Tekla Structures 2025

Template attributes in drawing and report templates

March 2025

Contents

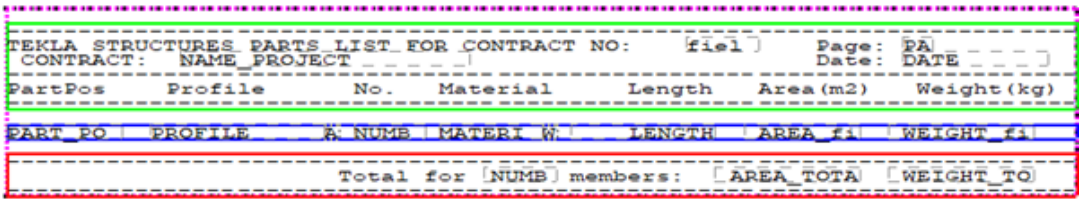
1 Template attributes in drawing and report templates

You can use template attributes in drawing and report templates, in filters, as values for various export settings, and in drawing marks and notes, for example.

When you open a drawing, create a report, export an object, or use a filter, Tekla Structures uses the defined attributes or formulas to calculate and display information from the model database. This could, for example, include assembly weight or cover area.

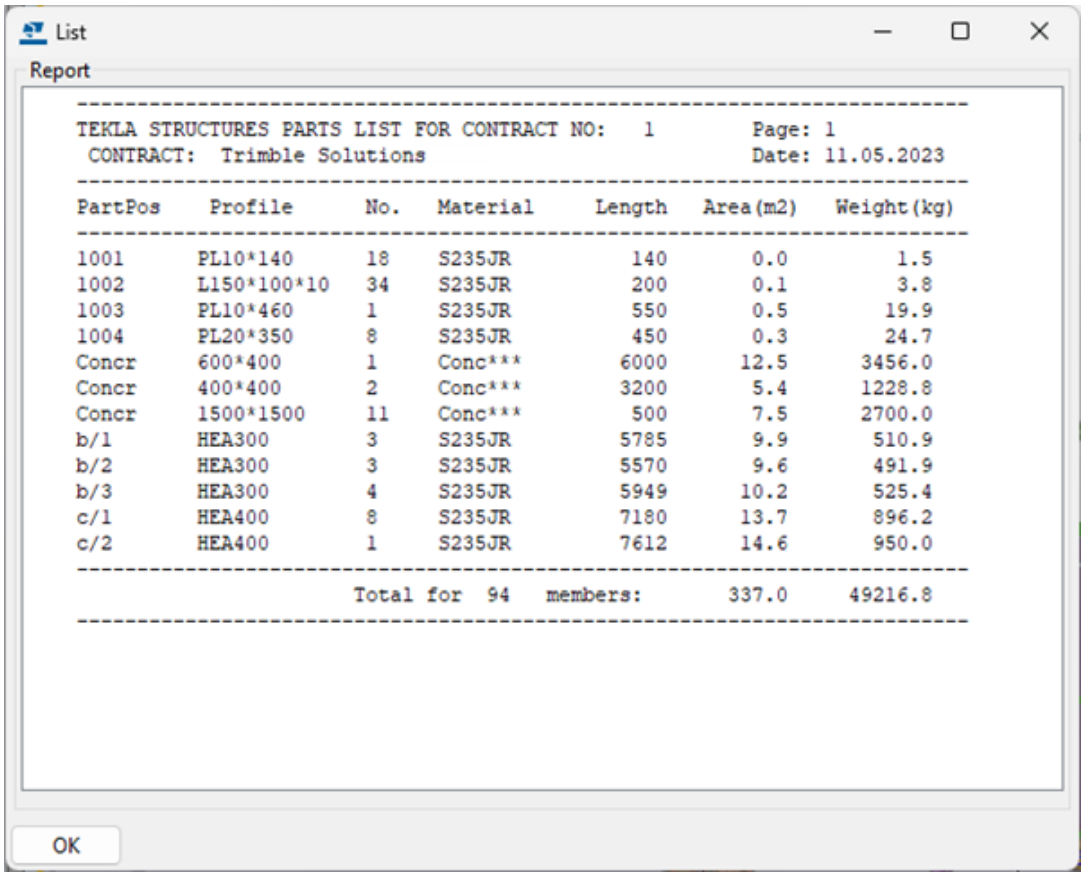
In report and drawing templates, the needed attributes or formulas are added in value fields. Which template attributes are available for a value field depends on the content type of the row where the value field is used.

Below is an example of the part list report template.

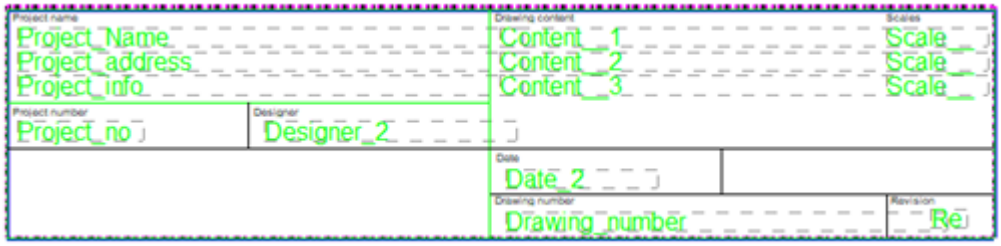


The report template above contains a page header (green frame) with the report description and date, a row (blue frame) for the part list, and a page footer (red frame) for summarizing the part data. The final report will have a separate row for the different part types. All rows contain text labels and value fields with template attributes.

Here is the final report:



Below is an example of a title block drawing template:



The graphical template above does not contain rows, but an empty area where you can add text labels and value fields with template attributes. The title block contains drawing and project information such as project details, designer name, scale, and the date when the drawing was created. Frames have been drawn around the different areas with the line tool.

Here is the title block in the drawing:

Template attributes can also be used in Organizer, drawing marks and notes, IFC export, or in automated precast fabrication exports, for example.

The template attributes together with their descriptions are listed in alphabetical order in Tekla User Assistance. Click the letter in the table of contents to show all the attributes beginning with that letter.

2 Template attributes - A

2.1 ACN

Shows control numbers.

2.2 ACTIVE_DESIGN_CODE

Shows the active design code of material.

2.3 ADDED_TO_POUR_UNIT

This attribute shows whether an object is added to a pour unit, and how it was added.

Use with the following content types:

- `ASSEMBLY`
- `BOLT`
- `CAST_UNIT` (only precast, not cast-in-place cast units)
- `MESH`
- `REBAR`
- `REBAR_ASSEMBLY`
- `SINGLE_REBAR`
- `SINGLE_STRAND`
- `STRAND`

- `STUD`

The possible values are:

- `0`: The object is not added to any pour unit, or has been modified after the pour units were calculated the last time.
- `1`: The object was manually added to the pour unit using the **Add to pour unit** command.
- `2`: The object was automatically added to the pour unit using the **Calculate pour units** command.

2.4 ADDED_TO_REBAR_ASSEMBLY

This template attribute shows whether an object is added to a rebar assembly. The attribute returns `1` if the object belongs to a rebar assembly, otherwise it returns `0`.

2.5 ADDRESS

Shows the address entered in the **Project properties** in **File menu** --> **Project properties**.

2.6 ALIAS_NAME1, ALIAS_NAME2, ALIAS_NAME3

This attribute shows the alias name of the material.

Use for part and main part material attributes in `ASSEMBLY` and `PART` content types.

2.7 ANALYSIS_MODEL_NAME

Shows the name of the analysis model in which the rigid link is included.

Use with the `ANALYSIS_RIGID_LINK` content type.

2.8 ANG_S, ANG_T, ANG_U, ANG_V

This attribute shows the bending angles of the reinforcing bars based on the mappings in the `rebar_schedule_config.inp` file, located in the `..\ProgramData\Trimble\Tekla Structures\<version>\environments\<environment>\system` folder. These mappings are environment-specific by default. You can modify them to suit your company or project needs.

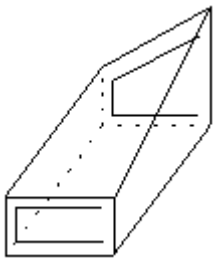
See also

ANG_U_MAX, ANG_U_MIN, ANG_V_MAX, ANG_V_MIN (page 22)

DIM_A ... DIM_G, DIM_H1, DIM_H2, DIM_I, DIM_J, DIM_K1, DIM_K2, DIM_L, DIM_O, DIM_R, DIM_R_ALL, DIM_TD, DIM_WEIGHT, DIM_X, DIM_Y (page 69)

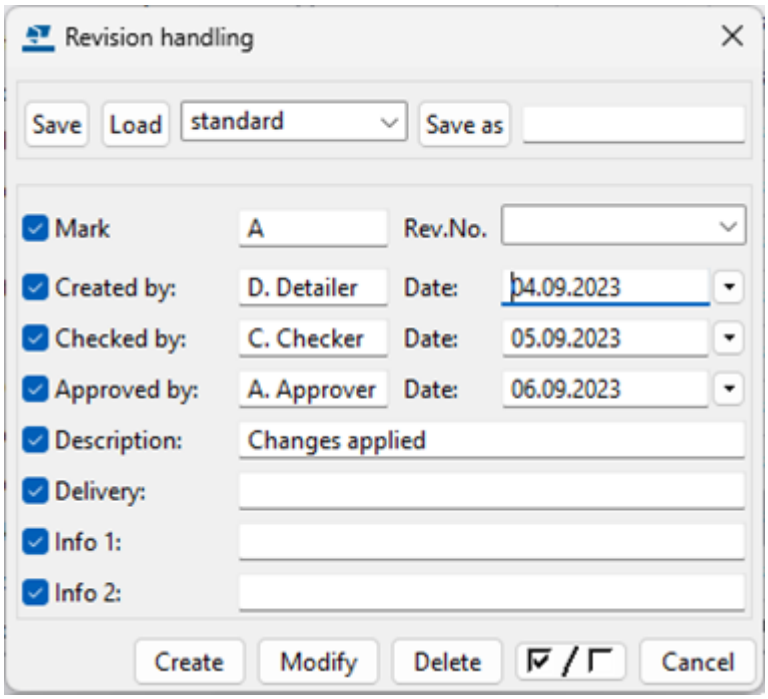
2.9 ANG_U_MAX, ANG_U_MIN, ANG_V_MAX, ANG_V_MIN

Shows the minimum and maximum bending angles of reinforcing bars or meshes in tapered cross sections. See the example below:



2.10 APPROVED_BY

This attribute shows the **Approved by** information of the revision from the **Revision handling** dialog.



2.11 AREA

Shows the following information:

- For plate type catalog profiles, any parametric profiles and any catalog profiles with **Cover area** property not defined, shows the total net area of all surfaces.
- For other types of catalog profiles with **Cover area** property defined, shows the gross total surface area.

  The area is calculated using the extreme length and profile cover area per meter (value defined in the profile catalog). The cross area on profile ends, cuts and fittings are not taken into account.

See also

AREA_GROSS (page 25)

AREA_NET (page 25)

COVER_AREA (page 53)

2.12 AREA_FORM_TOP, AREA_FORM_BOTTOM, AREA_FORM_SIDE

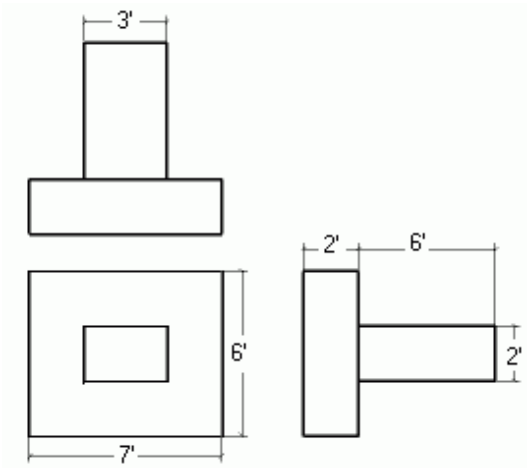
These template attributes show the area of faces whose normal vector points in the following directions:

- Top of form (AREA_FORM_TOP)
- Bottom of form (AREA_FORM_BOTTOM)
- Form sides (AREA_FORM_SIDE)

Use these template attributes with the CAST_UNIT content type to report the formwork areas of precast cast units.

For assemblies and cast units, the main part local up direction dictates the form up/bottom/sides directions. Faces which are inclined less than 5 degrees are counted in the top and bottom areas. Faces which are skew => 85 degrees are counted in the side areas. Faces which are exactly 45 degrees against main global or local axes, are not counted to any direction.

Steel embeds are ignored when calculating the AREA_FORM_... values of cast units.



AREA_FORM_TOP = 42 sq.ft.

AREA_FORM_BOTTOM = 42 sq.ft.

AREA_FORM_SIDE = 2*(2*7 + 3*6) + 2*(2*6 + 2*6) = 64 + 48 = 112 sq.ft.

To report the formwork areas of cast-in-place cast units, use the template attributes (page 24) AREA_FORM_TOP_GLOBAL, AREA_FORM_BOTTOM_GLOBAL, and AREA_FORM_SIDE_GLOBAL with the CAST_UNIT content type. With these ..._GLOBAL attributes, **Top-in-form face** settings have no effect.

2.13 AREA_FORM_TOP_GLOBAL, AREA_FORM_BOTTOM_GLOBAL, AREA_FORM_SIDE_GLOBAL

These template attributes show the area of faces whose normal vector points in the following directions in the global coordinate system:

- Top of form (AREA_FORM_TOP_GLOBAL)
- Bottom of form (AREA_FORM_BOTTOM_GLOBAL)
- Form sides (AREA_FORM_SIDE_GLOBAL)

Use these template attributes with the CAST_UNIT content type to report the formwork areas of cast-in-place cast units. These attributes and areas are not dependent on the **Top-in-form face** settings.

To report the formwork areas of precast cast units, use the template attributes (page 23) AREA_FORM_TOP, AREA_FORM_BOTTOM, and AREA_FORM_SIDE.

2.14 AREA_GROSS

For profiles this field shows the same result as AREA (page 23). For plates it shows the square area (extreme length multiplied by extreme width) needed to include the entire plate. For other objects it shows a zero.

2.15 AREA_NET

For parts this field shows the net surface area that forms the actual area of the fabricated part. For other objects it shows a zero.

2.16 AREA_PER_TONS

Shows AREA/WEIGHT x 1000.

2.17 AREA_PGX, AREA_NGX, AREA_PGY, AREA_NGY, AREA_PGZ, AREA_NGZ

Shows the area of faces whose normal vector points to the positive or negative direction of the following global axes:

Attribute	Direction
AREA_PGX	Positive direction of global X-axis
AREA_NGX	Negative direction of global X-axis
AREA_PGY	Positive direction of global Y-axis

Attribute	Direction
AREA_NGY	Negative direction of global Y-axis
AREA_PGZ	Positive direction of global Z-axis
AREA_NGZ	Negative direction of global Z-axis

Also faces whose normal vector is located in less than 45 degree angle to global axis are also included in the area. Faces exactly in 45 degree angle are not included in any global direction.

2.18 AREA_PLAN

For parts this field shows the total upper surface area (perpendicular to the global Z-axis).

ASSEMBLY content type

- Shows the total upper surface area (perpendicular to the global Z-axis) of the parts included in an assembly.

2.19 AREA_PROJECTION_GXY_GROSS, AREA_PROJECTION_GXZ_GROSS, AREA_PROJECTION_GYZ_GROSS

Shows the area of the "shadow" of a part, assembly, or cast unit at the following global planes:

- XY-plane
- XZ-plane
- YZ-plane

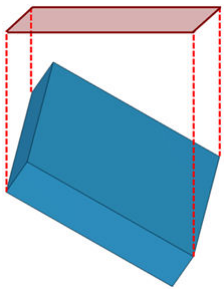
Restrictions

- Areas are calculated always in net areas (holes are taken into account) even when gross is requested.
- Overlapping faces are counted twice.

2.20 AREA_PROJECTION_GXY_NET, AREA_PROJECTION_GXZ_NET, AREA_PROJECTION_GYZ_NET

Shows the net area of the "shadow" of a part, assembly, or cast unit at the following global planes:

- XY-plane
- XZ-plane
- YZ-plane



2.21 AREA_PROJECTION_XY_GROSS, AREA_PROJECTION_XZ_GROSS, AREA_PROJECTION_YZ_GROSS

Shows the area of the "shadow" of a part, assembly, or cast unit at its local planes:

- XY-plane
- XZ-plane
- YZ-plane

2.22 AREA_PROJECTION_XY_NET, AREA_PROJECTION_XZ_NET, AREA_PROJECTION_YZ_NET

Shows the net area of the "shadow" of a part, assembly, or cast unit at its local planes:

- XY-plane
- XZ-plane
- YZ-plane

2.23 AREA_PX, AREA_NX, AREA_PY, AREA_NY, AREA_PZ, AREA_NZ

Shows the area of faces whose normal vector points to the positive or negative direction of the following local axes:

Attribute	Direction
AREA_PX	Positive direction of local X-axis
AREA_NX	Negative direction of local X-axis
AREA_PY	Positive direction of local Y-axis
AREA_NY	Negative direction of local Y-axis
AREA_PZ	Positive direction of local Z-axis
AREA_NZ	Negative direction of local Z-axis

2.24 ASSEMBLY.LOCK_PERMISSION

Shows the effective permission for the assembly. Options are **ALL** or **NONE**.

See also

ASSEMBLY.OBJECT_LOCKED (page 28)

ASSEMBLY.OWNER_ORGANIZATION (page 28)

2.25 ASSEMBLY.OBJECT_LOCKED

Shows the value of the object lock. The value options are **Yes**, **No**, and **Organization**.

The object lock status can be modified in the **Object locks** dialog.

See also

ASSEMBLY.OWNER_ORGANIZATION (page 28)

ASSEMBLY.LOCK_PERMISSION (page 28)

2.26 ASSEMBLY.OWNER_ORGANIZATION

Shows the name of the organization that owns the assembly lock. The organization is based on the Windows account.

See also

ASSEMBLY.OBJECT_LOCKED (page 28)

ASSEMBLY.LOCK_PERMISSION (page 28)

2.27 ASSEMBLY_BOTTOM_LEVEL

This attribute shows the bottom level of an assembly. Bottom level takes the unit and accuracy from the `MarkDimensionFormat.dim` dimension property file. You can modify the settings saved in `MarkDimensionFormat.dim` in the dimension property pane in a drawing.

You can use this attribute as a user-defined attribute also in part marks and associative notes.

NOTE This attribute returns the value as text, so you cannot use formulae with this attribute. Use ASSEMBLY_BOTTOM_LEVEL_UNFORMATTED (page 30) instead.

2.28 ASSEMBLY_BOTTOM_LEVEL_GLOBAL

This attribute shows the bottom level of an assembly by global axis. The bottom level takes the unit and accuracy from the `MarkDimensionFormat.dim` dimension property file. You can modify the settings saved in `MarkDimensionFormat.dim` in the dimension property pane in a drawing.

You can use this attribute as a user-defined attribute in part marks and associative notes, and also in reports and templates.

2.29 ASSEMBLY_BOTTOM_LEVEL_GLOBAL_UNFORMATTED

Shows the bottom level of an assembly by global axis. Unformatted level returns the bottom levels as a length in mm so you can format them and include them into formulas in templates.

You can use this attribute as a user-defined attribute also in part marks and associative notes.

2.30 ASSEMBLY_BOTTOM_LEVEL_UNFORMATTED

Shows the unformatted bottom level of an assembly. Unformatted level returns the bottom levels as a length in mm so you can format them and include them into formulas in templates.

You can use this attribute as a user-defined attribute also in part marks and associative notes.

NOTE Unlike the ASSEMBLY_BOTTOM_LEVEL attribute, the ASSEMBLY_BOTTOM_LEVEL_UNFORMATTED attribute cannot be formatted through the MarkDimensionFormat.dim file.

2.31 ASSEMBLY_DEFAULT_PREFIX

Shows the default value for the assembly prefix defined in the part properties.

2.32 ASSEMBLY_PLWEIGHT

Shows the weight of plates attached to an assembly. For other objects it shows a zero.

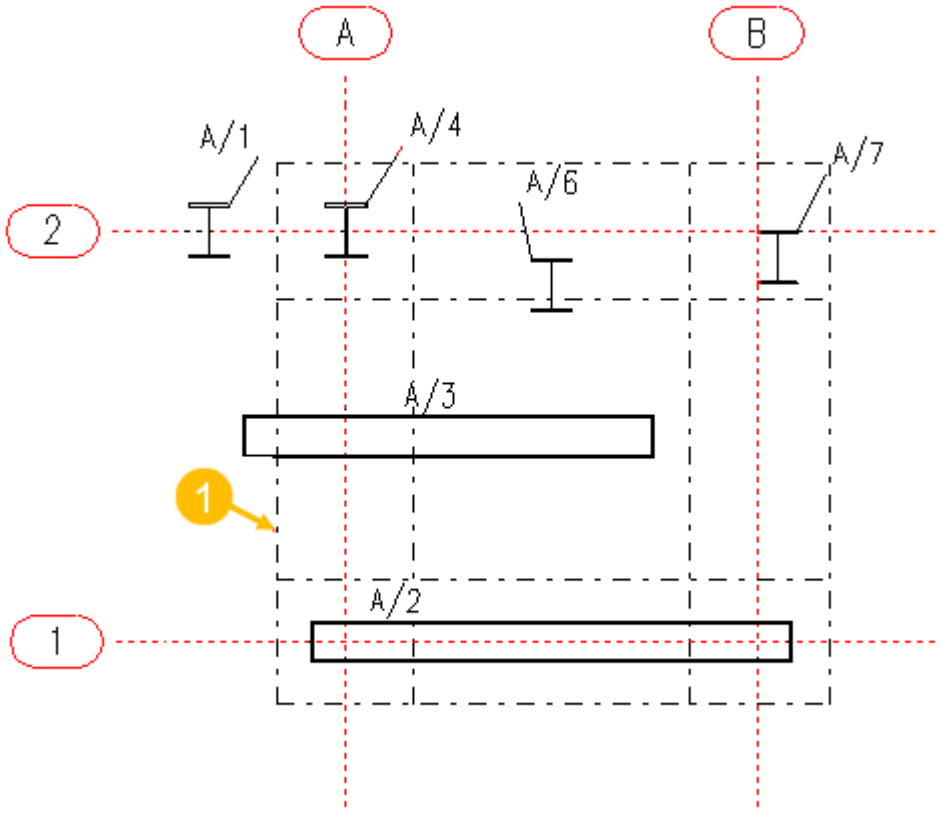
2.33 ASSEMBLY_POS

Shows the assembly position number. For parts ASSEMBLY_POS shows the assembly position number of the assembly that contains the part. For reinforcement objects ASSEMBLY_POS shows the assembly position number of the rebar assembly that contains the reinforcement object. For bolts the field is blank.

2.34 ASSEMBLY_POSITION_CODE

This template attribute shows the assembly position code. The code identifies the grid position. The position of the objects is calculated based on the closest grid.

Assembly	Code
A/1	<A/2
A/2	A-B/1
A/3	<A-B/1-2
A/4	A/2
A/6	A-B/1-2
A/7	B/2



(1) TOLERANCE LINE

The position code consists of grid line labels in the x and y directions (alternatively in the z direction). If an assembly begins or ends outside the first or last grid line, a < or > character is included in the position code. For example, if an assembly begins outside the A grid line, this field shows:

<A/2

If an assembly is completely within a tolerance distance (by default 500 mm) of grid line A, the position code is the label of that grid line: A.

If the assembly is partially or entirely outside the tolerance distance, the code is a combination of grid labels: A-B.

To change the default tolerance distance, set the advanced option `XS_ASSEMBLY_POSITION_CODE_TOLERANCE=750`, for example.

To include the Z orientation in the code, set the advanced option `XS_ASSEMBLY_POSITION_CODE_3D` to TRUE. The code would be similar to: <A-B/1-2/1-+1000

Tekla Structures selects the grid to use as follows:

1. Tekla Structures checks the location of the assembly.
2. If it is located inside several grids, Tekla Structures checks whether the assembly is parallel to grid lines or the plane.
3. If there are several parallel grids, Tekla Structures selects the closest.

2.35 ASSEMBLY_PREFIX

Shows the assembly prefix, defined in the part or assembly properties.

2.36 ASSEMBLY_SERIAL_NUMBER

Shows the assembly number without prefix and separator.

2.37 ASSEMBLY_START_NUMBER

Shows the assembly start number.

2.38 ASSEMBLY_TOP_LEVEL

This attribute shows the top level of an assembly. Top level takes the unit and accuracy from the `MarkDimensionFormat.dim` dimension property file.

You can modify the settings saved in `MarkDimensionFormat.dim` in the dimension property pane in a drawing.

You can use this attribute as a user-defined attribute also in part marks and associative notes.

NOTE This attribute returns the value as text, so you cannot use formulae with this attribute. Use ASSEMBLY_TOP_LEVEL_UNFORMATTED (page 33) instead.

2.39 ASSEMBLY_TOP_LEVEL_GLOBAL

This attribute shows the top level of an assembly by global axis. The top level takes the unit and accuracy from the `MarkDimensionFormat.dim` dimension property file. You can modify the settings saved in `MarkDimensionFormat.dim` in the dimension property pane in a drawing.

You can use this attribute as a user-defined attribute in part marks and associative notes, and also in reports and templates.

2.40 ASSEMBLY_TOP_LEVEL_GLOBAL_UNFORMATTED

Shows the top level of an assembly by global axis. Unformatted level returns the top levels as a length in `mm` so you can format them and include them into formulas in templates.

You can use this attribute as a user-defined attribute also in part marks and associative notes.

2.41 ASSEMBLY_TOP_LEVEL_UNFORMATTED

Shows the unformatted top level of an assembly. Unformatted level returns the top levels as a length in `mm` so you can format them and include them into formulas in templates.

You can use this attribute as a user-defined attribute also in part marks and associative notes.

NOTE Unlike the `ASSEMBLY_TOP_LEVEL` attribute, the `ASSEMBLY_TOP_LEVEL_UNFORMATTED` attribute cannot be formatted through the `MarkDimensionFormat.dim` file.

