

**HILTI**

**PROFIS  
INSTALLATION  
INSTRUCTION  
MANUAL**

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#### Legal Disclaimer

Typical details shown are examples only and not for construction, contact Hilti for detailed design to meet project specific requirements. All loading and design criteria supplied by customer is assumed accurate. Only the stated Design Assumptions were considered, and must be verified by the responsible Engineer of Record (EOR). The basis of Hilti component and connection design is the published data in the current Hilti Technical Guide, including material and cross-section properties, allowable load values, factors of safety, methods of calculation, and limiting factors. The EOR must verify suitability for any specific application, and the capacity of the supportive structure to receive the shown configuration and associated reaction loads. Modification to components and/or design may alter performance and must be evaluated by the EOR.

Conditions of Use: Provided pursuant to Hilti's Terms and Conditions of Sale. Software specifications, system listings, functionality and appearance are subject to change.

# GETTING STARTED

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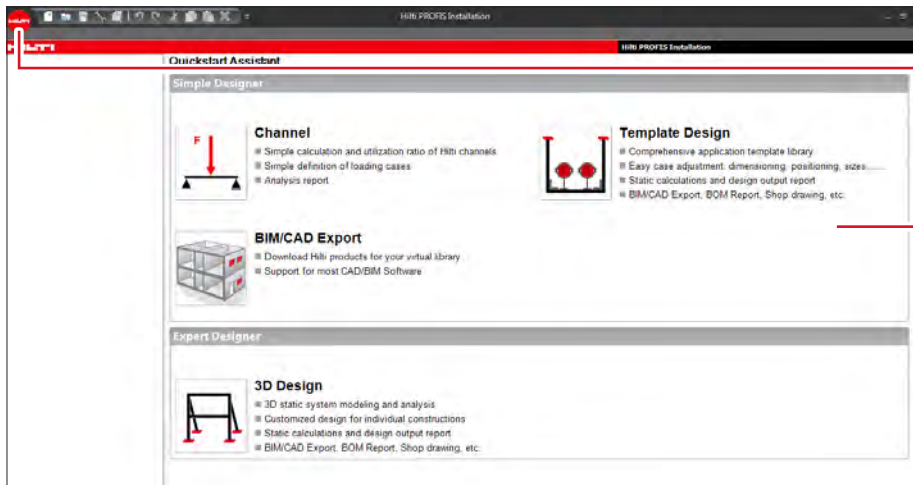
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## Creating a project

To create a new project, select one of the following:

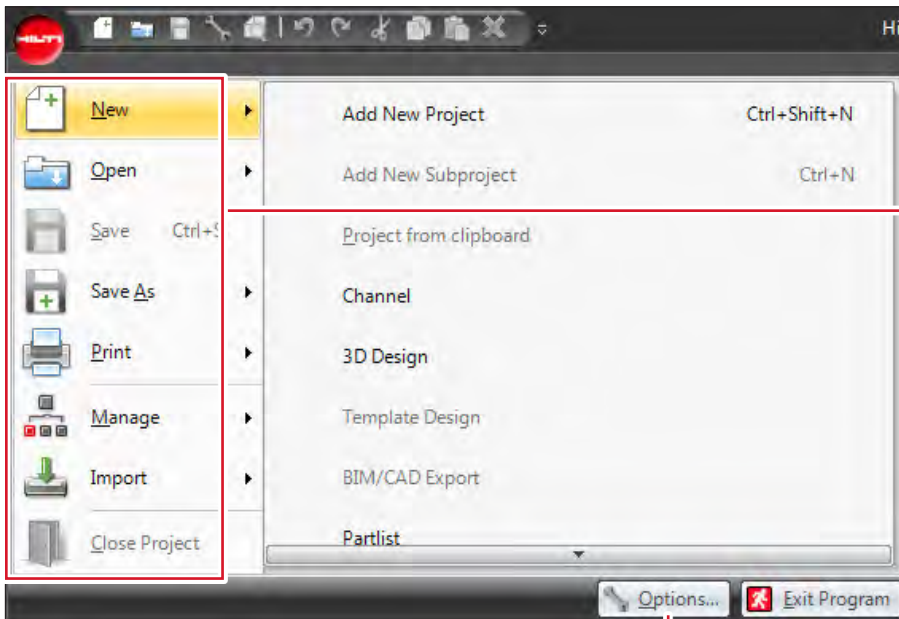


Click the “Hilti” button to create a new project or assembly, open an existing project, or change settings (Language, Units, Portfolio, etc.) (see page 5).

-or-

Select an assembly designer option from the “Quickstart Assistant” to create a new project.

Hilti button



**Menu**

Top to bottom:

**New:** Create a new project, sub project, assembly, or parts list

**Open:** Open an existing project, a favorite project, or a recent project

**Save:** Save the current project in its previous location

**Save As:** Save a project in a new location or save one as a favorite

**Print:** Open the “Print preview” and print the selection

**Manage:** Manage customers in the customers list or manage the favorites list

**Import:** Import files for list prices or translations

**Close project:** Close the current project

**Options**

**Settings:** Select language, enable/disable auto save, set auto save interval, etc.

**Units:** Selects units to use for length, weight, load, torque, and stress as well as the number of decimal places to use for each

**Parts list:** Select which fields to sum on the parts list, sales price factor, etc.

**Parts list layout:** Select which fields to display/export on parts lists and the order they should appear in

**Catalogue:** Select the currency and catalog portfolio to use

**Resources:** Check for updates, view version information, activate other PROFIS software keys, etc.

**Calculation:** Set proxy settings (if required) for accessing the cloud calculations

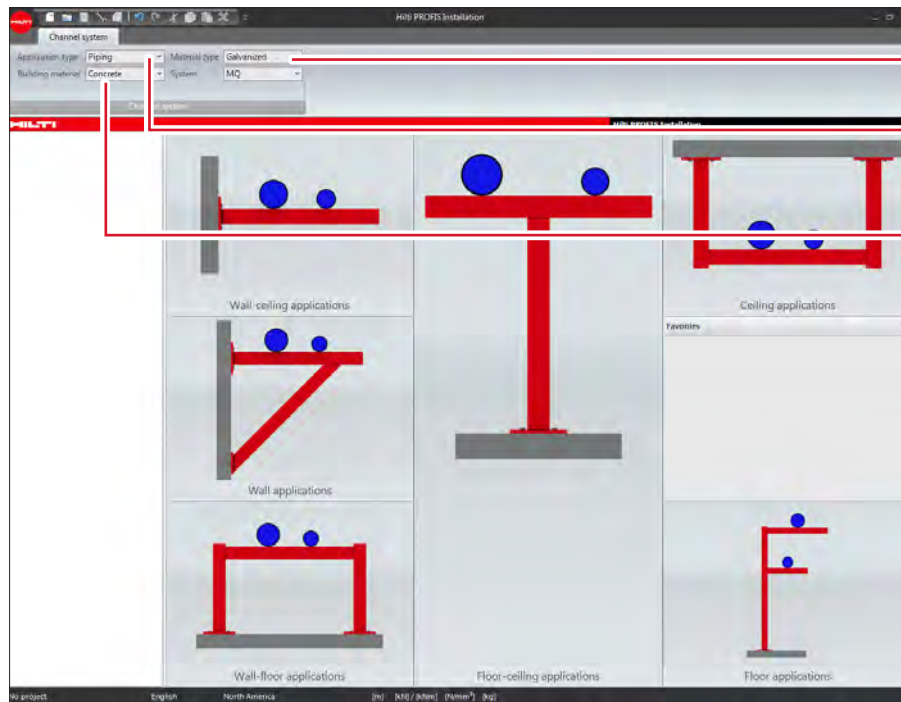
**Channel 3D:** Select to enable/disable hardware acceleration, show/hide fixed positions, and show/hide the base material in CAD models

# TEMPLATE DESIGN

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# Template design

Use one of the following standard template designs

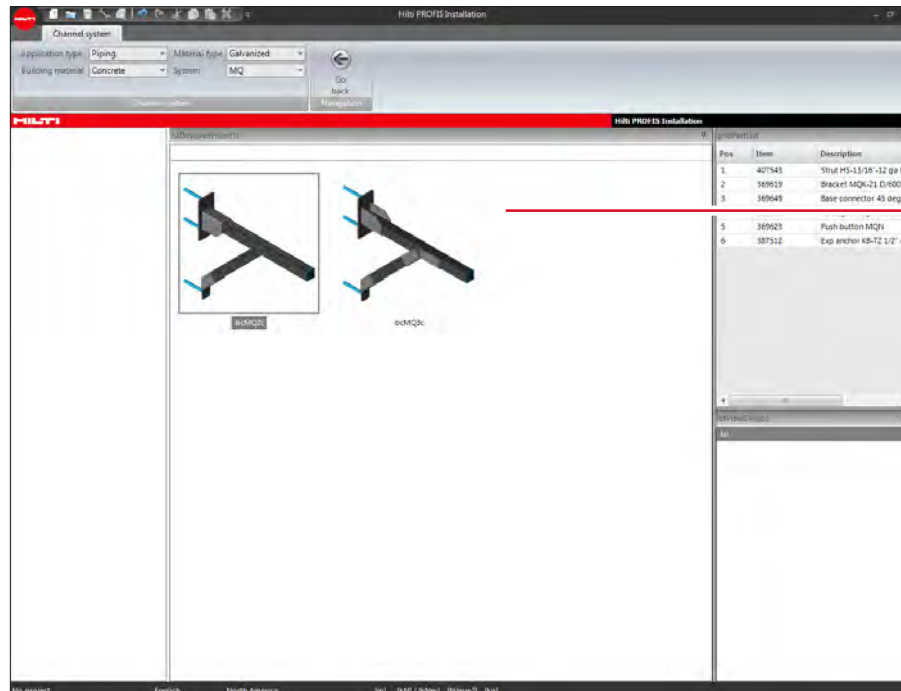


Select Material Type "MI/MQ (Heavy/Light)"

