FP HUB

CAD User Guide

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1   General information

1.1   Preface

In order to describe the process-related components in the FP Hub environment, it has become necessary to supplement the "CAD Guide in Factory Planning" with the CAD User Manual. The areas described here are:
- Plant and business area-specific process-related work instructions
- Instruction manuals for the software provided by the FP Hub.

1.2   Differentiation between the CAD Guide and the CAD User Manual

The CAD guide contains all global and binding basics for the execution of FP Hub CAD-supported factory planning.

The user manual contains the local plant-specific working methods that have been taken from the guide.

1.3   CAD guide in Daimler Truck Business ID

You can find the CAD guide and all relevant documents on the Daimler Truck Supplier Portal:
https://supplier.daimlertruck.com/en/collaboration/factory-planning

1.4   Contacts

If you have any questions about the CAD manual, please contact our FP Hub Careline.

You can find the contact details of the FP Hub-Careline on the Internet:
https://supplier.daimlertruck.com/en/collaboration/factory-planning/contact

2 FP Hub fundamentals

2.1 3 Worlds Model

All documents are assigned to a working envoironment, project environment or existing environment.

Workingf environment

In the environment of work, CAD documents are processed. Here, the planner can create various working documents (AW) without using an invalid or outdated planning status as a basis for further planning. The environment of work is comparable to the planner's desk.

Project environment

Documents in the project environment are called project documents (PW). These are created by publishing working documents. The process is documented in the system (time, assignee, source document). In the project environment, therefore, there are only official and documented planning statuses.

As-built Environment

Documents in the as-built environment are called as-built documents (BW). These are created by publishing working or project documents. The process is documented in the system (time, assignee, source document). Thus, there are only official and documented stands in the as-built environment.

The existing environment corresponds to a revised image of the conditions on site.

2.2 Publishing in the FP Hub

Publishing in FP Hub (Release) is used to make the AW documents visible in the project environment or the as-built environment for the other project participants. It is **not a** planning approval with legal relevance in the sense of an assumption of liability or planning approval by an examining authority.
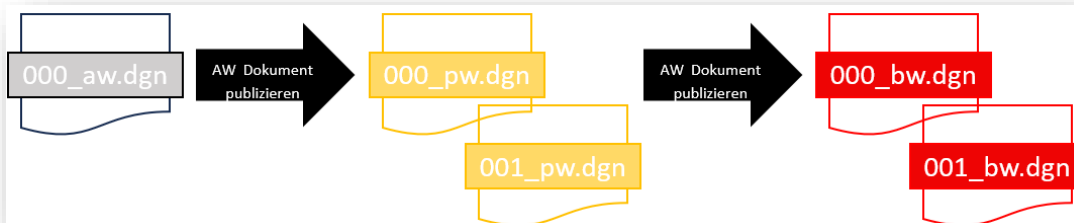
Illustration 1: 3-Environments Model

2.3 FP Hub Data Management with ELO

FP Hub uses customized ELO software for data management for location-based CAD data.

Access to the system can be found via the Daimler Truck Supplier Portal. There you can access various applications **after logging** in, including FP Hub:
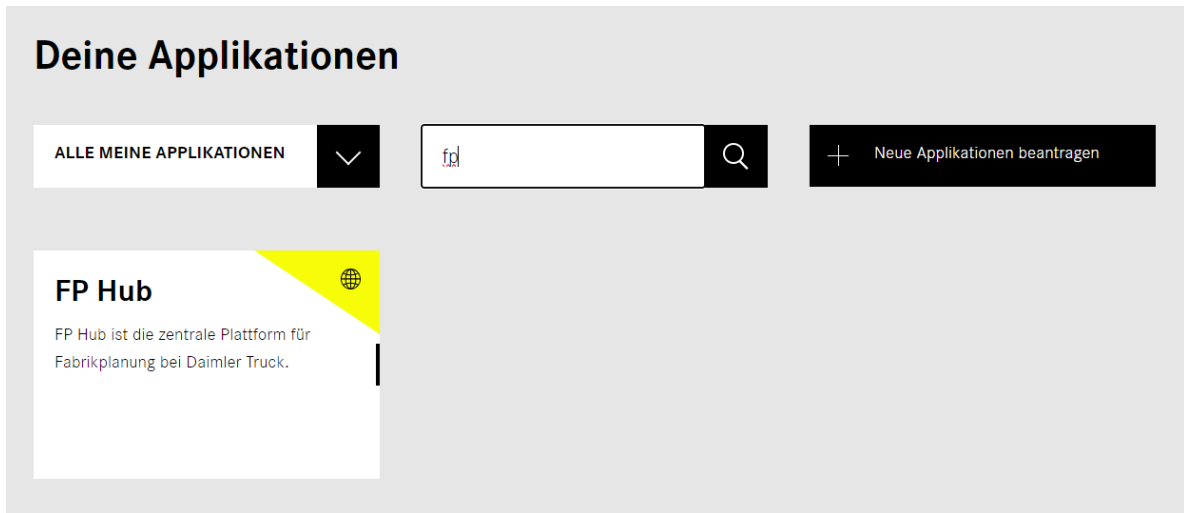
Illustration 2: FP Hub application in the Daimler Truck Supplier Portal

The application can also be accessed directly via the following link:
https://fp-hub.daimlertruck.com

Within FP Hub (ELO), planning sets are organized in the following predefined structure:
- Location structure (plant, plant section, building, ...)
- Project
- Subject Area/Discipline/Applications

Documents are structured in planning sets:
- Planning sets have a description
- Planning sets contain the DGN documents
- The DGN documents have versioning, history and index
- The DGN documents are subject to the workflow via the three environments (AW, PW, BW)
- DGN documents are exchanged with external planning partners.

2.4 Location Structure

The FP Hub location structure is divided into 6 "levels":

Level 1	Plant	Factory code, e.g. 034 060, 069, etc.
Level 2	Plant section	"geographically contiguous area"
Level 3	Building	Building number of the main building
Level 4	Sub-building	Numbering of building parts, peripheral buildings, etc.
Level 5	Storey	Floors within the building
Level 6	Level	Level surface as altitude indication

Denotes changes

2.5   Versioning, history and change index

Within the individual environments, versioning of the documents is possible.
The individual versions are distinguished by a change index.
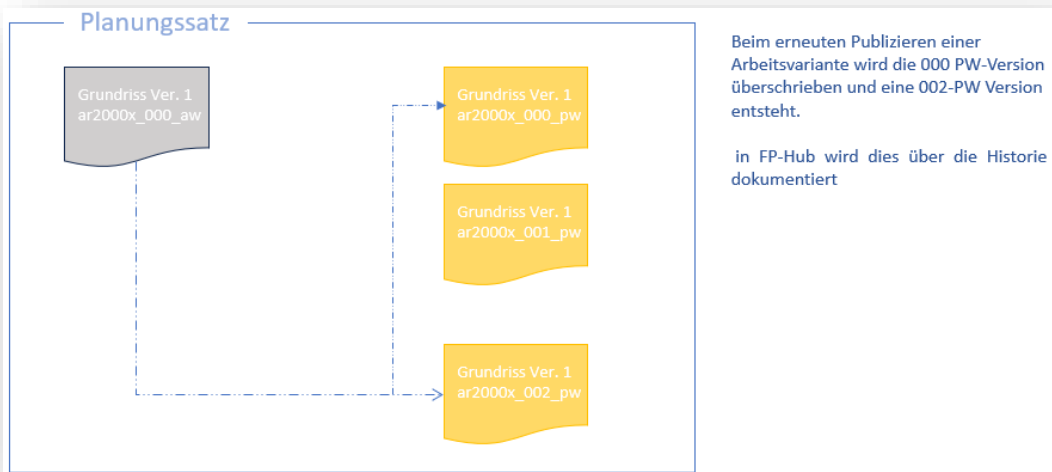
Illustration 3: Versioning in the FP Hub (ELO)

The PW and BW documents with the change index 000 are always the currently valid versions that are used as the base for planning. The documents with a change index greater than 000 are the documents published so far. The highest change index is always identical to the change index 000. The versioning of the PW and BW documents thus creates a history in addition to the current statuses.

