

DAIMLER TRUCK



FP HUB

CAD Guidelines

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# 1 General information

## 1.1 Preface

The shortening of planning times and the complexity of the task contents in the factory planning environment require the use of simultaneous engineering. This requires intensive and high-quality data exchange between the planning partners.

The objective of the “FP Hub CAD Guide” is to regulate and simplify cooperation in the factory planning environment for both parties.

Global, site-specific and procedural specifications (CAD user manual) can be found on the Internet at: <https://supplier.daimlertruck.com/en/collaboration/factory-planning>

## 1.2 Scope of application

The “FP Hub CAD Guide” is valid for employees active in the FP Hub system environment and the external planning partners in the factory planning environment.

It governs the CAD technical cooperation and is part of the tender and the award of the contract. It covers the following main applications/disciplines:

- Surveying/Line register
- Architecture/Construction/Steelwork
- Building services
- Conveyor technology
- Supply and disposal technology
- Office and hall furnishings (layout)
- Factory documentation
- Electrical system documentation

More particularly, it governs the technical and organizational flow of the CAD data exchange and contains the creation specifications for CAD models and their structuring.

This CAD guideline applies to all structural measures on all types of buildings (including lightweight buildings, tents, containers, etc.)

## 1.3 CAD Guide Translations

The CAD guide is available in English and Spanish. The translations are derived from the German version. In the case of detailed questions, translation errors cannot be completely ruled out. In case of doubt, the wording of the German guide applies.

## 1.4 CAD guideline on the Internet/Intranet

You can find the CAD guide and all relevant documents on the Internet:

<https://supplier.daimlertruck.com/en/collaboration/factory-planning/cad-guidelines>

## 1.5 Whom to Contact

If you have any questions about the CAD Guide, please contact our FP Hub Careline:

Tel: +49 7271-71-8222

E-mail: [FP\\_Hub@daimlertruck.com](mailto:FP_Hub@daimlertruck.com)

Please note the operating times: Monday to Friday 9:00 – 12:00

## 1.6 Glossary

Term	Explanatory Text
<b>FP Hub</b>	Factory planning hub, the factory planning system used at Daimler Truck
<b>DMU</b>	Digital mock-up, digital image, e.g. of a production hall
<b>ELO</b>	CAD Document Management System for FP Hub Software for accessing FP Hub data via the Internet
<b>MicroStation</b>	CAD software from Bentley
<b>CARF</b>	CAD software from LuArtX IT GmbH
<b>Speed icon</b>	Architecture software from Bentley
<b>Revit</b>	Architecture software from Autodesk
<b>DGN</b>	CAD document format from MicroStation
<b>Global Origin (GO)</b>	Global coordinate origin in DGN documents (defined for each plant)
<b>Font</b>	Font in MicroStation
<b>Level (DGNLIB)</b>	<b>Library</b> Settings library for DGN documents (e.g. layers, text styles, dimension styles)
<b>VR</b>	Virtual reality
<b>Cells</b>	Grouped elements in MicroStation
<b>LID</b>	Civil engineering software from BERIT
<b>CARF ENV</b>	Settings files of the CARF software for FP Hub
<b>Tecnomatix</b>	CAD software from Siemens

## 2 Fundamentals

### 2.1 Basic instructions

#### 2.1.1 Validity:

This chapter is valid for all Daimler Truck and Daimler Busses locations: Wörth, Mannheim, Gaggenau, Kassel, Stuttgart, Leinfelden-Echterdingen, Neu-Ulm, Ligny.

The prescribed software is MicroStation in the version described in chapter 2.2.1.

#### 2.1.2 System landscape/description

##### 2.1.2.1 Common, General

The MicroStation product from Bentley is used as the basic software to support CAD applications in the factory planning environment.

Based on MicroStation, various applications can be used at the locations. This results from the different planning and production scopes of the individual locations.

The generated data is managed in FP Hub by the ELO administration system.

#### Objective & Targets

Planning takes place within a 3D model. Top views, sections, detailed investigations and drawings are derived from the 3D model.

All documents are kept in the ELO administration system. Storage in this system requires compliance with certain rules and structures when processing data. The objective is to create the factory DMU (Digital Mock-Up). ELO is the leading system. Planning and inventory data are stored and continuously updated here. The Factory DMU is used to coordinate the setup trades and collision control.