Change Application type to "Piping" or "Cable trays"

Change Building material to "Concrete" or "Steel"

## To open a template design



Click an application type, then select a template to load

The template will open in the "Manage Pipe Layers" window (page 8)

# Manage Pipe Layer window

Manage Pipe Layer window allows user to manage pipe properties and insulation properties

**Dimension type**  
**Axis to axis:** Specify measurements from center to center  
**Surface to surface:** Specify measurements from edge to edge

**Dimension orientation**  
**Horizontal:** Specify measurements in the horizontal direction  
**Vertical:** Specify measurements in the vertical direction

**Add/Remove pipe**  
 Add a pipe above or below the support or delete a pipe

**Pipe layer**  
 Select a pipe to edit attributes (selection highlighted in red) or edit dimensions

**Pipe properties**  
 Edit type and size of pipe

**Insulation properties**  
 Select insulation material and thickness (if applicable)

**Pipe support properties**  
 Select support type and assembly options

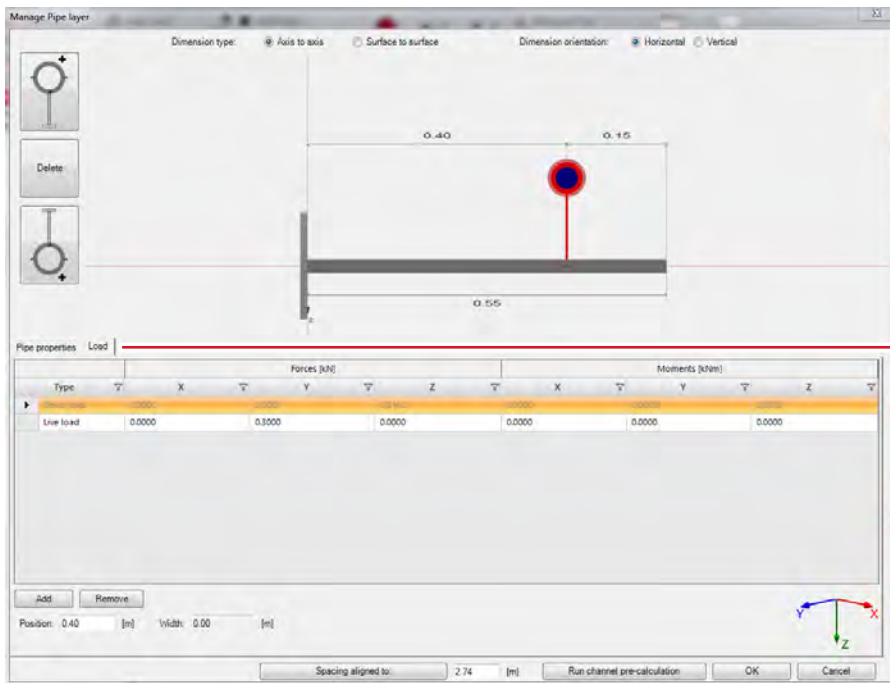
**Weight**  
 View supported weight and add additional weight if necessary

**Other properties**  
 Add or remove insulation and pipe fill by selecting the boxes

**Run channel pre-calculation**  
 Runs an initial calculation and reports the max utilization percentage and deflection utilization percentage for the channel

**Spacing**  
 Edit spacing between supports along pipe





**Loads**

Click on "Loads" tab to add/modify/remove loads in addition to dead loads

# Projects

How to navigate through a project to set project properties.  
 Double click on the Project 1 (Project name) in project tree pane.

## Calculations

**Sum:** Provides sum of lengths

**Round to sales quantity:** Total length of MI girders to purchase

**Renewal of aggregation:** Refreshes the parts list with changes made in the assemblies

## Extras

**Refresh prices from catalog:** Prices from HOL

**Refresh all prices in project:** Price based on BOM

**Excel export:** Exports the parts list to an Excel file

**AutoCAD export:** Exports the parts list to an AutoCAD object

## Modification

Add a new line to the parts list

Note: To delete a line, click on the line in the table to highlight it and press the "Delete" key.

## Project

Select to open the project information and parts list for all assemblies in the project.

## Assembly

Select to edit the assembly

When a project or assembly is selected, right click for additional options (New, Copy, Rename, Delete, etc.)

## Report

Creates a PDF file with the parts list and cut plan for beams

## Hilti Online

Opens Hilti Online in a web browser with parts placed in the shopping cart

## Project

Add Project Description (Name, Number, etc)

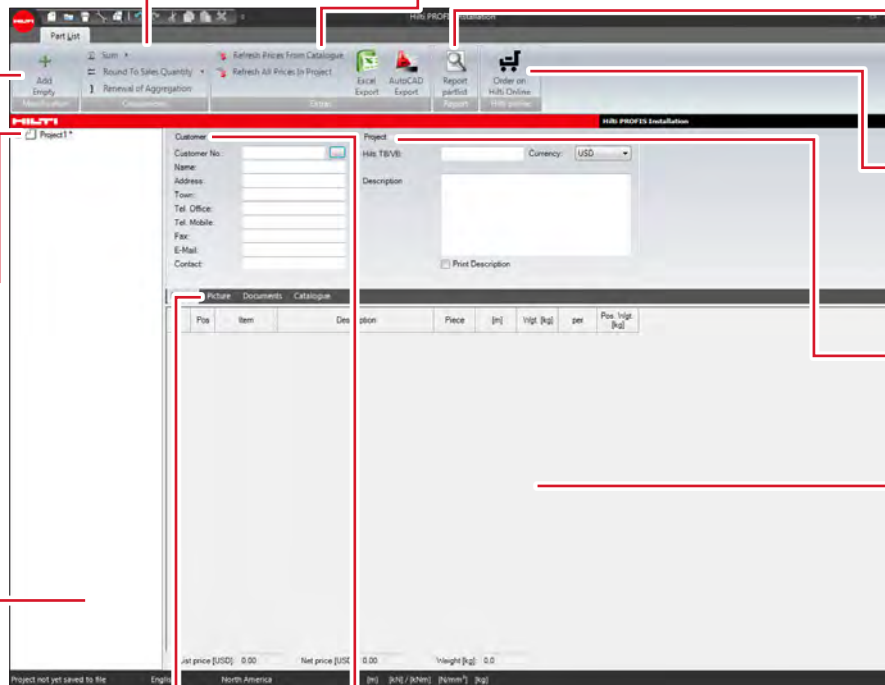
## Parts list

Displays parts required for the project

Note: Right click for additional options (add column, remove column, sort, etc.).

## Customer

Information appears on reports generated for the project. Use the button to insert customer information from the customer list



## Picture

Insert pictures associated with the project.

Note: Selecting the "Print" option will include the images on reports.

## Documents

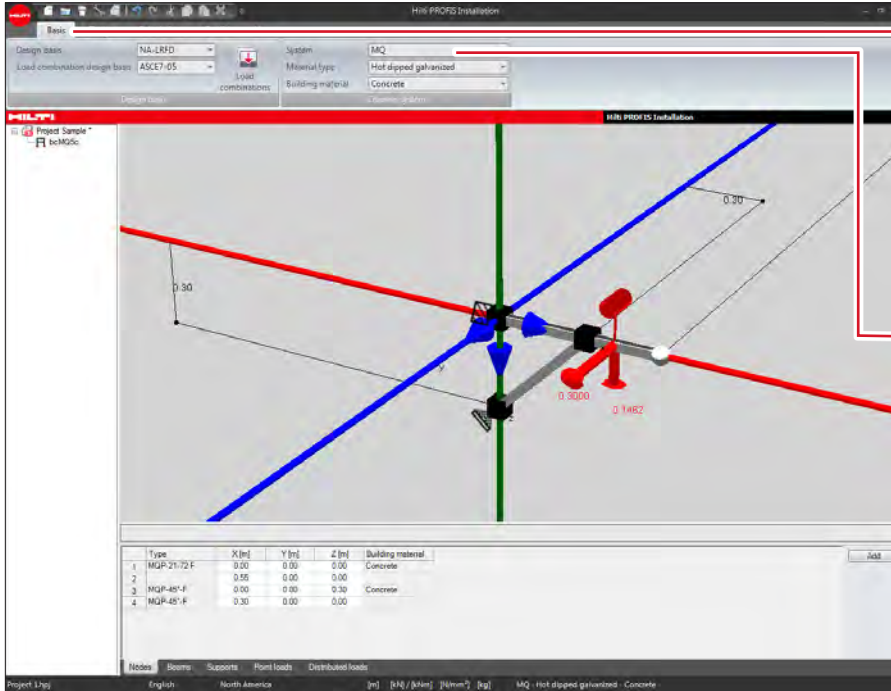
Attach documents associated with the project.