2.42 ATTACHED_TO

Shows whether a surface is attached to a part or to a pour.

The attribute returns 0 if the surface is attached to a part, and 1 if the surface is attached to a pour.

2.43 axial1, axial2

These attributes show the values entered for **Tension, Nt** on the **End conditions** tab in the user-defined attributes dialog of the part. `axial1` shows the value in the **Start** box and `axial2` shows the value in the **End** box.

3 Template attributes - B

3.1 BOLT_COUNTERSUNK

Use to check or show if a bolt is countersunk. The attribute returns the value `1` for countersunk bolts, otherwise it returns `0`.

See also

HEAD_TYPE (page 81)

3.2 BOLT_EDGE_DISTANCE

Shows the edge distance of a bolt.

3.3 BOLT_EDGE_DISTANCE_MIN

Shows the edge distance multiplied by the coefficient set in the modeling settings in **File menu** --> **Settings** --> **Options** --> **Components** .

3.4 BOLT_FULL_NAME

Shows the name of a bolt defined in the bolt catalog, without the standard.

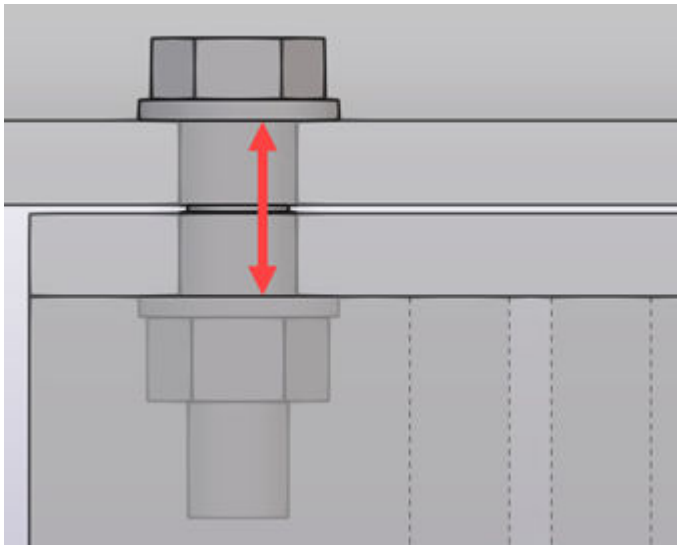
For objects other than bolts, the field shows a blank.

See also

BOLT_SHORT_NAME (page 36)

3.5 BOLT_MATERIAL_LENGTH

For bolts this template attribute shows the total thickness of the connected material.



3.6 BOLT_NPARTS

For bolts this field shows the number of connected parts.

3.7 BOLT_SHORT_NAME

When used in a **BOLT** or **WASHER** row, shows the **Short name** defined in the **Bolt Assembly Catalog** dialog.

When used in a **NUT** row, shows the **Standard** defined in the **Bolt Assembly Catalog** dialog.

See also

BOLT_FULL_NAME (page 35)

3.8 BOLT_STANDARD

Shows the bolt standard as it appears in the **Bolt assembly catalog** dialog (for example, 7968).

See also

TYPE (page 153)

3.9 BOLT_THREAD_LENGTH

Shows the length of the threaded part of the bolt shaft.

3.10 BOTTOM_LEVEL

This attribute shows the bottom level of a single part, cast unit, assembly, part of a connection, or a pour object.

Bottom level takes the unit and accuracy from the `MarkDimensionFormat.dim` dimension property file. You can modify the settings saved in `MarkDimensionFormat.dim` in the dimension property pane in a drawing.

You can use this attribute as a user-defined attribute also in part marks and associative notes.

NOTE This attribute returns the value as text, so you cannot use formulae with this attribute. Use BOTTOM_LEVEL_UNFORMATTED (page 38) instead.

3.11 BOTTOM_LEVEL_GLOBAL

This attribute shows the bottom level of a single part, cast unit, assembly, part of a connection or a pour object by global axis. `BOTTOM_LEVEL_GLOBAL` takes the unit and accuracy from the `MarkDimensionFormat.dim`

dimension property file. You can modify the settings saved in `MarkDimensionFormat.dim` in the dimension property pane in a drawing.

You can use this attribute as a user-defined attribute in part marks and associative notes, and also in reports and templates.

3.12 BOTTOM_LEVEL_GLOBAL_UNFORMATTED

Shows the bottom level of a single part, cast unit, assembly, part of a connection or a pour object. `BOTTOM_LEVEL_GLOBAL_UNFORMATTED` returns the bottom levels as a length in mm so you can format them and include them into formulas in templates. This attribute gives level information by the global axis.

You can use this attribute as a user-defined attribute also in part marks and associative notes.

3.13 BOTTOM_LEVEL_UNFORMATTED

Shows the unformatted bottom level of a single part, cast unit, assembly, part of a connection or a pour object. `BOTTOM_LEVEL_UNFORMATTED` returns the bottom levels as a length in mm so you can format them and include them into formulas in templates.

You can use this attribute as a user-defined attribute also in part marks and associative notes.

NOTE Unlike the `BOTTOM_LEVEL` attribute, the `BOTTOM_LEVEL_UNFORMATTED` attribute cannot be formatted through the `MarkDimensionFormat.dim` file.

3.14 BOUNDING_BOX_xxx

The following template attributes give the bounding box of the objects as X, Y or Z minimum or maximum distances from the absolute zero (0,0,0):

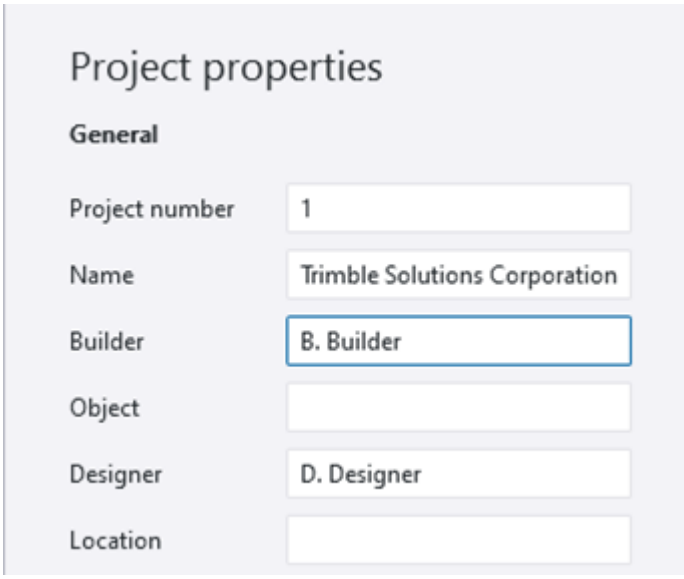
- `BOUNDING_BOX_MIN_X`
- `BOUNDING_BOX_MAX_X`
- `BOUNDING_BOX_MIN_Y`

- BOUNDING_BOX_MAX_Y
- BOUNDING_BOX_MIN_Z
- BOUNDING_BOX_MAX_Z

These attributes are available for parts, assemblies, cast units, reference models and reference objects.

3.15 BUILDER

This attribute shows the builder's name defined in the **Project properties** in **File** --> **Project properties**.



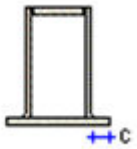
4 Template attributes - C

4.1 cambering

This user-defined template attribute shows the value entered in the **Camber** box on the **Parameters** tab in the object's user-defined attributes.

4.2 CANTILEVER

This template attribute shows the length of a protruding part of a profile. Below is an example of a welded box profile:



See also

PROFILE (page 122)

4.3 CAST_UNIT_BOTTOM_LEVEL

This attribute shows the bottom level of a cast unit. Bottom level takes the unit and accuracy from the `MarkDimensionFormat.dim` dimension property

file. You can modify the settings saved in `MarkDimensionFormat.dim` in the dimension properties property pane in a drawing.

You can use this attribute as a user-defined attribute also in part marks and associative notes.

4.4 CAST_UNIT_HEIGHT_ONLY_CONCRETE_PARTS

Shows the height of a cast unit including all concrete parts.

4.5 CAST_UNIT_HEIGHT_ONLY_PARTS

Shows the height of a cast unit, including all concrete parts, steel parts and parts made of miscellaneous material.

4.6 CAST_UNIT_HEIGHT_TOTAL

Shows the total height of a cast unit, including all concrete parts, steel parts and parts made of miscellaneous material, reinforcing bars, surface treatments and bolts.

4.7 CAST_UNIT_LENGTH_ONLY_CONCRETE_PARTS

Shows the length of a cast unit including all concrete parts.

4.8 CAST_UNIT_LENGTH_ONLY_PARTS

Shows the total length of a cast unit, including all concrete parts, steel parts and parts made of miscellaneous material.

4.9 CAST_UNIT_LENGTH_TOTAL

Shows the total length of a cast unit, including all concrete parts, steel parts and parts made of miscellaneous material, reinforcing bars, surface treatments and bolts.

4.10 CAST_UNIT_POS

Shows the position of a cast unit. The position consists of a prefix and a number.

4.11 CAST_UNIT_POSITION_CODE

Shows the position code of a cast unit. The code identifies the grid position. For more information, see ASSEMBLY_POSITION_CODE (page 31).

4.12 CAST_UNIT_PREFIX

Shows the cast unit prefix, defined in the part properties.

4.13 CAST_UNIT_REBAR_WEIGHT

Shows the weight of reinforcing bars in a cast unit.

4.14 CAST_UNIT_SERIAL_NUMBER

Shows the cast unit number without prefix and separator.

4.15 CAST_UNIT_TOP_LEVEL

This attribute shows the top level of a cast unit. Top level takes the unit and accuracy from the `MarkDimensionFormat.dim` dimension property file. You can modify the settings saved in `MarkDimensionFormat.dim` in the dimension properties property pane in a drawing.

You can use this attribute as a user-defined attribute also in part marks and associative notes.

4.16 CAST_UNIT_TYPE

Returns the type of the cast unit as text (`Precast` or `Cast in place`).

4.17 CAST_UNIT_VERTICAL_POSITION_CODE

Outputs the grid level height of a cast unit, for example +7200. The center of gravity point is used to determine the grid level for the cast unit. If the center of gravity is more than 100 mm away from the grid level, then two grid levels will be output separated with dash: the lower and higher grid levels, for example, +3600-+7200.

See also

ASSEMBLY_POSITION_CODE (page 31)

4.18 CAST_UNIT_WIDTH_ONLY_CONCRETE_PARTS

Shows the width of a cast unit including all concrete parts.

4.19 CAST_UNIT_WIDTH_ONLY_PARTS

Shows the total width of a cast unit, including all concrete parts, steel parts and parts made of miscellaneous material.

4.20 CAST_UNIT_WIDTH_TOTAL

Shows the total width of a cast unit, including all concrete parts, steel parts and parts made of miscellaneous material, reinforcing bars, surface treatments and bolts.

4.21 CATALOG_NAME

Shows the reinforcement mesh identifier, for example, 8-200-2350/5000 or Custom Mesh. For standard meshes, shows the mesh name used in the mesh catalog file `mesh_database.inp`.

This identifier is also shown in the **Mesh** box in the **Rebar mesh** properties, in the **Select mesh** dialog for standard meshes, and as **Catalog name** in the **Custom component browser**.

4.22 CC

Shows the center-to-center spacing of evenly-distributed reinforcing bars or a mesh.

4.23 CC_CROSS

Shows the center-to-center spacing of crossing bars in a reinforcement mesh.

4.24 CC_DIAMETER_xxx

The CC_DIAMETER_ template attributes show the bar diameters of a reinforcement mesh.

Template attribute	Description
CC_DIAMETER_CROSS	Shows all diameters of the crossing bars. For example, 30*8 4*10.
CC_DIAMETER_LONG	Shows all diameters of the longitudinal bars. For example, 5*10 25*8 5*10.
CC_DIAMETER_MAX_CROSS	Shows the largest diameter of the crossing bars.
CC_DIAMETER_MAX_LONG	Shows the largest diameter of the longitudinal bars.
CC_DIAMETER_MIN_CROSS	Shows the smallest diameter of the crossing bars.
CC_DIAMETER_MIN_LONG	Shows the smallest diameter of the longitudinal bars.

4.25 CC_EXACT

Shows the center-to-center spacing of a reinforcing bar group or a mesh.

4.26 CC_EXACT_CROSS

Shows all center-to-center spacings of crossing bars in a reinforcement mesh.

4.27 CC_EXACT_LONG

Shows all center-to-center spacings of longitudinal bars in a reinforcement mesh.

4.28 CC_LONG

Shows the center-to-center spacing of longitudinal bars in a reinforcement mesh.

4.29 CC_MAX

Shows the largest center-to-center spacing in reinforcing bar groups or meshes with varied spacing.

4.30 CC_MAX_CROSS

Shows the largest center-to-center spacing of crossing bars in reinforcement meshes with varied spacing.

4.31 CC_MAX_LONG

Shows the largest center-to-center spacing of longitudinal bars in reinforcement meshes with varied spacing.

4.32 CC_MIN

Shows the smallest center-to-center spacing in reinforcing bar groups or meshes with varied spacing.

4.33 CC_MIN_CROSS

Shows the smallest center-to-center spacing of crossing bars in reinforcement meshes with varied spacing.

4.34 CC_MIN_LONG

Shows the smallest center-to-center spacing of longitudinal bars in reinforcement meshes with varied spacing.

4.35 CC_TARGET

Shows the target center-to-center spacing value in reinforcing bar groups, rebar sets bar groups, or meshes.

4.36 CHANGES

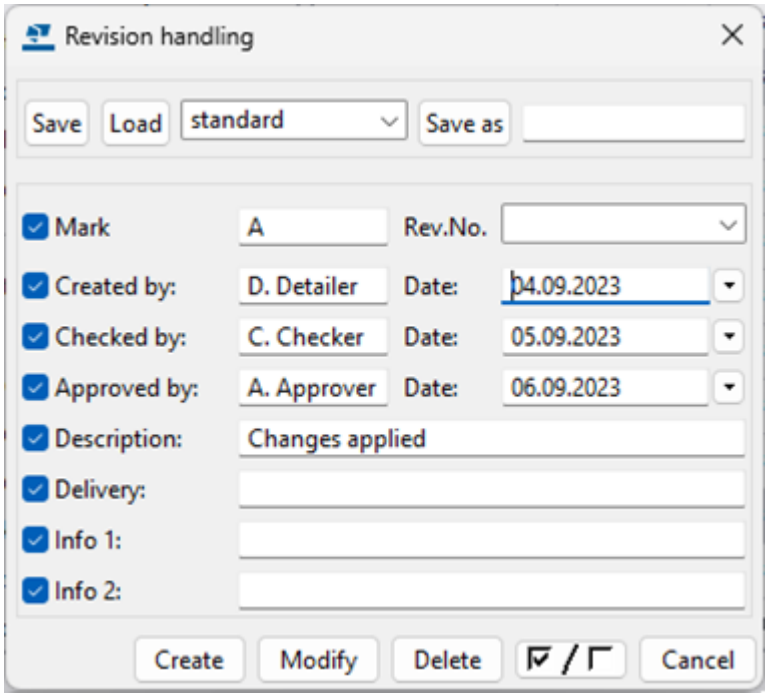
The CHANGES attribute tells the changes occurred in a drawing, for example, if an issued drawing has been changed, or if parts have been modified. This attribute can be used for adding the information about the changes in drawing reports. The **Document manager** also contains a column **Changes** for this information.

Below is an example of the changes column in **Document manager**.

Name	Changes
STANDARD	Parts modified
GA-drawing	
CAST UNIT	
STANDARD	Drawing was updated
STANDARD	Issued drawing changed
STANDARD	

4.37 CHECKED_BY

This attribute shows the value entered in the **Checked by** box in the part or assembly user-defined attributes. Also shows the value that you have entered in the **Checked by** box in the **Revision handling** dialog.



4.38 CHECKED_DATE

Shows the value entered in the **Check date** box in the part or assembly user-defined attributes.

4.39 CLASS

Only use to set rules in the Template Editor. It shows the string `ASSEMBLY` for assemblies, `PART` for parts, and `BOLT` for bolts, holes, nuts etc. For drawings it shows `DRAWING`, and for revisions it shows `REVISION`.

4.40 CLASS_ATTR

Shows the class number of parts, reinforcement, and surfaces.

For assemblies and cast units, `MAINPART.CLASS_ATTR` shows the class number of the main part.

For bolts, welds, and connections, `CLASS_ATTR` can be used for showing the class number of bolted, welded, or connected parts. For example, to show the class number of the bolt main part or the first secondary part, use `MAIN_PART.CLASS_ATTR` or `SECONDARY_1.CLASS_ATTR`.

4.41 CODE

Shows the abbreviation code of a surface treatment, for example, TS1 for Tile surface 1.

Surface treatment codes and names are defined in the `product_finishes.dat` file.

See also

SURFACING_NAME (page 146)

4.42 COG_X, COG_Y, COG_Z

Shows the coordinates of the center of gravity of assemblies, parts, or welds:

- For parts, assemblies, and cast units the attributes COG_X, COG_Y, and COG_Z return values in global coordinate system.
- For welds the attributes COG_X, COG_Y, and COG_Z return values in local coordinate system (current work plane grid).

These attributes cannot be used in headers or footers.

4.43 comment

This user-defined template attribute shows the comment entered in the **Comment** box in the object's user-defined attributes.

4.44 CONCRETE_COVER_FROM_PLANE

Shows the distance from the part surface to the reinforcing bar, perpendicular to the bar plane.

This is the first value entered in the **From plane** box in the **Single rebar** or **Rebar group** properties.

See also

CONCRETE_COVER_ON_PLANE (page 50)

CONCRETE_COVER_START, CONCRETE_COVER_END (page 50)

4.45 CONCRETE_COVER_ON_PLANE

Shows the distance from the part surface to the reinforcing bar on the bar plane.

This is the first value entered in the **On plane** box in the **Single rebar** or **Rebar group** properties.

To show the minimum or maximum value entered in the **On plane** box, use the following template attributes:

- `CONCRETE_COVER_ON_PLANE_MIN`
- `CONCRETE_COVER_ON_PLANE_MAX`

See also

CONCRETE_COVER_FROM_PLANE (page 49)

CONCRETE_COVER_START, CONCRETE_COVER_END (page 50)

4.46 CONCRETE_COVER_START, CONCRETE_COVER_END

`CONCRETE_COVER_START` shows the concrete cover thickness at the first end of the reinforcing bar. `CONCRETE_COVER_END` shows the concrete cover thickness at the second end of the reinforcing bar.

These are the values entered in the **Start** and **End** boxes in the **Single rebar** or **Rebar group** properties when the **Cover thickness** option is selected.

See also

CONCRETE_COVER_ON_PLANE (page 50)

CONCRETE_COVER_FROM_PLANE (page 49)

LEG_LENGTH_START, LEG_LENGTH_END (page 101)

4.47 CONN_CODE_END1, CONN_CODE_END2

Shows the values entered in the **Connection code** box on the **End conditions** tab in the user-defined attributes dialog of the part. `CONN_CODE_END1` shows the value in the **Start** box and `CONN_CODE_END2` in the **End** box.

4.48 CONNECTED_ASSEMBLIES

For bolts this field shows a string containing the position numbers of assemblies of connected parts (e.g. A17 A18 A23). In `ASSEMBLY_BOLT` lists Tekla Structures does not show the position number of the current assembly. Only use this field as an inquiry command for single bolts. For objects other than bolts the field is blank.

4.49 CONNECTED_PARTS

Shows a string containing the position numbers of connected parts (e.g. P102 -> P17 P18 P23) for bolts. If the list type is `ASSEMBLY_BOLT`, the first position number is a member of the current assembly. Only use as an inquiry command for single bolts. For objects other than bolts the field is blank.

4.50 CONNECTION_CODE

Shows the connection code defined in the connection properties dialog. Only for use in connection lists.

4.51 CONNECTION_DSTV

Shows the DSTV code of the connection in connection lists. This field blank if the connection is not a DSTV connection. Only for use in connection lists.

4.52 CONNECTION_ERROR

Shows the error flag of a connection in connection lists. Only for use in connection lists.

The values returned are:

- 1=green connection symbol
- 2=yellow connection symbol
- 3=red connection symbol
- 4=connection did not pass design check

4.53 CONNECTION_GROUP

Shows the class of the component, available on the **General** tab in the component dialog. Only for use in connection lists.

4.54 CONNECTION_NUMBER

Shows the number of a connection.

4.55 CONNECTION_RUNNING_NUMBER

Shows the running number of a connection. All connections are automatically numbered with a running number.

4.56 CONTENTTYPE

Shows the content type of the current row.

4.57 COUNTRY

Shows the country entered in the **Project properties** in **File** --> **Project properties** .

4.58 COVER_AREA

Shows the total cover area of the part profile, or of the main part profile in the assembly or cast unit.

For example:

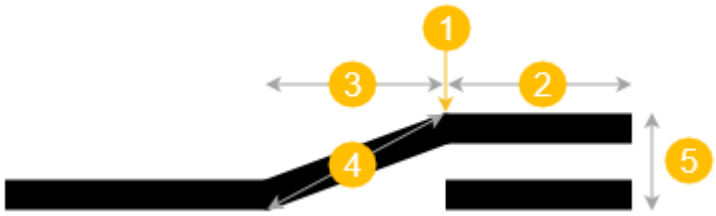
- Use `PROFILE.COVER_AREA` with the `PART` content type.
- Use `MAINPART.PROFILE.COVER_AREA` with the `ASSEMBLY` or `CAST_UNIT` content type.

See also

PROFILE (page 122)

4.59 CRANK_xxx

Use the following template attributes to show rebar set bar crank information defined by using a rebar set splitter or end detail modifier.



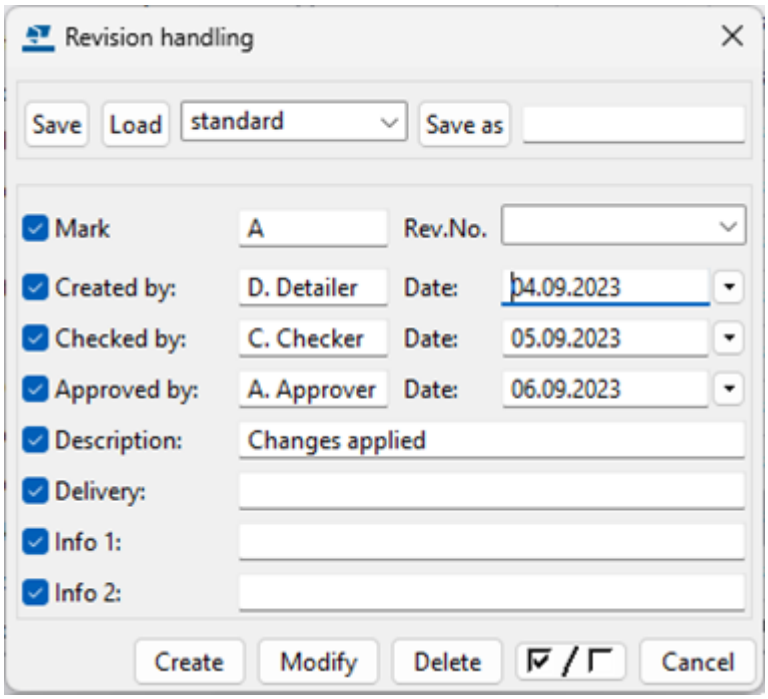
(1) = Location of the splitter

Template attribute	Description
`CRANK_SIDE_START` `CRANK_SIDE_END`	Shows to which side of the splitter the crank is created at the start or end of the bar: `Left` or `Right`.
`CRANK_ROTATE_START` `CRANK_ROTATE_END`	Shows to which angle the crank is rotated at the start or end of the bar.

Template attribute	Description
CRANK_STRLEN_START CRANK_STRLEN_END	Shows the length of the straight segment of the crank at the start or end of the bar. This is **(2)** in the image above.
CRANK_LENTYPE_START CRANK_LENTYPE_END	Shows the type of the cranked length at the start or end of the bar: `Diagonal ratio`, `Diagonal distance`, `Horizontal ratio`, `Horizontal distance`.
CRANK_RATIO_START CRANK_RATIO_END	Shows the multiplier of the bar diameter that is used to define the cranked length at the start or end of the bar.
CRANK_DIST_START CRANK_DIST_END	Shows the length of the cranked segment at the start or end of the bar. If the cranked length type is `Horizontal distance`, this is **(3)** in the image above. If the cranked length type is `Diagonal distance`, this is **(4)** in the image above.
CRANK_OFFSET_START CRANK_OFFSET_END	Shows the offset distance of the straight segment of the crank at the start or end of the bar. This is **(5)** in the image above.

4.60 CREATED_BY

This attribute shows the name of the revision creator entered in the **Created by** box in the **Revision handling** dialog.



4.61 CROSS_SECTION_AREA

Shows the area (mm2) of a cross section.

See also

PROFILE (page 122)

4.62 CURRENT_PHASE

Shows the current phase. Used for filtering parts. You can also use selection filters.

4.63 CURVED_SEGMENTS

Returns the number of segments of a curved beam.

4.64 CUSTOM.ELEMENT_WEIGHT

This custom template attribute sums up net weights of all cast unit and subassembly parts, but ignores all subassemblies whose main part's `MATERIAL_TYPE` is `STEEL`.

The same weight is wanted to be reported

1. early in the project when only sample elements are detailed but the great majority of the elements is not
2. in the final stage of the project when all elements have been fully detailed

The `CAST_UNIT.WEIGHT` attribute also takes into account the weight of all embedded subassemblies, such as lifting anchors and cable loops. This is not wanted as the reinforcement and embed weights are already included into a little bit exaggerated concrete density.

For cast units with dense reinforcement, the `CUSTOM.ELEMENT_WEIGHT.REINFORCED` attribute is more accurate than `CUSTOM.ELEMENT_WEIGHT`.

