INTEGRATED FLOOR SYSTEM

Improving the design and construction management of control rooms

July 6th, 2017
Belgioioso, Italy
1.0 Our Company
2.0 Hilti Energy & Industry
3.0 Integrated System Business
4.0 The Integrated Floor System
THIS IS HILTI

Founded in 1941 in Liechtenstein

Partner of the professional construction industry

More than 24,000 employees

Operations in more than 120 countries
WE PASSIONATELY CREATE ENTHUSIASTIC CUSTOMERS AND BUILD A BETTER FUTURE.
PRODUCT AREAS

Anchor systems
Electric tools and accessories
Direct fastening and screw fastening
Firestop systems
Diamond systems
Measuring systems
Installation systems
OUR CUSTOMER SEGMENTS & TRADES

Building construction
Civil engineering
Steel/metal construction
Interior finishing
HVAC
Electrical installation
Diamond service contractors
Natural resources
Power
Industry

Energy and Industry
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ENERGY AND INDUSTRY: WE ARE WHERE YOU ARE
A GLOBAL TEAM WITH OVER 1,400 EMPLOYEES

Over 1,000 of our team members have direct interaction with Energy and Industry customers
FOCUS SEGMENTS - ENERGY

Thermal & Ren Power Gen  Nuclear & Decommission  T&D Projects  Utilities, MRO

Oil & Gas Offshore  Oil & Gas Onshore  Mining  Shipbuilding

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FOCUS SEGMENTS - INDUSTRY

Vehicle
Machinery
Food & Beverage
Electronics

Facade
Telecom & Data
Pharmaceutical
Elevators
WE ARE PRESENT THROUGHOUT THE E&I VALUE CHAIN

**New Build Projects**

- Engineering Design
  - Design support
  - Technical libraries
  - Software
  - Model integration
  - Engineering advisory

- Procurement
  - Global logistics
  - Customized purchasing solutions
  - Range of solutions

- Construction
  - Jobsite support
  - Engineering advisory
  - Health & safety
  - Trainings

**Brownfield works**

- MRO & upgrades
  - Engineering advisory
  - On-time jobsite support
  - Health & safety
  - Logistics

- Decommissioning
  - Engineering advisory
  - Engineering consulting
  - Customized solutions

MRO – Maintenance, Repairs and Operation
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VALUE PROPOSITION OF INTEGRATED SYSTEM BUSINESS GOES FAR BEYOND PRODUCT ONLY

- Technical calculations
- Design support
- Kitting, cutting, pre-assembly
- Trainings & jobsite support

- Modular system, Fastening solutions and more
- Customer and project specific products to complete the system solution
- Testing for special application conditions

- 2D/3D drawings
- Typical libraries
- BIM and Plant Design

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WE CAN SUPPORT YOU ON A WIDE RANGE OF APPLICATIONS
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THE TRADITIONAL ARRANGEMENT OF TECHNICAL ROOMS REQUIRES 3 SEPARATED KINDS OF SUPPORT

- The floating floor
- The electrical cable tray support
- The panel stand

What happens?
- Narrow space for cables
- Time consuming
- Additional scaffolding
- Conflicts during the work
- Need a lot of coordination
- Modification is difficult
- Heavy lifting required
HILTI INTEGRATED FLOOR SUPPORT IS AN INNOVATIVE AND COST EFFICIENT SOLUTION
ONE SUPPORT STRUCTURE SOLUTION FOR DIFFERENT KINDS OF EQUIPMENT, CABLE TRAYS AND FLOOR TILES

The solution
3 different supports in 1 integrated system

Comparison
Traditional vs. Hilti IFS

- Narrow space for cables
- Time consuming
- Additional scaffolding
- Conflicts during the work
- A lot of coordination
- Modification is difficult
- Heavy lifting required

- Easier cable routing
- Fast installation
- No scaffolding
- 3 systems integrated
- Minimal coordination
- Easily adaptable
- Light components
THE RESULT: TIME SAVING AND LESS TOTAL COST

- Hilti support system is able to reduce more than half the installation time, compared to the traditional structures.
- Flexibility, less planning, lower coordination effort and time savings lead to considerable overall cost saving.
IMPROVE THE DESIGN PROCESS

- The design of the cable routing is not affected by the rigid grid of the pedestals of the traditional false floor, but can be easily managed with a larger span and flexible layout.
- The cabinets position and spare management for future needs are flexible and can be handled without the use of panel frames in steelwork.