2.6   Workflow based on an example

In a planning set, an AW document (*_000_AW_*) is created and released.

- Publishing the AW document creates a PW document with change index 000 (*_000_PW_*) and in PW document with change index 001 (*_001_PW_*).
- Another publication of the AW document overwrites the PW document with change index 000 (*_000_PW_*) and creates another PW document with change index 002 (*_002_PW_*).

Kurzbezeichnung
WOE_35_0_EG_0_ar_20000000000023_000_aw
WOE_35_0_EG_0_ar_20000000000023_000_pw
WOE_35_0_EG_0_ar_20000000000023_001_pw

Kurzbezeichnung
WOE_35_0_EG_0_ar_20000000000023_000_aw
WOE_35_0_EG_0_ar_20000000000023_000_pw
WOE_35_0_EG_0_ar_20000000000023_001_pw
WOE_35_0_EG_0_ar_20000000000023_002_pw

Illustration 4: first publication   **Illustration 5: second publication**

A similar procedure can also be seen in the publication of as-built documents (BW).

Kurzbezeichnung
⬜ WOE_35_0_EG_0_ar_20000000000023_000_aw
🟥 WOE_35_0_EG_0_ar_20000000000023_000_bw
🟥 WOE_35_0_EG_0_ar_20000000000023_001_bw

Illustration 6: Publishing as a BES document

Note: As a rule, PW and BW documents that have the change index 000 are used as the basis for planning, because only these are subject to ongoing changes due to publishing. Documents with a higher change index are used to track the planning history.

2.7   Projects

All data belonging to a topic is summarized in a project.
Examples of projects:
- Conversion measures for a vehicle series
- Building data as-built

The project structures vary from plant to plant. Within the projects, the data is stored in location structures.
New projects can be requested via the FP Hub-Careline.

2.8   Planning set

The "planning set" logically summarizes the data involved in the workflow.
- A "planning set" is a logical structure, comparable to a file folder.
- Within a "planning set", there are only documents from a single subsection (subject area/discipline).

2.9   CAD Document

The FP Hub ELO is primarily specialized in managing DGN files from Bentley MicroStation.

The DGN documents are the actual CAD files that are combined in a planning set. The information is displayed in the data window.

All CAD documents (in DGN format) in the FP Hub are stored under a unique document name.
This name is generated by the system independently of selected structures and assigned numerically.

For better handling, a document description must also be assigned in the FP Hub.

2.10 Logicals

The logicals in FP Hub are formed from the following components:

Short form of the work part (WOE for Wörth)
Main building designation (4 for building 4)
Name of sub-building (0 for sub-building 0)
Floor designation (ground floor for the ground floor)
Level (0 for the 0.00m level)

the individual components are connected with "_"

Examples:

WOE_17_A: Logical for Wörth: Plant Wörth WOE, building 17, sub-building A
RAGA_321_0: Logical for Gaggenau: Plant Rastatt Gaggenau RAGA, building 211, sub-building 0

2.11 Filename

The file is named according to the following pattern:

WOE_35_0_EG_0_ar_20000000000023_000_aw.dgn

ar:	Discipline abbreviation (subject area/discipline)
20000000000023:	sequence no. (assigned by the system)
000:	Index (versioning)
aw:	Environment (AW-working environment, PW-project environment, BW-as-built environment)
DGN:	Document Type (dgn-Microstation, doc-Word,...)

The combination of the file name, composed of logical and document-specific information, is unique within the system.

2.12 Field, discipline, model name and application

The term "trade" is replaced in the FP Hub by the combination of specialist area and discipline.
The subject area serves to group the disciplines:

Field	Discipline	Discipline abbreviations
TGA mechanics	Indoor Air	lu
	Heating element	he
	….	
Building construction	Steel Structures Stages	sb
Conveyor technology	Equipments	fe

This is an overview of all the subject areas and disciplines described in the CAD Guide:
fp-hub_faculty-disciplines_mui.xlsx

Further help documents can be found in the Daimler Truck Supplier Portal:
https://supplier.daimlertruck.com/en/collaboration/factory-planning

3 Applications

The specialiised applications prescribed in FP Hub must be used. They are described in detail in Chapters 3, 4 and 5 of the Guide. The version numbers to be used in each case are listed in Chapter 2.2.1.

Field	Discipline	Discipline abbreviations	Application	Application
TGA Mechanics	Indoor Air	lu	CARF Ventilation LU	MicroStation with CARF Ventilation 3D
Layout	Equipments	ly	CARF Equipments Layout LY	MicroStation with CARF Layout 3D

3.1   FP Hub application environments

3.1.1   FP Hub Workspace for MicroStation Connect

For the use of the MicroStation CONNECT Edition, the FP Hub provides a workspace "WorkspaceDT" with workset "WorksetDT". The workspace/workset defines the MicroStation variables for the integration of the FP Hub standard.

Download the [ZIP archive](#) from our FP Hub homepage. The files and directories contained in it represent the files and documents needed to work with FP Hub for MicroStation Connect.

Other documents available for download can be found at:
https://supplier.daimlertruck.com/en/collaboration/factory-planning

After unpacking the ZIP archive into any directory, you will get a directory with substructures and a CFG file:
C:\<Your Directory>\WorkspaceDT\
C:\<Your Directory>\WorkspaceDT.cfg

The deployed workspace/workset consists of folders/files and only needs to be copied to the existing workspace/workset installation location from the MicroStation Connect installation. In a standard MicroStation   Connect   installation,   the   target   path   is   e.g.
C:\ProgramData\Bentley\MicroStation   CONNECT   Edition\Configuration\WorkSpaces\WorkspaceDT
C:\ProgramData\Bentley\MicroStation CONNECT Edition\Configuration\WorkSpaces\WorkspaceDT.cfg

The file names and folder structures must not be changed.

If necessary, individual adjustments must be made in the WorkspaceDT.cfg, e.g. to set the installation location for the CARF version, the path from the user ENV or the license search path.