See also

CUSTOM.ELEMENT_WEIGHT.REINFORCED (page 56)

4.65 CUSTOM.ELEMENT_WEIGHT.REINFORCED

This custom template attribute shows the weight of a concrete element. The element weight is calculated as follows:

The volume of concrete parts minus the volume of steel embeds and reinforcing bars is multiplied by a concrete density of 2450 kg/m3 (hard-coded) to achieve the concrete weight. Then the weights of the concrete, reinforcement, and embeds are summed up.

The calculation uses a steel density of 7850 kg/m3 for steel embeds and reinforcing bars. Steel embeds and reinforcing bars are assumed to be completely within the concrete.

Note that this template attribute does not take reinforcement meshes into account.

For cast units with dense reinforcement, this template attribute is more accurate than CUSTOM.ELEMENT_WEIGHT.

See also

CUSTOM.ELEMENT_WEIGHT (page 56)

4.66 CUSTOM.HC_xxx

The following attributes for part-specific opening and area calculations are available for Hollowcore slabs. The calculations can be output with custom reports.

- CUSTOM.HC_GROSS_AREA: This is the gross area calculated by formula L*B , where L is the max length of the slab and B is the width of the original hollow core slab section before any narrow cutting of the slab.
- CUSTOM.HC_INSUL_CUT_L: This is the total linear length of insulation cutting measured along insulation edges where the edge of insulation is not overlapping with exterior edges of the slab.
- CUSTOM.HC_NET_AREA: This is the net area of the hollow core slab. The net area is excluding all openings penetrating.
- CUSTOM.HC_OPENINGS_L: This is the total perimeter length of all openings in the slab. The perimeter is measured along the “shape boundary” of the opening.
- CUSTOM.HC_RECESSES_L: This is the total perimeter of recesses (not fully penetrating the slab thickness). The perimeter is measured along the “shape boundary” of the recess.
- CUSTOM.HC_SAWINGS_END_L: This is the total linear length of skew end sawings in the slab. Please note that the straight ends are not counted to the total sawing length.
- CUSTOM.HC_SAWINGS_END_N: This is the total number of individual sawing lines.
- CUSTOM.HC_SAWINGS_SIDE: This is the total length of sawing parallel to center axis of the slab.

In Template Editor, these attributes are located in the CUSTOM subfolder in the **Attribute** dialog.

4.67 CUSTOM.MESH_xxx

The following attributes are available for reinforcement meshes:

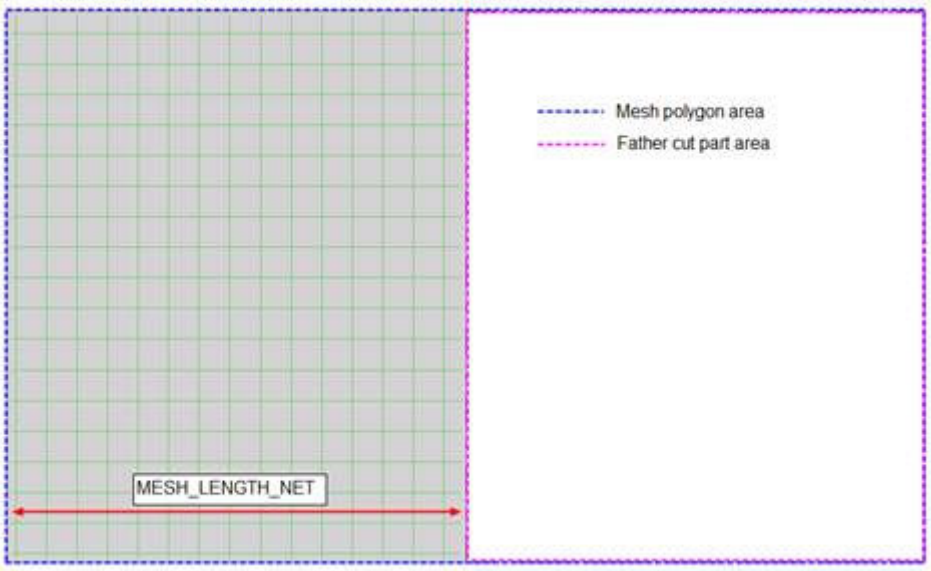
- CUSTOM.MESH_LENGTH_NET (distance)
- CUSTOM.MESH_WIDTH_NET (distance)
- CUSTOM.MESH_SIZE_NET (text)

All these attributes are calculated based on the mesh wires considering all cuts. The net length is always the longer dimension of the mesh and the net width is the shorter. The net size is always expressed based on net length and net width including the text for sizes and spacings.

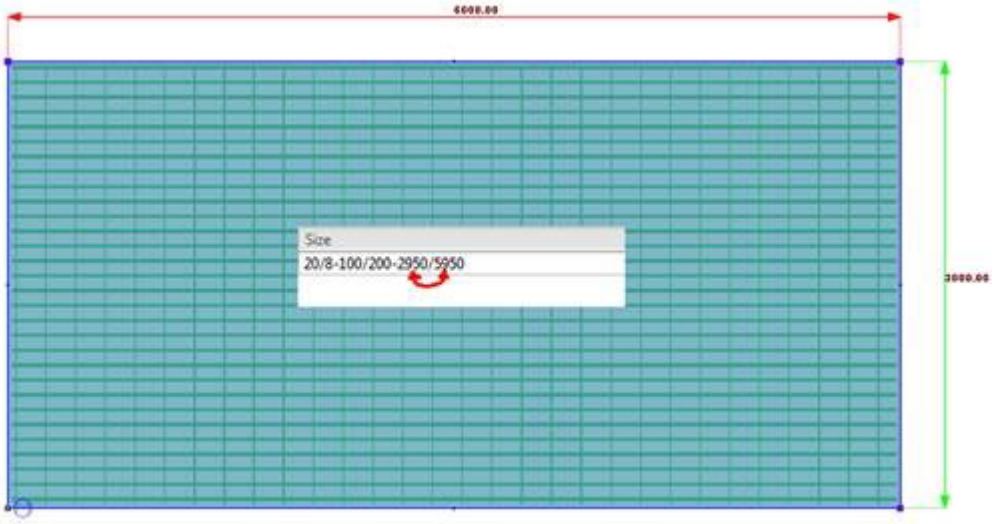
The calculations can be output with custom reports. In Template Editor they are located in the CUSTOM subfolder in the **Attributes** dialog.

We recommend that you use these attributes instead of any other mesh attributes for size calculations.

Tekla Structures length inquiry gives the whole length, whereas the MESH_LENGTH_NET gives the length of the mesh itself.



Tekla Structures size inquiry gives the size so that it gives the height first and the width last, whereas MESH_SIZE_NET reports the width first and the height last: 20/8-100/200-**5950/2950** .



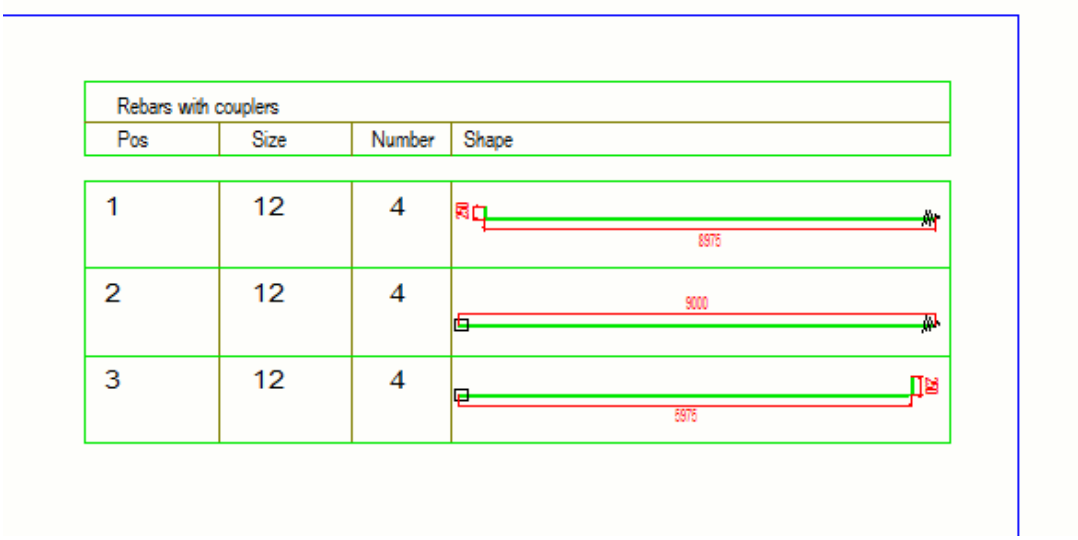
4.68 CUSTOM.REBAR_SHAPE_COUPLERS

The `CUSTOM.REBAR_SHAPE_COUPLERS` custom template attribute shows in pull-out pictures the reinforcing bar geometry, bending dimensions, and the graphical symbols representing the couplers at the bar ends. The coupler data is taken from the user-defined attributes from the rebar coupler components **Rebar coupler**, **Rebar end anchor**, and **Split rebar and add coupler**.

The `CUSTOM.REBAR_SHAPE_COUPLERS` attribute is available only in graphical fields when the content type is **REBAR**.

In Tekla Structures, ensure that your drawing layout contains the desired table. By default, the `rebar_with_couplers` table is available in the available tables list.

The drawing needs to contain at least some reinforcing bars as otherwise the table does not have anything to show.



Customize the symbols for couplers and end anchors

You can customize how the symbols for couplers and end anchors are shown.

1. You can define the mapping between the model properties and the actual symbol for various types of couplers or end anchors.

   The mapping is handled in the `RebarCoupler.Symbols.dat` file, located by default in `..\ProgramData\Trimble\Tekla Structures\<version>\environments\common\system`. The file can be placed under the model folder or under any of the common system folders defined by the advanced options `XS_PROJECT`, `XS_FIRM`, and `XS_SYSTEM`. For instructions on how to control the mapping, see the `RebarCoupler.Symbols.dat` file.

   You can give both the symbol file name and symbol number in the configuration file `RebarCoupler.Symbols.dat`. If the symbol file name is not given, the default file (`CouplerSymbols.sym`) will be used. For more details, see sample files included in the environments.

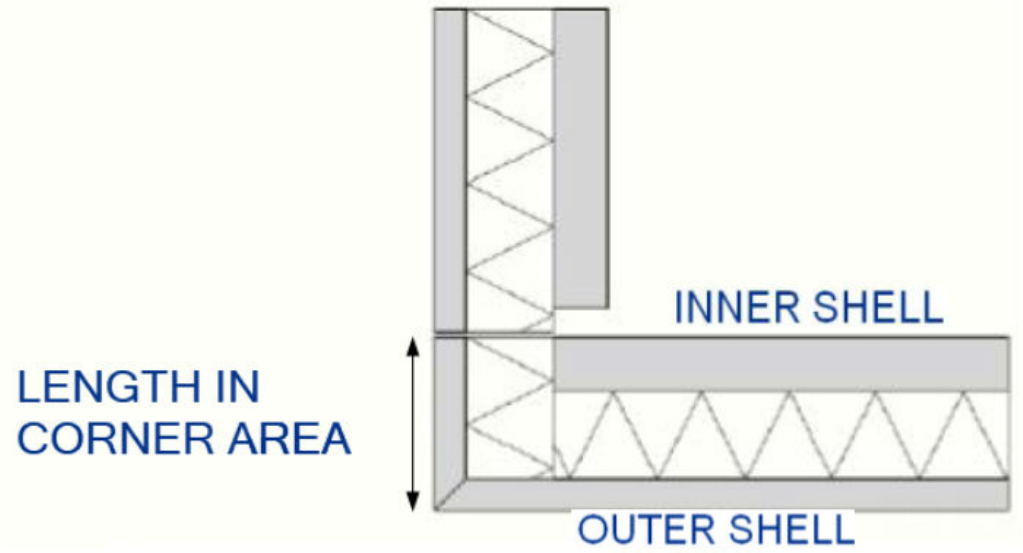
2. You can create your own symbols that are drawn at the reinforcing bar ends.

   All symbols to be used are in the symbol file `CouplerSymbols.sym`, located by default in `..\ProgramData\Trimble\Tekla Structures\<version>\environments\common\symbols`. You can create and add new symbols in Symbol Editor.

4.69 CUSTOM.WALL_xxx

The following part-specific attributes for opening and area calculations are available for Sandwich wall. The calculations can be output with custom reports.

- CUSTOM.WALL_CORNER_AREA: This is the façade area of the turning corner in the wall. The turning corner part has to be at the very end of the corner to get the total length. The corner part needs to be defined in the same way as explained in the **Including turning corners in area calculation** section below.

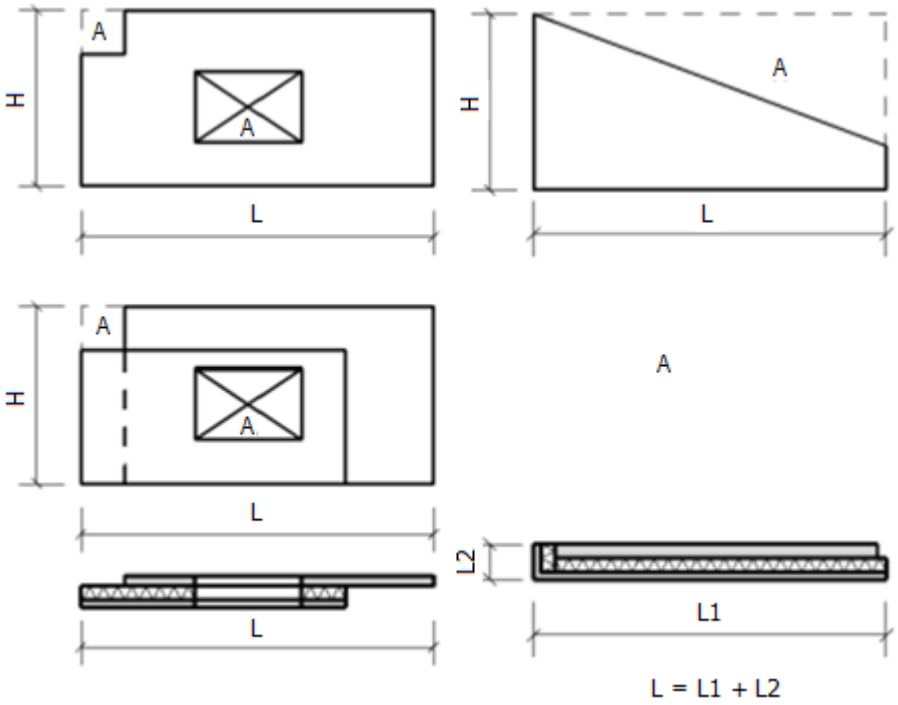


- CUSTOM.WALL_GROSS_AREA: This is the gross area of the wall.
- CUSTOM.WALL_NET_AREA: This is the net area of the wall. All openings inside the wall and/or at exterior boundaries of the wall are excluded.
- CUSTOM.WALL_OPENINGS_AREA: This is the total area of all openings inside the wall and/or at exterior boundaries of the wall.
- CUSTOM.WALL_OPENINGS_N: This is the total number of openings inside the wall and/or at exterior boundaries of the wall.

In Template Editor these attributes are located in the CUSTOM subfolder in the **Attribute** dialog box.

The examples below show the gross and net areas of sandwich walls:

- Gross area: Calculation formula: (HxL), excluding possible lifting loops or other non-concrete materials. If you need to include the area of the turning corner to the total sum of area, it must be added separately (e.g. CUSTOM.WALL_GROSS_AREA + CUSTOM.WALL_CORNER_AREA).
- Net area: Calculation formula: HxL - ΣA i



Including turning corners in area calculation

To include turning corners in area calculation, ensure that you have the name of the turning corner part (**L2** in the image above) listed in the `SandwichWallCornerPartNames.dat` file. This file lists all valid corner part names. When property CUSTOM.WALL_CORNER_AREA is inquired, the file is searched in the normal file search order, starting from the model folder and then continuing the search from the folders defined for the advanced options `XS_PROJECT`, `XS_FIRM`, and `XS_SYSTEM`. The first file found will be loaded.

NOTE The `SandwichWallCornerPartNames.dat` file is not re-loaded even if another model is opened and thus it may happen that the report is based on a file from another model.

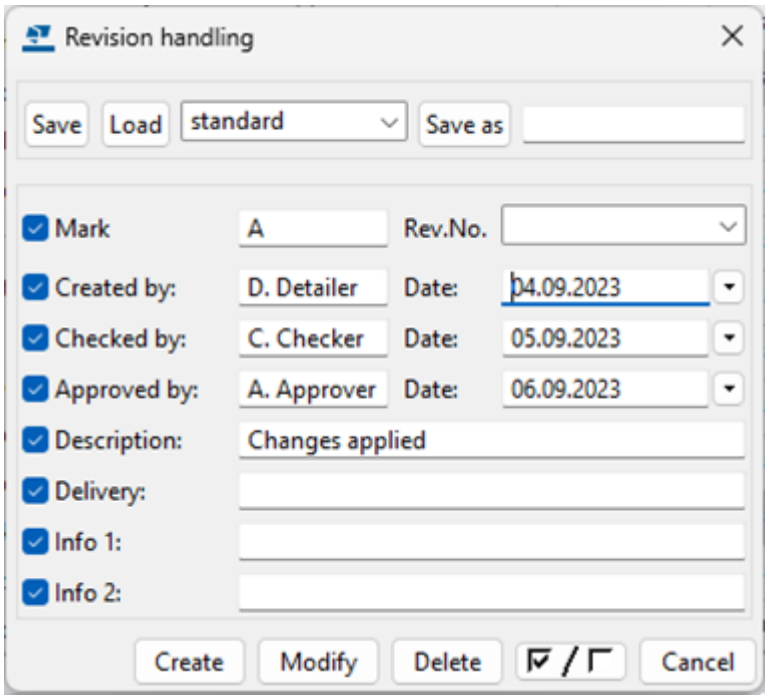
5 Template attributes - D

5.1 DATE

This template attribute returns the current date. If the advanced option XS_IMPERIAL_DATE is set, the date format is `mm/dd/yyyy`. Otherwise the format is `dd.mm.yyyy`.

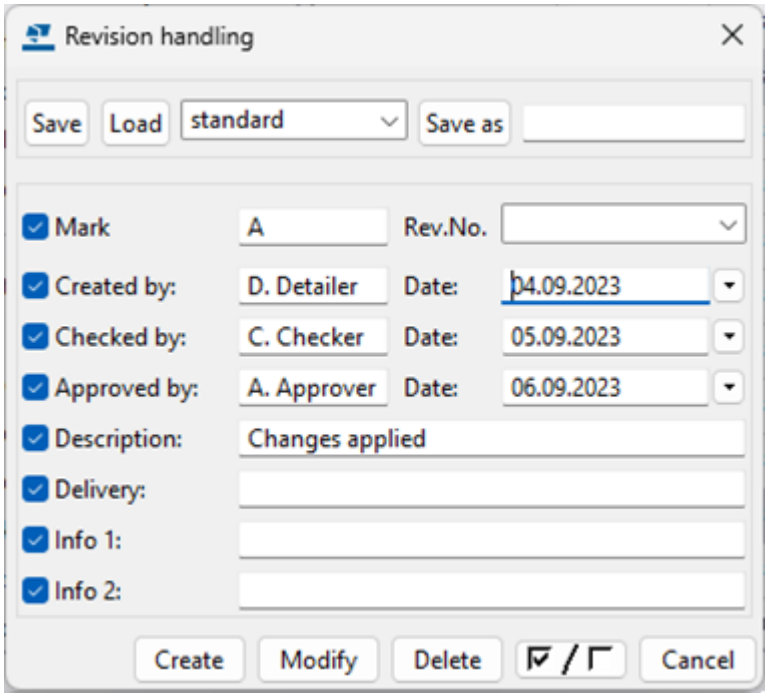
5.2 DATE_APPROVED

In templates, this attribute shows the approval date of the drawing entered in the **Revision handling** dialog.



5.3 DATE_CHECKED

This attribute shows the date when a drawing was checked. This attribute can be included in templates. The attribute field is located in the **Revision handling** dialog.



5.4 DATE_CREATE

This attribute shows the creation date of the drawing. If the advanced option XS_IMPERIAL_DATE is set, the format of the date is `mm/dd/yyyy`. Otherwise the format is `dd.mm.yyyy`.

In drawing templates, this attribute shows the last revision date. In `REVISION` lists it also shows the revision history.

5.5 DATE_END

Shows the completion date of a project from the **Project properties** in **File menu** --> **Project properties**.

5.6 DATE_ISSUE

Shows the issue date of the drawing. Use with DRAWING content type.

5.7 DATE_LAST

In drawing templates this field shows the date of the last revision. In `REVISION` lists it also shows the entire revision history.

5.8 DATE_MODIFY

This attribute shows the date of the last changes to the drawing. If the advanced option XS_IMPERIAL_DATE is set, the date format is `mm/dd/yyyy`. Otherwise the format is `dd.mm.yyyy`.

Use this attribute in part, cast unit, and assembly lists.

5.9 DATE_PLOT

This attribute shows the date when the drawing was last printed. If the advanced option XS_IMPERIAL_DATE is set, the date format is `mm/dd/yyyy`. Otherwise the format is `dd.mm.yyyy`.

Use this attribute in drawing tables and drawing reports. You can also use this attribute in part, assembly, and cast unit lists with `DRAWING.DATE_PLOT` value field formula.

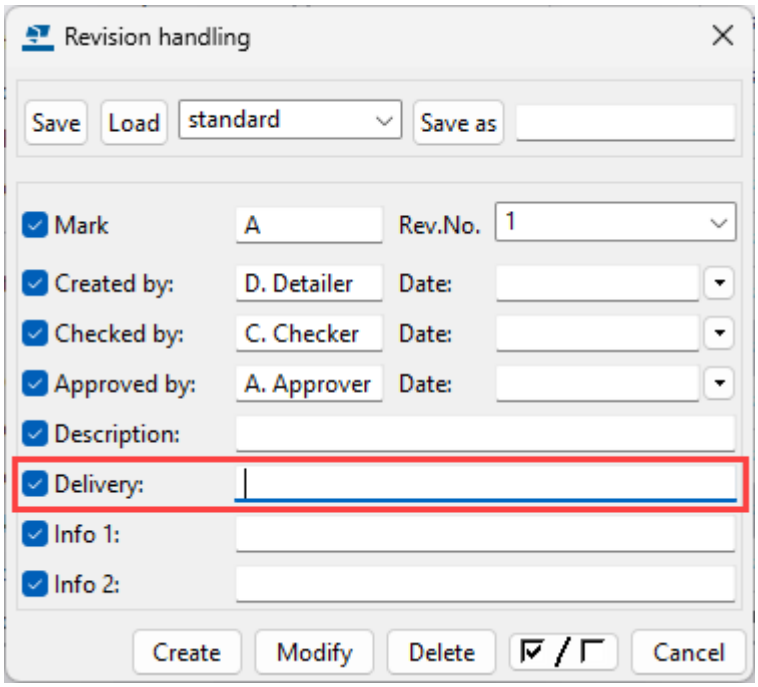
NOTE If you have set the advanced option XS_DISABLE_DRAWING_PLOT_DATE to `TRUE`, the drawing plot date is not stored to the database. When you set it to `FALSE`, the drawing plot date is stored.

5.10 DATE_START

Shows the starting date of the project entered in the **Project properties** in **File menu** --> **Project properties**.

5.11 DELIVERY

This attribute shows the value entered in the **Delivery** box in the **Revision handling** dialog.



5.12 DEPTH

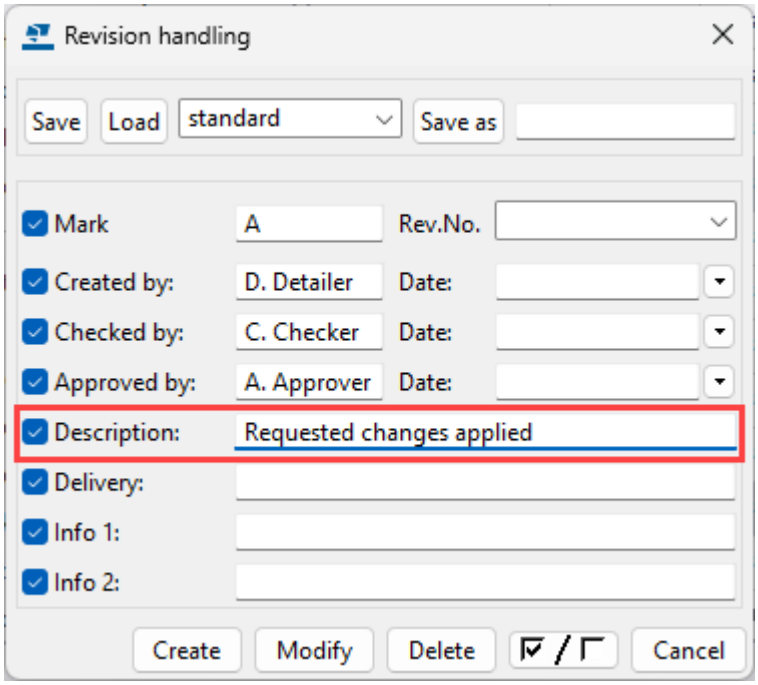
Shows the depth of bolt holes. The hole depth is measured from the bolt/hole reference points (yellow and magenta handles).

Use with the `HOLE` content type, for example, to report the depth of blind holes that do not extend completely through parts.

5.13 DESCRIPTION

Shows the description entered in the **Description** box in **File** --> **Project properties** .

Shows the revision **Description** entered in the **Revision handling** dialog for a drawing.



5.14 DESIGNER

Shows the name of the designer in the **Project properties** in **File menu** --> **Project properties**.

5.15 DesignGroup

Shows the values entered in the **Design group** box on the **Analysis** tab in the analysis properties dialog of the part.

5.16 DIAMETER

Shows the bolt, nut, screw, washer, stud shank, hole or part profile diameter, depending on the content type you use.

WASHER content type:

- The inner diameter of the washer.

NUT content type:

- The inner diameter of the nut.

SCREW content type:

- The screw diameter.

STUD content type:

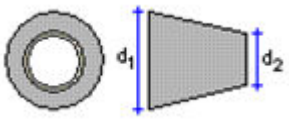
- The diameter of the stud shank.