#### The basic rules are:

- Working in the correct position in a uniform coordinate system
- Use of the required CAD standards
- Compliance with data quality criteria

#### The overall model in the management system is structured as follows:

- Breakdown of the total data into individual disciplines
- Division of the disciplines into smaller location-related design files with building, floor or plant reference
- Structuring of these design files within the documents using level symbols and level assignment

These regulations and structures are described in the following chapters.

#### 2.1.3 Creation specifications (MicroStation V8 format)

##### 2.1.3.1 Creation of documents

All data is kept exclusively in 3D documents. Planning is based on the 3D models. 2D plans, such as views, sections and detailed drawings, are derived from the 3D models.



All planning is based on documents created in ELO. New documents cannot be created directly from seed files. The seed files contain only a part of the necessary settings. All necessary settings are only set when a new document is created in ELO. Such a document is then set up correctly in relation to the plant part, the sub-building and the application. Therefore, a new DGN may not be created outside of ELO!

Only the working documents created in FP Hub are to be used. The only exception is: For the creation of work documents within the same sub-building and the same application, it is possible to create new documents by copying.

### 2.1.3.2 DGN Settings

The coordinate origin of the plant is defined by the Global Origin (GO) of the MicroStation document. The data must be correctly positioned in the coordinate system valid for the company premises and must refer to the coordinate zero point. The DGN settings zero point and resolution are set part-specifically when creating a new DGN in FP Hub. The DGN settings of the documents exported from FP Hub must therefore not be changed subsequently.

The current GO settings can be found on our FP Hub homepage at <https://supplier.daimlertruck.com/en/collaboration/factory-planning>

### 2.1.3.3 Correct planning/Rotated views

All plans must be created with the correct position and height relative to each other. The axis grid in the architectural model (target position and target heights) or measured coordinates of the actual status in the respective construction phase serve as the basis for correct position and height work.

Since the buildings have different orientations, they are normally not displayed in parallel with the screen.

In ELO, some fixed views ("saved views") are set per sub-building to create screen-parallel views. If not, this can be defined using the View rotate function.

All required screen-parallel settings are made with saved views. The German terms such as above, right, left, etc. apply. It is thus possible to switch between vi=top (parallel to the screen) and vi=top (correct position).

### 2.1.3.4 Measurements

All elements in the documents must be represented in original size (scale 1:1).

### 2.1.3.5 Standards & Norms

#### 2.1.3.5.1 Workspace/Workset link for files edited with MicroStation CONNECT Edition

All drawing files in the FP Hub must be linked to the workspace/workset = WorkspaceDT/WorksetDT and thus edited.

#### 2.1.3.5.2 Font (Font)

The font resource dcfont.rsc provided by FP Hub must be used. The use of fonts that are not included in the scope of this font resource is not permitted. Native Windows fonts and AutoCAD fonts offered in MicroStation may not be used.

The current font tables can be found on our FP HUB homepage at <https://supplier.daimlertruck.com/en/collaboration/factory-planning>

### **2.1.3.5.3 User-defined line types (Linestyles)**

The custom linestyles used in FP Hub are offered as a MicroStation resource. Currently, line types are available for use in surveying and in approval plans (PlanzV90) and can be used as required. Using line types that are not included in the scope of this line style resource is not allowed. The file in which these line styles are defined works in the same way as the font resource and can be imported into the same directory. The referring MicroStation CFG variable is also the same.

### **2.1.3.5.4 Color (Color)**

Only colors from the color chart dccolor.ctb may be used. This color chart is attached to each document in FP Hub under the logical path dccolor:dccolor.ctb. This entry must not be changed.

To attach the color chart, the variable DCCOLOR must be set in the system. The variable points to the directory in which the color chart dccolor.ctb is located.

It is appended via the microstation command CT=dccolor:dccolor.ctb.

### **2.1.3.6 Data structuring and content**

#### **2.1.3.6.1 Discipline-specific content**

Only elements of a specific discipline or application may be contained within a document. Mixing different disciplines/applications within a document is not permitted.

#### **2.1.3.6.2 Site-specific content of documents**

In principle, all documents are created on a floor-by-floor basis. In individual cases, it is necessary that cross-floor systems are not divided up, but instead represented in a single document.

#### **2.1.3.6.3 Top views, sections, views and details**

Sections, top views, views are derivations of the 3D model geometries. These derived documents must be stored as separate documents.