## Catalogue

Item description and number.

## Basis tab

Expand project 1 and then double click on bcMQ5c to get to the Basis tab or project design screen



### Design Basis

**Design basis:** Select the basis of design for calculations

**Load combination design basis:** Select the load combination basis of design to use for calculations

**Load combinations:** View the load combination selected in tabular format

### Channel System

**System:** Select channel systems to include in calculations

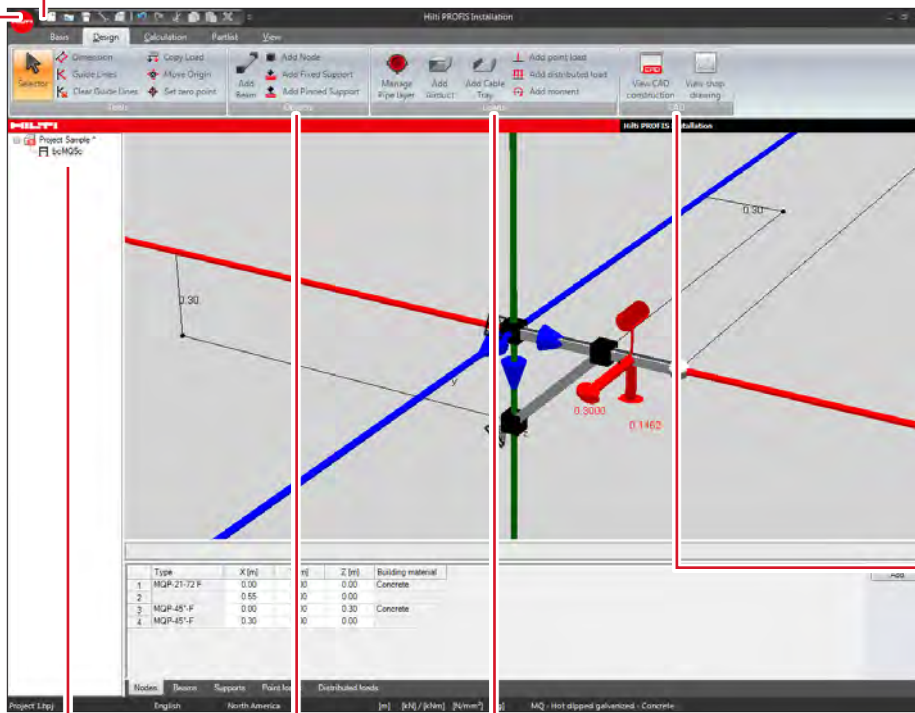
**Material type:** Select channel material or finish to include in calculations

**Building material:** Select base material supports will connect to

**Note:** Not all material types are available for each channel system.

## Design tab

Design tab enables user to change dimensions, add/modify objects, view construction.



**Project tree**  
See page 10

**Quick access toolbar**  
See page 4

### Tools

**Selector:** Use to select and edit features in the model

**Dimension:** See page 19

**Guide lines:** Adds 3D coordinate lines to a node. Beams can be attached to these guide lines

**Clear guide lines:** Removes all guide lines in the model

**Copy load:** With a load selected, this will duplicate the load and place it next to the current one

**Move origin:** When selected, click and hold in the model view to pan the origin

**Set zero point:** Select a node to move the zero point of the main axes

### CAD

**View CAD construction:** Opens the “CAD Model Viewer” (see page 18)

**View shop drawing:** Creates a shop drawing with CAD models and a parts list of the assembly. Includes the option to insert and maintain a revision block

### Loads

**Add pipe:** See page 21

**Add custom load:** See page 25

**Add airduct:** See page 21

**Add cable tray:** See page 21

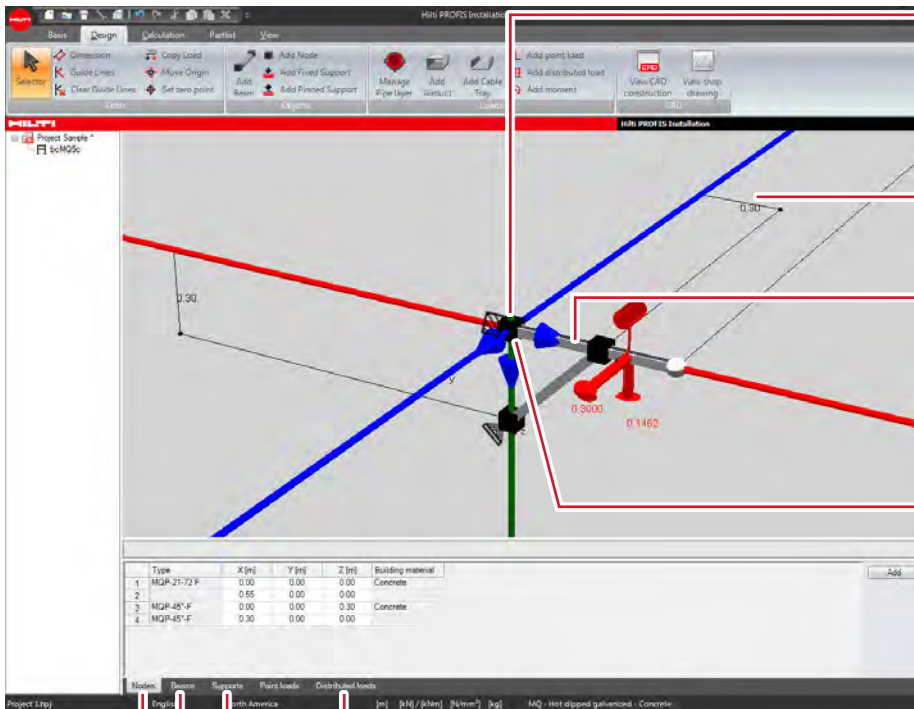
### Objects

**Add beam:** See page 20

**Add node:** Click on an existing beam to add a node

**Add fixed support:** Click on an existing node to add a fixed support (resists forces and moments)

**Add pinned support:** Click on an existing node to add a pinned support (resists forces only)



**Nodes:** To edit nodes, double click to open the “Node Properties” window. This displays the node geometry and loads (after a calculation is run) and allows for selection of connection type

**Dimensions:** To edit dimensions, see page 19

**Beams:** To edit beams, double click to open the “Beam Properties” window. This displays the beam stresses and loads (after a calculation is run) and section data and allows for selection of channel type and rotation

**Supports:** To edit supports, double click to open the “Support Properties” window. This displays the support geometry and loads (after a calculation is run) and allows for selection of base material connector and fixation method

**Nodes**

Displays the type and location of each node in the assembly. The location attributes can be edited

**Beams**

Displays the type, start and end point locations, length, and weight of beams in the assembly. The start and end point locations can be edited

**Supports**

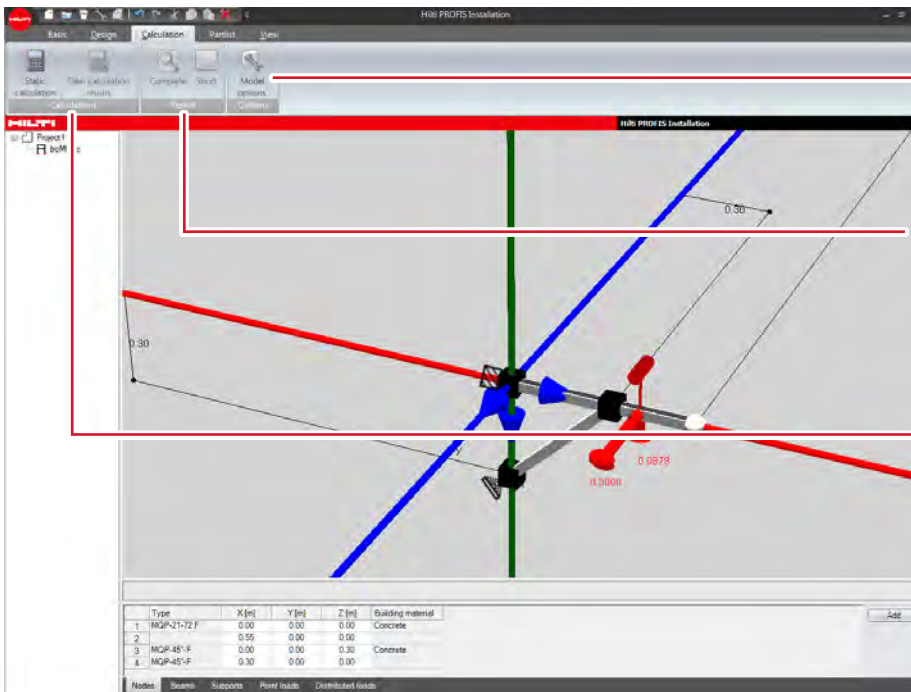
Displays the type and location of supports in the assembly

