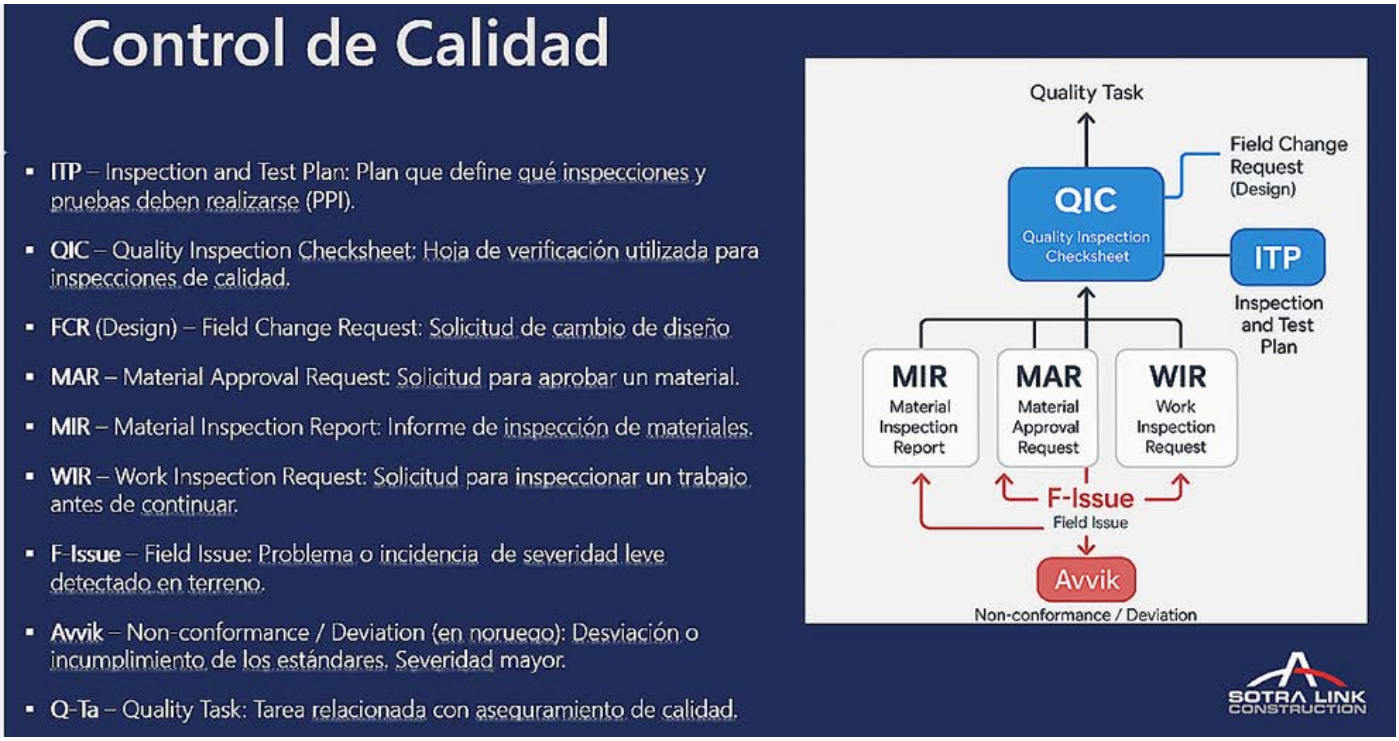
During its implementation, the key indicators to be monitored were defined, prioritizing those most relevant from a strategic and operational standpoint. To this end, factors such as their impact on the business, their exposure to audits, and the quality of the available data were taken into account.

The system allows for the structuring and standardization of information management, facilitating the monitoring of indicators and ensuring data consistency throughout all phases of the process.

Important conclusions from this action include:

- Improving data quality.
- Standardizing criteria.
- Strengthening internal controls.
- Increasing transparency in reporting.