- LUARTX   = C:/CAD/LUARTX/CARF_2024.0/
- LUARTX_LIC   = \\\\servername\licman$
- LUARTX_USER_ENV   = C:/CAD/FIRMENSTANDARDS/DT/

The Workspace/Workset defines the following variables for the FP Hub standard files:

- DCCOLOR = $(_USTN_WORKSETSTANDARDS)color/
- MS_SYMBRSRC = $(_USTN_WORKSETSTANDARDS)font/*.rsc
- MS_SYMBRSRC > $(_USTN_WORKSETSTANDARDS)linestyles/*.rsc
- MS_DGNLIBLIST > $(_USTN_WORKSETSTANDARDS)dgnlibs/levellibs/global/*.dgnlib
- MS_DGNLIBLIST > $(_USTN_WORKSETSTANDARDS)dgnlibs/stylelibs/textstyles/*.dgnlib
- MS_DGNLIBLIST > $(_USTN_WORKSETSTANDARDS)dgnlibs/stylelibs/dimensionstyles/*.dgnlib
- MS_DGNLIBLIST > $(_USTN_WORKSETSTANDARDS)dgnlibs/stylelibs/displaystyles/*.dgnlib
- MS_FILTER_LIB_DIR = $(_USTN_WORKSETSTANDARDS)dgnlibs/levellibs/applications/
- MS_LEVEL_LIB_DIR = $(_USTN_WORKSETSTANDARDS)dgnlibs/levellibs/applications/

When opening the FP Hub files with MicroStation Connect, the workspace "WorkspaceDT" and the workset "WorksetDT" must be set:
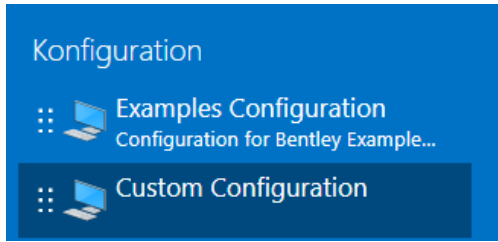
I Denotes changes

In the event that a query for the workspace/WorkSet to be used appears after opening the file, activate the workspace "WorkspaceDT"/ WorkSet "WorksetDT":

3.1.2 Speedikon Industrial Construction Project Standard

3.1.2.1 Speedikon Industrial Construction (FP Hub Standard)
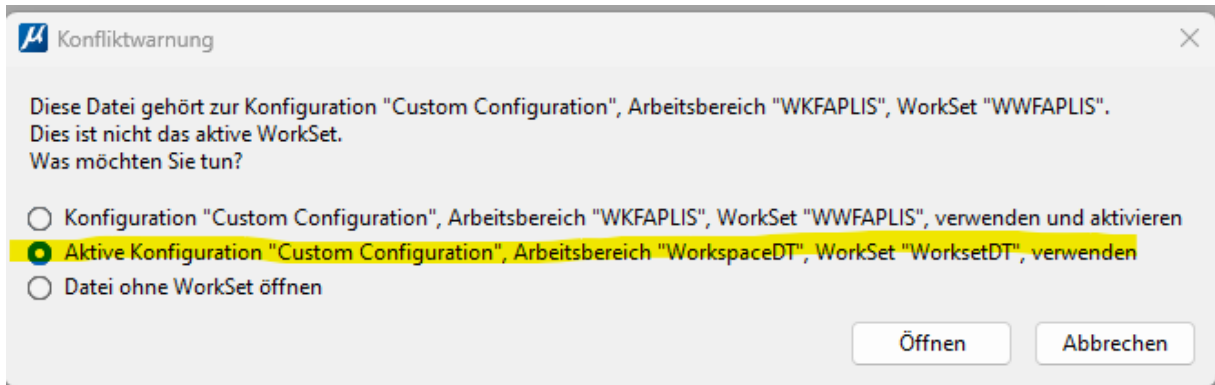
The Speedikon project standard summarizes all project-specific macros, filters, cell libraries and special components (objects, object solids). The content of the project standard is all folders and files that are located in the STD folder of a project directory.

3.1.2.2 Download the Speedikon Industrial Construction Project Standard

When working on the Speedikon project externally, it is important to ensure that the correct project standard and FP Hub company standard are used. The company standard can be downloaded from the following link:

fp-hub_speedikon-firmenstandard_connect_mui.zip

Please copy all files contained in the ZIP archive into the Speedikon default directory, which is defined by the variable IEZstd.

3.1.3 CARF ENV from FP Hub

3.1.3.1 Download the CARF ENV from the FP Hub

You can download the FP Hub CARF ENV at the following link:

fp-hub_carf-einstellungsdateien_mui.zip

The ENV matching the CARF version number must be used. These settings automatically make all the necessary programmatic presets in CARF.

3.1.3.2 Setting the Project Directory

A MicroStation project must be set up before the start of the project. The project setting for CARF is done using the variable "**LUARTX_USER_ENV**". The FP Hub ENV must be copied into this folder.

3.1.3.3 Setting the software language and FP Hub ENV language

In CARF, the dialog language of the software and the language settings of the FP Hub ENV are only set via the *variable "***LUARTX_LANG***".* The same software version and the same FP Hub ENV are used for all language variants. The MicroStation files contain language-dependent information (attributes) and may only be edited with the corresponding CARF language version.

In the works with a German-language arrangement, the variable LUARTX_LANG is **not** to be set.

3.1.3.4 MicroStation Configuration for CARF

Explanation of the most important variables for CARF:

Variable:	Description:
LUARTX	Path where CARF is installed.
HOME	Path where the temporary files are stored by CARF
LUARTX_USER_ENV	Path where the FP Hub environment for CARF is stored.

Variable:	Description:
LUARTX_LANG	This variable can be used to set a language that differs from German for software and FP Hub ENV: e = English s = Spanish
LUARTX_LST	Path in which the TGA parts lists (Excel) of the report manager are stored.
LUARTX_LSTFT	Path in which the report manager's conveyor technology, layout, platforms, crane, paint and chip conveyor parts lists (Excel) are stored.
LUARTX_LSTFL	Path in which the area module BOMs (Excel) of the report manager are stored.
LUARTX_BUILDING	the floors are read from this file
LUARTX_DIALOG	Dialog.ini can be read from another directory (e.g. in the case of network installation)
LUARTX_LACK_KABINEN_CFG	If this variable exists and points to a file, all cabins sample data from this file will be read (e.g. cabin.BSP).
LUARTX_LACK_EXAMPLES_CFG	If this variable exists and points to a file, all object sample data from that file will be read (e.g. LUARTX_ZB. INI).
LUARTX_USER_LIBRARYPATH	If this variable exists and points to a directory, the cell libraries are searched for here first. In addition, MS_CELL path is searched for in the standard MicroStation.
LUARTX_LACKINI	If this variable exists and points to a file, the basic settings are read from that file.
LUARTX_LAYOUT_USER_DIR	Path in which the cell libraries and settings created by the user are stored.