**Loads**

Displays the type, description, position, width, load type, forces, and moments of loads in the assembly. The position attributes can be edited

*Note: When a custom load is inserted, the position, width, load type, forces, and moments can be edited*

## Calculation tab



### Options

**Model Options:** Adjust defaults for maximum beam displacement, maximum cantilever allowable deflection, and minimum deflection limit

### Report

**Complete:** Complete report

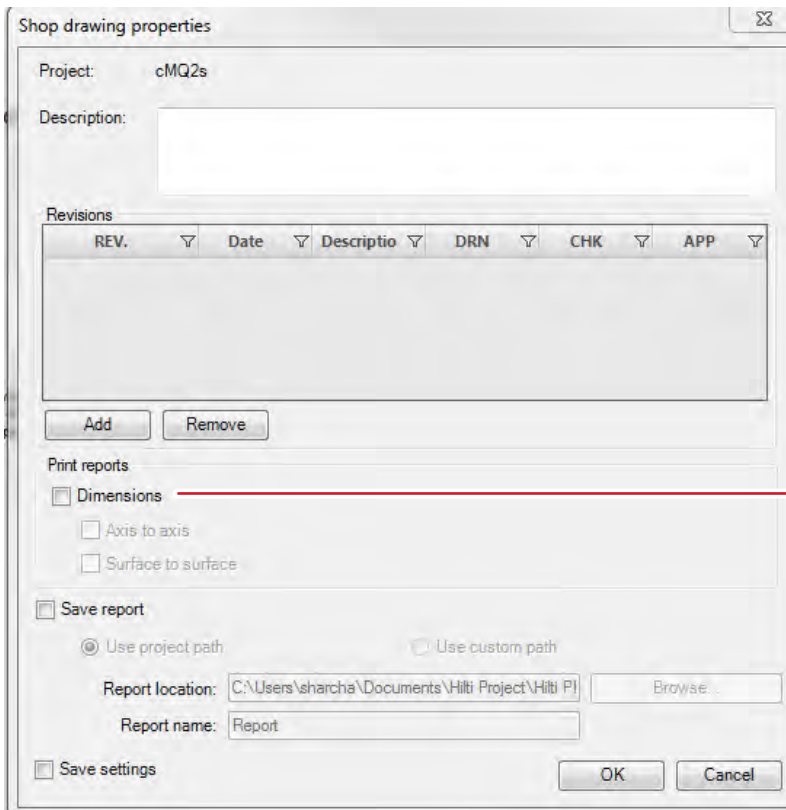
**Short:** Creates a shop drawing of the assembly

### Calculation

**Static calculate:** Creates a calculation (using the "Model Options" selected) and makes the Report tab available

**Clear calculation results:** Removes current calculation to allow for changes and recalculation

## Short

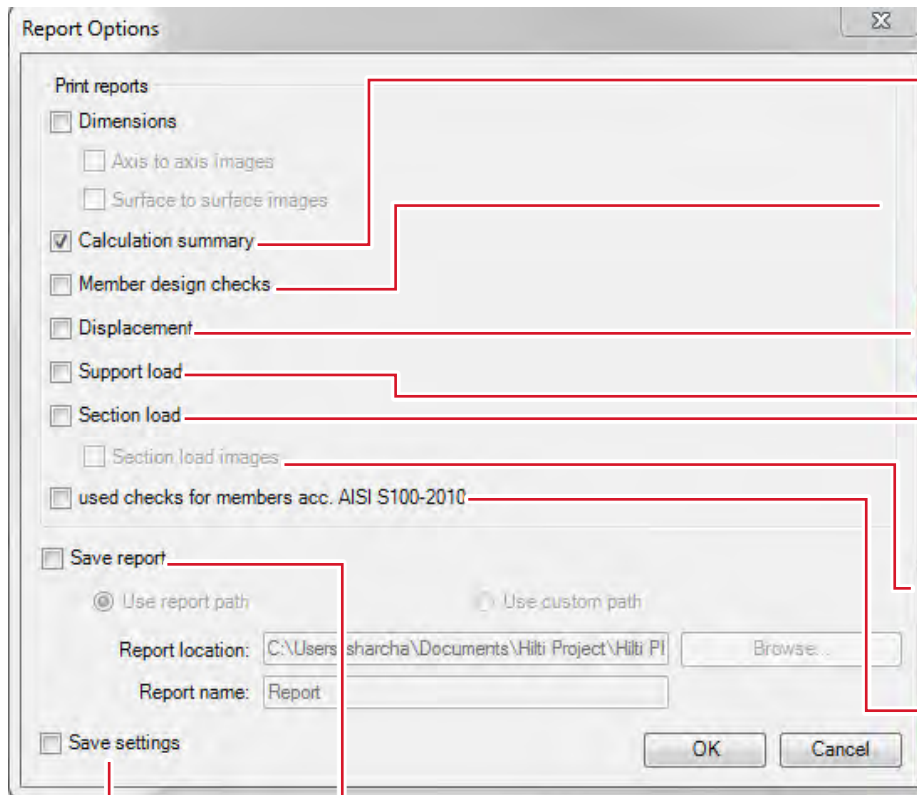


### Short

Check when pipes are present and uncheck when pipes are absent

## Reports options window

Click on "Complete" to get report options



### Print Reports

Top to bottom:

**Calculation summary:** Includes calculations for deflection and combined loading on beams as well as forces and moments at connections and supports in the report

**Member design checks:** Includes compression, tension, shear, torsion, flexure, and combined loading calculations for beams in the report

**Displacement:** Includes displacement calculations for beams in the report

**Support load:** Includes reaction forces and moments at the connection to the structure in the report

**Section load:** Includes calculations for forces and moments along the beam lengths in the report

**Section load images:** Includes images reflecting the normal and shear loads, moments, and torsion along the beam lengths in the report

**Used check for members acc. AIS S100-2010:** Provides formulas used to perform AISI code check on members

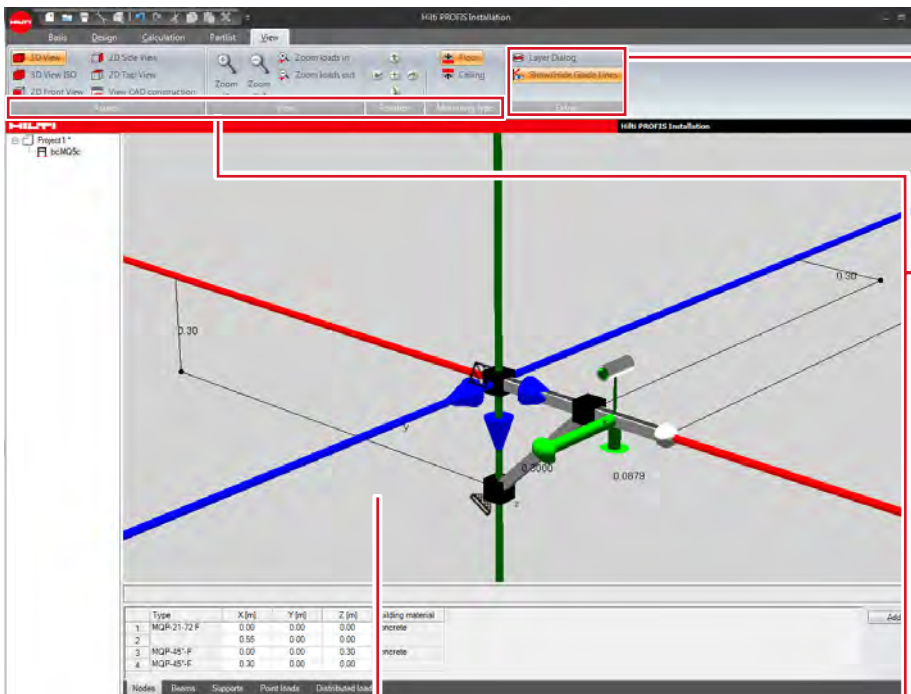
### Save report

Save the generated report to the computer in PDF format

### Save settings

Save the selected options as default

## View tab



Holding the right mouse button and moving the mouse rotates the view about the origin.