#### **2.1.3.6.4 Models and Model Names**

Each DGN may only contain one model. The model names of the documents delivered by the FP Hub must not be renamed.

Exceptions are the following specialty/discipline combinations:

Plans – Plans/Overviews

Layout – Fire protection layout

Unless otherwise defined in the application (see Chapters 3, 4 and 5), “3D Model-000” is to be used as the model name.

#### **2.1.3.6.5 Schematics**

Schematics can be created without position reference and with 2D symbols.

### 2.1.3.6.6 Level assignment and element symbols

All elements and components must always be placed on the designated levels and with the specified element symbols. The exact assignments for the individual applications can be found in Chapters 3, 4 and 5.

### 2.1.3.7 Level libraries

FP Hub uses the concept of level libraries (DGNLIBs) from MicroStation. A DGN thus has the level selection of the assigned level libraries. Two level libraries are attached to each DGN from the FP Hub:

- An application-specific layer library with an application-specific layer selection
- A global layer library with a selection of global (free, temporary and system used) layers

The following actions are not allowed:

- Creating additional layers
- Renaming the layer name
- Editing the layer number
- Edit description
- Use of self-created or modified layer libraries
- Dependency of layer libraries

#### 2.1.3.7.1 Application-specific layer libraries

The current set of application-specific layer libraries is available on the Internet.

#### 2.1.3.7.2 Global Layer Libraries

A selection of common layers is available in each DGN delivered by FP Hub. These levels are defined in the level library "global\_DC-level.dgnlib". This layer library is attached to each DGN. The levels defined there are listed below:

- The free levels (z\_freie\_Ebene\_\*) are to be used project-specifically (change clouds, markings, comments)
- The temporary layers can be used as desired
- zz\_Zero circle and zz\_Info cell are reserved for the plant zero circle and the tabular info cell

You can find the level assignment for this application on the Internet:

<https://supplier.daimlertruck.com/en/collaboration/factory-planning/cad-guidelines/levels>

VR-relevant levels

In the level assignment tables of this FP Hub CAD guide, all levels that are relevant for the VR model are marked in color.

For example, type:

Layer Name	Layer number
Non-VR-relevant level	001
VR-relevant level	002

Table Five: VR-relevant levels

### 2.1.3.8 Organization of data in cells and complex elements

Dissolving cells and complex elements is not allowed.

#### **2.1.3.8.1 Pseudocells**

Pseudocells should be used when a large number of identical cells with identical names are placed in a DGN. It should be noted here that the nested cells themselves are real cells and not pseudocells.

#### **2.1.3.8.2 Dimensions of the**

The geometric dimensions must always be associated with the element to be dimensioned.

#### **2.1.3.8.3 Level of detail**

The 3D model has to be detailed so precisely that important interference contours can be determined across disciplines.

For example: Screws and screw holes are not shown in any application and must not be included in the documents handed over to FP Hub.

The external planning partner coordinates with the client in the specialist department on the further 3D detailing depth. Too much detail has a negative effect on the subsequent compilation of coordination plans.

#### **2.1.3.8.4 Duplicate Elements**

The documents must not contain any duplicate elements.

#### **2.1.3.8.5 Compressing the design files**

All documents must be compressed in FP Hub before delivery.

#### **2.1.3.8.6 Functions not allowed inMicroStation**

The following MicroStation features are not allowed when working with FP Hub:

- File history activation
- Password protected files
- Digital Signing
- ByLevel Settings of Drawing Elements

#### **2.1.3.8.7 Prohibited functions in MicroStation CONNECT Edition**

The following MicroStation features may not be used when working with FP Hub:

- Parametric volume elements
- Parametric surfaces
- Parametric cells
- Tables
- Functions that affect the resolution of the drawing file

## 2.1.4 Quality of the data

### 2.1.4.1 Common, General

Design files that are to be imported or exported to ELO are checked according to certain criteria. Each DGN must meet the criteria described below.

Criteria	Beschreibung	KO criterion
3D	Checking the design file header	X
Source references	References must be attached with logical name	X
	Logical name must be defined as variable	
	The directory must exist	
	The reference document must exist	
Model designation	The model name in a DGN must match the managed model name/index in FP HUB.	X
GO	Global origin	X

Test Results:

Documents that do not meet the KO criteria will not be accepted and cannot be integrated into FP Hub.