See also

PROFILE (page 122)

5.17 DIAMETER_1, DIAMETER_2

This template attribute shows the diameters of a tapered profile. Below the diameters of the parametric profile PD:



See also

PROFILE (page 122)

5.18 DIAMETER_X

Shows the length of the slotted hole in the X direction (hole size + tolerance + LONG_HOLE_X).

Use with `BOLT`, `HOLE`, `NUT` and `WASHER` content types.

5.19 DIAMETER_Y

Shows the length of the slotted hole in the Y direction (hole size + tolerance + LONG_HOLE_Y).

Use with `BOLT`, `HOLE`, `NUT` and `WASHER` content types.

5.20 DIM_A ... DIM_G, DIM_H1, DIM_H2, DIM_I, DIM_J, DIM_K1, DIM_K2, DIM_L, DIM_O, DIM_R, DIM_R_ALL, DIM_TD, DIM_WEIGHT, DIM_X, DIM_Y

These attributes show dimensions of bent reinforcing bars based on the mappings in the `rebar_schedule_config.inp` file, located in the system folder defined with the advanced option `XS_SYSTEM`. These mappings are environment-specific by default. You can modify them to suit your company or project needs.

`DIM_TD` shows the diameter of the bending cylinder, `DIM_R` shows the radius. `DIM_R_ALL` shows multiple radiuses.

TIP When you use `DIM_R_ALL` in a value field, use `Text` as **Datatype** and `DistanceList` as **Meaning**.

5.21 DIM_A_MAX ... DIM_G_MAX, DIM_H1_MAX, DIM_H2_MAX, DIM_I_MAX, DIM_J_MAX, DIM_K1_MAX, DIM_K2_MAX, DIM_O_MAX, DIM_R_MAX, DIM_TD_MAX, DIM_X_MAX, DIM_Y_MAX

Shows the maximum dimensions of bent reinforcing bars in tapered cross sections.

5.22 DIM_A_MIN ... DIM_G_MIN, DIM_H1_MIN, DIM_H2_MIN, DIM_I_MIN, DIM_J_MIN, DIM_K1_MIN, DIM_K2_MIN, DIM_O_MIN, DIM_R_MIN, DIM_TD_MIN, DIM_X_MIN, DIM_Y_MIN

Shows the minimum dimensions of bent reinforcing bars in tapered cross sections.

5.23 DRAWING_USERFIELD_1 ... DRAWING_USERFIELD_8

These attributes show the values that you type in the **User field 1 - User field 8** boxes on the **Parameters** tab in the user-defined attributes of a drawing.

To access the user-defined attributes of a drawings click **User-defined attributes** in the drawing properties dialog, for example, in **General arrangement drawing properties** or in **Cast Unit Drawing Properties**.

User-defined drawing attributes can be used in templates, **Document manager** columns, and drawing marks, for example.

5.24 DR_DEFAULT_HOLE_SIZE

Shows the default bolt hole size that you define in drawing properties. This attribute is for template purposes only.

The default bolt hole size (**Ignore size**) in the bolt mark properties defines the default size of bolt holes. This setting defines the size of bolt holes that do not have bolt marks in drawings.

5.25 DR_DEFAULT_WELD_SIZE

This attribute shows the default weld size that you define in drawing weld properties. This attribute is for template purposes only. It can be found under the **Drawing** content type in Template Editor.

The **Weld size limit** setting in drawing properties and drawing view weld properties filters welds and weld marks of the defined weld size and smaller out of the drawing.

5.26 DR_PART_POS

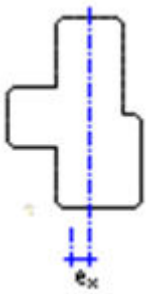
Shows the position number of the drawing main part. Can be used in drawing templates and drawing reports.

`DR_PART_POS` returns attribute `PART_POS` in all other drawing types, except for the assembly and cast unit drawings, where it returns `ASSEMBLY_POS` attribute value.

6 Template attributes - E

6.1 ECCENTRICITY_X, ECCENTRICITY_Y

This template attribute shows the eccentricity dimensions of a profile. Below is an example of the eccentricity x dimension of the RCXX profile:

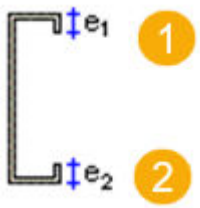


See also

PROFILE (page 122)

6.2 EDGE_FOLD, EDGE_FOLD_1, EDGE_FOLD_2

This template attribute shows the edge fold dimensions of a profile. Edge fold dimension 1 and 2 concern unsymmetrical profiles. See an example of a CC profile below:



(1) EDGE_FOLD_1

(2) EDGE_FOLD_2

See also

PROFILE (page 122)

6.3 END_X_xxx, END_Y_xxx, END_Z_xxx

The template attributes `END_X`, `END_Y`, and `END_Z` show the coordinates of a part's end reference point (magenta handle).

To show the coordinates relative to the current base point, project base point, or work plane, use `_BASEPOINT`, `_PROJECT`, or `_IN_WORK_PLANE` at the end of the template attributes. For example:

- `END_X_BASEPOINT` shows the x coordinate of the part's end reference point relative to the current base point.
- `END_Y_PROJECT` shows the y coordinate of the part's end reference point relative to the project base point.
- `END_Z_IN_WORK_PLANE` shows the z coordinate of the part's end reference point relative to the current work plane.

See also

START_X_xxx, START_Y_xxx, START_Z_xxx (page 141)

6.4 END1_ANGLE_Z

Shows the end angle of the first end of a profile in the local z-direction, for parts with cross-section profiles.

6.5 END1_ANGLE_Y

Shows the end angle of the first end of a profile in the local y-direction, for parts with cross-section profiles.

6.6 END2_ANGLE_Z

Shows the end angle of the second end of a profile in the local z-direction, for parts with cross-section profiles.

6.7 END2_ANGLE_Y

Shows the end angle of the second end of the profile in the local y-direction, for parts with cross-section profiles.

6.8 END1_CODE, END2_CODE

Shows the shape information of the first and second ends of a profile, for parts with cross-section profiles. The options are:

- 0 = no operation
- 1 = fitting
- 2 = cut
- 3 = fitting and cut

6.9 END1_SKEW, END2_SKEW

Shows 1 (INTEGER) if the corresponding end of a part has a skewed cut or fitting and 0 if the end is straight.

6.10 ERECTIONSTATUS

Shows the value selected in the **Erection Status** list on the **Status** tab in the user-defined attributes dialog of the part.

6.11 EXTRA_LENGTH

Shows the bolt extra length.

7 Template attributes - F

7.1 fabricator

Shows the value entered in the **Fabricator name** box on the **Parameters** tab in the user-defined attributes dialog of the part.

7.2 FATHER_ID

Shows the ID of the part that a reinforcement mesh belongs to.

Note that part IDs are temporary, and may change when you reopen a model, or use the read in command in Tekla Model Sharing, for example.

7.3 FINISH

This attribute shows the final properties of a part defined in the part properties (for example, in the beam properties). For all other objects the field is blank.

7.4 FLANGE_LENGTH_B

Shows the total length of the lower flange of an I profile. Use when you need to show welded profiles as plates.

7.5 FLANGE_LENGTH_U

Shows the total length of the upper flange of an I profile. Use when you need to show welded profiles as plates.

7.6 FLANGE_SLOPE_RATIO

Shows the slope ratio of a flange.

See also

PROFILE (page 122)

7.7 FLANGE_THICKNESS

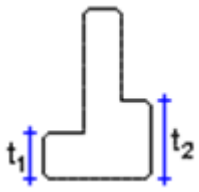
Shows the thickness of a flange.

See also

PROFILE (page 122)

7.8 FLANGE_THICKNESS_1, FLANGE_THICKNESS_2

This template attribute shows the flange thicknesses of unsymmetrical profiles, such as in an unsymmetrical RCDL profile:



See also

PROFILE (page 122)

7.9 FLANGE_THICKNESS_B

Shows the thickness of the lower flange of an I profile. Use when you need to show welded profiles as plates.

See also

PROFILE (page 122)

7.10 FLANGE_THICKNESS_U

Shows the thickness of the upper flange of an I profile. Use when you need to show welded profiles as plates.

See also

PROFILE (page 122)

7.11 FLANGE_WIDTH

Shows the width of a flange.

See also

PROFILE (page 122)

7.12 FLANGE_WIDTH_1, FLANGE_WIDTH_2

Shows the flange widths of unsymmetrical profiles.

See also

PROFILE (page 122)

7.13 FLANGE_WIDTH_B

Shows the width of the lower flange of an I profile. Use when you need to show welded profiles as plates.

See also

PROFILE (page 122)

7.14 FLANGE_WIDTH_U

Shows the width of the upper flange of an I profile. Use when you need to show welded profiles as plates.

See also

PROFILE (page 122)

7.15 FOLD_ANGLE

Shows the fold angle of a profile.

See also

PROFILE (page 122)

8 Template attributes - G

8.1 GROUP_POS

Shows the position number of a tapered reinforcing bar group in a rebar set as defined by XS_REBARSET_TAPERED_GROUP_POSITION_NUMBER_FORMAT_STRING.

If XS_REBARSET_TAPERED_GROUP_POSITION_NUMBER_FORMAT_STRING is not set, XS_REBAR_POSITION_NUMBER_FORMAT_STRING defines the `GROUP_POS` format.

See also

REBAR_POS (page 130)

8.2 GROUP_TYPE

Shows the group type of a reinforcing bar:

- Normal = 0
- Tapered = 1
- Tapered 2 = 2
- Tapered curved = 3
- Tapered N = 4
- Spiral = 5

8.3 GRADE

Shows the grade of the object. Use with `BOLT`, `NUT`, `MESH`, `REBAR`, and `STUD` content types.

8.4 GUID

This template attribute shows the globally unique identifier (GUID) of an object. GUID is a permanent object property and can be used to identify objects reliably.

NOTE The report property GUID adds the prefix “ID” to the value. For example, `ID56497C3E-0000-06F6-3134-343736353635`.

---

9 Template attributes - H

9.1 HAS_CONNECTIONS

Use to check whether a part contains connections. The attribute returns 1 if the part contains connections, otherwise it returns 0.

9.2 HAS_HOLES

Use to check whether a part contains bolt holes. The attribute returns `1` if the part contains bolt holes, otherwise it returns `0`.

This attribute does not take cuts into account.

9.3 HEAD_DIAMETER

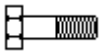
Shows the diameter of the stud head.

9.4 HEAD_THICKNESS

Shows the thickness (height) of the stud head.

9.5 HEAD_TYPE

Shows the type of the bolt head.

Bolt head type	Description	Image
1	Hex-headed	
2	Round- or cup-headed	
3	Flat-headed or countersunk	

See also

BOLT_COUNTERSUNK (page 35)

9.6 HEIGHT

Shows the height of an object.

`DRAWING` content type:

- The height of the drawing.

`ASSEMBLY` content type:

- The height of the assembly main part for assemblies, parts, and bolts.

`PART` content type:

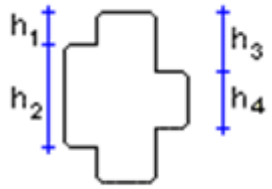
- The height of single-part or assembly drawings. Use in part and assembly lists.

See also

PROFILE (page 122)

9.7 HEIGHT_1 ... 4

This template attribute shows the height dimensions of unsymmetrical profiles, such as in RCDX profile below:



9.8 HIERARCHY_LEVEL

Shows the hierarchical level of an assembly. The possible values are:

- `0`: The assembly is on the highest level of the hierarchy.
- `1`: The assembly is on the highest level in a nested assembly.
- `2`: The assembly does not have any nested assemblies within it.
- Any other number: The assembly is a nested assembly within an another assembly. The number defines the level of the assembly in the assembly hierarchy.

9.9 HISTORY

Use to retrieve information on the model history. You can use this template attribute with content types `PART`, `SURFACING`, `REBAR`, `CONNECTION`, and `DRAWING`.

The following attributes can be used with the `HISTORY` attribute:

- `CREATED`
- `CREATED_BY`
- `MODIFIED`
- `MODIFIED_BY`
- `MODIFIED_ACTION`
- `TOUCHED`

- TOUCHED_BY
- TOUCHED_ACTION
- OWNER

Example

To find out which user has created an object in the model, use the combination HISTORY.CREATED_BY.

Offline usage history is stored according to the Windows domain user account. Note that in Tekla Model Sharing models, when you write out your changes to the sharing service, the changes are stored using your Trimble Identity.

Limitations

- You need to turn on the collection of model history. Set XS_COLLECT_MODEL_HISTORY to TRUE.
- Information cannot be retrieved for deleted objects.
- Changes in user-defined attributes do not affect this template attribute.

9.10 HOLE_1_TYPE, HOLE_2_TYPE, HOLE_3_TYPE, HOLE_4_TYPE, HOLE_5_TYPE

These five template attributes show the bolt hole types when several parts are connected with a bolt group, and the holes in each of the parts might be different. HOLE_1_TYPE shows the hole type in the first part closest to the bolt head, HOLE_2_TYPE shows the hole type in the second part, and so on.

The hole types can be:

- -1 = regular hole
- 0 = slotted hole
- 1 = oversized hole
- 2 = no hole
- 3 = tapped hole

Use these attributes with the HOLE and BOLT content types.

9.11 HOLE.DIAMETER

The `HOLE.DIAMETER` attribute returns the diameter of the holes in drawings. It only takes the visible holes into account.

9.12 HOLE_TOLERANCE

Only use in bolt lists. Shows the bolt tolerance. Shows a zero in all other lists.

9.13 HOLE_TYPE

Shows the type of a bolt hole.

- `-1` = regular hole
- `0` = slotted hole
- `1` = oversized hole
- `2` = no hole
- `3` = tapped hole

Use with the `HOLE` and `BOLT` content types.

9.14 HOOK_START, HOOK_END

Shows 1 if there is a hook at the start or end of a reinforcing bar, and 0 if there is no hook.

9.15 HOOK_START_ANGLE, HOOK_END_ANGLE

Shows the angle of the hook at the start or end of a reinforcing bar.

9.16 HOOK_START_LENGTH, HOOK_END_LENGTH

Shows the length of the straight part of the hook at the start or end of a reinforcing bar.

9.17 HOOK_START_RADIUS, HOOK_END_RADIUS

Shows the internal bending radius of the hook at the start or end of a reinforcing bar.

10 Template attributes - I

10.1 ID

Shows the identification number of an object. Use with all content types.

Note that object IDs are temporary, and may change when you reopen a model, or use the read in command in Tekla Model Sharing, for example.

10.2 IFC_BUILDING

Shows the value entered in the **IFC building name** box on the **IFC export** tab in the user-defined attributes dialog of the part.

10.3 IFC_BUILDING_STOREY

Shows the value entered in the **IFC building storey name** box on the **IFC export** tab in the user-defined attributes dialog of the part.

10.4 IFC_ENTITY

This template attribute is used in Tekla Structures version 2021 and older. For newer Tekla Structures versions, use IFC_ENTITY_OVERRIDE (page 88) instead.

Shows the value selected in the **IFC entity** list on the **IFC entity** tab in the user-defined attributes dialog of the part.

10.5 IFC_ENTITY_OVERRIDE

This template attribute shows the value selected in the **IFC entity** list in the **IFC export** section in the model object properties.

This template attribute can be used in the IFC export, where it defines the format in which the objects are exported. You can also use this attribute in reports, drawing templates, and **Organizer**.

10.6 IFC_SITE

Shows the value entered in the **IFC site name** box on the **IFC export** tab in the user-defined attributes dialog of the part.

10.7 INFO1, INFO2

These attributes show the values of the **Info 1** and **Info 2** boxes in the **Project properties** in **File** --> **Project properties**.

With the content type REVISION, these attributes show the values of the **Info 1** and **Info 2** boxes in the **Revision handling** dialog.

10.8 INNER_DIAMETER

Shows the inner diameter of an object in the bolt catalog, for example, washers or nuts.

Use with BOLT, HOLE, NUT, and WASHER content types.

10.9 INSTALL_ACTUAL

This template attribute shows the actual erection date selected on the **Workflow** tab in the user-defined attributes of a part or assembly.

10.10 INSTALL_PLAN

This template attribute shows the planned erection date selected on the **Workflow** tab in the user-defined attributes of a part or assembly.

10.11 IS_BENT_PLATE

Use to check whether an object is a bent plate. You can use this attribute in filtering, for example. The attribute returns `1` if the object is a bent plate, otherwise it returns `0`.

10.12 IS_CONCEPTUAL

Use to check whether the component is conceptual. The attribute returns `TRUE` if the component is conceptual, otherwise it returns `FALSE`.

10.13 IS_CURVED

Use to check whether a reinforcing bar is curved. You can use this attribute in filtering, for example. The attribute returns `1` if the bar is curved or has a shape similar to a curved bar. Otherwise the attribute returns `0`.

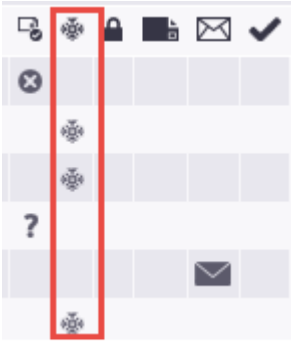
10.14 IS_FROZEN

The `IS_FROZEN` attribute tells if the drawing is frozen. This attribute can be used for adding **Document manager** information about frozen drawings in

drawing reports. The report returns the value 1 if the drawing is frozen, and 0 if it is not frozen.

Document manager has a column **Freeze** for this information.

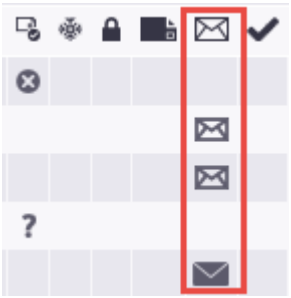
In the image below, you can see that some of the drawings are frozen (a flag in the **Freeze** column).



10.15 IS_ISSUED

The `IS_ISSUED` attribute tells if the drawing is issued. Issuing prevents the recreation of the drawing during drawing update. This attribute can be used for adding **Document manager** information about issuing in drawing reports. The report returns the value 1 if the drawing is issued, and 0 if it is not issued. Also the **Document manager** has a column **Issue** for this information.

In the image below, you can see that some of the drawings have been issued, and there is a flag in the **Issue** column. One of the issued drawings has changed, which is indicated by the flag



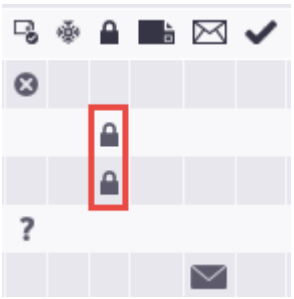
10.16 IS_ITEM

Use to check whether an object is an item. The attribute returns `1` if the object is an item, otherwise it returns `0`.

10.17 IS_LOCKED

The `IS_LOCKED` attribute tells if the drawing is locked. This attribute can be used for adding **Document manager** information about locking in drawing reports. The report returns the value 1 if the drawing is locked, and 0 if it is not locked. Also **Document manager** has a column **Lock** for this information.

In the image below, you can see that two of the drawings are locked (a flag in the **Lock** column).



10.18 IS_LOFTED_PART

Use to check whether an object is a lofted plate or lofted slab. You can use this attribute in filtering, for example. The attribute returns `1` if the object is a lofted part, otherwise it returns `0`.

10.19 IS_POLYBEAM

Use to check whether a part is a polybeam. The attribute returns `1` if the part is a polybeam, otherwise it returns `0`.

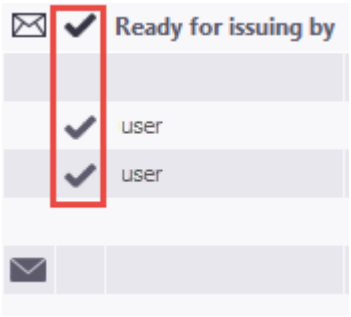
10.20 IS_POUR_BREAK_VALID

Use to check whether a pour break is valid, and to find invalid pour breaks. An invalid pour break does not split a pour object completely into two. The attribute returns the value `1` if the pour break is valid and `0` if the pour break is invalid.

10.21 IS_READY_FOR_ISSUE

The `IS_READY_FOR_ISSUE` attribute tells if the drawing has been marked ready for issuing in **Document manager**. This attribute can be used for adding **Document manager** information about drawings marked for issuing in drawing reports. The report returns the value 1 if the drawing is marked ready for issuing, and 0 if it is not marked ready for issuing.

The **Document manager** has a column **Ready for issuing** for this information. If the drawing has been marked, there is a check mark in the column.



To include in the report who has marked the drawing ready for issuing, use the attribute READY_FOR_ISSUE_BY (page 128). This information is shown in the **Ready for issuing by** column in **Document manager**.

10.22 IS_REBARSET_BAR

Use to check whether a reinforcing bar belongs to a rebar set. The attribute returns `1` if the bar belongs to a rebar set, otherwise it returns `0`.

10.23 IS_SPIRAL_BEAM

Use to check whether an object is a spiral beam. You can use this attribute in filtering, for example. The attribute returns `1` if the object is a spiral beam, otherwise it returns `0`.

11 Template attributes - L

11.1 LAP_xxx

Use the following template attributes to show lapping information defined by using a rebar set splitter.

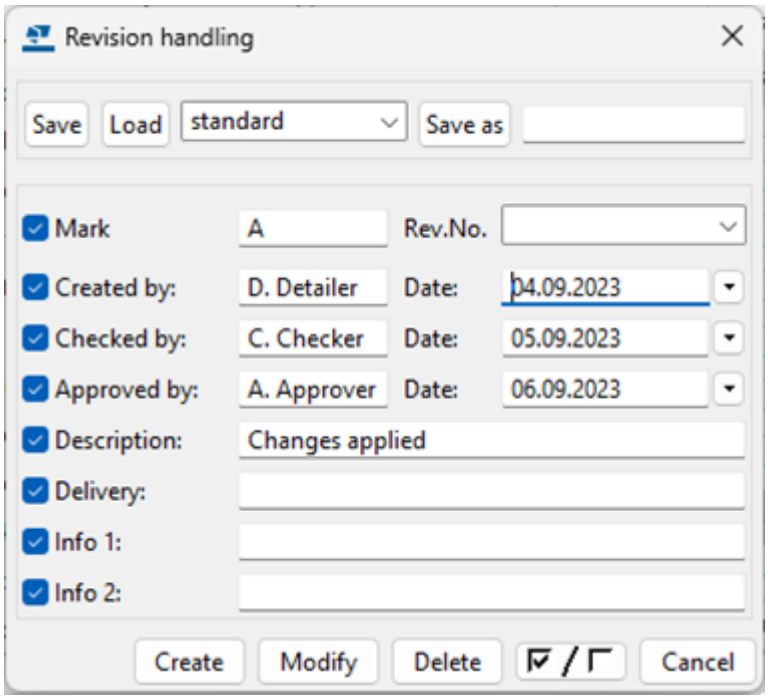
Template attribute	Description
`LAP_SIDE_START` `LAP_SIDE_END`	Shows the side of the lap splice from the splitter at the start or end of the bar: `Left`, `Right`, or `Middle`.
`LAP_PLACEMENT_START` `LAP_PLACEMENT_END`	Shows whether the lapping bars are parallel to each other or on top of each other at the start or end of the bar.
`LAP_LENGTH_START` `LAP_LENGTH_END`	Shows the length of the lap splice at the start or end of the bar.

11.2 LAST

This attribute shows the last revision number of a drawing (as an integer).

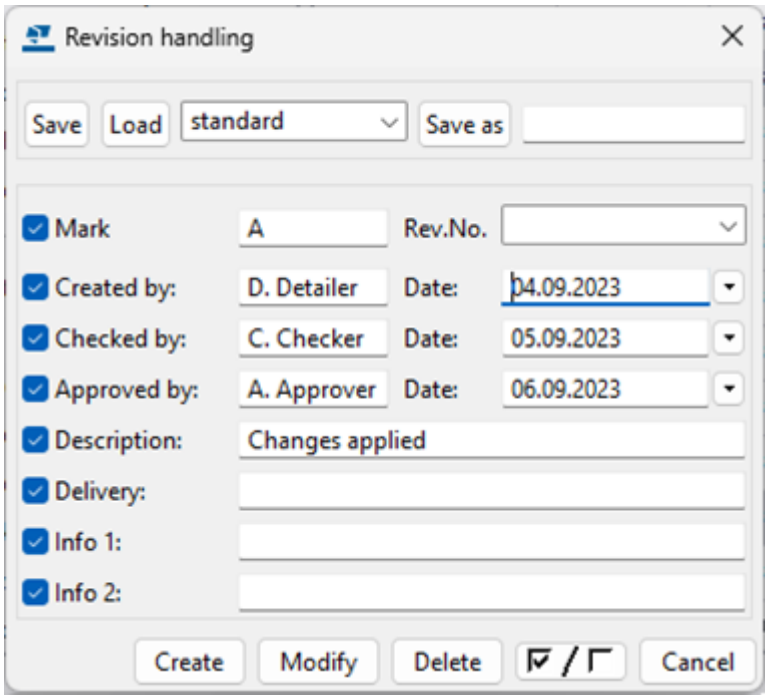
11.3 LAST_APPROVED_BY

This attribute shows the **Approved by** information of the latest delivery of a drawing from the **Revision handling** dialog.