### Extras

**Layer dialog:** Opens the “Layers” window where objects (Dimensions, Loads, Elements, etc.) can be hidden or displayed

**Show/Hide guide lines:** Hides or displays all guide lines present on the model

### Aspect

**3D View:** Displays the model in a perspective view

**3D View ISO:** Displays the model in an isometric view

**2D Front view:** Displays the XZ plane orthographic view

**2D Side view:** Displays the YZ plane orthographic view

**2D Top view:** Displays the XY plane orthographic view

**View CAD construction:** Opens the “CAD Model Viewer” to view, print, or export the assembly (see page 17)

### View

**Zoom in:** Zooms in on the model origin

**Zoom out:** Zooms out from the model origin

**Zoom loads in:** Increases the scale of the load objects

**Zoom loads out:** Decreases the scale of the load objects

### Rotation

Rotates the view vertically or horizontally about the origin. The middle button resets the zoom, rotation, and origin to default

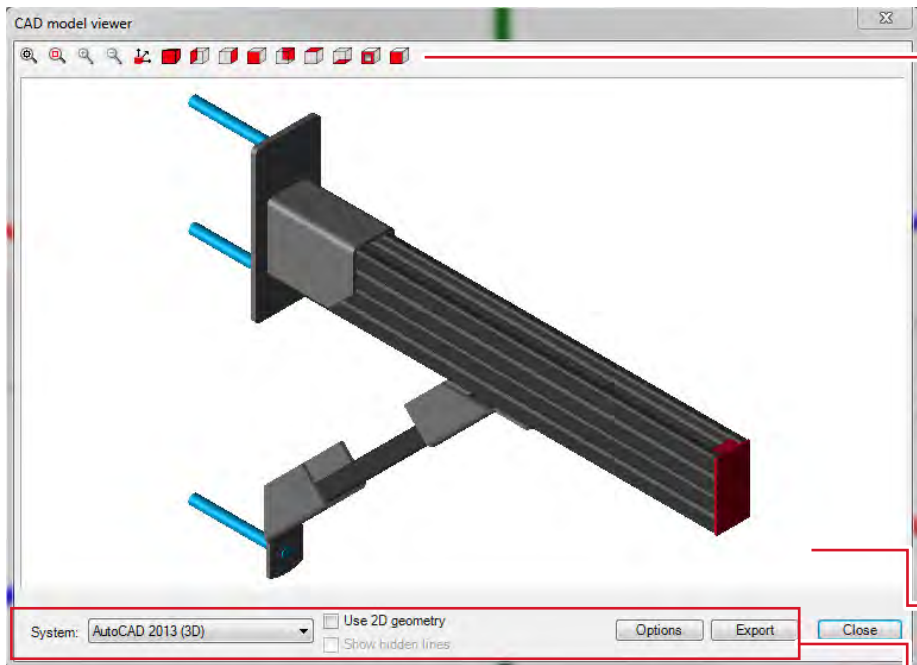
### Mounting Type

**Floor:** Configures background colors to view from above the model

**Ceiling:** Configures background colors to view from below the model



# CAD model viewer



**Icons**

Left to right:

- Zoom extents
- Zoom window (click and drag inside the viewport to draw the window)
- Zoom in
- Zoom out
- Show/hide coordinate system icon
- Home view
- Left view
- Right view
- Front view
- Back view
- Top view
- Bottom view
- Detailed view
- Simplified view

By right-clicking inside the viewer, additional options appear (Rotate, Pan, Print, Copy to Clipboard, etc.)

**System**

Select the CAD program the model will be exported to

*Note: When exporting a 2D drawing, select the "Use 2D geometry" box before selecting the System so the correct options are available in the System list*

**Use 2D geometry**

Uncheck to export a 3D model or check to export a 2D drawing of the model as it appears in the viewer

**Show hidden lines**

When exporting a 2D drawing, uncheck to hide hidden lines or check to display hidden lines

**Options**

Opens the "Settings" window to adjust attribute options including layer, color, and linetype

**Export**

With the CAD program open, click "Export" to create the object in the CAD program

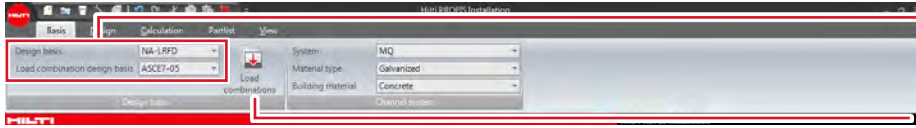
# 3D DESIGN

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### 3D design

Expert Design Mode enables the user to design virtually any configuration/any geometry using Hilti Modular Supports.

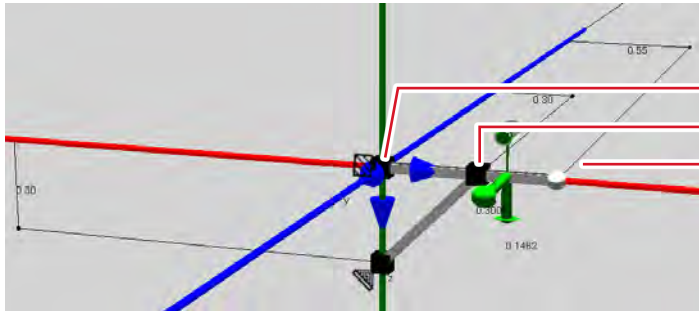
Add a new project or create a new project



Select "Design basis" and "Load combination design basis"

Apply different load combinations using "Load combinations" table

### Dimensions



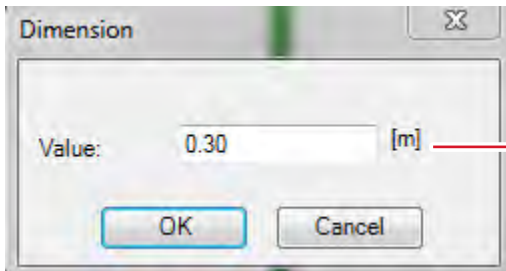
**To add a dimension in the drawing:**

Click the "Dimension" button:

Select the first node

Select the second node

Select the location of the dimension label



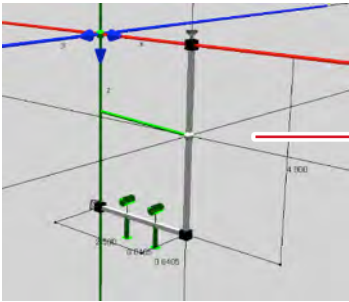
**To edit a dimension in the drawing:**

Double click the dimension to change

Enter the new value

*Note: Whenever possible, create dimensions from the origin to the node (as shown). When editing dimensions between nodes, the node closest to the origin will drive and the node farther away will be driven*

# Beams



**To add a beam in the drawing:**

Click the "Add Beam" button:

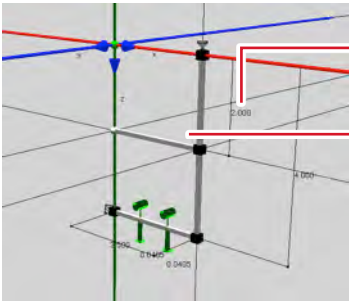


Select the location of the first end of the beam

**Note:** The first beam node must be placed on the zero point or an existing beam

Select the location of the second end of the beam

**Note:** The line will turn green when the mouse is moved over a valid beam location (along a major axes, node guideline, another beam, etc.). The new beam will also snap to run along a guideline if the location of the second beam end is selected close to the guideline it will run along

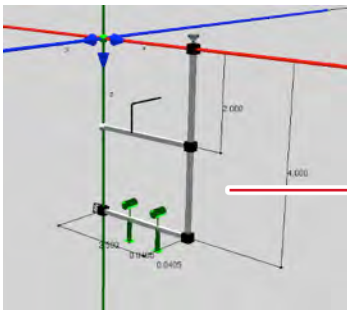


**To edit a beam in the drawing:**

Position the beam using dimensions

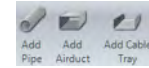
Double click the beam to change beam properties (see page 13)

## Pipes, airducts, and cable trays



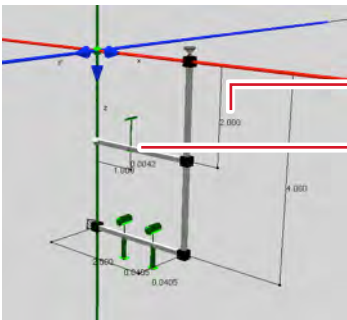
**To add a pipe, airduct, or cable tray in the drawing:**

Click the “Add” button for the desired item:



Select the location on the beam

Move the mouse around the beam location to rotate the direction of attachment. Click to select an orientation. Do the same to select the direction of travel for the item