3.1.3.5 Examples of configuration files

User settings e.g. luartx.ucf
```
LUARTX             = c:\CARF
#LUARTX_LANG        = e
MS_MDLAPPS         > $(LUARTX)/bin/
MS_HELPPATH        < $(LUARTX)/help/
LUARTX_HOME        = $(LUARTX)/home
LUARTX _ADMIN = 1
```

Project settings, e.g. projekt.pcf
```
MS_DEF                      = c:/Projects/FP Hub/
LUARTX _USER_ENV            = $(MS_DEF)
LUARTX _LST                 = $(MS_DEF)dc_report_templates/tga/
LUARTX _LSTFL               = $(MS_DEF)dc_report_templates/Layout_Flaeche
LUARTX _LSTFT               = $(MS_DEF)dc_report_templates/ft/
LUARTX _BUILDING            = $(MS_DEF)env/db/ts000000_000_arw.tsd
LUARTX _LACKINI             = $(MS_DEF)env/db/lack/carflack8.ini
LUARTX _LAYOUT_USER_DIR     = $(HOME)/luartx/layout/user/
LUARTX _SPAENE_EXAMPLES_CFG      = $(MS_DEF)env/db/ft/scrap/
```

3.1.4 LIDS Standard for the FP Hub Data Model "Wastewater"

3.1.4.1 Download the LIDS standard

Download the ZIP archive from the following link: fp-hub_lids-standarddateien_mui.zip

The files and directories contained in it represent the files and documents required to work with FP Hub for the LIDS and MicroStation applications, respectively.

3.2 Data Quality Checks

Data verification with the CARF Qualitool in the FP Hub

3.2.1 Starting the CARF Qualitool application

First, the file to be checked must be opened in the PF hub.
When MicroStation is started, the application can be accessed via the FP Hub toolbox.
FP Hub Toolbox -> CARF Qualitool
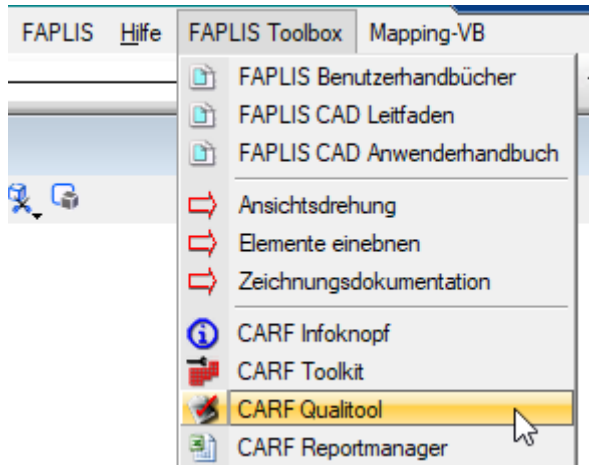
3.2.2 Set Work Folders

First, a working folder must be defined for the audit log files (for example, c:\tmp).
The user must have write permission for this folder.
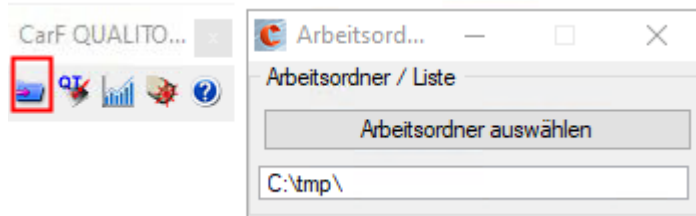
3.2.3 Call the "CARF Qualitool" function:

I Denotes changes
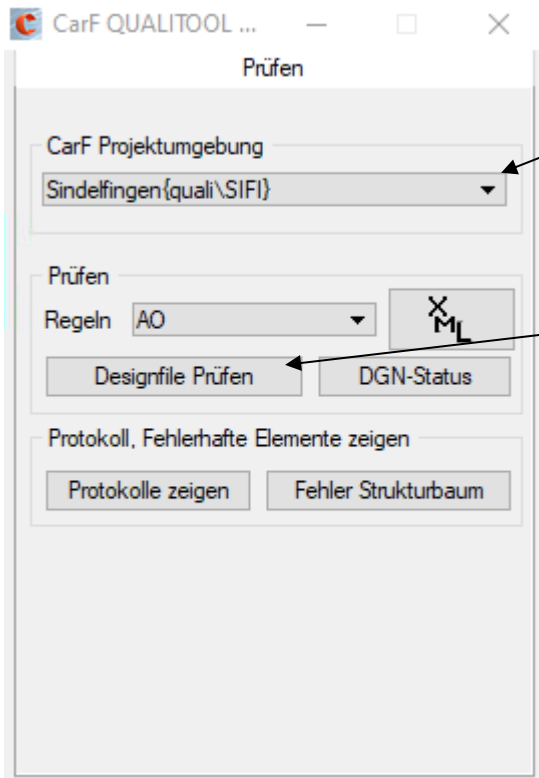
Check the CARF project environment for the corresponding plant. In FAPLIS, the corresponding rule is automatically set via the existing location structure. This can be

Press "Check Design File". The check rule is set automatically via the file name (after previous query). If a different check rule is desired, answer the query with "Cancel".

3.2.4 Display of test results (logs)

CarF QUALITOOL ...

Prüfen

CarF Projektumgebung

Sindelfingen{quali\SIFI}

Prüfen

Regeln AO

Designfile Prüfen   DGN-Status

Protokoll, Fehlerhafte Elemente zeigen

Protokolle zeigen   Fehler Strukturbaum

```
Pruef - Protokoll
Statistik - Protokoll
```