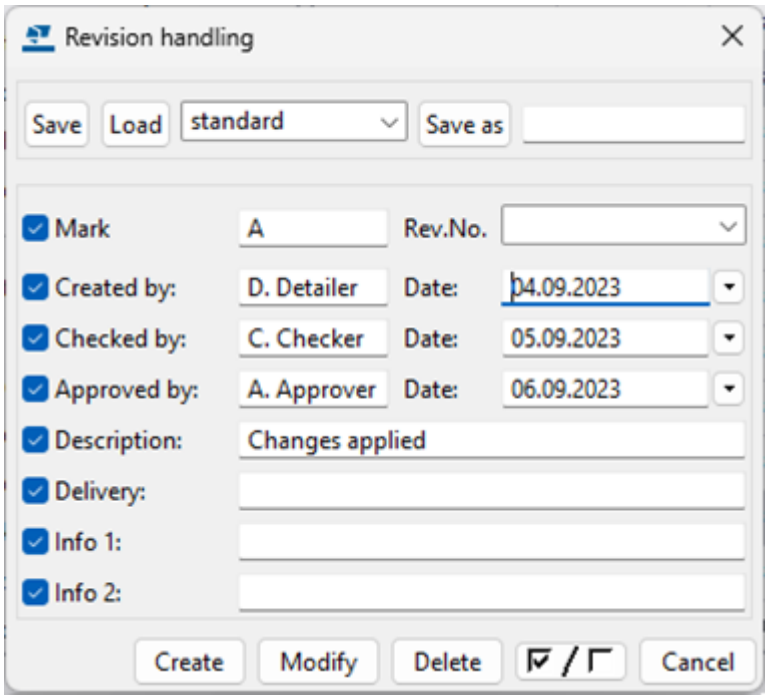
11.4 LAST_CHECKED_BY

This attribute shows the **Checked by** information of the latest revision of the drawing from the **Revision handling** dialog.



11.5 LAST_CREATED_BY

This attribute shows the **Created by** information of the latest revision of the drawing from the **Revision handling** dialog.

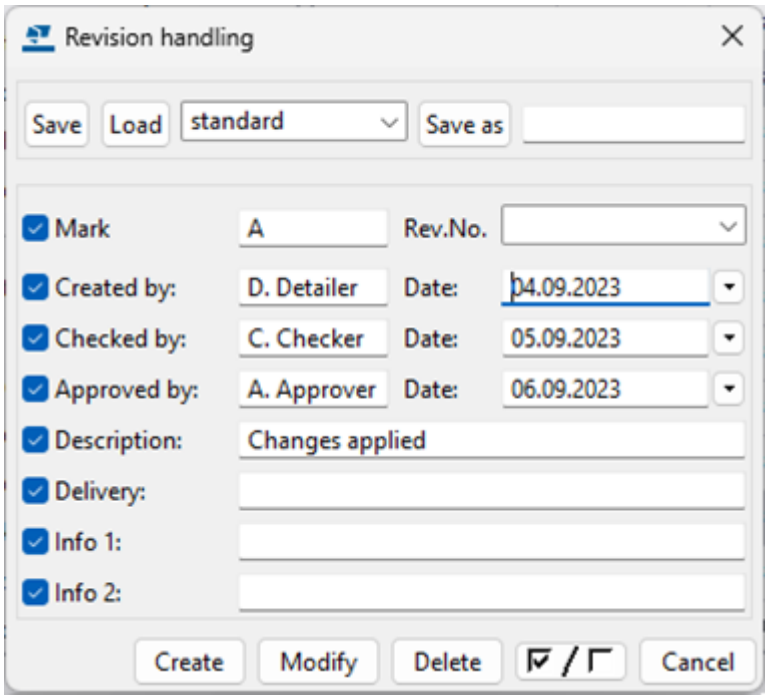


11.6 LAST_DATE_APPROVED

This attribute shows the approval **Date** of the latest revision of a drawing from the **Revision handling** dialog.

11.7 LAST_DATE_CHECKED

This attribute shows the **Checked by** date of the latest revision of a drawing from the **Revision handling** dialog.



11.8 LAST_DATE_CREATE

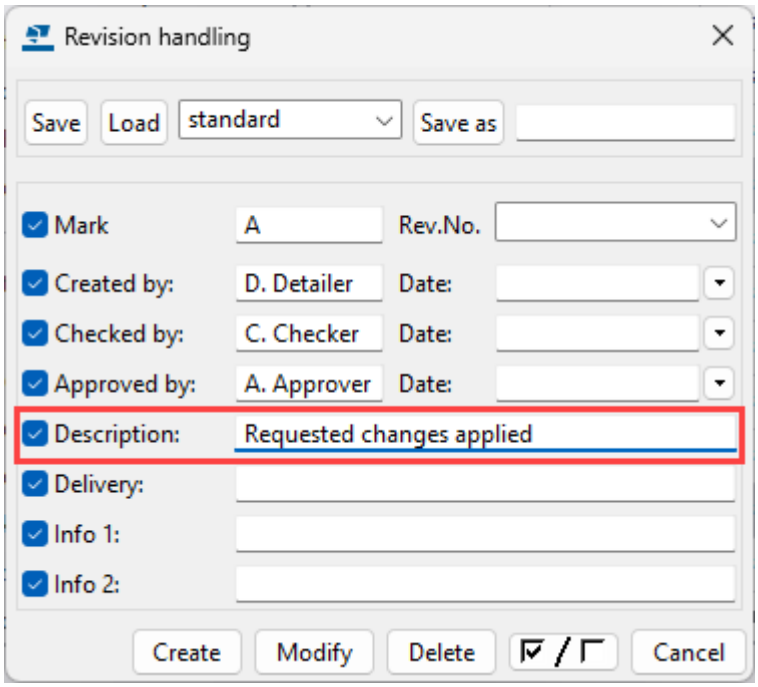
In drawing templates, this template attribute shows the date of the last revision of the drawing. In `REVISION` lists it also shows the entire revision history.

11.9 LAST_DELIVERY

This template attributes shows the **Delivery** information of the latest revision of the drawing from the **Revision handling** dialog.

11.10 LAST_DESCRIPTION

This template attribute shows the **Description** of the latest revision of the drawing from the **Revision handling** dialog.



11.11 LAST_INFO1

With the content type REVISION, this attribute shows the value of the **Info 1** text of the latest revision of the drawing in the **Revision handling** dialog.

11.12 LAST_INFO2

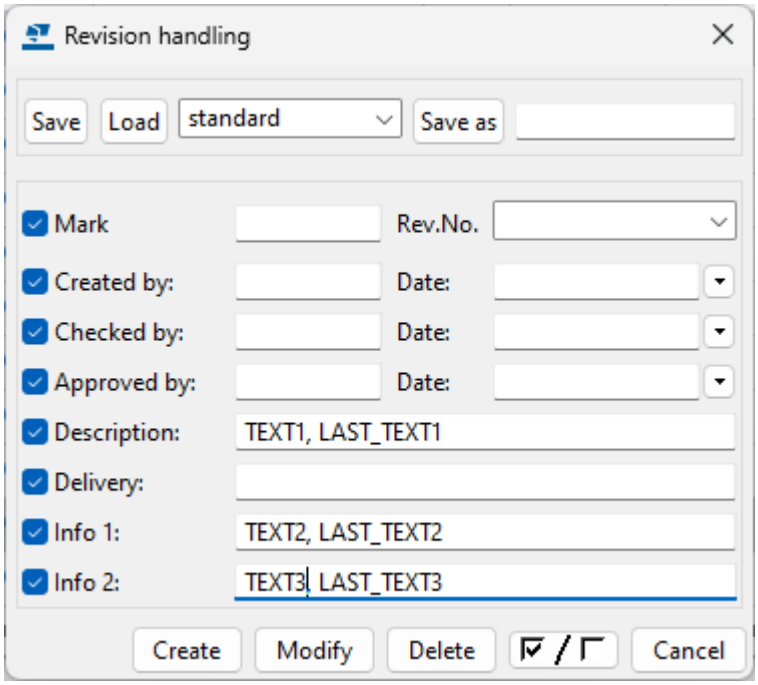
With the content type REVISION, this attribute shows the value of the **Info 2** text of the latest revision of the drawing in the **Revision handling** dialog.

11.13 LAST_MARK

In drawing templates, this template attribute shows the revision mark entered in the **Mark** box of the last revision of the drawing in the **Revision handling** dialog. In `REVISION` lists, it also shows the entire revision history.

11.14 LAST_TEXT1, LAST_TEXT2, LAST_TEXT3

In drawing templates, these attributes show the contents of the **Description**, **Info 1**, and **Info 2** boxes in the **Revision handling** dialog for the latest revision of the drawing.



11.15 LAYER

Shows the layer information of rebar set bars as defined by XS_REBARSET_REBAR_LAYER_FORMAT_STRING.

See also

LAYER_PREFIX (page 101)

LAYER_NUMBER (page 100)

11.16 LAYER_NUMBER

Shows the order number of a rebar set bar layer.

You can define layer numbers for entire rebar sets or individual leg faces, or for individual rebar set bars using the user-defined attributes of property modifiers.

Layer numbering starts from 1. The smaller the layer number, the closer to the concrete surface the bar layer is.

See also

LAYER_PREFIX (page 101)

LAYER (page 100)

11.17 LAYER_PREFIX

Shows the prefix used for a layer of rebar set bars.

You can define the default layer prefixes of a model in the **Options** dialog. You can also define bar layer prefixes for individual rebar sets using their user-defined attributes, or for individual rebar set bars using the user-defined attributes of property modifiers.

See also

LAYER_NUMBER (page 100)

LAYER (page 100)

11.18 LEG_LENGTH_START, LEG_LENGTH_END

`LEG_LENGTH_START` shows the length of the first leg of the reinforcing bar. `LEG_LENGTH_END` shows the length of the last leg of the reinforcing bar.

These are the values entered in the **Start** and **End** boxes in the **Single rebar** or **Rebar group** properties when the **Leg length** option is selected.

See also

CONCRETE_COVER_START, CONCRETE_COVER_END (page 50)

11.19 LENGTH

Shows the length of an object. Use with the following content types:

- ANALYSIS_RIGID_LINK
- ANTIMATERIAL
- ASSEMBLY
- BOLT
- CAST_UNIT
- HIERARCHIC_CAST_UNIT
- CHAMFER
- MESH
- PART
- REBAR
- REBAR_ASSEMBLY
- SIMILAR_ASSEMBLY
- SIMILAR_CAST_UNIT
- SIMILAR_PART
- SINGLE_REBAR
- SINGLE_STRAND
- STRAND
- STUD
- WELD

Takes the cuts, fittings, and end offsets of the parts, assemblies, and cast units into account.

11.20 LENGTH_GROSS

Shows the length of assemblies, parts, and bolts before cuts are made.

11.21 LENGTH_MAX

Shows the maximum length of a reinforcing bar in a reinforcing bar group.

11.22 LENGTH_MIN

Shows the minimum length of a reinforcing bar in a reinforcing bar group.

11.23 LOCATION

Shows the location entered in the **Project properties** in **File** --> **Project properties**.

11.24 LOCKED_BY

The `LOCKED_BY` attribute tells who has locked a drawing. If the user who has locked the drawing has logged in with Trimble Identity, the account name is given, otherwise the user name is given. This attribute can be used for adding **Document manager** information about who locked the drawing in drawing reports. Also the **Document manager** has a column **Locked by** for this information. The  **Lock** column has a flag when a drawing is locked.

11.25 LONGHOLE_MAX

This attribute shows the longer of the slotted hole dimensions.

See also

LONGHOLE_MIN (page 103)

11.26 LONGHOLE_MIN

This attribute shows the shorter of the slotted hole dimensions.

See also

LONGHOLE_MAX (page 103)

11.27 LONG_HOLE_X

Shows the value from the **Slotted hole X** box in the bolt properties. See also DIAMETER_X (page 69).

11.28 LONG_HOLE_Y

Shows the value from the **Slotted hole Y** box in the bolt properties. See also DIAMETER_Y (page 69).

11.29 LOT_NUMBER

Shows the lot number to which the assembly belongs.

11.30 LOT_NAME

Shows the name of the lot to which the assembly belongs.

12 Template attributes - M

12.1 MAIN_PART

Shows `1` to indicate the main parts of assemblies and `0` for all other objects. Can be used for sorting.

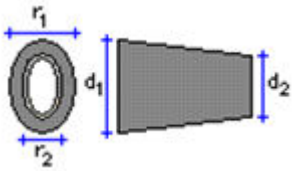
To show a main part of an assembly on top of part lists:

1. In the **Template Editor**, add value field `MAIN_PART` to `PART` row.
2. Set the **Order** to **Descending** and (if needed) hide the field in output, in the **Value Field Properties** dialog.
3. Drag the `MAIN_PART` field to be first in sort order in the **Content browser**.

TIP To check and highlight the main part of an assembly in the model, click the down arrow next to  on the ribbon, select **Assembly objects**, and then select an assembly. The main part is highlighted in orange.

12.2 MAJOR_AXIS_LENGTH_1 ... 2

This template attribute shows the major axis length dimensions of a tapered profile. Below d1 is the major axis length 1and d2 is the major axis length 2 in parametric profile EPD.

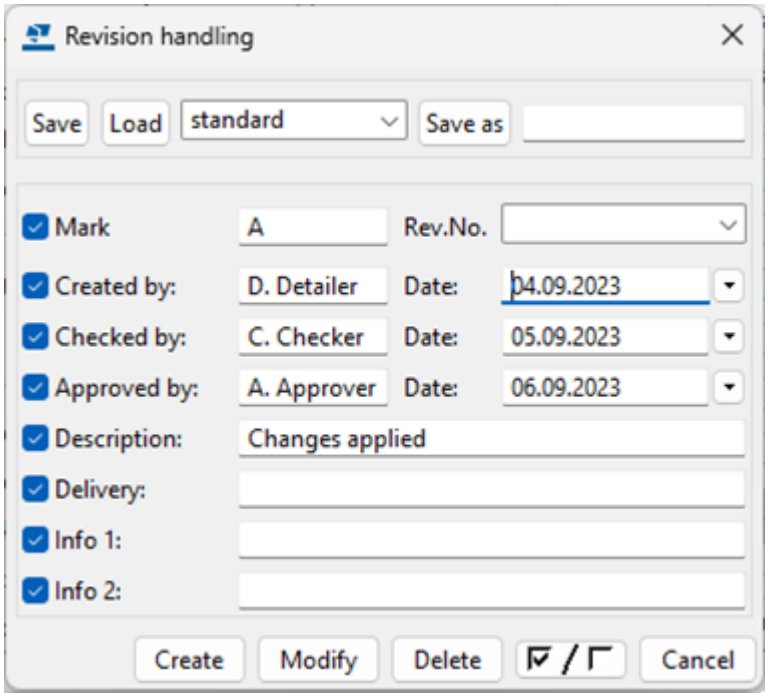


See also

PROFILE (page 122)

12.3 MARK

In drawing templates this attribute shows the revision mark of the drawing. In the `REVISION` lists it also shows the revision history. This is the revision mark of the revision entered in the **Mark** box in the **Revision handling** dialog.



12.4 MATERIAL

Shows the material name for parts. Shows the material of the assembly main part for assemblies. Shows the grade entered in the **Bolt assembly catalog** dialog for bolts.

12.5 MATERIAL_TYPE

Shows the material type of assemblies or parts.

The material catalog contains the following predefined material types:

- STEEL

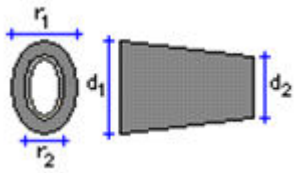
- CONCRETE
- TIMBER
- MISCELLANEOUS

12.6 MESH_POS

Shows the position of a mesh as defined by the advanced option .

12.7 MINOR_AXIS_LENGTH_1 ... 2

This template attribute shows the minor axis length dimensions of a tapered profile. Below r1 is the minor axis length 1and r2 is the minor axis length 2 in parametric profile EPD.



See also

PROFILE (page 122)

12.8 MODEL

Shows the name of the model.

12.9 MODEL_PATH

You can use the template attribute `MODEL_PATH` in all content types to find the path to the current model, for example `C:\TeklaStructuresModels\New Model 1\`.

12.10 MODEL_TOTAL

Shows the number of similar objects in a model (i.e. those with the same position number).

12.11 MODULUS_OF_ELASTICITY

Shows the modulus of elasticity of a material from the material catalog.

12.12 MOMENT_OF_INERTIA_X

Shows the moment of inertia around the x-x reference axis of a cross section. Moment of inertia is also known as the second moment of area.

See also

PROFILE (page 122)

12.13 MOMENT_OF_INERTIA_Y

Shows the moment of inertia around the y-y reference axis of a cross section. Moment of inertia is also known as the second moment of area.

See also

PROFILE (page 122)

12.14 moment1, moment2

These attributes show the values entered for **Moment, Mz (major)** on the **End conditions** tab in the user-defined attributes dialog of the part. `moment1` shows the value in the **Start** box and `moment2` shows the value in the **End** box.

12.15 MORTAR_VOLUME

Shows the mortar volume used in surface treatment.

13 Template attributes - N

13.1 NAME

This template attribute shows the name of the object. If the object does not have a name, it is searched from the next level.

Depending on the content type, shows:

Content type	Description
ASSEMBLY	The assembly mainpart, project, phase or drawing name.
BOLT	Bolt name from the bolt catalog. Nut, washer, phase, or project name.
CAST UNIT	Project, mainpart, phase, or drawing name
CONNECTION	The connection name that appears in the title bar of the corresponding connection properties dialog, or the project name.
DRAWING	The entire drawing name, including the drawing type (A, W, C, G, M) and mark, or the project name. The difference between NAME and NAME_BASE (page 110) is that NAME shows the drawing type and mark (from **Document manager**), whereas NAME_BASE shows the mark only. NAME = A [K1] NAME_BASE = [K1]
HOLE	Bolt, nut, washer, phase, or the project name.

Content type	Description
MESH	The mesh name, or the project name.
NUT	The nut name, or bolt, washer, the project or phase name.
PART	Name entered in the part properties dialog for parts. Phase, assembly main part, drawing or project name.
REBAR	The reinforcing bar name. Phase or project name.
STUD	The stud name. Project or phase name.
SURFACING	Surface treatment name defined in the `product_finishes.dat` file or the project name.
WASHER	The washer name from the bolt catalog. Bolt, nut, project, or phase name.

13.2 NAME_BASE

This template attribute shows the drawing name (drawing mark from **Document manager**).

The difference between NAME_BASE and NAME (page 109) is that NAME shows the drawing type and mark (from **Document manager**), whereas NAME_BASE shows the mark only.

NAME = A [K1]

NAME_BASE = [K1]

13.3 NEUTRAL_AXIS_LOCATION_ELASTIC_X

Shows the location of elastic neutral axis.

See also

PROFILE (page 122)

13.4 NEUTRAL_AXIS_LOCATION_ELASTIC_Y

Shows the location of elastic neutral axis.

See also

PROFILE (page 122)

13.5 NEUTRAL_AXIS_LOCATION_PLASTIC_X

Shows the location of plastic neutral axis.

See also

PROFILE (page 122)

13.6 NEUTRAL_AXIS_LOCATION_PLASTIC_Y

Shows the location of plastic neutral axis.

See also

PROFILE (page 122)

13.7 NORMALIZED_WARPING_CONSTANT

Shows the warping constant of a profile.

See also

PROFILE (page 122)

13.8 NUMBER, NUMBER#1, NUMBER#2

`NUMBER` shows the revision number in the **Rev.No.** box in the **Revision handling** dialog.

`NUMBER#1` shows the total number of objects on a list. `NUMBER#1` also shows the total number of parts and bolts for one assembly for list types `ASSEMBLY`, `ASSEMBLY_BOLT`, `ASSEMBLY_PART`, and `ASSEMBLY_ALL`, if the object is part of an assembly on the list.

`NUMBER#2` shows the project number as text.

For spiral reinforcing bars, NUMBER always shows 1. To show the number of rounds, use the ROUNDS attribute (page 133).

13.9 NUMBER_IN_DRAWING

Note that NUMBER_IN_DRAWING works in associative notes and reinforcement marks, but it does not work in templates or filtering.

The attribute NUMBER_IN_DRAWING shows the number of all rebars in a drawing that have the same position number. The neighbor part rebars are ignored. Therefore, use NUMBER_IN_DRAWING in main reinforcement marks only, and not in marks of the visible neighbor reinforcement.

If you include the attribute NUMBER_IN_DRAWING in a reinforcement mark element, you get the number of all rebars in the drawing that have the same position number. For meshes, NUMBER_IN_DRAWING returns the number of similar meshes.

See also

NUMBER_VISIBLE (page 113)

13.10 NUMBER_IN_PHASE(X)

Returns the quantity of assemblies in phase X. The result is the same as the NUMBER template attribute but by phase.

You can also use the template attribute PHASE and the function GetValue instead of a number in the template attribute.

Example

```
GetValue("NUMBER_IN_PHASE(GetValue("PHASE"))")
```

13.11 NUMBER_OF_BARS_IN_GROUP

Shows the number of the reinforcing bars in a bar group.

Use with the row content type SINGLE_REBAR as follows:

```
REBAR.NUMBER_OF_BARS_IN_GROUP
```

See also

WEIGHT_TOTAL_IN_GROUP (page 169)

13.12 NUMBER_OF_TILE_TYPES

Returns the number of tiles in a tile pattern. For example, the **Basketweave** pattern is made up of eight tiles, so the template attribute returns `8` for a tile surface treatment whose pattern type is **Basketweave**.

13.13 NUMBER_VISIBLE

When added in the reinforcing bar group mark, shows the number of visible reinforcing bars in the view. This is a context-specific template attribute.

14 Template attributes - O

14.1 OBJECT

Shows project information entered in the **Object** box in **File menu** --> **Project properties**.

14.2 OBJECT_DESCRIPTION

Shows the object type and ID. Below examples:

- PART 780*380 Id: 227
- ASSEMBLY Id: 144
- MESH Id: 946

Note that object IDs are temporary, and may change when you reopen a model, or use the read in command in Tekla Model Sharing, for example.

14.3 OBJECT_LOCKED

Shows the status of the user-defined attribute **Locked**.

See also

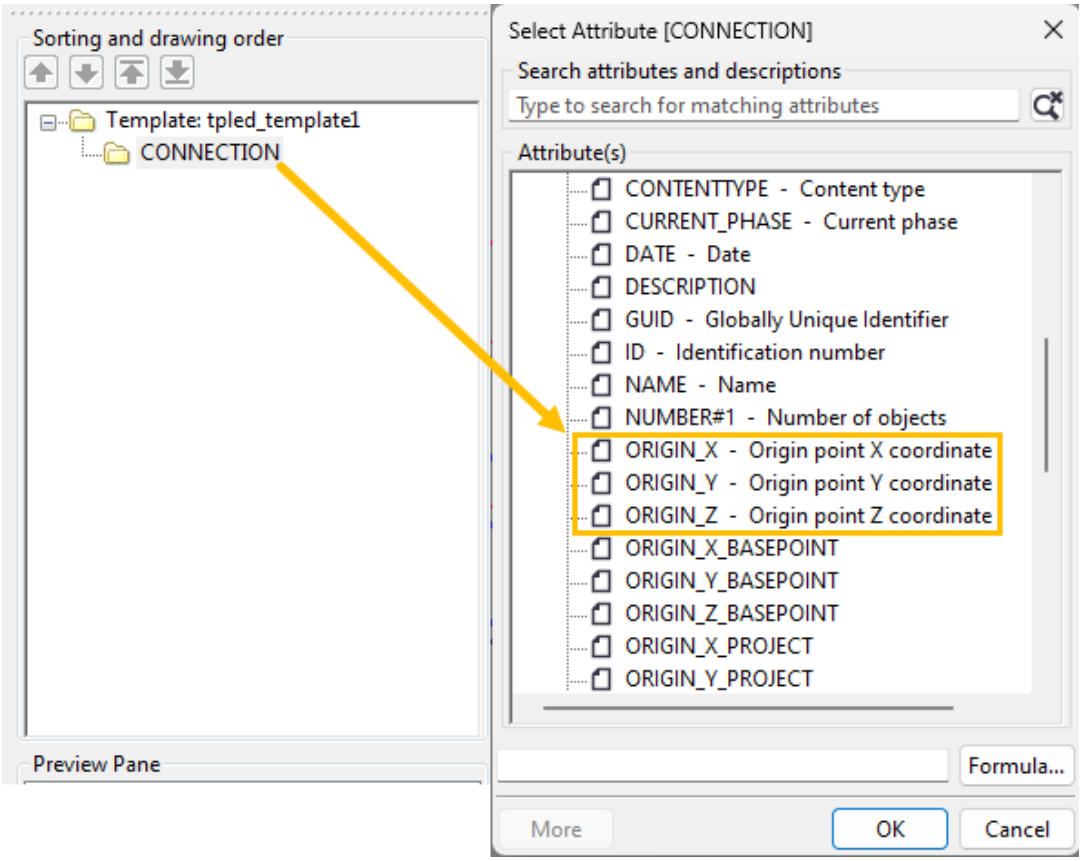
ASSEMBLY.OBJECT_LOCKED (page 28)

ASSEMBLY.OWNER_ORGANIZATION (page 28)

ASSEMBLY.LOCK_PERMISSION (page 28)

14.4 ORIGIN_X, ORIGIN_Y, ORIGIN_Z

You can use the template attributes `ORIGIN_X`, `ORIGIN_Y`, and `ORIGIN_Z` to show the global coordinates of a connection's origin.



14.5 OBJECT_TYPE

The type of object. The message files contain the translations of these strings (numbers 576 - 587).

The object types are:

- POINT
- PART
- JOINT
- FITTING
- SCREW

- ANTI-MATERIAL
- CUT
- WELDING
- ASSEMBLY
- DRAWING
- PROJECT
- OBJECT

14.6 OWNER

For native Tekla Structures objects, shows the object owner in format `domain\user`.

15 Template attributes - P

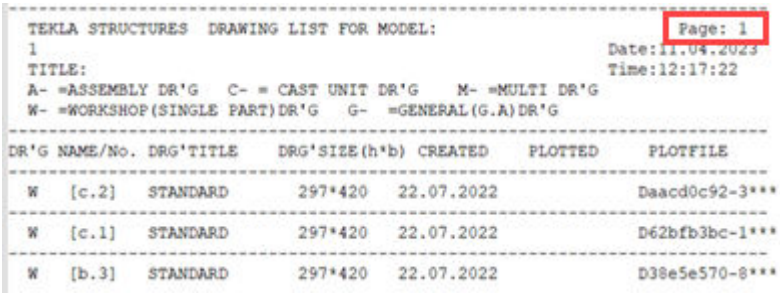
15.1 PAGE

This template attribute shows the current page number in a report or drawing.