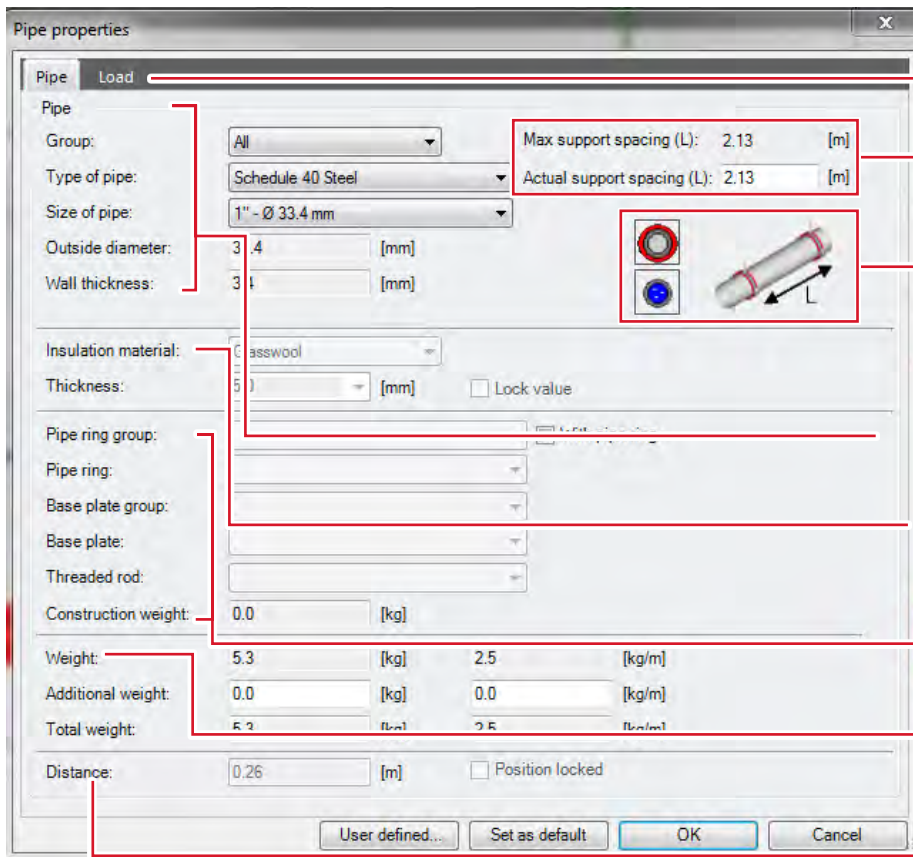


**To edit a pipe, airduct, or cable tray in the drawing:**

Position the load using dimensions (see page 19)

Double click the load to change the properties (see pages 22)

# Pipe properties window



**Load**

Displays loads associated with the pipe. Also allows for additional loads to be manually entered

**Spacing**

Edit spacing between supports along pipe

**Other properties**

Add or remove insulation and pipe fill by selecting the boxes

**Pipe properties**

Edit type and size of pipe

**Insulation properties**

Select insulation material and thickness (if applicable)

**Pipe support properties**

Select type and assembly options

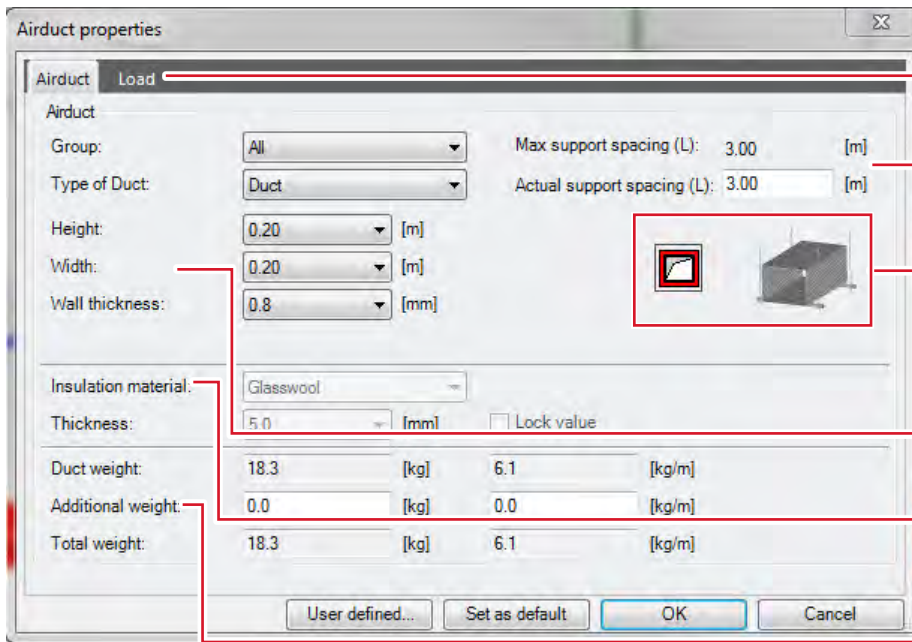
**Weight**

View supported weight and add additional weight if necessary

**Distance**

Edit the position of the pipe along the beam

## Air duct properties window



**Load**

Displays loads associated with the pipe. Also allows for additional loads to be manually entered

**Spacing**

Edit spacing between supports along pipe

**Other properties**

Add or remove insulation and pipe fill by selecting the boxes

**Pipe properties**

Edit type and size of pipe

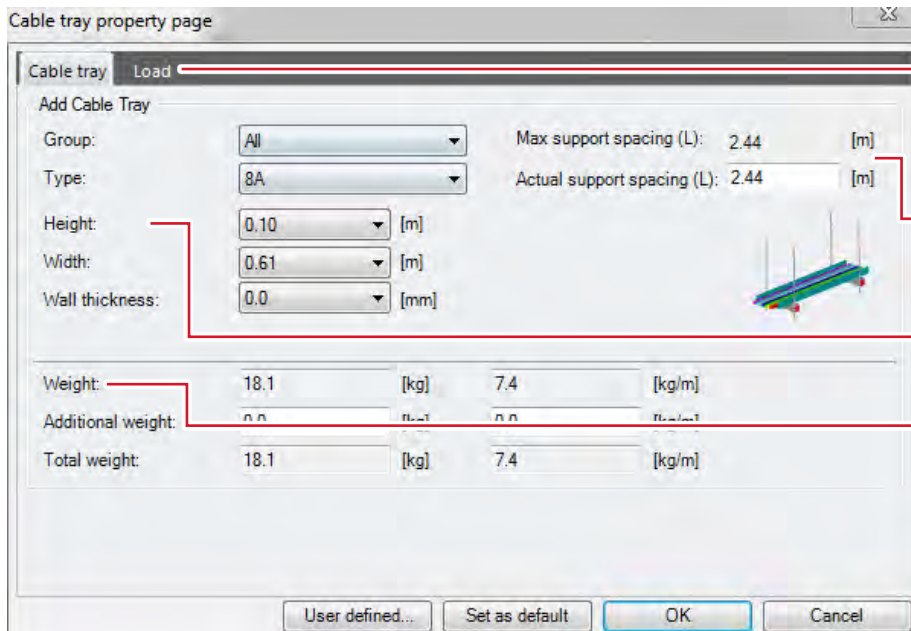
**Insulation properties**

Select insulation material and thickness (if applicable)

**Weight**

View supported weight and add additional weight if necessary

# Cable tray properties



**Load**

Displays loads associated with the pipe. Also allows for additional loads to be manually entered

**Spacing**

Edit spacing between supports along cable tray

**Pipe properties**

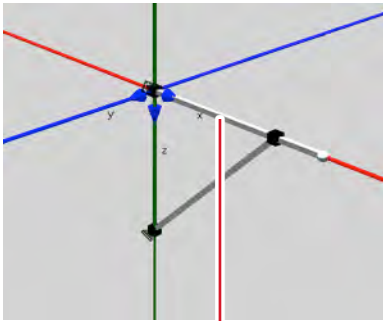
Edit type and size of cable tray

**Weight**

View supported weight and add additional weight if necessary



# Loads

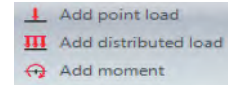


**To add a load in the drawing:**

Click the Add Custom Load button (Template Design or 3D Design Projects):



Or the desired Live Load button (Channel):



Select a point on the beam that the load acts on

Enter the values where necessary in the Load Properties window (see page 26)

**Note:** Depending on project type, some load properties may not be available

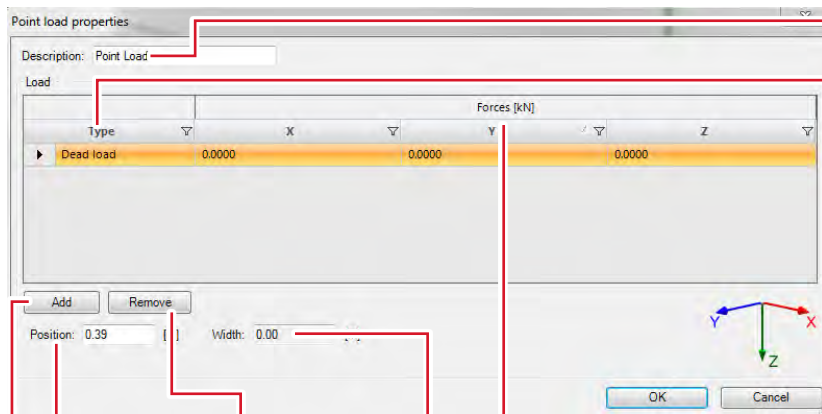


**To edit a load in the drawing:**

Double click the load to change

Enter new values where necessary in the Load Properties window (see page 26)

# Load properties window



**Description**

Descriptive text given to the load

**Load type**

Change the load type to be used in calculations

Note: Different load types are available depending on the Design Basis selected (see page 11)

**Moments**

Add moments about one or more of the axes

Note: The positive Z-axis is "down" in the normal model view

**Forces**

Add forces along one or more of the axes

Note: The positive Z-axis is "down" in the normal model view

**Position**

Position of the load along the selected beam.