### 2.1.4.2 Provision of workdocuments

The provision of so-called DGN blank documents by the FP Hub to the external planning partner is no longer necessary and cannot be requested by the external planning partner.

DGN documents for editing can either be provided by the client or they must be created, downloaded and edited by the external planning partner with ELO Teamspace. The exact procedure shall be coordinated with the client on a project-specific basis.

### 2.1.4.3 Data check with the CARF quality tool

The CARF Qualitool in the currently released release version (see Chapter 2.2.) must be used as the data checking tool.

The current test rules are made available together with the CARF settings files.

### 2.1.4.4 Data from non-MicroStation CAD systems

The use of native converters (CATIA > DGN, JT > DGN, etc.), for example, to convert geometry from systems for plant engineering to the MicroStation format, is not permitted under any circumstances. If necessary, this data can be used as a template for the design of guide-compliant elements using the FP Hub applications.

## 2.1.5 Data exchange

### 2.1.5.1 Common, General

Data exchange between FP Hub and external partner companies takes place exclusively via the supplier portal with a closed user group in ELO Teamspace.

For Daimler Truck AG via supplier portal:

<https://supplier.daimlertruck.com/en/collaboration/factory-planning>

Data exchange via e-mail or other exchange boxes (e.g. Dropbox, OneDrive, ...) is not permitted for IT security reasons.

### 2.1.5.2 Registration process

In order to ensure the integration of the external partner company into FP Hub, the external partner company must register in FP Hub via the supplier portal.

During the registration process, the external partner must identify himself with his supplier number.

Further information on registration can be found at the following link:

<https://supplier.daimlertruck.com/en/collaboration/factory-planning/cad-guidelines>

## 2.2 Software

### 2.2.1 Prescribed software

The following software release versions are to be used internally and externally in cooperation with FP Hub:

- MicroStation CONNECT Edition Update 15.2 (10.15.02.11) or 17.2 (10.17.02.61) in combination with workspace/workset of FP Hub
- CARF software version 2024.0 MEP modules (Heating 3D, Ventilation 3D, Sanitation 3D, Sprinkler 3D, Electricity 3D, Schematic module, MEP calculations)
- CARF software version 2024.0 for factory planning modules (equipment layout, fire protection layout, conveyor technology layout, paint layout, Drag curves, stage module, chip conveyor, area, Mapping, Infrabeamer, Qualitool, Toolkit, Infrastructure 3D)
- Speedikon MI 8.11.12.35 (German)
- OpenBuildings Speedikon CONNECT Edition
- LIDS V7.6.8 for LIDS channel cadastre and SAMO tree cadastre
- Browser for using FP Hub: Edge, Chrome, Firefox
- Browser for using SAMO tree registers: Chrome

### 2.2.2 Software updates during the project

In FP Hub, a maximum of two release changes take place annually for the software products used. The software version currently used in the FP Hub must always be used. These release changes will be announced 4 weeks before the implementation date. If a release change takes place during the project term, this must also be carried with the external partner at the same time. For this reason, it is recommended to conclude a maintenance contract for the software used during the course of the project.

### 2.2.3 Download the CAD standard

The CAD standard can be downloaded from the FP Hub-CAD-Standard section at the following link:

<https://supplier.daimlertruck.com/en/collaboration/factory-planning>

## **2.2.4 CARF ENV from FP Hub**

### **2.2.4.1 Differences between the guide and the CARF ENV files**

The tables given in the guide are copies of the CARF ENV from the FP Hub. In case of doubt, the layer names, colors, etc. automatically set by CARF ENV from the FP Hub apply.

### **2.2.4.2 Update to newer CARF versions**

If it is necessary to switch to a new CARF version (release) during the course of the project, the corresponding CARF ENV from the FP Hub must also be used.

If necessary, the project documents must be adapted to the new FP Hub settings. This must be coordinated with the respective CAD coordinator of the project.

### **2.2.4.3 Text Styles**

In order for the settings of the CARF ENV of the FP Hub to work, the text styles under MicroStation must be used. The required text styles for CARF can be found in the carftextstyles.DGNlib library. This library must be used when using CARF.

## 3 Application-specific guides for externally available applications, for all FP Hub sites

### 3.1 Introductory notes

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 valid for all FP Hub locations.