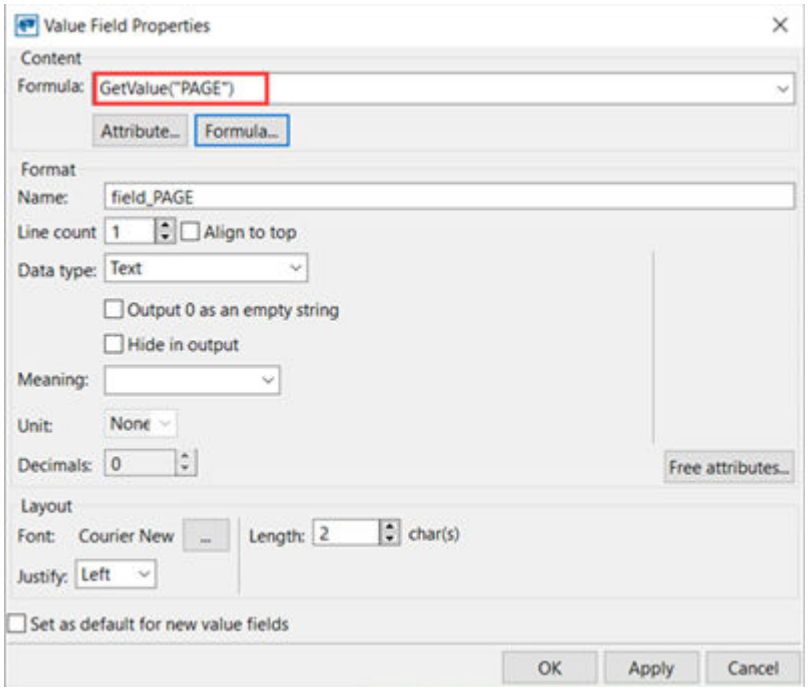
Example of use in a report

If you want to show just the current page number, use the following in the report template:

```
GetValue("PAGE")
```



```
TEKLA STRUCTURES  DRAWING LIST FOR MODEL:                          Page: 1
1                                                                  Date:11.04.2023
TITLE:                                                             Time:12:17:22
A- =ASSEMBLY DR'G   C- = CAST UNIT DR'G    M- =MULTI DR'G
W- =WORKSHOP(SINGLE PART)DR'G   G-  =GENERAL(G.A)DR'G
-------------------------------------------------------------------------------
DR'G NAME/No. DRG'TITLE    DRG'SIZE(h*b) CREATED    PLOTTED     PLOTFILE
-------------------------------------------------------------------------------
  W   [c.2]   STANDARD       297*420   22.07.2022              Daacd0c92-3***
-------------------------------------------------------------------------------
  W   [c.1]   STANDARD       297*420   22.07.2022              D62bfb3bc-1***
-------------------------------------------------------------------------------
  W   [b.3]   STANDARD       297*420   22.07.2022              D38e5e570-8***
```



If you want to have the page number in the format "1/10" you need to combine it with the PAGES (page 118) template attribute:

```
format(GetValue("PAGE"),"string",0,0)+"/"+format(GetValue("PAGES"),"string",0,0)
```

15.2 PAGES

This template attribute shows the total number of pages in the report. This template attribute can be used only in reports.

If you want to show just the current page number, use the PAGE (page 117) attribute.

Example of use in reports

To have the page number in the format PAGE / PAGES → "1/10" use the following:

```
format(GetValue("PAGE"),"string",0,0)+"/"+format(GetValue("PAGES"),"string",0,0)
```

Data type: Text

15.3 PART_POS

The position number of parts. Shows a blank cell for all other objects.

Shows the mark of assembly main part for assemblies, parts, and bolts. For all other objects the field is blank.

15.4 PART_PREFIX

Shows the part prefix, defined in the part properties.

15.5 PART_SERIAL_NUMBER

Shows the part number without the prefix and separator.

15.6 PART_START_NUMBER

Shows the part start number.

15.7 PCS

Shows the number of bars in a reinforcing bar group.

15.8 PERIMETER

The template attribute `PERIMETER` gives the perimeter of concrete slabs or polygon plates. In **Template Editor**, the content type of this template attribute is `PART.PERIMETER`. It can be used both in textual templates and in graphical templates.

`PERIMETER` can also be used for calculating formwork area, for take-offs, and in filtering.

In filtering, you can use `PERIMETER` to distinguish beam plates from polygon (contour) plates. If you create a filter with a row "Template - PERIMETER - Does

not equal - 0", you can catch plates that are created using the contour plate command instead of the steel beam command.

15.9 PHASE

The number of the phase to which the object belongs.

To show the phase name, use the PHASE.NAME field.

15.10 PLAIN_HOLE_TYPE

Shows `0` for **Through** bolt holes that are open throughout the part, and `1` for **Blind** (i.e. partial-depth) bolt holes that do not extend completely through the part.

Use with the `HOLE` and `BOLT` content types.

15.11 PLASTIC_MODULUS_X

Shows the plastic modulus of x-x reference axis of a cross section. Also known as the first moment of area.

See also

PROFILE (page 122)

15.12 PLASTIC_MODULUS_Y

Shows the plastic modulus of y-y reference axis of a cross section. Also known as the first moment of area.

See also

PROFILE (page 122)

15.13 PLATE_DENSITY

Shows the material density of a plate (kg/m3).

15.14 PLATE_THICKNESS

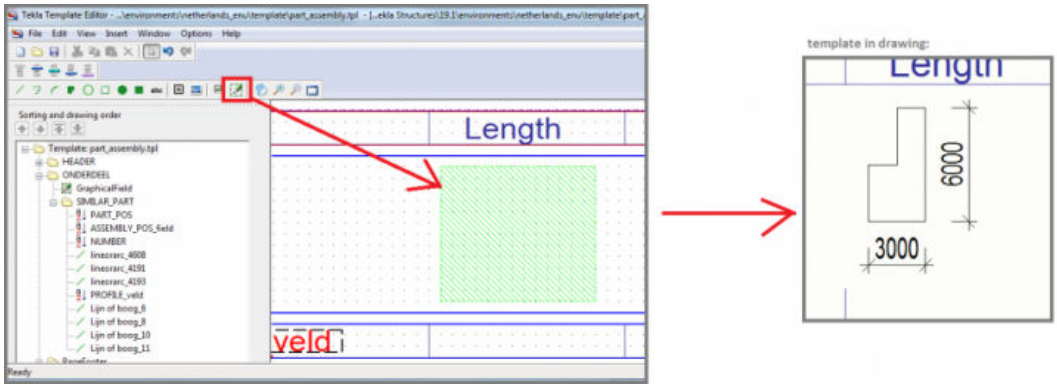
Shows the thickness of a plate (mm) if the profile has the **Plate thickness** property defined in the profile catalog. For example, it works for circular and rectangular hollow sections, and for some CC profiles which do not have separate thicknesses for flanges and web. This attribute does not work for plate profiles, because there is no **Plate thickness** that you can define in profile properties.

See also

PROFILE (page 122)

15.15 PLATE_TOP_VIEW

This attribute is available for rows with the content type **PART**. It displays the top view of the contour plate. You can use `PLATE_TOP_VIEW` in a graphical field only.



For more information about attributes that you can use in graphical fields, see support article Attributes for graphical fields in Template Editor.

Limitations

The following attributes have no impact on `PLATE_TOP_VIEW`: `FontColor`, `Dimensions`, `ImageWidth`, `ImageHeight`, and `ScaleType`.

15.16 PLOTFILE

Shows the name of the drawing `.dg` file. Only for use in drawing tables and drawing reports.

15.17 POISSONS_RATIO

Shows the Poisson's ratio (analysis property) of material.

15.18 POLAR_RADIUS_OF_GYRATION

Shows the polar radius of gyration (analysis property) of a profile.

See also

PROFILE (page 122)

15.19 POSTAL_BOX

Shows the postal box entered in the **Project properties** in **File** --> **Project properties**.

15.20 POSTAL_CODE

Shows the postal code entered in the **Project properties** in **File** --> **Project properties**.

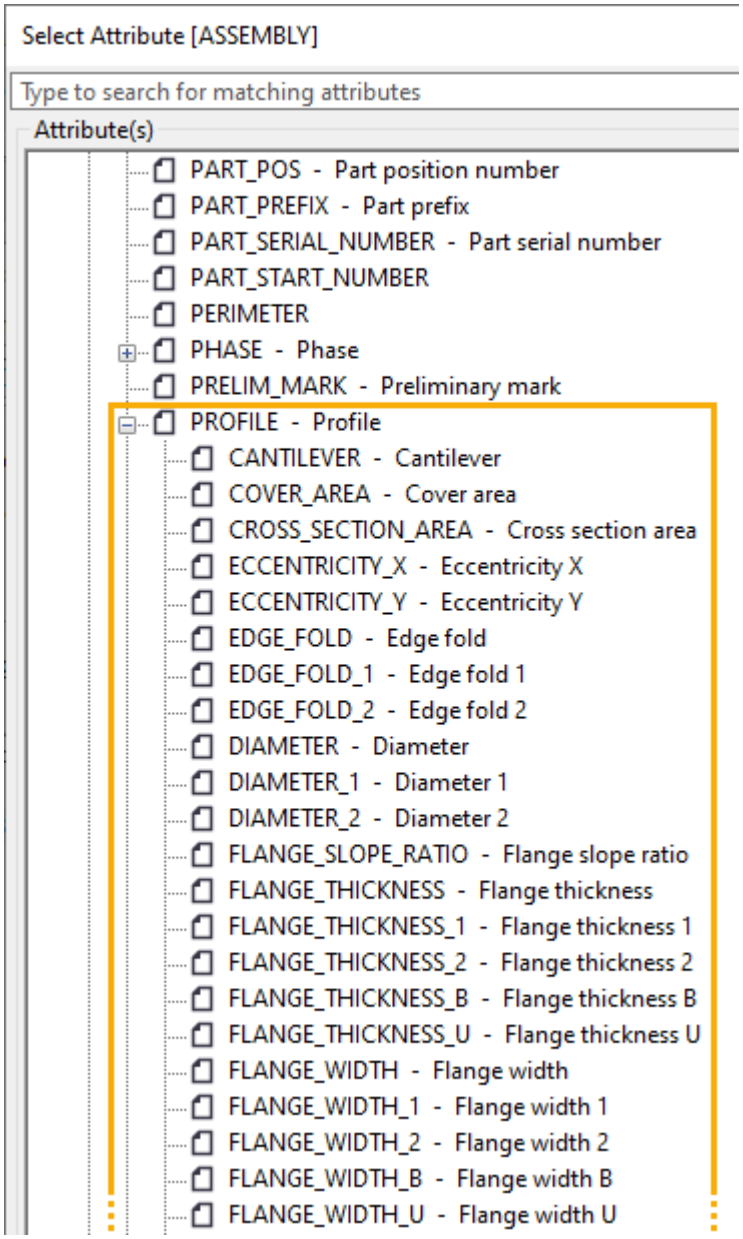
15.21 PRELIM_MARK

Shows the user-defined attribute **Preliminary mark**.

15.22 PROFILE

Shows the part profile name, or the main part profile name in an assembly or cast unit.

You can also show other profile attributes in templates and reports. In Template Editor, open the **Select attribute** dialog and select `PROFILE.*` attributes for the selected content type:



For example, `MAINPART.PROFILE.HEIGHT` with the `ASSEMBLY` content type shows the height of the main part profile in the assembly.

15.23 PROFILE_DENSITY

Shows the profile density of material (kg/m3).

15.24 PROFILE_TYPE

This template attribute shows the DSTV-NC profile type of the part. The DSTV-NC profile types are listed in the last column in the table below.

The default profile types in Tekla Structures conform to the DSTV-NC documentation. They are defined as messages, numbered from 588 to 599, in the `by_number.ail` message file in the `..\Tekla Structures\<version>\bin\messages` folder. The table below shows the relationship between the messages, the profiles in Tekla Structures, and the DSTV-NC profile types defined in the messages.

Tekla Structures profiles		Message number	DSTV-NC profile type
I-profiles		588	I
L-profiles		589	L
U-profiles		591	U
Plates		592	B
Round bars		593	RU
Round tubes		594	RO
Rectangular tubes		595	M
CC-profiles		596	C
T-profiles		597	T
Polygon plates		598	B
Bent plates		599	B
Z-profiles and all the other types of profile	 etc.	590	Z

15.25 PROFILE_WEIGHT

The weight of a part. For profiles Tekla Structures calculates the weight using the weight per unit length and weight/m values in the profile catalog. If the weight/m is not defined in the profile catalog, this field works in the same way as WEIGHT_NET (page 167), but uses the plate density value (Property weight for plates) from the material catalog instead of profile density.

15.26 PROFILE_WEIGHT_NET

The net weight of a part. For profiles Tekla Structures calculates the weight using the length and weight/m values in the profile catalog. Line cuts do not affect the length value, which is calculated using the fitted centerline. For all other objects this field works in the same way as WEIGHT_NET (page 167).

15.27 PROCURED_LENGTH

This template attribute represents the LENGTH_NET value from the last submittal of the part.

The attribute can be used in reports and drawings, and for filtering.

It is related to the Tekla PowerFab Connector procurement workflow.

15.28 PROCURED_MATERIAL

This template attribute represents the material value from the last submittal of the part.

The attribute can be used in reports and drawings, and for filtering.

It is related to the Tekla PowerFab Connector procurement workflow.

15.29 PROCURED_PROFILE

This template attribute represents the profile value from the last submittal of the part.

The attribute can be used in reports and drawings, and for filtering.

It is related to the Tekla PowerFab Connector procurement workflow.

15.30 PROCUREMENT_NUMBER

This template attribute is the number of the procured part.

The attribute can be used in reports and drawings, and for filtering.

It is related to the Tekla PowerFab Connector procurement workflow.

15.31 PROCUREMENT_POSITION

This template attribute represents the full mark of the procured part including the prefix.

The attribute can be used in reports and drawings, and for filtering.

It is related to the Tekla PowerFab Connector procurement workflow.

15.32 PROCUREMENT_STATUS

This attribute indicates the procurement status.

- 0 - New
- 1 - Modified
- 2 - Numbered
- 3 - Submitted
- 4 - Excluded (not in procurement workflow)

The attribute can be used in reports and drawings, and for filtering.

It is related to the Tekla PowerFab Connector procurement workflow.

15.33 PROJECT_COMMENT

Shows the value entered in the **Project Comment** box in the user-defined attributes dialog of the project in **File menu** --> **Project properties** --> **User-defined attributes**.

15.34 PROJECT_USERFIELD_1 ... 8

Shows the value of the user-defined attribute of the project that you can define in the **User field 1** , **User field 2** and so on boxes on the **Parameters** tab in the user-defined attributes dialog of the project (**File menu** --> **Project properties** --> **User-defined attributes**).

16 Template attributes - R

16.1 RADIUS

The **Radius** value of a curved beam.

16.2 RADIUS_OF_GYRATION_X

Shows the radius of gyration x (analysis property) of a profile.

See also

PROFILE (page 122)

16.3 RADIUS_OF_GYRATION_Y

Shows the radius of gyration y (analysis property) of a profile.

See also

PROFILE (page 122)

16.4 READY_FOR_ISSUE_BY

The `READY_FOR_ISSUE_BY` attribute tells who has marked a drawing ready for issuing. This attribute can be used for adding **Document manager** information about who marked the drawing ready for issuing in drawing

reports. You can also add the column **Ready for issuing by** to **Document manager**.

To include in a report the information whether the drawing has been marked ready for issuing, use the attribute IS_READY_FOR_ISSUE (page 92).

16.5 REBAR_ASSEMBLY_TYPE

Shows the type of a rebar assembly, selected in the rebar assembly properties. For example, `Cage`, `Bent mesh`, `Braced girder`, or blank, which is the default value.

Use with the `REBAR_ASSEMBLY` content type.

To show the rebar assembly type for a reinforcement object that belongs to a rebar assembly, use `REBAR_ASSEMBLY.USERDEFINED.REBAR_ASSEMBLY_TYPE`. A blank value is shown for reinforcement objects that do not belong to a rebar assembly.

16.6 REBAR_MESH_LEFT_OVERHANG_CROSS

Shows the extensions of the crossing bars over the outermost longitudinal bars on the left.

16.7 REBAR_MESH_LEFT_OVERHANG_LONG

Shows the extensions of the longitudinal bars over the outermost crossing bars on the left.

16.8 REBAR_MESH_RIGHT_OVERHANG_CROSS

Shows the extensions of the crossing bars over the outermost longitudinal bars on the left.

16.9 REBAR_MESH_RIGHT_OVERHANG_LONG

Shows the extensions of the longitudinal bars over the outermost crossing bars on the right.

16.10 REBAR_POS

Shows the position number of a reinforcing bar as defined by XS_REBAR_POSITION_NUMBER_FORMAT_STRING.

For reinforcing bars in tapered bar groups in rebar sets, the `REBAR_POS` format is defined by XS_REBARSET_TAPERED_REBAR_POSITION_NUMBER_FORMAT_STRING, and if that is not set, then by XS_REBAR_POSITION_NUMBER_FORMAT_STRING.

See also

GROUP_POS (page 79)

16.11 REBAR_SEQ_POS

This template attribute shows the sequence number of a reinforcement object. Reinforcement sequence numbers are running numbers assigned to reinforcement objects within each cast unit or pour unit. This attribute can be used in drawing and report templates and in reinforcement marks in drawings.

16.12 REFERENCE_ASSEMBLY

Lists assembly level information on reference models in reports and templates.

The following attributes are bound to the content type in `contentattributes_global.lst`:

```
// ---------------------
// REFERENCE_ASSEMBLY - reference model assembly
// ---------------------
REFERENCE_ASSEMBLY = NAME
REFERENCE_ASSEMBLY = BOUNDING_BOX_MIN_X
REFERENCE_ASSEMBLY = BOUNDING_BOX_MIN_Y
REFERENCE_ASSEMBLY = BOUNDING_BOX_MIN_Z
REFERENCE_ASSEMBLY = BOUNDING_BOX_MAX_X
REFERENCE_ASSEMBLY = BOUNDING_BOX_MAX_Y
REFERENCE_ASSEMBLY = BOUNDING_BOX_MAX_Z

// Logical building area attributes
REFERENCE_ASSEMBLY = LOGICAL_BUILDING_AREA.ID
REFERENCE_ASSEMBLY = LOGICAL_BUILDING_AREA.NAME
REFERENCE_ASSEMBLY = LOGICAL_BUILDING_AREA.GUID
REFERENCE_ASSEMBLY = LOGICAL_BUILDING_AREA.DEFINITION_NAME
REFERENCE_ASSEMBLY = LOGICAL_BUILDING_AREA.HIERARCHY_LEVEL
REFERENCE_ASSEMBLY = LOGICAL_BUILDING_AREA.LBA_SITE
REFERENCE_ASSEMBLY = LOGICAL_BUILDING_AREA.LBA_BUILDING
REFERENCE_ASSEMBLY = LOGICAL_BUILDING_AREA.LBA_SECTION
REFERENCE_ASSEMBLY = LOGICAL_BUILDING_AREA.LBA_STOREY

// Building object types hierarchy
REFERENCE_ASSEMBLY = OBJECT_TYPES.ID
REFERENCE_ASSEMBLY = OBJECT_TYPES.NAME
REFERENCE_ASSEMBLY = OBJECT_TYPES.GUID
REFERENCE_ASSEMBLY = OBJECT_TYPES.DEFINITION_NAME
REFERENCE_ASSEMBLY = OBJECT_TYPES.HIERARCHY_LEVEL
REFERENCE_ASSEMBLY = OBJECT_TYPES.ROOT_DEFINITION_NAME
//Project attributes
REFERENCE_ASSEMBLY = PROJECT.ADDRESS
REFERENCE_ASSEMBLY = PROJECT.BUILDER
REFERENCE_ASSEMBLY = PROJECT.DATE_END
REFERENCE_ASSEMBLY = PROJECT.DATE_START
REFERENCE_ASSEMBLY = PROJECT.DESCRIPTION
REFERENCE_ASSEMBLY = PROJECT.DESIGNER
REFERENCE_ASSEMBLY = PROJECT.INFO1
REFERENCE_ASSEMBLY = PROJECT.INFO2
REFERENCE_ASSEMBLY = PROJECT.MODEL
REFERENCE_ASSEMBLY = PROJECT.NAME
REFERENCE_ASSEMBLY = PROJECT.NUMBER#2
REFERENCE_ASSEMBLY = PROJECT.OBJECT
```

The following user-defined attributes are bound to the content type in `contentattributes_userdefined.lst`:

```
REFERENCE_ASSEMBLY = USERDEFINED.subref_description
REFERENCE_ASSEMBLY = USERDEFINED.OBJECT_LOCKED
REFERENCE_ASSEMBLY = USERDEFINED.subref_info_string
REFERENCE_ASSEMBLY = USERDEFINED.subref_logical_name
REFERENCE_ASSEMBLY = USERDEFINED.[Workflow].DESIGN_CHECKED_BY
REFERENCE_ASSEMBLY = USERDEFINED.[Workflow].DESIGN_COMMENT
REFERENCE_ASSEMBLY = USERDEFINED.[Workflow].DESIGN_ASSIGNED_TO
REFERENCE_ASSEMBLY = USERDEFINED.[Workflow].DESIGN_CODE
REFERENCE_ASSEMBLY = USERDEFINED.[Workflow].PLANS_STATUS
REFERENCE_ASSEMBLY = USERDEFINED.[Workflow].DESIGN_CHECK_DATE
REFERENCE_ASSEMBLY = USERDEFINED.[Workflow].PLANNED_START_D
REFERENCE_ASSEMBLY = USERDEFINED.[Workflow].PLANNED_END_D
REFERENCE_ASSEMBLY = USERDEFINED.[Workflow].ACTUAL_START_D
REFERENCE_ASSEMBLY = USERDEFINED.[Workflow].ACTUAL_END_D
REFERENCE_ASSEMBLY = USERDEFINED.[Workflow].FABRICATION_CODE
REFERENCE_ASSEMBLY = USERDEFINED.[Workflow].DELIVERY_NUMBER
REFERENCE_ASSEMBLY = USERDEFINED.[Workflow].PACKAGE_NUMBER
REFERENCE_ASSEMBLY = USERDEFINED.[Workflow].SHIPMENT_NUMBER
REFERENCE_ASSEMBLY = USERDEFINED.[Workflow].FABRICATION_STATUS
REFERENCE_ASSEMBLY = USERDEFINED.[Workflow].PLANNED_START_F
REFERENCE_ASSEMBLY = USERDEFINED.[Workflow].PLANNED_END_F
REFERENCE_ASSEMBLY = USERDEFINED.[Workflow].ACTUAL_START_F
REFERENCE_ASSEMBLY = USERDEFINED.[Workflow].ACTUAL_END_F
REFERENCE_ASSEMBLY = USERDEFINED.[Workflow].ERECTION_CODE
REFERENCE_ASSEMBLY = USERDEFINED.[Workflow].ERECTION_COMMENT
REFERENCE_ASSEMBLY = USERDEFINED.[Workflow].ERECTION_STATUS
REFERENCE_ASSEMBLY = USERDEFINED.[Workflow].CIP_STATUS
REFERENCE_ASSEMBLY = USERDEFINED.[Workflow].PLANNED_START_E
REFERENCE_ASSEMBLY = USERDEFINED.[Workflow].PLANNED_END_E
REFERENCE_ASSEMBLY = USERDEFINED.[Workflow].ACTUAL_START_E
REFERENCE_ASSEMBLY = USERDEFINED.[Workflow].ACTUAL_END_E
```

16.13 REFERENCE_MODEL

Lists reference models in reports.

16.14 REFERENCE_MODEL_OBJECT

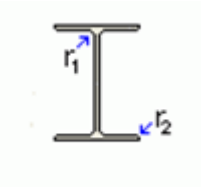
Lists reference model objects in reports.

16.15 REGION

Shows the region entered in the **Project properties** in **File** --> **Project properties**.

16.16 ROUNDING_RADIUS, ROUNDING_RADIUS_1, ROUNDING_RADIUS_2

This template attribute shows different rounding radii of profiles. Below as an example rounding radius 1 and 2 for a specific I profile:



See also

PROFILE (page 122)

16.17 ROUNDS

This template attribute shows the number of rounds for a spiral reinforcing bar. The attribute can be used wherever the number of rounds is needed, for example, in report templates and in reinforcement marks in drawings. The same value is also shown for spiral bars in the **Inquire object** dialog.

The `ROUNDS` attribute shows a decimal value, since the number of rounds is not always a whole number.

16.18 ROW_IN_ALLPAGES

The row number incrementing continues on the next page. Use in reports and templates.

Can be used together with the `PAGE` field to include page or row information in the drawing template. Set **Type** to **Text** and enter the following field definition in the Text field properties:

```
=%PAGE% %/% %ROW_IN_ALLPAGES%
```

See also

ROW_IN_PAGE (page 134)

16.19 ROW_IN_PAGE

Produces an incremental number starting from 1 at the beginning of each new page. Use in reports and templates.

Example

Can be used together with the `PAGE` field to include page or row information in the drawing template. Set **Type** to **Text** and enter the following field definition in the Text field properties:

```
=%PAGE% %/% %ROW_IN_PAGE%
```

See also

ROW_IN_ALLPAGES (page 133)

17 Template attributes - S

17.1 SCALE1, SCALE2, SCALE3, SCALE4, SCALE5

The template attributes `SCALE1`, `SCALE2`, `SCALE3`, `SCALE4`, and `SCALE5` can be used in drawing templates.

`SCALE1` shows the biggest view scale in the current drawing, `SCALE2` shows the second biggest view scale, and so on. If you have more than 5 different view scales, only the 5 biggest can be displayed in your template. If you have less than 5 different view scales, the rest of the value fields will not have any value.

For example, your main view has the view scale 1:20, your detail views have the view scale 1:5, and your section views have the view scale 1:10. Now `SCALE1 = "1:5"` (biggest), `SCALE2 = "1:10"` (second biggest), `SCALE3 = "1:20"` (third biggest), `SCALE4 = ""` (empty), and `SCALE5 = ""` (empty).