**Remove**

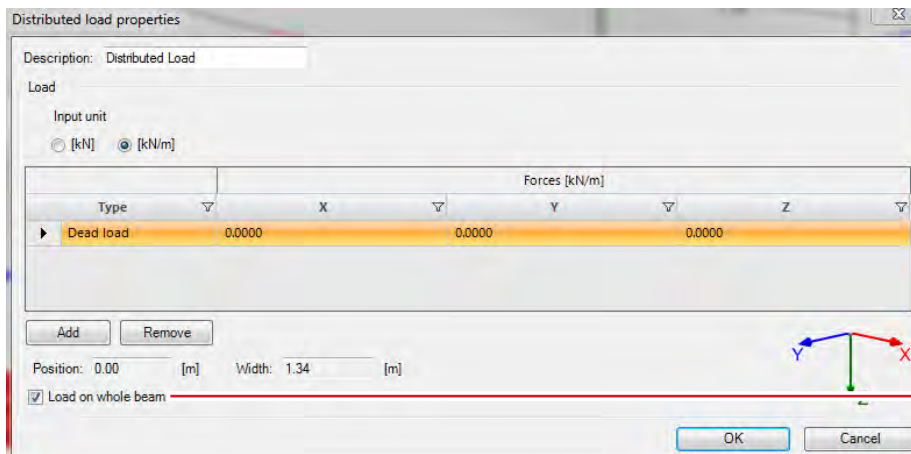
Click to remove the selected load type line.

**Width**

Width of a distributed load.

**Add**

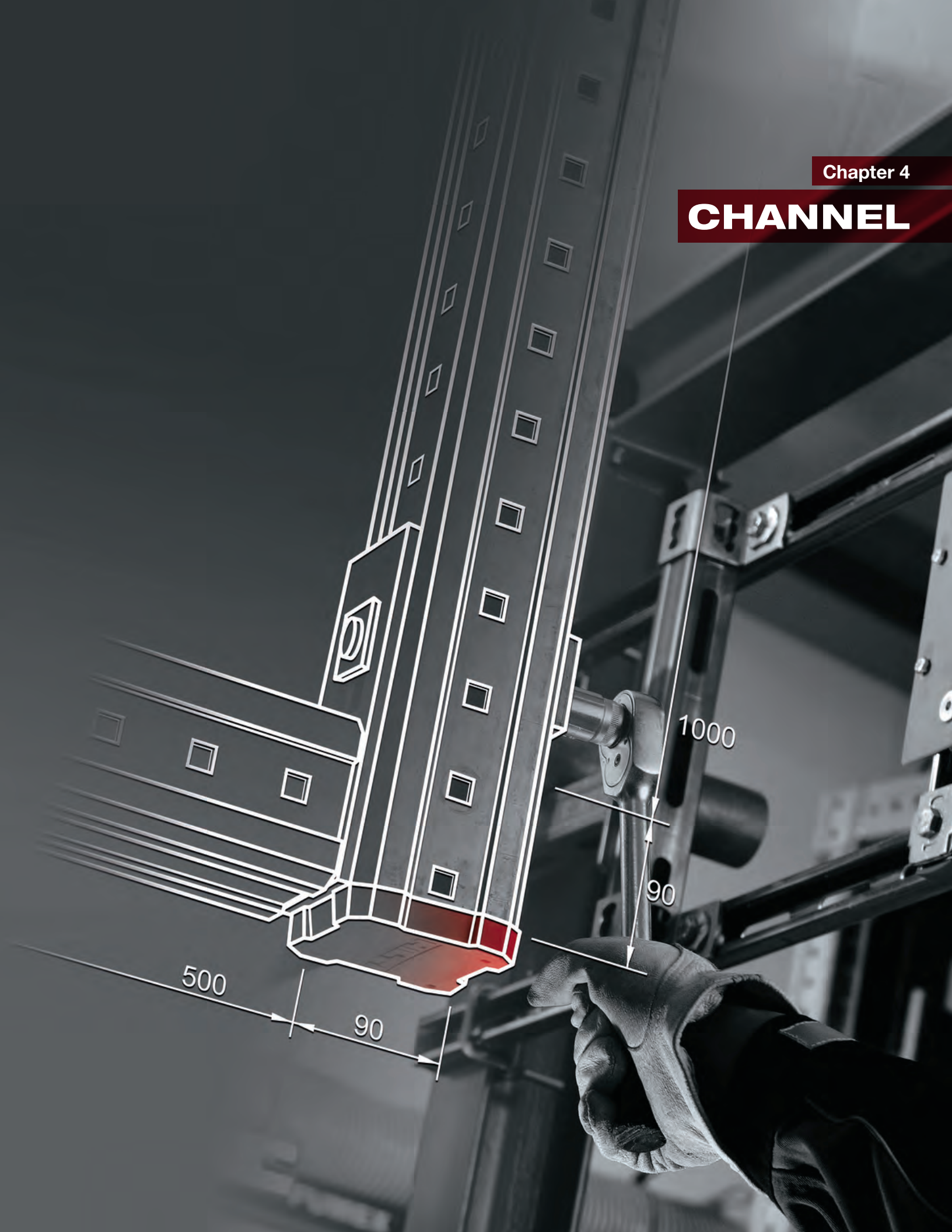
Click to add another line for an additional load type.



**Distributed load properties**

Distributed load is applied to the entire length of the beam

# CHANNEL



500

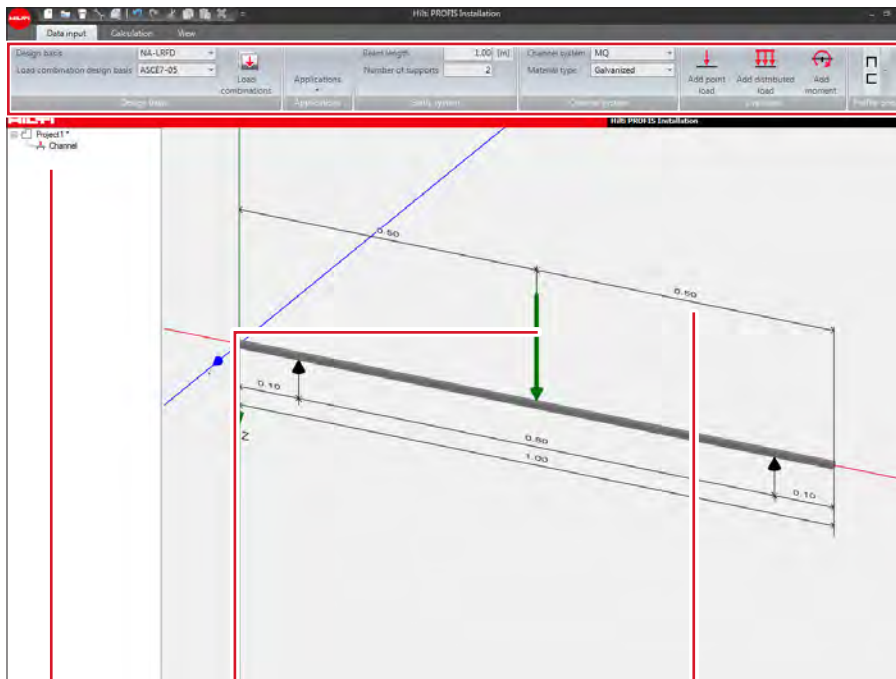
90

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90

# Channel

Hilti button > Channel



**Project tree**  
(See page 11)

**Loads:** To edit loads, see page 25

**Dimensions:** To edit dimensions, see page 19  
*Note: In Channel projects, dimensions are preset*

**Quick Access Toolbar** (See page 4)

**Design Basis** (See page 11)

**Applications**

Standard templates for various types of channel construction

**Static system**

**Beam length:** Define channel length either in the ribbon or using the dimension on the model (see page 20)

**Number of supports:** Determine number of supports present in model. Positions are edited using dimensions on the model (see page 16)

**Channel system**

**Channel system:** Select channel systems to include in calculations

**Material type:** Select channel material or finish to include in calculations

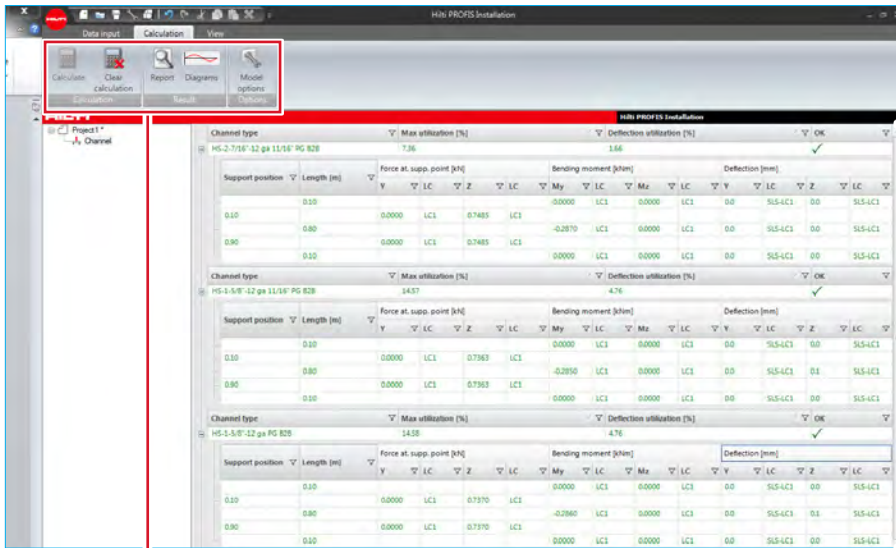
*Note: Not all material types are available for each channel system*