## 3.2 Building planning FP HUB Standard

### 3.2.1 Validity:

This chapter is valid for all FP Hub locations.

### 3.2.2 Prescribed software

The following software in the currently prescribed version (see chapter 2.2.1.) with the corresponding current FP Hub settings files (see chapter 2.2) must be used:

- Bentley MicroStation
- Bentley Speedikon/M Industriebau German language version

### 3.2.3 FP HUB data structures (German language version)

Faculty:	Building construction	
Discipline:	Speedikon Project Standard	
Application name:	"SPEEDIKON PROJECT STANDARD V8"	
Document code:	sj	
DGNLIB:	<none>	
Discipline:	Speedikon design	
Application name:	"SPEEDIKON DESIGN V8"	
Document code:	see	
DGNLIB:	speedikon_IEZ-level.dgnlib, global_DC-level.dgnlib	speedikon_DC-level.dgnlib,
Discipline:	Speedikon 3DDesign	
Application name:	"SPEEDIKON-3D DESIGN V8"	
Document code:	sk	
DGNLIB:	speedikon_IEZ-level.dgnlib, global_DC-level.dgnlib	speedikon_DC-level.dgnlib,
Discipline:	Speedikon section/view	
Application name:	"SPEEDIKON CUT V8"	
Document code:	ss	
DGNLIB:	speedikon_IEZ-level.dgnlib, global_DC-level.dgnlib	speedikon_DC-level.dgnlib,
Discipline:	Speedikon project	
Application name:	"SPEEDIKON PLAN V8"	
Document code:	sp	
DGNLIB:	speedikon_IEZ-level.dgnlib, global_DC-level.dgnlib	speedikon_DC-level.dgnlib,

Application for published Speedikon documents:

Application name:	"MICROSTATION FROM SPEEDIKON V8"
Document code:	"se" or "sk" or "ss" or "sp"
DGNLIB:	speedikon_DC-level.dgnlib, global_DC-level.dgnlib

### 3.2.4 Construction & Architecture

#### 3.2.4.1 Application principles

Data entry is only to be performed with Speedikon elements.

#### 3.2.4.2 Speedikon model editing

#### 3.2.4.3 Floor/Sections

First, the individual floors/building sections (= Speedikon construction areas) must be defined according to the following criteria:

For reasons of work organization, a division into individual construction phases, which are designated as construction phases in the program, is required. A real construction phase does not necessarily have to be a construction phase (construction phase in Speedikon).

When dividing up, it must be ensured that a meaningful disassembly of the object is achieved. The procedure must always be component-oriented, as explained in the examples in the section 3.2.4.6 "Ground floor definition".

The use of the axis grid is generally recommended for the purposeful disassembly of the object. In practice, disassembly according to the course of expansion joints has proven to be an alternative.

Stage levels are generally to be treated as independent St/Ba.

In any case, the definition must be consistent and known to all parties involved. The specification is therefore binding for the project.

St/Ba numbering of the main floors (horizontal) must be specified. Due to the individuality of each construction project, the further structure must be defined before the start of processing.

The floors and building sections are named and designated according to the following assignment:

Master floors:

Floors	Name of part	Level	Notes view:
01	Establishment		
02	2nd basement/main level		Main layers
03-05	Intermediate levels/Individual levels		Individual layers, for example for complicated ceilings or large UZ data
06	1st basement/main level		
07-09	Intermediate level		
10	Ground floor/main level		
11-19	Intermediate level		
20	1st floor/main level		
21-29	Intermediate level		
30	2nd floor/main level		
31-39	Intermediate level		
40	3rd floor/main level		
.....	.....		
90	Top floor/main level		

#### 3.2.4.4 Drawing filter (German language version)

The filters transferred with the project must be used for editing:

Short description of the	Edit filter name	Created by
Design planning, M: 1:100	entp0100	FP HUB
Design planning, M: 1:200	entp0200	FP HUB
Design planning, M: 1:500	entp0500	FP HUB
Design planning, M: 1:1000	entp1000	FP HUB
Approval planning, M: 1:100	genp0100	FP HUB
Approval planning, M: 1:200	genp0200	FP HUB
Execution planning, M: 1:50	ausp0050	FP HUB
Execution planning, M: 1:100	ausp0100	FP HUB
Default screen entry filter	dc_stand	FP HUB
Layout planning for export FP as well as inventory formation	lay0100	FP HUB

The filter “lay0100” must be used for FP HUB-internal publishing (release).