NOTE The values in the template are not updated when you modify a view scale in the drawing. Templates are only updated during certain operations, for example, when you reopen the drawing, or run the **Arrange views** command.

17.2 SCHED_FAB_DATE

Shows the value selected in the **Fabrication Scheduled** field on the **Status** tab in the user-defined attributes dialog of the part.

17.3 SCREW_HOLE_DIAMETER_X

Shows the length of a screw hole in the x direction (hole diameter + LONG_HOLE_X (page 104)).

17.4 SCREW_HOLE_DIAMETER_Y

Shows the length of a screw hole in the y direction (hole diameter + LONG_HOLE_Y (page 104)).

17.5 SECTION_MODULUS_X, SECTION_MODULUS_Y

Shows section modulus (analysis property) of a profile.

See also

PROFILE (page 122)

17.6 SHAPE

Shows the environment-specific bending type of a reinforcing bar.

17.7 SHAPE_INTERNAL

Shows the internal bending type of Tekla Structures for a reinforcing bar, for example, 2_1.

17.8 SHEAR_CENTER_LOCATION

Shows the shear center location (analysis property) of a profile.

See also

PROFILE (page 122)

17.9 shear1, shear2

These attributes show the values entered for **Shear, Vy (major)** on the **End conditions** tab in the user-defined attributes dialog of the part. `shear1` shows the value in the **Start** box and `shear2` shows the value in the **End** box.

17.10 SHOP_ISSUE

Shows the value selected in the **Plans Actual** field on the **Status** tab in the user-defined attributes dialog of the part or in the assembly properties dialog.

17.11 SHOPSTATUS

Shows the value entered in the **Fabrication status** box on the **Workflow** tab in the user-defined attributes dialog of the part or in the assembly properties dialog.

17.12 SIMILAR_TO_MAIN_PART

Returns 1 if the position number of the given part is the same as the position number of the main part in the assembly.

To show a main part of an assembly on top of part lists:

1. In the Template Editor, add value field `SIMILAR_TO_MAIN_PART` to `PART` row.
2. Set the **Order** to **Descending** and (if needed) hide the field in output, in the **Value Field Properties** dialog.
3. Drag the SIMILAR_TO_MAIN_PART field to be first in sort order in the **Content browser**.

17.13 SITE_WORKSHOP

For bolts this field shows the assembly type information in a string (Site or Shop). The message files (466 and 467) contain translations of these strings.

For studs this field shows the assembly type information in a string (Site or Shop).

17.14 SIZE

This template attribute shows the size of the drawing (e.g. 210x297). This attribute can be used only in drawing templates and drawing reports.

17.15 SORT_OF_E_x_Cw_PER_G_x_J

Shows sqrt(ECw/GJ) analysis property of a profile.

See also

PROFILE (page 122)

17.16 SPACE

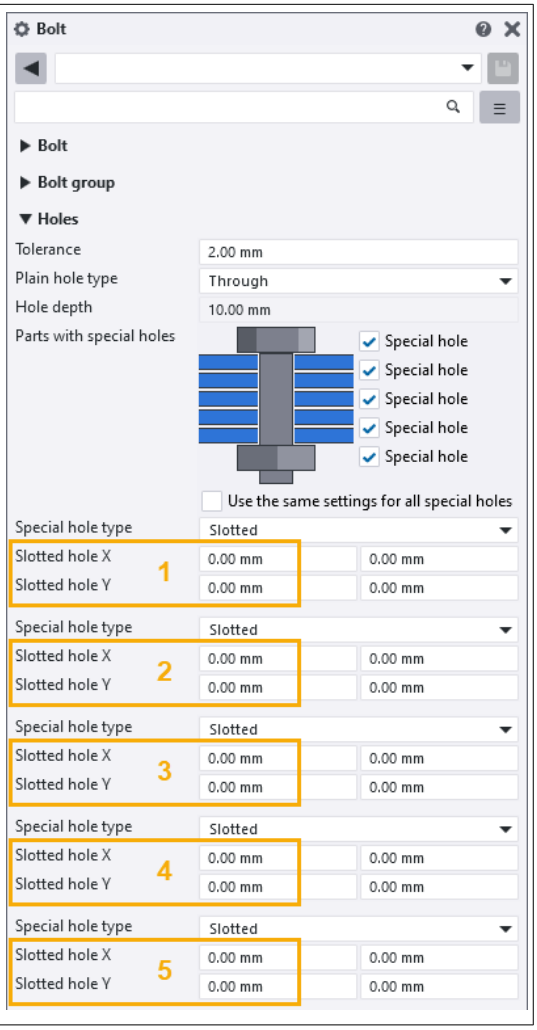
Use the following attributes to report space object properties for assemblies and cast units.

- `SPACE.GUID` shows the globally unique identifier of the space.
- `SPACE.ID` shows the temporary ID of the space.
- `SPACE.NAME` shows the name of the space.
- `SPACE.OWNER` shows the owner of the space.
- `SPACE.CONTENTTYPE` shows the content type of the current space.
- `SPACE.BOTTOMOFFSET` shows the bottom offset of the space.
- `SPACE.VOLUME` shows the volume of the space.
- `SPACE.AREA` shows the area of the space.
- `SPACE.HEIGHT` shows the height of the space.
- `SPACE_NUMBER` shows the space number.
- `DESCRIPTION` is a description of the space.

17.17 SPECIAL_HOLE_1...5_X, SPECIAL_HOLE_1...5_Y

These template attributes show the x and y allowances of slotted bolt holes that are created with a bolt group, or a single bolt, in up to five connected parts.

- SPECIAL_HOLE_1_X
- SPECIAL_HOLE_1_Y
- SPECIAL_HOLE_2_X
- SPECIAL_HOLE_2_Y
- SPECIAL_HOLE_3_X
- SPECIAL_HOLE_3_Y
- SPECIAL_HOLE_4_X
- SPECIAL_HOLE_4_Y
- SPECIAL_HOLE_5_X
- SPECIAL_HOLE_5_Y



The x and y allowances comply with the x and y directions of the bolt group.

For example, SPECIAL_HOLE_1_X shows the allowance of the slotted holes in the x direction of the bolt group in the first slotted part closest to the bolt head. SPECIAL_HOLE_5_Y shows the allowance in the y direction in the fifth slotted part.

Use with the HOLE and BOLT content types.

17.18 SPIRAL_ROTATION_ANGLE

Shows the total +/- angle of the rotation of a spiral beam.
For example: (+)720.00 = 2 full rounds of rotation in counterclockwise.

17.19 SPIRAL_ROTATION_AXIS_xxx

- SPIRAL_ROTATION_AXIS_BASE_POINT_X
- SPIRAL_ROTATION_AXIS_BASE_POINT_Y
- SPIRAL_ROTATION_AXIS_BASE_POINT_Z
- SPIRAL_ROTATION_AXIS_BASE_POINT_X_PROJECT
- SPIRAL_ROTATION_AXIS_BASE_POINT_Y_PROJECT
- SPIRAL_ROTATION_AXIS_BASE_POINT_Z_PROJECT
- SPIRAL_ROTATION_AXIS_BASE_POINT_X_BASEPOINT
- SPIRAL_ROTATION_AXIS_BASE_POINT_Y_BASEPOINT
- SPIRAL_ROTATION_AXIS_BASE_POINT_Z_BASEPOINT
- SPIRAL_ROTATION_AXIS_BASE_POINT_X_IN_WORK_PLANE
- SPIRAL_ROTATION_AXIS_BASE_POINT_Y_IN_WORK_PLANE
- SPIRAL_ROTATION_AXIS_BASE_POINT_Z_IN_WORK_PLANE
- SPIRAL_ROTATION_AXIS_UP_POINT_X
- SPIRAL_ROTATION_AXIS_UP_POINT_Y
- SPIRAL_ROTATION_AXIS_UP_POINT_Z
- SPIRAL_ROTATION_AXIS_UP_POINT_X_PROJECT
- SPIRAL_ROTATION_AXIS_UP_POINT_Y_PROJECT
- SPIRAL_ROTATION_AXIS_UP_POINT_Z_PROJECT
- SPIRAL_ROTATION_AXIS_UP_POINT_X_BASEPOINT
- SPIRAL_ROTATION_AXIS_UP_POINT_Y_BASEPOINT
- SPIRAL_ROTATION_AXIS_UP_POINT_Z_BASEPOINT
- SPIRAL_ROTATION_AXIS_UP_POINT_X_IN_WORK_PLANE
- SPIRAL_ROTATION_AXIS_UP_POINT_Y_IN_WORK_PLANE

- SPIRAL_ROTATION_AXIS_UP_POINT_Z_IN_WORK_PLANE

Shows the spiral beam center axis using 2 points. The rotation axis direction is calculated from those points.

17.20 SPIRAL_TOTAL_RISE

Shows the distance between the spiral beam start point and end point along the coordinate system z axis.

17.21 SPIRAL_TWIST_END

Shows the twist +/- angle of the spiral beam profile at the end of the part. The default is 0.00

17.22 SPIRAL_TWIST_START

Shows the twist +/- angle of the spiral beam profile at the start of the part. The default is 0.00

17.23 SUPPLEMENT_PART_WEIGHT

Shows the weight of supplementary parts. SUPPLEMENT_PART_WEIGHT = the weight of the whole assembly less the weight of the main part.

See also WEIGHT (page 165).

17.24 START_X_xxx, START_Y_xxx, START_Z_xxx

The template attributes START_X, START_Y, and START_Z show the coordinates of a part's start reference point (yellow handle).

To show the coordinates relative to the current base point, project base point, or work plane, use _BASEPOINT, _PROJECT, or _IN_WORK_PLANE at the end of the template attributes. For example:

- START_X_BASEPOINT shows the x coordinate of the part's start reference point relative to the current base point.
- START_Y_PROJECT shows the y coordinate of the part's start reference point relative to the project base point.
- START_Z_IN_WORK_PLANE shows the z coordinate of the part's start reference point relative to the current work plane.

See also

END_X_xxx, END_Y_xxx, END_Z_xxx (page 73)

17.25 STATICAL_MOMENT_Qf

Shows the statical moment of the flange.

See also

PROFILE (page 122)

17.26 STATICAL_MOMENT_Qw

Shows the statical moment of the web.

See also

PROFILE (page 122)

17.27 STIFFENER_DIMENSION

Shows the stiffener dimension of a profile.

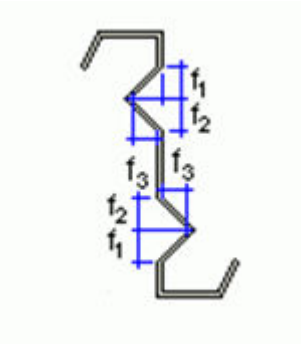
See also

STIFFENER_DIMENSION_1, STIFFENER_DIMENSION_2, STIFFENER_DIMENSION_3 (page 142)

PROFILE (page 122)

17.28 STIFFENER_DIMENSION_1, STIFFENER_DIMENSION_2, STIFFENER_DIMENSION_3

These template attributes show the stiffener dimensions of a profile. In the example below, f1 is `STIFFENER_DIMENSION_1`, f2 is `STIFFENER_DIMENSION_2`, and f3 is `STIFFENER_DIMENSION_3` in the parametric profile EZ.



See also

PROFILE (page 122)

17.29 STRAND_DEBONDED_STRANDS_1...5

Shows a list of debonded strands. Strand numbers are separated by spaces.

`STRAND_DEBONDED_STRANDS_1` corresponds to row 1 on the **Debonding** tab in the **Strand Pattern Properties** dialog, `STRAND_DEBONDED_STRANDS_2` to row 2, and so on.

17.30 STRAND_DEBOND_LEN_FROM_END_1...5

Shows the debonding length from the end of the strands.

`STRAND_DEBOND_LEN_FROM_END_1` corresponds to row 1 on the **Debonding** tab in the **Strand Pattern Properties** dialog, `STRAND_DEBOND_LEN_FROM_END_2` to row 2, and so on.

17.31 STRAND_DEBOND_LEN_FROM_START_1...5

Shows the debonding length from the start of the strands.

`STRAND_DEBOND_LEN_FROM_START_1` corresponds to row 1 on the **Debonding** tab in the **Strand Pattern Properties** dialog, `STRAND_DEBOND_LEN_FROM_START_2` to row 2, and so on.

17.32 STRAND_DEBOND_LEN_MIDDLE_TO_END_1...5

Shows the debonding length from the middle to the end of the strands.

`STRAND_DEBOND_LEN_MIDDLE_TO_END_1` corresponds to row 1 on the **Debonding** tab in the **Strand Pattern Properties** dialog, `STRAND_DEBOND_LEN_MIDDLE_TO_END_2` to row 2, and so on.

17.33 STRAND_DEBOND_LEN_MIDDLE_TO_START_1...5

Shows the debonding length from the middle to the start of the strands.

`STRAND_DEBOND_LEN_MIDDLE_TO_START_1` corresponds to row 1 on the **Debonding** tab in the **Strand Pattern Properties** dialog, `STRAND_DEBOND_LEN_MIDDLE_TO_START_2` to row 2, and so on.

17.34 STRAND_N_PATTERN

Shows the number of different cross-sections in a strand pattern.

17.35 STRAND_N_STRAND

Shows the number of strands.

17.36 STRAND_POS

Shows the position (prefix and running number) of a strand.

17.37 STRAND_PULL_FORCE

Shows the pull force of a strand.

17.38 STRAND_UNBONDED

Shows the sequence numbers of debonded strands, separated by spaces or commas.

17.39 SUB_ID

Shows the running index number of a reinforcing bar in a bar group.

Use with the `SINGLE_REBAR` content type.

See also

SUB_ID_WITH_LETTERS (page 145)

SUB_ID_LAST (page 145)

SUB_ID_WITH_LETTERS_LAST (page 146)

17.40 SUB_ID_LAST

Shows the running index number of the last reinforcing bar in a bar group.

Use with the `REBAR` and `SINGLE_REBAR` content types.

See also

SUB_ID_WITH_LETTERS_LAST (page 146)

SUB_ID (page 145)

SUB_ID_WITH_LETTERS (page 145)

17.41 SUB_ID_WITH_LETTERS

Shows the running index number of a reinforcing bar in a rebar set bar group using letters.

Use with the `SINGLE_REBAR` content type.

See also

SUB_ID (page 145)

SUB_ID_WITH_LETTERS_LAST (page 146)

SUB_ID_LAST (page 145)

17.42 SUB_ID_WITH_LETTERS_LAST

Shows the running index number of the last reinforcing bar in a rebar set bar group using letters.

Use with the `REBAR` and `SINGLE_REBAR` content types.

See also

SUB_ID_LAST (page 145)

SUB_ID_WITH_LETTERS (page 145)

SUB_ID (page 145)

17.43 SUBTYPE

This template attribute shows the subtype of a profile. The subtype options vary depending on the profile. For example, for fixed steel profiles, the subtype could be cold rolled, hot rolled, or welded.

For parametric profiles, the subtype usually lists the profile parameters (or property symbols) in a formula-like format, for example, s*h-b*h2*h1 for RCX concrete ledger profiles.

See also

PROFILE (page 122)

17.44 SURFACING_NAME

Shows the name of a surface treatment, for example, Tile surface 1.

Surface treatment codes and names are defined in the `product_finishes.dat` file.

See also

CODE (page 49)

18 Template attributes - T

18.1 TANGENT_OF_PRINCIPAL_AXIS_ANGLE

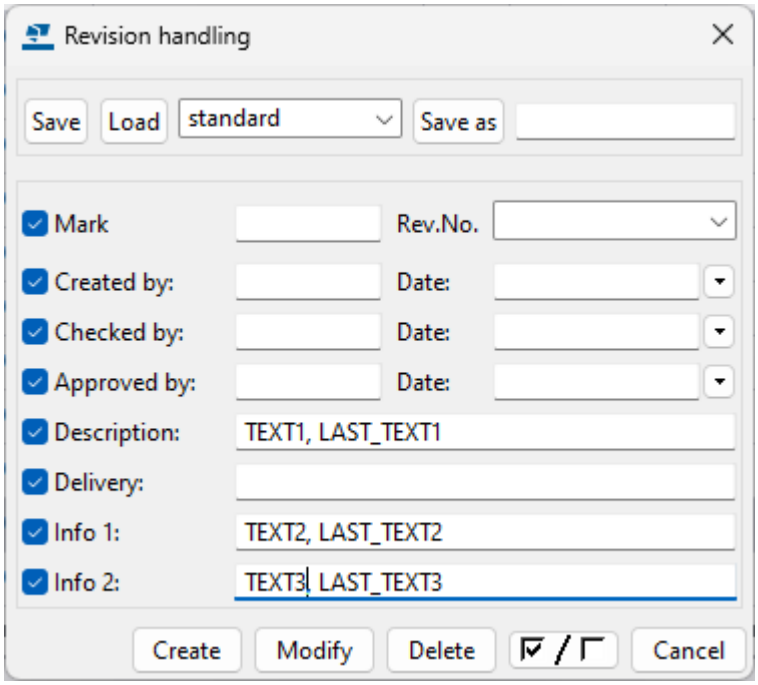
Shows the tangent of principal axis angle (analysis property) of a profile.

See also

PROFILE (page 122)

18.2 TEXT1, TEXT2, TEXT3

In drawing templates, these attributes show the contents of the **Description**, **Info 1**, and **Info 2** boxes in the **Revision handling** dialog for the drawing revision. In `REVISION` lists they also show the revision history.



You can also use these attributes as print file name switches. For example, to add the contents of the **Info 1** field in the drawing print file name, add

`%TPL:REVISION.TEXT2%`

as the value for the advanced option XS_DRAWING_PLOT_FILE_NAME_A, XS_DRAWING_PLOT_FILE_NAME_W, XS_DRAWING_PLOT_FILE_NAME_G, XS_DRAWING_PLOT_FILE_NAME_M, or XS_DRAWING_PLOT_FILE_NAME_C.

18.3 THERMAL_DILATATION

Shows the thermal dilatation coefficient of material.

18.4 THICKNESS

Shows the thickness of a tile in a tile pattern.

18.5 THREAD_IN_MATERIAL

Shows 1 if the thread of the screw can be inside the material to be connected and 0 if not.

18.6 TILE_NUMBER

Shows the number of tiles used in surface treatment (approximate value).

18.7 TILE_VOLUME

Shows the volume of tiles used in surface treatment, without the mortar volume. See also MORTAR_VOLUME (page 108).

18.8 TIME

Shows the current time (hh:mm:ss).

18.9 TITLE

This attribute shows the drawing name defined in the drawing properties. This attribute can also be used for parts and assemblies. For example, you could create a report of assemblies listing which assembly drawings have been created.

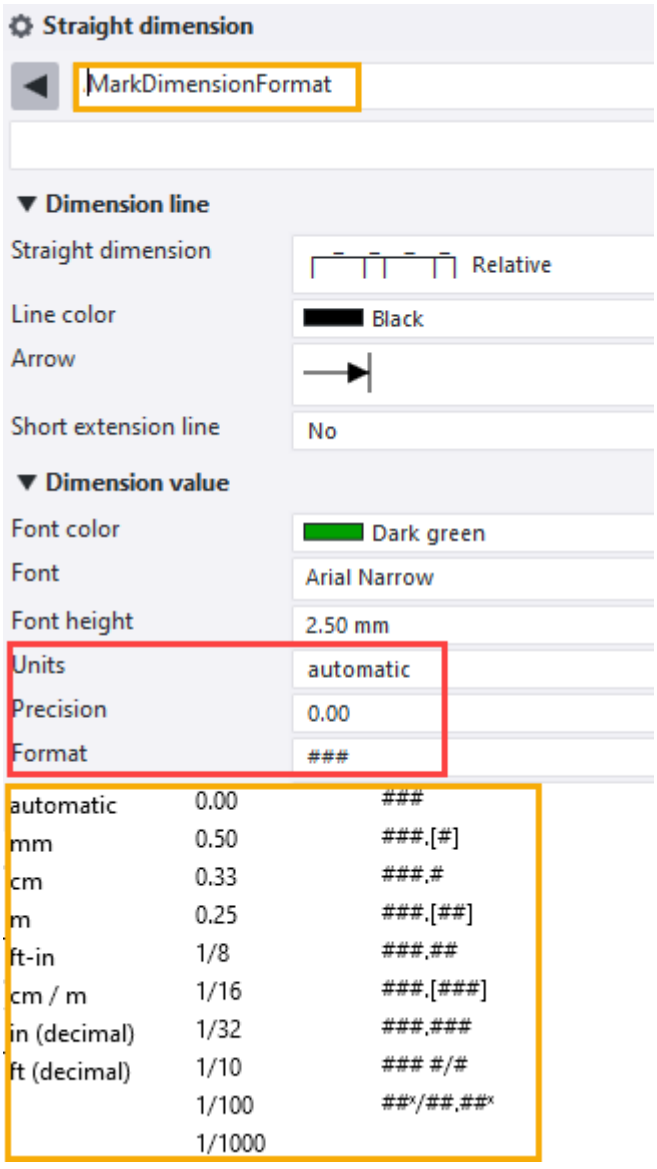
18.10 TITLE1, TITLE2, TITLE3

In reports, this template attribute shows the user-defined titles entered in the **Reports** dialog. In drawing templates, this field shows the drawing titles entered in the drawing properties.

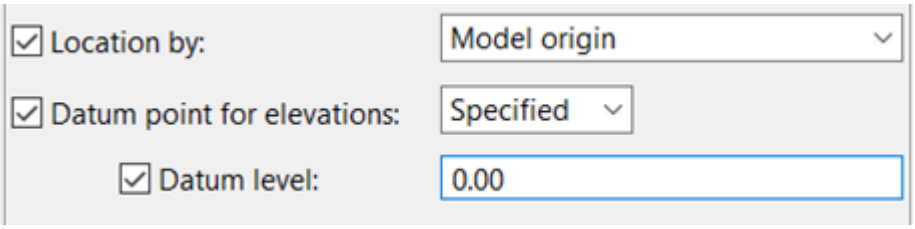
18.11 TOP_LEVEL

This attribute shows the top level of a single part, cast unit, assembly, part of a connection, or a pour object.

Top level takes the unit and accuracy from `MarkDimensionFormat.dim` dimension property file. You can modify the settings saved in `MarkDimensionFormat.dim` in the dimension property pane in an open drawing.



The datum level only affects the `TOP_LEVEL` attribute when **Location by** is set to **Model origin** or to the project base point that is in the model origin.



You can use this attribute as a user-defined attribute also in part marks and associative notes.

NOTE This attribute returns the value as text, so you cannot use formulae with this attribute. Use TOP_LEVEL_UNFORMATTED (page 152) instead.

18.12 TOP_LEVEL_GLOBAL

This attribute returns the top level of a single part, cast unit, assembly, part of a connection, or a pour object. This attribute gives level information by the global axis. `TOP_LEVEL_GLOBAL` takes the unit and accuracy from the `MarkDimensionFormat.dim` dimension property file. You can modify the settings saved in `MarkDimensionFormat.dim` in the dimension property pane in an open drawing.

You can use this attribute as a user-defined attribute in part marks and associative notes, and also in reports and templates.

18.13 TOP_LEVEL_GLOBAL_UNFORMATTED

This attribute shows the top level of a single part, cast unit, assembly, part of a connection, or a pour object. `TOP_LEVEL_GLOBAL_UNFORMATTED` returns the top levels as a length in mm so you can format them and include them into formulas in templates. This attribute gives level information by the global axis.

You can use this attribute as a user-defined attribute also in part marks and associative notes.

18.14 TOP_LEVEL_UNFORMATTED

This attribute shows the top level of a single part, cast unit, assembly, part of a connection or a pour object. `TOP_LEVEL_UNFORMATTED` returns the top levels

as a length in mm so you can format them and include them into formulas in templates.

The datum level only affects the attribute `TOP_LEVEL_UNFORMATTED` when **Location by** is set to **Model origin** or to the project base point that is in model origin.

You can use this attribute as a user-defined attribute also in part marks and associative notes.

NOTE Unlike the `TOP_LEVEL` attribute, the `TOP_LEVEL_UNFORMATTED` attribute cannot be formatted through the `MarkDimensionFormat.dim` file.

18.15 TORSIONAL_CONSTANT

Shows the torsional constant (analysis property) of a profile.

See also

PROFILE (page 122)

18.16 TOWN

Shows the city entered in the **Project properties** in **File** --> **Project properties**.

18.17 TYPE

Shows the object type or standard:

Content type	Description
ANALYSIS_RIGID_LINK	Shows whether the analysis rigid link was created automatically (`auto`), or added manually by a user (`user`).
BOLT	Shows the bolt standard as it appears in the **Bolt assembly catalog** dialog (for example, 7968).
DRAWING	Shows the drawing type: A, W, C, G or M.
MESH	Shows the mesh type: Rectangle, Polygon, or Bent.

Content type	Description
NUT	Shows the nut standard.
SURFACE	Shows the surface type: Formwork or Concrete finish.
SURFACING	Shows the surface treatment type: Concrete finish, Special mix, Tile surface, or Steel finish.
WASHER	Shows the washer standard.

For all other objects the field is blank.

18.18 TYPE1

For bolts, shows the bolt standard and the standard of each possible washer or nut as they appear in the **Bolt assembly catalog** dialog (for example, `7968/2041/2041/2041/2067/2067`). For objects other than bolts, the field is blank.

See also

TYPE2 (page 154)

TYPE3 (page 154)

TYPE4 (page 155)

18.19 TYPE2

For bolts, shows `1` for existing and `0` for non-existing washers and nuts (for example, `10011`). For objects other than bolts, the field is blank.

See also

TYPE1 (page 154)

TYPE3 (page 154)

TYPE4 (page 155)

18.20 TYPE3

The same as `TYPE2`, but shows `X` for existing and `o` for non-existing washers and nuts (for example, `XooXX`). For objects other than bolts, the field is blank.