Using Dalux Field on a Construction Site



Title of the Action

Use of a Digital Construction Management Tool

Related Work Centers

Sotrasambandet Project

Summary of the Innovation:

At Sotra Link, Dalux Field is used in conjunction with Aconex and Autodesk Construction Cloud (ACC) to improve traceability, collaboration, and real-time documentation.

While Aconex serves as the official platform for communication and document traceability, and ACC enables simultaneous editing of "living documents," Dalux Field focuses on capturing information directly from the job site and sharing it immediately with users (joint venture personnel, subcontractors, and the client), providing traceability and control over project execution.

Dalux enables the creation and management of project-related forms and tasks, providing all joint venture personnel with access to up-to-date 2D documentation and 3D models directly on-site. This facilitates the tracking of necessary actions and ensures that both Quality, Environment, Health, and Safety teams, as well as Production teams, can record key data using integrated checklists. Daily input from the production team also supports cost control and planning.

By providing continuous access to all parties—including the client and subcontractors—Dalux improves coordination, facilitates proactive quality and safety management, and helps optimize productivity and decision-making during the construction phase.

Important conclusions from this action include:

- Improved communication on-site.
- Access to up-to-date information.
- Enhanced oversight of project execution.
- Improved operational efficiency.

High-Voltage Cable Installation in a Railway Environment

Title of the Action

Installation of overhead cables over railroad tracks

Related Work Centers

SE Nudo Terrer

Summary of the Innovation:

A solution has been developed for the installation of high-voltage power lines in an active railway environment, simultaneously crossing a conventional line and a high-speed line.

The project required detailed planning and a high degree of coordination, adapting to restricted work windows and ensuring the safety of the existing infrastructure at all times. To this end, a specific solution was designed to allow for controlled installation, avoiding interference with the rail lines.

This approach enabled the project to be carried out safely and efficiently, minimizing the impact on operations and meeting the project's demanding deadlines.

Important conclusions from this action include:

- Reliable implementation in a highly complex environment.
- Minimizing the impact on active infrastructure.
- Optimizing implementation timelines.
- A solution applicable to similar projects.

Betonblock Solution for Emergency Response

Title of the Action

Use of Betonblock Prefabricated Parts

Related Work Centers

3T24_EMERGENCY REPAIRS TO THE BRIDGE OVER THE M-507 IN ALDEA DEL FRESNO

Summary of the Innovation:

Following the damage caused by a cold low-pressure system (DANA) to various road infrastructure, an emergency response was launched to restore the connection between the affected towns by constructing a temporary bridge.

To this end, a construction solution based on Betonblock-type prefabricated components was used, which allowed for the quick and easy installation of the support bases for the abutments of the temporary bridge. These components were installed using a crane, which facilitated their assembly and allowed them to be adapted to the terrain conditions.

This solution proved particularly effective in an emergency situation, as it significantly reduced construction time and restored traffic in the shortest possible time.

Important conclusions from this action include:

- Speed of execution.
- Reduced execution times.
- Effective solution for emergencies.
- High adaptability.
- Improved incident response capability
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DELPHOS Project

Title of the Action

Project Management Support Tool – DELPHOS

Related Work Centers

PTUS Project (Canada)

Summary of the Innovation:

The DELPHOS project involves the development of an artificial intelligence-based tool to support project management, facilitating the understanding of contractual documentation and the generation of reports.

The tool allows users to query information using natural language, helping to interpret contract requirements and generate documentation more efficiently. It also includes features for searching for technical solutions in similar projects, promoting the reuse of knowledge within the organization.

This approach improves analytical capabilities and reduces the time needed to access information, supporting decision-making at various stages of the project, from inception through execution.

Important conclusions from this action include:

- Improved understanding of contractual documentation.
- Reduced time spent searching for and analyzing information.
- Support for the generation of project reports.
- Reuse of corporate technical knowledge.