### 3.2.4.5 Layer structure in MicroStation

The layer structure is specified by the attached layer library. The drawing filters used in Speedikon automatically control the layers.

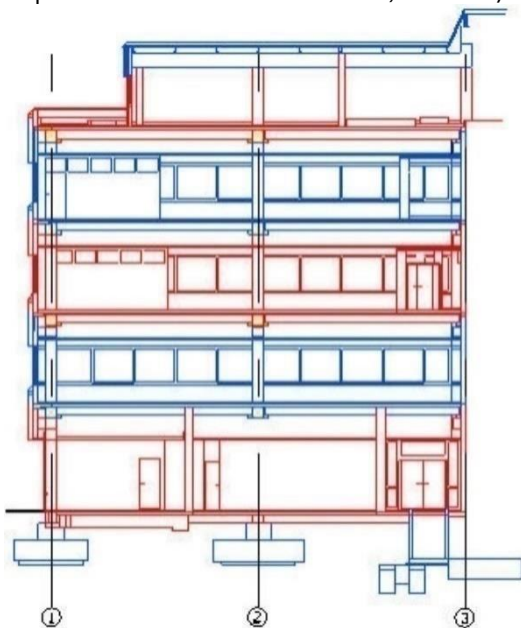
You can find the layer assignment for this application on the Internet ( [fp-hub-ebenen-MicroStation\\_aus\\_IFC\\_mui.xlsx](#) ):

<https://supplier.daimlertruck.com/en/collaboration/factory-planning/cad-guidelines>

### 3.2.4.6 Floor definition

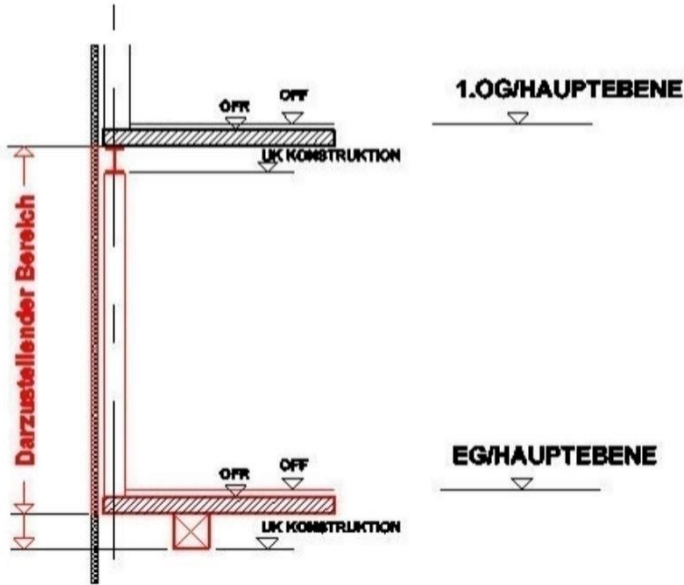
A floor contains the components from the lower edge of the structure to the lower edge of the structure. Foundations, platforms and roof are shown in separate floors/construction sections. Overlapping components are not randomly cut through, but are assigned to a floor as completely as possible. See also the following examples

Important: The roof is not a floor, but a St/Ba.



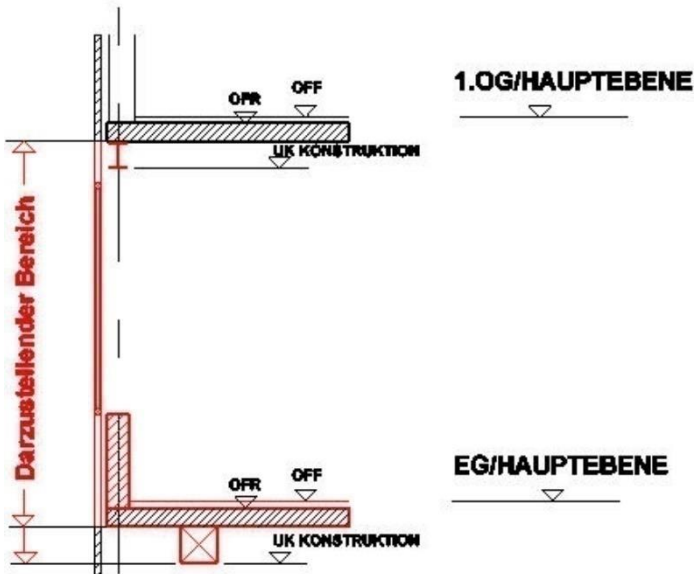
Floor definition

**BEISP.: TRAPEZBLECHFASSADE**



Cut the component to the UK ceiling panel!  
Example "Trapezoid sheet facade"