**Live loads**

Selecting a load case opens the load properties window (see page 26)

**Profile orientation**

Change orientation of channel



**Results**

Left to right, top to bottom:

**Channel type:** Type of channel used to calculate values

**Max utilization:** Maximum stress utilization from tensile, shear, and equivalent stresses

**Deflection utilization:** Maximum beam deflection utilization

**OK:** Denotes whether or not the channel type can be used in the application

**Support position:** Placement of support node along beam

**Length:** Distance between support nodes

**Force at support point:** Load acting at support node

**Bending moment:** Bending moment acting between support nodes

**Deflection:** Deflection between support nodes

**Calculation**

**Calculate:** Creates a calculation (using the Model Options selected) and makes the Result tab available

**Clear calculation:** Removes current calculation to allow for changes and recalculation

**Result**

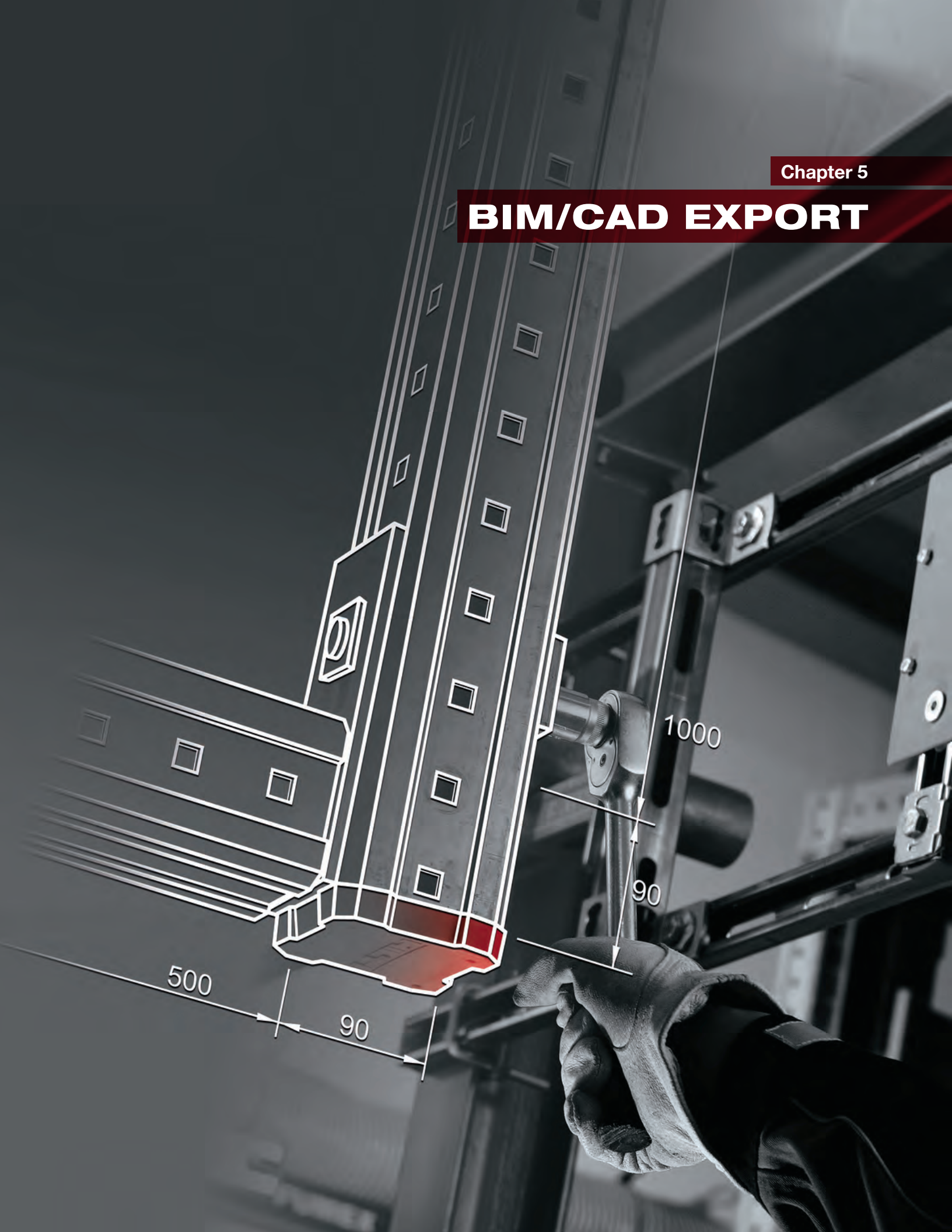
**Report:** See page 22

**Diagrams:** Displays graphical representations of the bending moment and deflection diagrams

**Options**

**Model options:** Adjust defaults for maximum beam displacement, maximum cantilever allowable deflection, and minimum deflection limit

# BIM/CAD EXPORT



# BIM/CAD Export

Hilti Button > Create or add new BIM/CAD Export > Installation Systems Basis and View tabs refer back to Page 11 and Page 16 respectively.

### Product Tree

Use to navigate through products/templates by type. Select a product/template to open it in the export window

Note: In the Profis BIM/CAD Library, in addition to exporting installation systems products/templates, there are anchor and firestop systems products/templates available for export

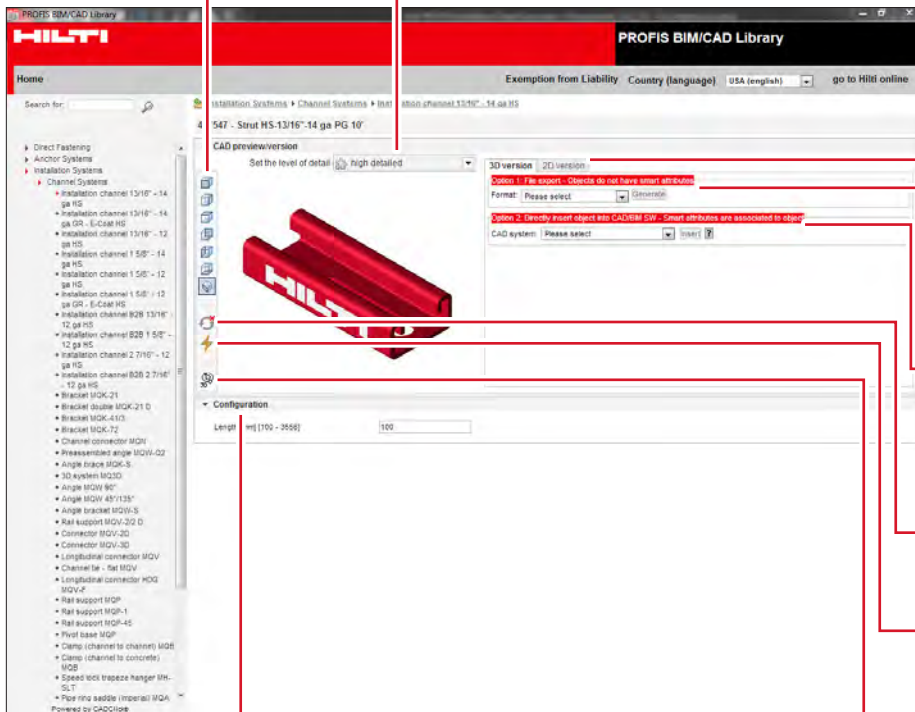
### Views

Select the model view as an orthographic view (from top to bottom: front, right, top, back, left, bottom) or as an isometric view

### Detail

Select either a "High Detail" (realistic) or "Simple Detail" (block) object to export

Note: "Simple Detail" may not be available with all products/templates



### Version

Select either a 3D object to export or a 2D object with one or more views

### File export

Select a file type to export (dwg, jpg, pdf, etc.) and click Generate to create the file

### Object export

Select a CAD system to export to (AutoCAD, Inventor, Solidworks, etc.) and with the CAD program open, click Insert to create the object in the CAD program

### Automatic preview generation

Click to determine whether or not the model preview refreshes as options are changed

### Regenerate view

With "Automatic Preview Generation" off, click to refresh the model preview with the selected options.

### Preview

Show an enlarged model with the selected options

### Configuration

Adjust attributes of the system including products, sizes, base materials, connection types, lengths, etc.

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