Suchen

OK   Abbrechen

```
################################################################
DESIGNFILE: C:\DOCUME~1\acwagne\LOCALS~1\Temp\eFAPLIS\SIFI_28_0\br000008_000_arw.dg
   - Project: DAIMLER_SIFI{quali\DAIMLER_SIFI}
   - Rule: BR
   Version: 8.80
   - Date: 23.04.10 , Time: 16.53.56
################################################################


################################################################
MODEL: 3D-Model-000--> 3D DESIGN


+Error+
LOCATION CUBES:
       - Outside LAGEWUERFEL : FilePos (4000024)
       - Outside LAGEWUERFEL : FilePos (4000033)
       - Outside LAGEWUERFEL : FilePos (4000042)
```

```
STATISTICS:                                          DESIGNFILE:
C:\DOCUME~1\acwagne\LOCALS~1\Temp\eFAPLIS\SIFI_28_0\br000008_000_arw.dgn

MODEL: 3D-Model-000
       Percentage of CARF elements: 85.7 percent


LUARTX:
       - Ventilation
       - Heating
       - Sanitary
       - Electronics
       - Sprinklers
             - 8.8 : 6 elements
       - Infrastructure
       - Piping
       - Conveyor technology
       - Layout
       - Area module
       - Crane module
       - Stage module
       - drag curves
       - paint module
       - Chip disposal
       -Other
MICROSTATION:
       -CELLS:
             - sifi : 1
       - Nested cells: 0
       - LINE: 0
       - LINE STRING: 0
       - Shapes: 0
       - TEXT NODE: 0
       - CURVE_ELM: 0
       - CMPLX_STRING_ELM: 0
       - CONIC_ELM: 0
       - CMPLX_SHAPE_ELM: 0
       - CIRCLE: 0
       - ARC_ELM: 0
       - TEXT_ELM: 0
       - SURFACE_ELM: 0
       - SOLID_ELM: 0
       - BSPLINE_POLE_ELM: 0
```
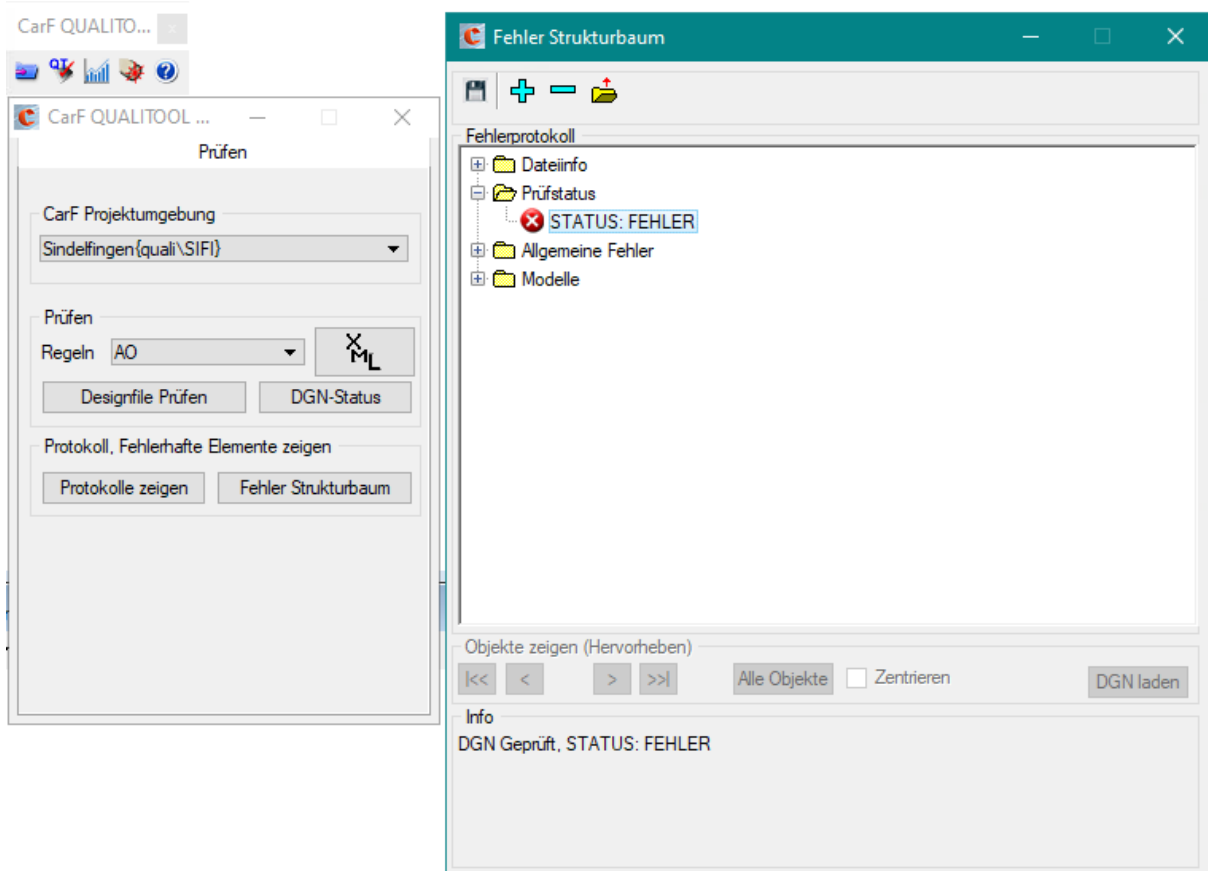
| Denotes changes

If there are faulty individual elements, they can be marked in the DGN display by clicking on them in the dialog box.

Denotes changes

4 ELO Teamspace

4.1 Foreword

ELO Teamspace is the name given to the area in which the external planning partners have access to the projects, planning sets and files to which they are authorized.

After successful access to ELO (see section 2.3), the team spaces activated by the client are accessible. To get access to a Teamspace, you can also contact the FP Hub Careline (see section 1.4).

4.2 Administration

The projects are managed on the ELO Teamspace homepage in topic areas. Each tile represents an area where projects are linked. Each external planning partner sees and has access to projects in which they have been activated in the FP Hub ELO.

Each project has its own location structure (main building, sub-buildings, floors, levels) and the planning sets and files created underneath.

4.2.1 Unlock project

To be activated for a project, use the function CAD Toolbox → Project → Access Request
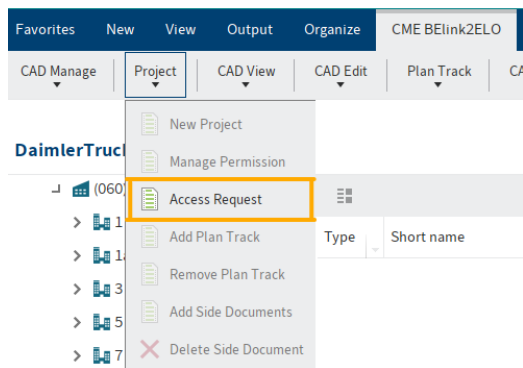
In the access request, the subplant, project, permission, authorization reason and members must be selected.

The possible constellations are read from the database and can be listed as pull-down fields by pressing the backspace key ⟵ on the keyboard in the respective fields.
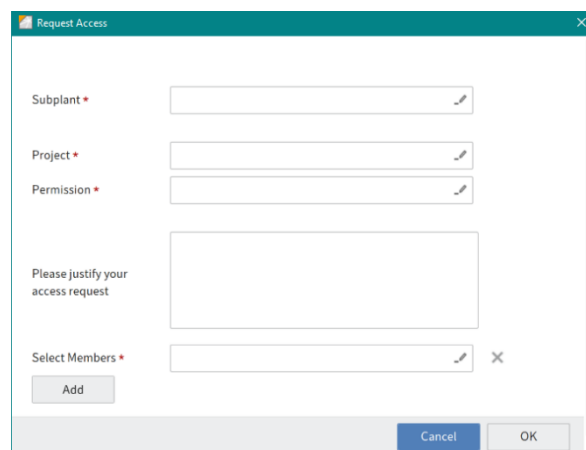
4.2.2 Planning set and drawing file

Planning records are "folders" in which the CAD factory planning data is stored purely with defined specialist applications.
In ELO, the term "trade" is replaced by the combination of specialist area and discipline.
The subject area serves to group the disciplines:

Field	Discipline	File abbreviations
Layout	Equipments	ly
TGA mechanics	Compressed air	dl

4.2.2.1 Berth

Planning records are created within the project at the corresponding location structure. The location structure can be double-clicked from the main building to the level by double-clicking.

CAD *Toolbox* → *Plan Track* → *Create Plan Track* opens the creation mask.
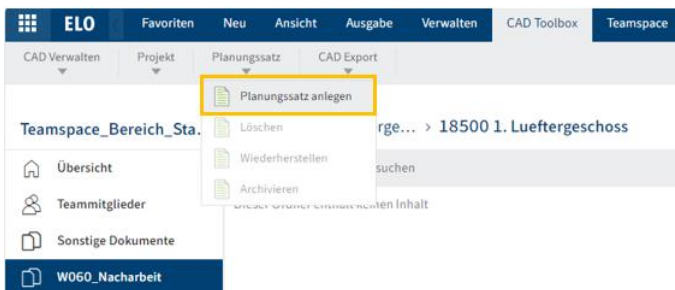
In the creation mask, the pull-down fields are used to select the desired specialty/discipline combination and assign a short designation (description).