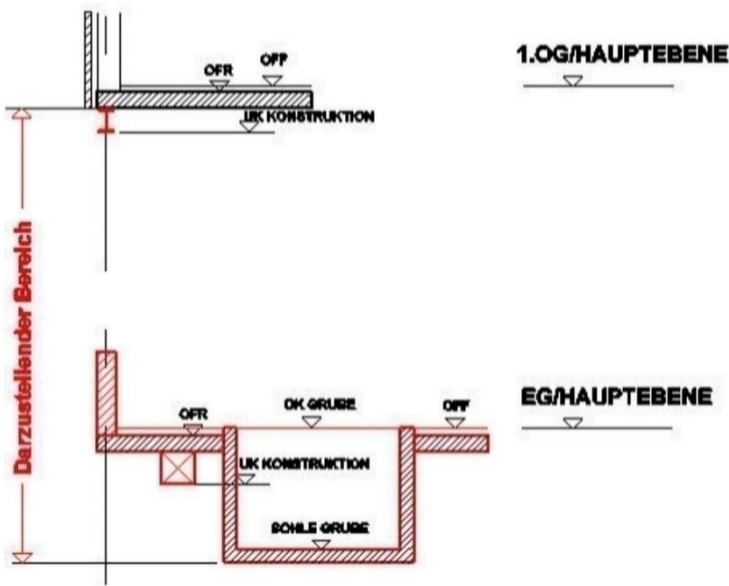
**BEISP.: VORGEHÄNGTES ELEMENT**



FP-Hub\_CAD-guidelin  
es\_en\_DT.pdf

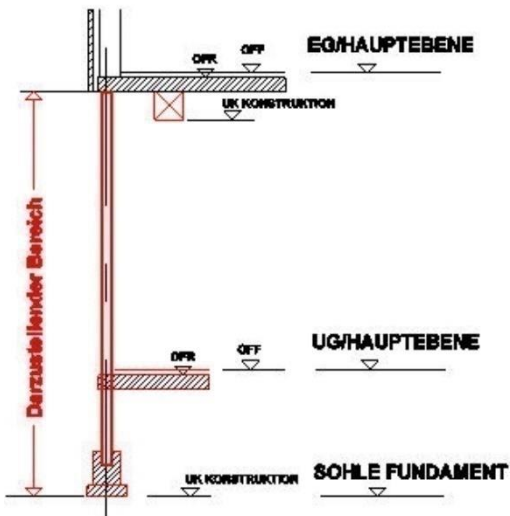
Cut the component to the UK ceiling panel!  
Example "Hanging item"

**BEISP.: GRUBE MIT AUFKANTUNG**



Pit is to be treated as one component  
 Example "Pit with upstand"

**BEISP.: KÖCHERFUNDAMENT**



The support and foundation are to be treated as a separate component.  
 Example of "tube foundation"

**3.2.4.7 Reference planes**

Reference planes 1-10 are fixed default reference planes from Speedikon and cannot be changed.

Do not exceed	Lower edge of wall
2	Zero value (+- 0.0)

3	Floor level
4	Component height
5	Adapt to roof/ceiling (maximum component height)
6	adapt to roof/ceiling
7 Ether net cable	Ridge height
8	adapt to stairs
9	Surface of the terrain body
10	- reserved for later use -

note: Elements with reference plane 2 are always positioned at the absolute elevation 0.0. This means that level 2 (zero value) is unsuitable as a reference plane because floor reference and terrain height are not taken into account here. In the event of an elevation shift of the entire building, all components bound to this level remain at elevation 0.00.

The designations of the reference levels 11–20 are part of the FP HUB standard and should be used accordingly. The reference heights are to be adjusted according to project requirements.

11	OKRB	Top edge of raw floor
12	OKFF	Top edge of finished floor
13	OKBR	Upper edge of dash support
14	UKST	Lower edge of camber
15	UKAD	Lower edge of suspended ceiling
16	UKRD	Lower edge of raw ceiling
17	BULKHEAD	Floor height

Further reference planes can be freely defined under the numbers 21-100.