- Utilize the minimum space to accommodate the services and prevent from interferences.
- The modularity of the system enables last-minute changes and fine adjustment after installation.
- Reduce the re-work and re-design.

Electrical & Instrumentation Engineering

Civil Engineering
OPTIMIZE THE WORKFLOW

• The integration of the disciplines in one single system
  - minimizes the coordination needs
  - optimizes the workflow
  - mitigates conflicts and disruptions

• The minimization of interferences and rework strongly simplifies the erection and dramatically shrinks the installation time, thus reducing the time pressure

• Design to cost through optimization

• Reduce the site work (with pre-assembly and cut to length services)

• On-site support and supervision
EASY AND CUSTOMIZED DELIVERY

- Accurate MTO and cost forecast
- **Stock availability** without time delivery pressure or prefabrication lead-time
- Global coverage
- Provide special logistic requirements
• Flexibility and removability to incorporate later changes and future modifications

• Enable easier and safe maintenance and renovation, since panels can be added or moved directly on the floor without the need of temporary scaffolding
CASE STUDY: INTEGRATED FLOOR IN AN INSTRUMENT BUILDING WITH SEVERAL LAYOUT CHALLENGES

The “challenges”
- Narrow spaces and congested cable routes under the floor
- Portion of the room with sloping ground and no pillars allowed
- Large air duct laying on the ground under the floor

The “solution”
- Hilti Integrated Floor with MQ channels (C profiles) for the typical structures
- Special frames with heavy Hilti girders (MI system) in critical areas

Customer benefits
- **Flexible grid layout** that overcomes the issues met by the customer in early design
- **Easily adaptable structure**, despite the changes done during detail design
- Easy installation for **future cabinets**
- Full satisfaction also by the Plant Owner
CONGESTED CABLE ROUTES SOLVED WITH VARIABLE PILLARS LAYOUT

The solution

Pillars layout with variable grid
SLOPING GROUND SOLVED THROUGH SPECIAL STRUCTURES WITH HEAVY GIRDERS

Sloping ground, no pillars allowed

The solution

Special structure with Heavy Duty system MI
AIR DUCTS SECTIONS SOLVED WITH SPECIAL BRIDGES

Large air ducts and side by side in critical sections

The solution

Pillars layout with variable grid and bridges with Heavy Duty system MI
TYPICAL LAYOUTS OF INTEGRATED FLOORS

Single layer of channels with frame distance given by tiles size (e.g. 600mm). Typical grids:
- 600x800
- 600x1000
- 600x1200

Two layers of channels with frame distance variable, the layout is totally free. Typical grids:
- 800x1000
- 1000x1000
- 800x1200
TYPICAL LAYOUTS OF INTEGRATED FLOORS
In some cases it’s required that the panels are installed on fully separated structures.

For those situations the floor integrates the cable trays only and the panel stands are fabricated through Hilti modular system but with independent structures.
SPECIAL CASE: INDEPENDENT PANEL FRAMES
REFERENCES OF INTEGRATED FLOORS SYSTEM WITH MAIRE TECNIMONT GROUP

Under design:
• Combined Oil Refinery Unit (CORU) in Moscow refinery, Russia

In construction:
• Punta Catalina coal-fired power plant in Dominican Republic

Completed:
• Refinery Off Gas (ROG) in Antwerp petrochemical district, Belgium
DESIGN THE SYSTEM IN BIM TO EXPLOIT THE ADVANTAGES OF THE SOLUTION
IMPLEMENTED A CASE STUDY WITH TECNIMONT FOR THE INTEGRATION IN A 3D MODEL
A DESIGN RICH IN INFORMATION

- Automatic creation of elevations, plans and sections from the 3D model
- Clash detection
- Automatic Bill of Quantities
- Additional info like cost and installation time
BIM NOT ONLY FOR DESIGN
USEFUL TOOL FOR PROPOSAL AND PLANNING

Provides:
- Cost transparency
- Automatic update of material take-off
- Forecast installation time
- Integration in project schedule
- Sequence planning

PROVIDES

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THANKS FOR THE ATTENTION