Optionally, an empty planning record or a planning record with a new, empty working environment (AW) file can be created.

If a working environment file is to be created at the same time, a document description must be assigned to it.

4.2.2.2 Publish

CAD documents can be published in order to provide other planning and project participants with a read-only version of your working environment.

The following constellations can be published:

- Working environment (AW) ⬜ Project Environment (PW)

- Working environment (AW) ⬜ as-built Environment (BW)

- Project Environment (PW) ⬜ as-built Environment (BW)

In addition to the environment abbreviations AW, PW, BW, the "environment model affiliation" is also visually recognizable. In the data window, the metadata is displayed in different colors.

Working environment – black

Project Environment – orange

As-built environment – red

The publication is available at

CAD Toolbox ⬜ Manage CAD ⬜ Publish executed:

When executing from a working environment (AW) file, it is queried in which target environment you want to publish.

For the first publication in a planning set, two new documents are created for the selected target environment. Environment model index 000 and 001.
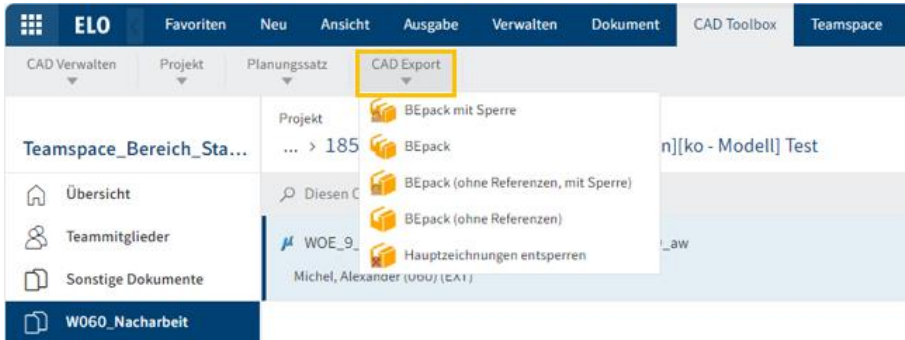
5 Transfer

5.1 CAD export

There are different constellations of how CAD documents can be exported locally from ELO. Each time, a zip package is created, which is "temporarily parked" in the personal area, for example.

All functions for this can be found in the CAD Toolbox ⛶ CAD Export menu

At least 1 CAD document must be selected to activate the export functions.

BEpack with Check out

If you use this function, all marked CAD documents PLUS their references are compiled in a zip package. As a result, working environment files (AW) are blocked for write use in the ELO management system.

BEpack

With the BEpack function, all selected CAD documents PLUS their references are also compiled in a zip package, but the working environment files (AW) are not locked in ELO for further processing.

BEpack (without references, with check out)

As the function already describes, only the marked CAD documents are compiled in a zip package, the working environment files (AW) contained in it are locked for editing, but their references are not stored in the zip package.

BEpack (without references)

With the BEpack function, all marked CAD documents are also compiled in a zip package WITHOUT their references, but the working environment files (AW) are not locked in ELO for further processing.
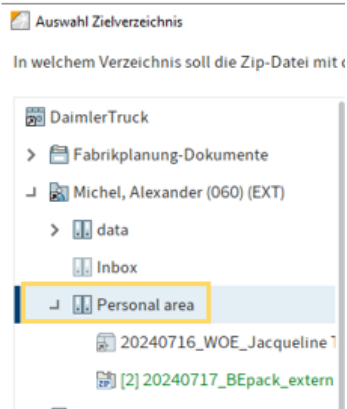
Unlock main drawings

Exported working environment (AW) files must be unlocked before importing.

❙ Denotes changes

5.2 Procedure CAD export (example)

When executing one of the bepack functions, a window opens in which you have to select where the zip package should be cached.
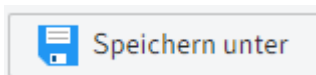
For this purpose, you use the *Personal Area* area, which is available to each user individually.

The system takes about 2 minutes to package the data. The completion of the zip package can be seen when the zip file name changes from blue to green font.

The actual download can then *be downloaded to Windows Explorer* via Save As.

If a BEpack export function has been used, which locks the working environment files (AW) for further processing in ELO, the MicroStation icon changes to table column "Type" and in the table column "Short name" the name of the user who locked the document by exporting is entered in square brackets.

Typ	Dokumentbeschreibung	Welt ▲	Kurzbezeichnung
μ	Gesamtmodell	aw - Arbeitswelt	WOE_17_C_1.UG_-3500_ko_200000000000095_000_aw
μ	Gesamtmodell V2	aw - Arbeitswelt	[Michel, Alexander (060) (EXT)] WOE_17_C_1.UG_-3500_ko_2...

If several CAD files are to be exported, it is recommended to use the *clipboard* as a temporary clipboard.

I Denotes changes

The *clipboard* can be filled with all the files that are to be exported by dragging and dropping the left mouse button.

If you open the clipboard, you can select all files and then start the corresponding *BEpack* export function. All files are then combined into a zip archive.

Via the context menu (right mouse button) you can *remove the files from it again* via the command Remove from clipboard.
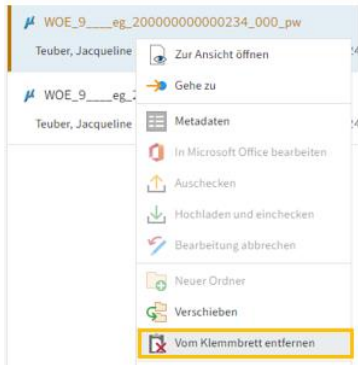
5.3   CAD Import

Integrating locally processed working environment (AW) CAD documents into the ELO management system is done according to the drag & drop principle.
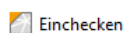
The CAD file to be imported is dragged from Windows Explorer directly to the working environment (AW) file in ELO.

Four prerequisites must be met for this:

-        Drawing number / file name

Both the source and destination files must have the same file name (short name).
If this is not the case, an import is not possible.

-        Model Name / Number of Models
         Each file may only have one model within the drawing file.
         The exceptions are the following specialty/discipline combinations
-        Plans / Plans Overviews
-        Layout / Fire Protection Layout
-        all disciplines in the field of objects
-        GO
         Each work part has its own factory zero point with defined x, y and z coordinates. These coordinates are checked to ensure the correct position of the drawing contents.

-        Unblock
         The target file must be unlocked back into write mode using the function: *CAD Toolbox* → *CAD Export* → *Unlock Master Drawings*

I Denotes changes

6 To provide the process-specific guides, externally available applications, for all FP Hub locations

6.1 Introduction

All applications described in this chapter can be used by external
partner companies. The software products defined here are available for purchase. The chapters are valid for all FP Hub locations.

6.2 Building planning FP Hub Standard

6.2.1 Conventions Floor/Construction Section and Section Number

6.2.1.1 Floor/construction phases

Projectile	Plain	Storey	construction sections	Description
Foundations	1 - 4	01 - 04	10 – 90	Axle area
UG	1 - 5	05 – 09	10 – 90	Axle area
EC	1 – 10	10 – 19	10 – 90	Axle area
1st floor	1 – 10	20 – 29	10 – 90	Axle area
2nd floor	1 – 10	30 – 39	10 – 90	Axle area
.				
1.LG – 8.LG	1 – 9	90 – 98	10 – 90	Axle area

The following are firmly occupied:	9999	Building axes and cross-sections
	7777	Terrain model of the surrounding area

6.2.1.2 Collective construction sections

Constructive sections	Cut No.		
1010 – 1090	1010	in the case of several collective CSs	1020, 1030, etc.
2010 – 2090	2010	in the case of several collective CSs	2020, 2030, etc.