See also

TYPE1 (page 154)

TYPE2 (page 154)

TYPE4 (page 155)

18.21 TYPE4

The same as `TYPE1`, but only shows the standard of the existing bolt elements. For objects other than bolts, the field is blank.

See also

TYPE1 (page 154)

TYPE2 (page 154)

TYPE3 (page 154)

19 Template attributes - U

19.1 USAGE

Shows if a reinforcing bar is a main bar, or a tie or stirrup. The attribute returns `Main bar` for main bars, and `Tie or stirrup` for ties and stirrups. If the type of use cannot be defined, the attribute returns a blank value.

See also

USAGE_VALUE (page 156)

19.2 USAGE_VALUE

Shows if a reinforcing bar is a main bar, or a tie or stirrup. The attribute returns `1` for main bars, and `2` for ties and stirrups. If the type of use cannot be defined, the attribute returns `0`.

See also

USAGE (page 156)

19.3 USERDEFINED.REBARSET_GROUP_GUID

Shows the globally unique identifier of a bar group in a rebar set.

Use with the `REBAR` or `SINGLE REBAR` content type, and with or without the `USERDEFINED.` prefix.

See also

USERDEFINED.REBARSET_GUID (page 157)

19.4 USERDEFINED.REBARSET_GUID

Shows the globally unique identifier of a rebar set.

Use with the `REBAR` or `SINGLE REBAR` content type, and with or without the `USERDEFINED.` prefix.

See also

USERDEFINED.REBARSET_GROUP_GUID (page 156)

19.5 USER_FIELD_1 ... _8

Shows the value of the user-defined attribute **User field 1**, **User field 2** etc.

19.6 USER_PHASE

Shows the value entered in the **User Phase** box in the user-defined attributes of the part.

20 Template attributes - V

20.1 VOLUME

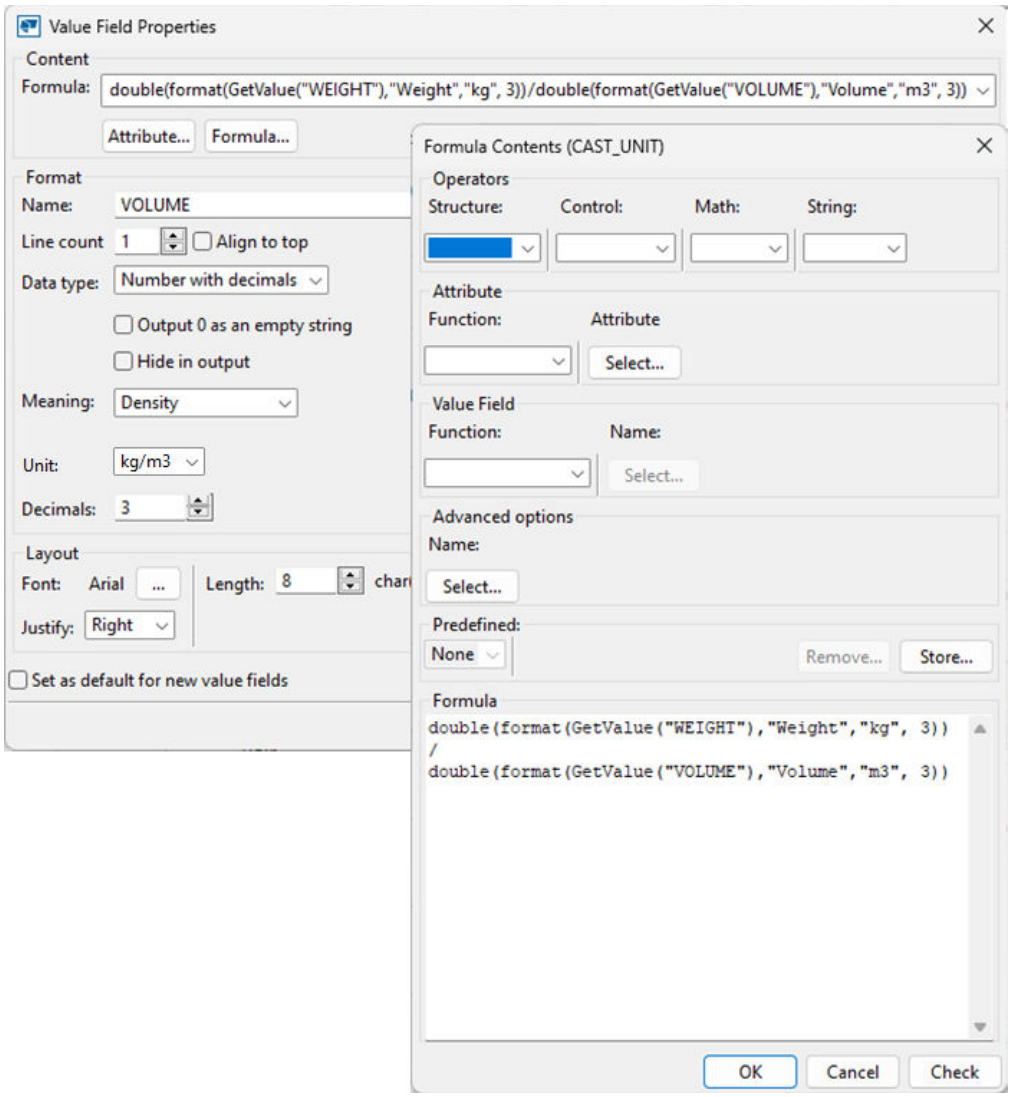
This template attribute shows the object volume, for example, the volume of an assembly or of a cast unit. This attribute takes holes and cuts into account.

TIP This attribute returns the value in cubic millimeters by default. You can easily change the unit in Template Editor's**Value Field Properties** if you are simply using the GetValue function in a formula to get the volume. However, if you are using this attribute in a formula containing arithmetic operations, you have to format the weight and volume units by using the format and double functions together. This is because cubic millimeters are also used in calculations by default.

You can change the final unit in **Value Field Properties** if required.

Here is an example how the density can be calculated in kg per cubic meters:

```
double(format(GetValue("WEIGHT"),"Weight","kg", 3))
/
double(format(GetValue("VOLUME"),"Volume","m3", 3))
```



See also

VOLUME_GROSS (page 159)

VOLUME_NET (page 160)

VOLUME_NET_ONLY_CONCRETE_PARTS (page 161)

VOLUME_ONLY_CONCRETE_PARTS (page 161)

VOLUME_ONLY_POUR_OBJECT (page 162)

20.2 VOLUME_GROSS

This attribute shows the object gross volume. It does not take into account holes and cuts.

TIP This attribute returns the value in cubic millimeters by default. You can easily change the unit in Template Editor's**Value Field Properties** if you are simply using the GetValue function in a formula to get the volume. However, if you are using this attribute in a formula containing arithmetic operations, you have to format the weight and volume units by using the format and double functions together. This is because cubic millimeters are also used in calculations by default.

You can change the final unit in **Value Field Properties** if required.

Here is an example how the density can be calculated in kg per cubic meters:

double(format(GetValue("WEIGHT"),"Weight","kg", 3))

/

double(format(GetValue("VOLUME_GROSS"),"Volume","m3", 3))

See also

VOLUME (page 158)

VOLUME_NET (page 160)

VOLUME_NET_ONLY_CONCRETE_PARTS (page 161)

VOLUME_ONLY_CONCRETE_PARTS (page 161)

VOLUME_ONLY_POUR_OBJECT (page 162)

20.3 VOLUME_NET

This attribute shows the object volume taking into account holes and cuts.

TIP This attribute returns the value in cubic millimeters by default. You can easily change the unit in Template Editor's**Value Field Properties** if you are simply using the GetValue function in a formula to get the volume. However, if you are using this attribute in a formula containing arithmetic operations, you have to format the weight and volume units by using the format and double functions together. This is because cubic millimeters are also used in calculations by default.

You can change the final unit in **Value Field Properties** if required.

Here is an example how the density can be calculated in kg per cubic meters:

double(format(GetValue("WEIGHT"),"Weight","kg", 3))

/

double(format(GetValue("VOLUME_NET"),"Volume","m3", 3))

See also

VOLUME (page 158)

VOLUME_GROSS (page 159)

VOLUME_NET_ONLY_CONCRETE_PARTS (page 161)

VOLUME_ONLY_CONCRETE_PARTS (page 161)

VOLUME_ONLY_POUR_OBJECT (page 162)

20.4 VOLUME_NET_ONLY_CONCRETE_PARTS

This attribute shows the volume by the solid of concrete parts in the cast unit. If a part uses a profile where cross section area is defined manually, it is ignored in calculation (cf. VOLUME_ONLY_CONCRETE_PARTS (page 161)).

TIP This attribute returns the value in cubic millimeters by default. You can easily change the unit in Template Editor's**Value Field Properties** if you are simply using the GetValue function in a formula to get the volume. However, if you are using this attribute in a formula containing arithmetic operations, you have to format the weight and volume units by using the format and double functions together. This is because cubic millimeters are also used in calculations by default.

You can change the final unit in **Value Field Properties** if required.

Here is an example how the density can be calculated in kg per cubic meters:

double(format(GetValue("WEIGHT"),"Weight","kg", 3))

/

double(format(GetValue("VOLUME_NET_ONLY_CONCRETE_PARTS"),"Volume","m3", 3))

See also

VOLUME (page 158)

VOLUME_NET (page 160)

VOLUME_GROSS (page 159)

VOLUME_ONLY_CONCRETE_PARTS (page 161)

VOLUME_ONLY_POUR_OBJECT (page 162)

20.5 VOLUME_ONLY_CONCRETE_PARTS

This attribute gets cast unit volume values only for concrete parts. Reinforcing bars or embeds are not taken into account.

TIP This attribute returns the value in cubic millimeters by default. You can easily change the unit in Template Editor's**Value Field Properties** if you are simply using the GetValue function in a formula to get the volume. However, if you are using this attribute in a formula containing arithmetic operations, you have to format the weight and volume units by using the format and double functions together. This is because cubic millimeters are also used in calculations by default.

You can change the final unit in **Value Field Properties** if required.

Here is an example how the density can be calculated in kg per cubic meters:

double(format(GetValue("WEIGHT"),"Weight","kg", 3))

/

double(format(GetValue("VOLUME_ONLY_CONCRETE_PARTS"),"Volume","m3", 3))

See also

VOLUME (page 158)

VOLUME_NET (page 160)

VOLUME_GROSS (page 159)

VOLUME_NET_ONLY_CONCRETE_PARTS (page 161)

VOLUME_ONLY_POUR_OBJECT (page 162)

20.6 VOLUME_ONLY_POUR_OBJECT

This attribute shows the volume of the concrete (=pour object) in a pour unit. This attribute takes holes and cuts into account.

TIP This attribute returns the value in cubic millimeters by default. You can easily change the unit in Template Editor's**Value Field Properties** if you are simply using the GetValue function in a formula to get the volume. However, if you are using this attribute in a formula containing arithmetic operations, you have to format the weight and volume units

by using the format and double functions together. This is because cubic millimeters are also used in calculations by default.

You can change the final unit in **Value Field Properties** if required.

Here is an example how the density can be calculated in kg per cubic meters:

double(format(GetValue("WEIGHT"),"Weight","kg", 3))

/

double(format(GetValue("VOLUME_ONLY_POUR_OBJECT"),"Volume","m3" , 3))

See also

VOLUME (page 158)

VOLUME_NET (page 160)

VOLUME_GROSS (page 159)

VOLUME_ONLY_CONCRETE_PARTS (page 161)

VOLUME_NET_ONLY_CONCRETE_PARTS (page 161)

WEIGHT_ONLY_POUR_OBJECT (page 168)

21 Template attributes - W

21.1 WARPING_CONSTANT

Shows the warping constant (analysis property) of a profile.

See also

PROFILE (page 122)

21.2 WARPING_STATICAL_MOMENT

Shows the warping statical moment (analysis property) of a profile.

See also

PROFILE (page 122)

21.3 WEB_HEIGHT

See WEB_WIDTH (page 165).

21.4 WEB_LENGTH

The gross length of the web of an I profile. Use to show welded profiles as plates.

21.5 WEB_THICKNESS

The thickness of the web of an I profile. Use to show welded profiles as plates.

See also

PROFILE (page 122)

21.6 WEB_THICKNESS_1, WEB_THICKNESS_2

The additional thickness values of the web of a profile.

See also

PROFILE (page 122)

21.7 WEB_WIDTH

The width of the web of an I profile. Use to show welded profiles as plates.

21.8 WEIGHT

Shows the weight of the object.

The calculation formula depends on the object type:

- For parts with cross-sections defined in the profile catalog, the weight is calculated from the cross section area in the profile catalog (on the list of **Properties** on the **Analysis** tab), length (`LENGTH`) and density of material (property weight for profiles in the material catalog). The result is the same as calculating `WEIGHT_GROSS`.
- For other profiles with no cross sections defined (typically parametric profiles), shows the net weight calculated using the profile volume and density of material. Fittings, cuts, weld preparations, and part adds affect volume calculation.
- For parts with surface treatment, shows both the weight of the part and the surface treatment.
- For assemblies, shows the sum of the part weights for each assembly.
- For reinforcement, shows the weight of one bar in the group. `WEIGHT_TOTAL` shows the weight of all bars in the group.
- For rebar assemblies, shows the sum of all objects' weights for each rebar assembly.

- For surface treatment, shows the weight of the surface treatment.
- For bolts, shows the weight of the bolt element in the corresponding content type rows:
  - `BOLT`: shows the weight of the bolt.
  - `NUT`: shows the weight of the nut.
  - `WASHER`: shows the weight of the washer.

21.9 WEIGHT_GROSS

Shows the gross weight, which is the total weight of material needed to fabricate the part. The calculation formula depends on the part:

- If the part has cross-sections defined in the profile catalog, the weight is calculated from part length (`LENGTH`), the cross section area in the profile catalog, and the density of material.
- If the part is a folded or contour plate without a cross section area, the weight is calculated from plate overall height, overall length and density of material (property weight for plates in the material catalog).
- For other profiles without cross sections (typically parametric profiles), the gross weight is calculated the same way as the `WEIGHT_NET`, but cuts are not taken into account and the plate density value is used instead of profile density.
- For assemblies, shows the combined gross weight of parts included in an assembly. For bolts it shows the bolt weight.

21.10 WEIGHT_M

Shows the property weight of a profile (defined in the material catalog). For parametric profiles, shows the weight of the profile divided by the length. For standard profiles, shows the **Weight per unit length** from the **Analysis** properties in the profile catalog.

21.11 WEIGHT_MAX

Shows the maximum weight of a single reinforcing bar or strand in a reinforcing bar group.

21.12 WEIGHT_MIN

Shows the minimum weight of a single reinforcing bar or strand in a reinforcing bar group.

21.13 WEIGHT_NET

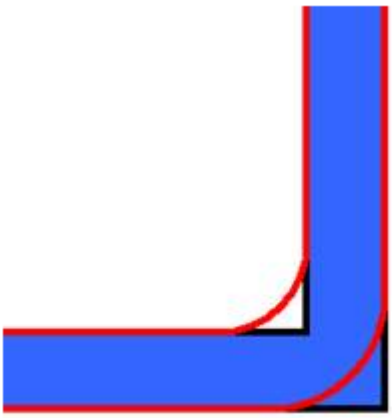
Shows the weight of the fabricated part, assembly or cast unit. The calculation formula depends on the object:

- For parts, returns the net weight, which is the actual weight of the fabricated part. Rounding of the profile corners are not taken into account.
- For bolts, returns the bolt weight, and for other objects a zero.
- For assemblies, returns the sum of part weights.

The calculation is based on part volume and density of material. The density value used in the calculation depends on the profile cross-sections:

- If cross-sections are defined in the profile catalog, density is the value of **Property: Profile Density** in the material catalog.
- If there are no cross-sections, density is the value of **Property: Plate Density** in the material catalog.

NOTE For parts, the net weight is **not** the actual weight of the fabricated parts. The profile cross section is calculated using straight angles, so the roundings in the corners are not taken into account (unless you are using the advanced option `XS_SOLID_USE_HIGHER_ACCURACY`). This causes significant difference between the calculated and the actual weight especially when big cross sections are used.



21.14 WEIGHT_NET_ONLY_CONCRETE_PARTS

Shows the net weight of a cast unit. It calculates the weight by the solid of the concrete parts in the cast unit. If a part uses a profile where cross section area is defined manually, it is ignored in calculation (cf. WEIGHT_ONLY_CONCRETE_PARTS (page 168)).

21.15 WEIGHT_ONLY_CONCRETE_PARTS

This attribute gets the cast unit gross weight for concrete parts only.

See also WEIGHT_NET_ONLY_CONCRETE_PARTS (page 167).

21.16 WEIGHT_ONLY_POUR_OBJECT

Shows the weight of the concrete (=pour object) in a pour unit. Takes holes and cuts into account. Reinforcing bars or embeds are not taken into account.

Pour object weight is calculated according to the pour object solid and the density of the material.

See also

VOLUME_ONLY_POUR_OBJECT (page 162)

21.17 WEIGHT_ONLY_REBARS

Shows the weight of all reinforcement in a pour unit, including reinforcing bars, meshes, and strands. Does not include the weight of reinforcement belonging to precast cast units inside the pour unit.

See also

WEIGHT_ONLY_POUR_OBJECT (page 168)

21.18 WEIGHT_PER_UNIT_LENGTH

Shows the weight per unit length (analysis property) of a profile.

See also

PROFILE (page 122)

21.19 WEIGHT_TOTAL

Shows the total weight of all reinforcing bars or of all strands in a reinforcing bar group. This template attribute is available in content type `REBAR` in graphical and textual templates.

21.20 WEIGHT_TOTAL_IN_GROUP

Shows the total weight of the reinforcing bars in a bar group.

Use with the row content type `SINGLE_REBAR` as follows:

```
REBAR.WEIGHT_TOTAL_IN_GROUP
```

See also

NUMBER_OF_BARS_IN_GROUP (page 112)

21.21 WELD_ACTUAL_LENGTH1, WELD_ACTUAL_LENGTH2

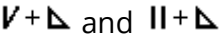
Shows the actual weld length in the model, or the sum of actual weld lengths, for welds above and below line.

The actual weld length is the distance between the weld seam start point and end point along the weld seam.

See also

WELD_LENGTH1, WELD_LENGTH2 (page 173)

21.22 WELD_ADDITIONAL_SIZE1, WELD_ADDITIONAL_SIZE2

Use these attributes to show the additional weld size. The additional weld size can be set for compound weld types  and  . `WELD_ADDITIONAL_SIZE1` shows the additional size value for the welds above line, and `WELD_ADDITIONAL_SIZE2` for the welds below line.

These attributes can be used in report templates.

21.23 WELD_ANGLE1, WELD_ANGLE2

Shows weld angle for welds above and below line.

21.24 WELD_ASSEMBLYTYPE

Shows the assembly type of a weld (Site or Workshop). Only use in welding lists.

21.25 WELD_DEFAULT

Shows the default weld size according to the drawing attributes. Only use in drawing tables.

21.26 WELD_CROSSSECTION_AREA1, WELD_CROSSSECTION_AREA2

Shows the theoretical cross section area for supported solid weld objects above and below line. For unsupported weld types, shows 0.00.

21.27 WELD_EDGE_AROUND

Returns the value selected in the **Edge/Around** list in the **Weld** properties: **Edge** if only one edge of a face is welded and **Around** if the entire perimeter is welded.

21.28 WELD_EFFECTIVE_THROAT, WELD_EFFECTIVE_THROAT2

Use these attributes to show the weld effective throat.
`WELD_EFFECTIVE_THROAT` shows the value for the welds above line, and `WELD_EFFECTIVE_THROAT2` for the welds below line.

21.29 WELD_ELECTRODE_CLASSIFICATION

Shows the weld electrode classification, selected in the **Electrode classification** list in the **Weld** properties.

21.30 WELD_ELECTRODE_COEFFICIENT

Shows the value entered in the **Electrode coefficient** box in the **Weld** properties.

21.31 WELD_ELECTRODE_STRENGTH

Shows the value entered in the **Electrode strength** box in the **Weld** properties.

21.32 WELD_ERRORLIST

This attribute shows error codes for a weld if there are issues related to the weld.

The error codes are:

Error code	Description
E1	Weld is not in the correct location.
E2	Welded parts are not touching each other.
E3	Weld is not on the edge of a part.
E4	Weld has a cross section type that is not supported.
E5	Weld properties are incorrect.
E6	There are issues related to the weld preparation of parts.
E7	Weld seams are far apart from each other.

21.33 WELD_FATHER_CODE

Shows the connection running number of the connection where the weld is located. The field is blank if the weld is not next to a connection. Use only in welding lists.

21.34 WELD_FATHER_NUMBER

Shows the connection number of the connection where the weld is located. The field is blank if the weld is not next to a connection. Use only in welding lists.

21.35 WELD_FILLTYPE1, WELD_FILLTYPE2

Shows the weld contour (None, Flush, Convex, Concave) for welds above and below line.

21.36 WELD_FINISH1, WELD_FINISH2

Shows the weld finish for welds above and below line.

21.37 WELD_INCREMENT_AMOUNT1, WELD_INCREMENT_AMOUNT2

Shows the amount of increments for intermittent welds above and below line.

21.38 WELD_INTERMITTENT_TYPE

Shows the shape of a weld (Continuous, Chain intermittent, or Staggered intermittent).

21.39 WELD_LENGTH1, WELD_LENGTH2

These attributes show the weld length values entered in the **Length** boxes in the weld properties. `WELD_LENGTH1` shows the length of the weld above the line and `WELD_LENGTH2` below the line.

See also

WELD_ACTUAL_LENGTH1, WELD_ACTUAL_LENGTH2 (page 169)

21.40 WELD_NDT_INSPECTION

Shows the non-destructive testing and inspection level of a weld, selected in the **NDT inspection** list in the **Weld** properties.

21.41 WELD_NUMBER

Shows the weld number.

21.42 WELD_PERIOD1, WELD_PERIOD2

These attributes show the value entered in the **Pitch** box in the weld properties. `WELD_PERIOD1` shows the value for the welds above line, and `WELD_PERIOD2` for the welds below line.

21.43 WELD_POSITION

Shows the weld position, selected in the **Position** list in the **Weld** properties.

21.44 WELD_POSITION_X

Shows the position of the weld in the x axis.

21.45 WELD_POSITION_Y

Shows the position of the weld in the y axis.

21.46 WELD_POSITION_Z

Shows the position of the weld in the z axis.

21.47 WELD_PROCESS_TYPE

Shows the welding process type of a weld, selected in the **Process type** list in the **Weld** properties.

21.48 WELD_ROOT_FACE_THICKNESS, WELD_ROOT_FACE_THICKNESS2

Shows the root face thickness of a weld above or below line and is used only in welding lists.

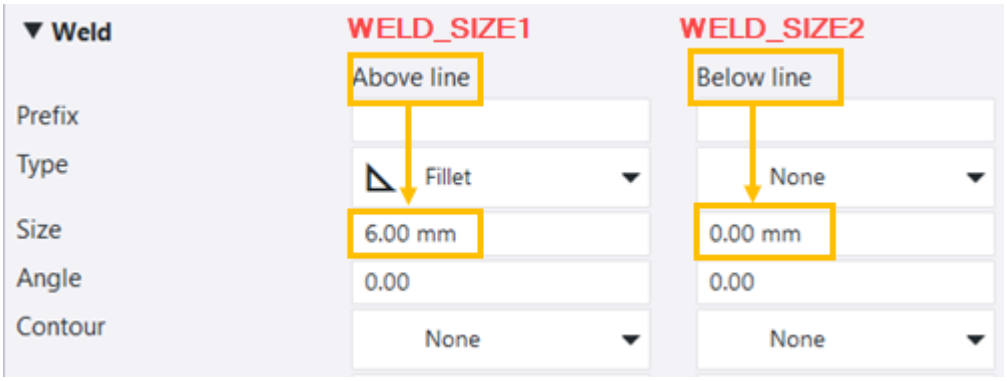
21.49 WELD_ROOT_OPENING, WELD_ROOT_OPENING2

Shows the root opening (space between the welded parts) for welds above and below line.

21.50 WELD_SIZE1, WELD_SIZE2

Shows weld size for welds above and below line.

WELD_SIZE1 takes the size value from the **Size** box under **Above line** and WELD_SIZE2 takes the size value from the **Size** box under **Below line**.



21.51 WELD_SIZE_PREFIX_ABOVE

Shows the weld size prefix, entered in the **Prefix** box in the **Above line** section in the **Weld** properties.

21.52 WELD_SIZE_PREFIX_BELOW

Shows the weld size prefix, entered in the **Prefix** box in the **Below line** section in the **Weld** properties.

21.53 WELD_TEXT

Shows the reference text of a weld.

The maximum number of characters that can be shown is 80, including one character for each line of text. To show long reference texts in reports, also adjust the template field length accordingly.

21.54 WELD_TYPE1, WELD_TYPE2

This attribute shows the weld type for above and below line.

WELD_TYPE1 is taken from the **Type** box under **Above line** and WELD_TYPE2 is taken from the **Type** box under **Below line**.

21.55 WELD_VOLUME

This attribute shows the volume of a solid weld object. If the solid weld object fails, the attribute shows 0.00. The attribute shows 0.00 also for unsupported weld types.

You can use this template attribute also to calculate weld weight, see the article How to show weld weight on templates and reports for more information.

21.56 WIDTH

The width of a part or assembly.

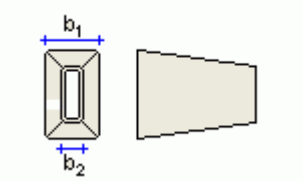
For drawings, shows the width of the drawing.

See also

PROFILE (page 122)

21.57 WIDTH_1, WIDTH_2

These template attributes show special width values of some profiles. Below is an example of a parametric profile rectangular hollow section with subtype h1*b1-h2*b2*t, where b1 is `WIDTH_1` and b2 is `WIDTH_2`.



See also

PROFILE (page 122)

22 Template attributes - X

22.1 xs_shorten

Shows the value entered in the **Shorten** box on the **Parameters** tab in the user-defined attributes dialog of the part.

23 Disclaimer

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