Collective sections are set up for each level and always contain the alignment grid.

6.2.1.3 Sections and Views

View	Cut No.
North	100
East	200
South	300
West	400
Cut	**Cut No.**
Looking north	110 – 190
Looking East	210 - 290
Looking south	310 - 390
Looking west	410 - 490

6.2.2   Planning Record and File Labels

6.2.2.1   Planning Sets with Level Reference

Name may refer to:

*Construction*_building_partial building_storey_level_Construction_*Phases*

Example: Bau_40_0_EG_0.00_Phases

*Construction*_building_partial building_storey_level_*Total*

Example: Bau_40_0_EG_0.00_total

6.2.2.2   Planning sets without level reference

Name may refer to:

*Construction*_Building_Teilbuilding_Beschreibung

Example: Bau_40_0_Ansicht North

6.2.2.3   Divisions

Name may refer to:

*Sto/BA_Bau*_Building_Partial building_storey_layer_Achsbereich

Example:

1010_Bau_40_0_EG_0.00_Axis_A-F_0-20

6.2.2.4   Collective construction sections

Name may refer to:

VSchnitt-No*._Bau*_Building_Partial building_storey_Ebene_axis range

Example:

V1010_Bau_40_0_EG_0.00_total

6.2.2.5   Sections and Views

Name may refer to:

VSchnitt-No*._Bau*_Building_Partial building_cut/View Designation

Examples:

V100_Bau_40_0_Ansicht_Nord

V110_Bau_40_0_Schnitt_Achse_C_Blickrichtung_Nord

6.2.3 Using Layer Filters

Layer filters are available for user-oriented work (Note: Layer filters in MicroStation control the layer display while the term drawing filter is used within Speedikons for the output type of a component).


Here, the user can quickly switch between floor plan and model, for example, or only display dimensions.

Layer filters are automatically provided with the Layer Library.

6.2.4 Attribute filters and user attributes

Attribute filters are used to control the display of component properties such as fire protection class, etc. Attribute filters are used optionally and in addition to the drawing filters.

- the model can be separated into "model shell" and "model inside". Logical components are automatically assigned (for example, walls with the use "Solid wall outside" are placed directly on the correct level, as are roofs). Additional components can be assigned as needed using the user-defined attribute u_huelle. u_huelle = 1 (as an integer) means:
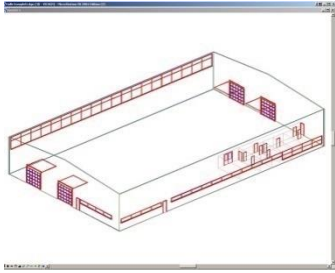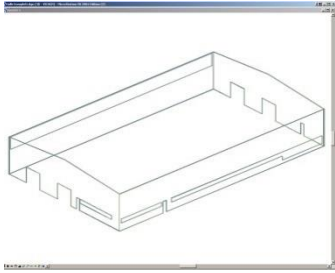 belonging to the shell.
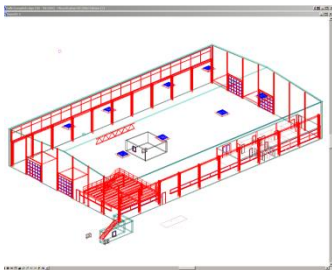
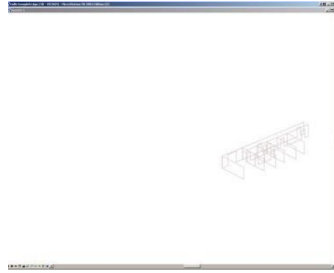Total model
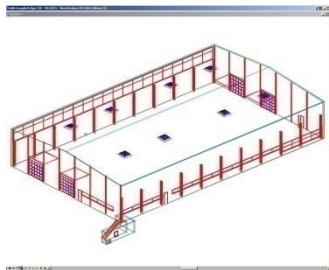
Model Shell
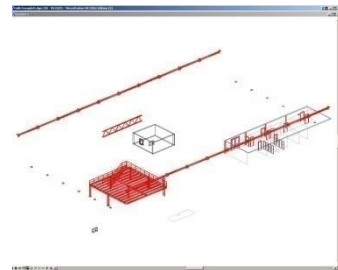
Model inside

- Openings can be switched per component. Here is an example on the model:
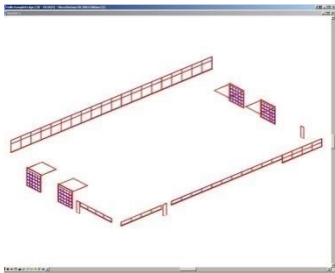

Lightweight walls with total openings

Lightweight walls on the outside

Lightweight walls inside

Openings for lightweight walls on the outside
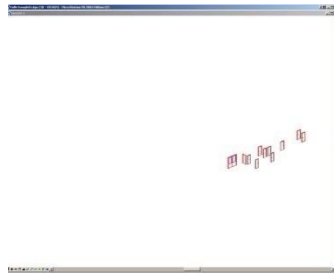
Openings for lightweight walls inside

Filter name: **VR_Attribute_V2**: Appends fire classes of all components, axle information for support as technical data (tag) in MicroStation.

Systemaic attributes in Speedikon

- a_fireclass: Fire protection class, to be entered in the respective component menu

Custom attributes in Speedikon

- u_achse_B: Column attribute, here letter designation of the affected grid axis on which the column is placed - to be entered in the "Attributes" tab (as text)

- u_achse_Z: Column attribute, here numerical designation of the affected grid axis on which the column is placed - to be entered in the "Attributes" tab (as text)

Example:
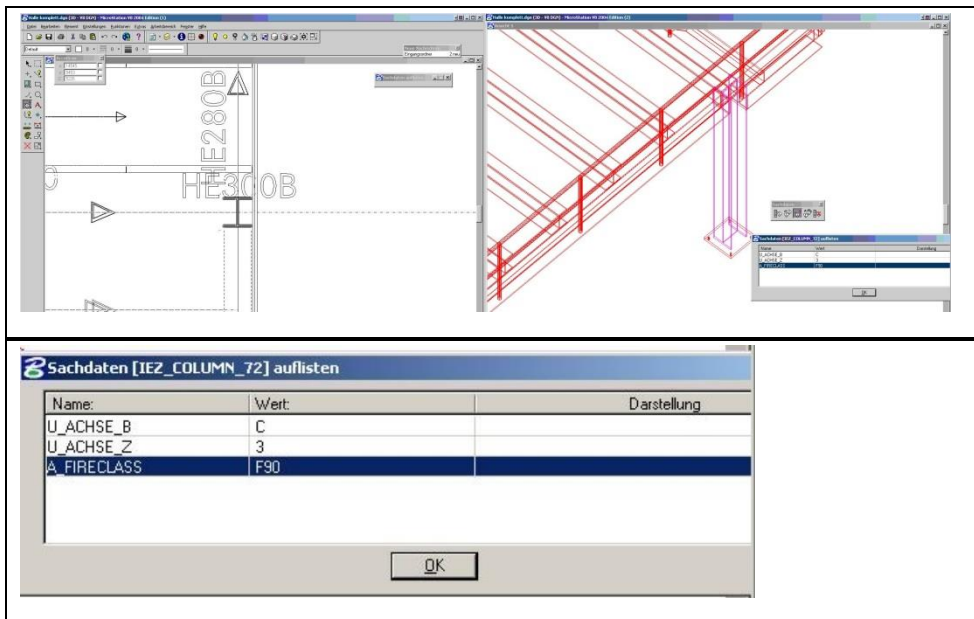
6.2.5 Prototypes

When entering a component, prototypes can make it much easier to enter.

Certain combinations of parameters of a component can be stored as prototypes. A wall prototype contains default values of the parameters of a particular wall type, including graphical and non-graphic parameters, functionality parameters, and a variety of attributes (such as material type).

Because of these default values, the desired values do not need to be set anew every time a wall is placed.

Several prototypes of a component are summarized in prototype tables.

There are a large number of prototype tables delivered on the system side.

A selection of these has been adapted to the FP Hub standard, others can be incorporated. In this case, the materials used in FP Hub are essentially adapted and the fire class is set to "not used". More detailed prototypes can be found, for example, for walls and beams.

6.3 Conveyor technology

There is no additional application information that goes beyond beyond the information in the CAD guide.

6.4 Building services

There is no additional application information that goes beyond beyond the information in the CAD guide.

6.4.1 Unified FP Hub Description

When referencing in FP Hub (ELO), the content of the description field is automatically adopted as the description of the reference. In order to have uniform information about the referenced files, e.g. in collective reference files, the following specifications for the description must be observed for building services:

File description:
Gebäude_Ebene_+/-Höhe_Planungsphase_Inhalt_Firma_Jahr-month day
Example:
12-2_E1 +3.60_EP_Elektroinstallation_Musterfirma_2023-03-03

Explanation of the possible planning phases:
EP Design Plan
AP Execution Plan
MP Assembly Diagram
RP Revision Plan
BP As-built plan
The planning phases are only to be entered in the files, not in the planning record.

The uniform FP Hub description does not apply to the following plants:
- Plant 020 Mannheim
- Plant 730 Ulm
- Plant 028 Mannheim Evobus
- Plant 034 Gaggenau
- Plant 060 Wörth
- Plant 069 Kassel

6.5 Painting technology

There is no additional application information that goes beyond beyond the information in the CAD guide.

6.6 Drag Curve Simulation

6.6.1 Objective

In order to be able to check the collision-free nature of drivable objects in the 3D model as well, CARF swept curves were implemented. With CARF swept curves, selected road vehicles and materials handling equipment can be moved in a 3D layout by means of driving simulation and the resulting driving contours can be documented in the CAD documents.

The vehicles can be simulated in a 2D or 3D representation, as well as a simplified or detailed representation. The simplified representations can be changed in dimensions spontaneously by the user within a simulation session (now also in trailer trains), while the detailed vehicles come from a library as firmly defined cells.

Driving courses as an input variable for the simulation can be specified planarly or three-dimensionally. In addition, "forward/backward maneuvering" can be carried out for some vehicle types. This results in 2D driving courses with vehicles depicted in 2D. The shunting courses can then be transferred to conventional polylines to be able to simulate the other vehicle types and/or vehicles in 3D representation.

Training: Although this complex application is relatively easy to use, we strongly recommend qualified training. Without precise knowledge of the subject matter (meaning of the dimensions, settings, steering strategies and relationships), simulation results can arise from incorrect operation that do not stand up to reality. Not all nonsensical or borderline inputs can be intercepted by the application. Within FP Hub, only trained users are given access to CARF swept curves.

6.6.2   Restrictions

Currently, the following vehicle steering types are verified in simulation accuracy on 2D driving courses:
- Cars and trucks
- Truck with drawbar trailer
- Semitrailer without rear-axle steering
- Buses

These types were compared with simulation results from other applications, which in turn were either certified by the German Federal Road Traffic Authority or verified with real driving tests.

Forced guided transports (monorail, pendulum conveyor, two-point guided AGVs) are naturally easy to calculate and therefore good accuracy can be assumed here.

All other steering types (especially vehicles/trailers with rear-axle steering) have not yet been compared with reality and may therefore not be used for productive simulations until further notice. The same applies to 3D driving courses (descents/inclines, ramps) for all vehicles that are not forcibly driven.

6.6.3   Vehicle Library

The vehicles supplied with the product (Actros, Unimog, ..., vehicles of other brands) in the vehicle catalogue must be used. There are two options for additional vehicles that are not available in the catalogue:

Modification of the dimensions of an existing vehicle

In the vehicle dialogs of the application, the fields for the different dimensions can be changed by the user. Such changes influence the calculation and the generic representation in the following simulations, provided that "simple vehicle" is selected for the representation (2D and 3D). The display "cells" cannot be influenced in this way. The changed dimensions remain active for the entire session until one or all vehicles are re-imported from the vehicle catalogue via a menu function. The advantage is the quick changeability, the disadvantage is the reduced accuracy due to the generic vehicle representation (missing exterior mirrors, roof/driver's cab length cannot be determined, load generically displayed, ...)

Such a modified vehicle can also be added relatively quickly to the vehicle catalogue within the FP Hub system by the FP Hub supervisors, so that the dimensions do not have to be changed again every time.

I Denotes changes

Inclusion of a new vehicle type in the vehicle catalogue

Here, both the new dimensions and exact vehicle cells are included in the vehicle catalog. Since the creation of accurate 2D and 3D cells including simulation-relevant marking points requires special knowledge, this can only be done by commissioning the manufacturer of CARF swept curves. The assignment is to be coordinated with the FP Hub support (bundling of requirements) and to be borne by the specialist departments on the cost side.

6.7   Steel Structure Stage

There is no additional application information that goes beyond beyond the information in the CAD guide.

7   Infrastructure planning

There is no additional application information that goes beyond beyond the information in the CAD guide.

▌Denotes changes

8 Application-specific guides for externally available applications, for individual FP Hub locations

8.1 Introduction

All applications described in this chapter can be installed and used by external partner companies. The software products defined here are available for purchase. The chapters are only valid for individual FP Hub locations.

8.2 Measurement Mapping

There is no additional application information that goes beyond beyond the information in the CAD guide.

I Denotes changes

9 Application-specific guidance for internal-only applications

9.1 Introduction

All applications described in this chapter are intended for internal use at FP Hub only. Therefore, the defined here

9.2 Area documentation

There is no additional application information that goes beyond beyond the information in the CAD guide.

9.3 Cleaning

There is no additional application information that goes beyond beyond the information in the CAD guide.

9.4 Drawing output

There is no additional application information that goes beyond beyond the information in the CAD guide.

9.5 BIM coordination

For information on BIM coordination at Plant 060 Daimler Truck AG / Wörth, please visit the website

https://supplier.daimlertruck.com/zusammenarbeit/fabrikplanung/bim-bei-daimler-truck