### 3.2.4.8 Detail level and scope of services

Prior to commissioning, the client must define the level of detail, i.e. for individual planning phases, it must be determined which building elements (optional or mandatory) are to be incorporated into the model

The following table serves as a basis for this. The design content of the respective building must be determined by "ticking off

**Project:**

**SpeedikonM – Industrial construction**

**Design content of digital building model (planning and inventory)**

Planning*					Building element	Comments Opt	Planning*					Building element	Comments Opt
V	E	G	A	B			V	E	G	A	B		
X	X	X	X	X	Grid							Object – Furniture	
X	X	X	X	X	Solid wall					X	X	Object – Fixed installations	
X	X	X	X	X	support				X	X		Dimensioning – Walls and Stairs	
	X	X	X	X	Substructure					X	X	Dimensioning – windows and doors	also on average
	X	X	X	X	Opening – Window					X		Dimensioning – cut-outs	
	X	X	X	X	Opening the door				X	X	X	Dimensions – Miscellaneous/Height	also on average
	X	X	X	X	Stairs				X	X	X	Suspended ceiling	
X	X	X	X	X	Roof					X	X	Opening – Hole/Nische	
X	X	X	X	X	Ceiling					X	X	Opening – Curtain Facade	
X		X	X	X	Lightweight wall					X	X	Opening – Ceiling	
		X	X	X	Toilet/shower wall					X	X	Opening – Roof	
		X	X	X	Name of the room	With room numbers				X	X	Opening – suspended ceiling	
		X	X	X	Object – Sanitary				X	X	X	Ceiling expansion joint	as flat steel ceiling support 100 x10
	X	X	X	X	Dimensions – Axles				X	X		Labeling – Material	
	X	X	X	X	Dimensioning – Building					X	X	Labeling – other text	Room numbers
			X	X	floor	e.g. floor surface Soz.-R.				X	X	Wall – multi-shell	
			X	X	Opening – floor				X	X	X	Foundation (place as ceiling)	
		X	X	X	Labeling – Fire class				X			Preparation for surface determination	
		X		X	Fixed ladders				X			Preparation for mass determination	
		X		X	Roof walkway(s)				X	X	X	Ramps	
		X		X	Roof drainage/RR					X	X	Collision protection and its platforms	
	X	X		X	Dimensions – floor heights	Intermediate				X	X	Barriers	
		X		X	Glaselem/Oberli. permanently installed.	Labeling of				X	X	Fences	e.g. mesh wire

Planning*					Building element	Comments Opt	Planning*					Building element	Comments Opt
		X		X	Rooflight domes			X	X	X	Stairs labeling	gradient	Intermediate

V=Preliminary planning, E=Draft planning, G=Approval planning, A=Execution planning, B=Inventory (revision)

Depending on the plant, axis grids are recorded in a speedikon design file or with CARF layout. It is always at 0.00 m elevation.

### 3.2.4.9 Data entry/editing conventions

All **sections and views** must be created using the SpeedikonM sectioning module.

**SpeedikonM control** components must always be used as specified in the Speedikon manual. If a component cannot be defined as a control component, objects must be defined.

The use of individual components as object solids is permitted.

The **layers** "Systemlines\_Restelemente\_Filterinfos\_2D" and "**Systemlines\_Restelemente\_Filterinfos\_3D**" are primarily used for control purposes to ensure correct processing in addition to the representation of design elements such as "wall axes" and "support crossings".

**Speedikon components that have not been created taking into account the FP HUB conventions are displayed in dashed green on these levels via the FP HUB filters.** They are to be redefined with the following tables "Material overview" and "Material-component combinations" in such a way that the correct form of representation is achieved.

In particular, the specified uses must be entered depending on the correct materials. Using the FP HUB prototypes facilitates processing.

The **axis** grid must be at floor level.

To make **escape** windows recognizable as such in the floor plan, a textual note should be provided by means of component labeling.

### List of materials

Hatching is only displayed for cut components and depends on the respective filter.

Ceilings, roofs, suspended ceilings, floors and objects are not shaded in the floor plan, even if they are cut.



		Ausführungsplanung						Genehmigungsplanung			Entwurfsplanung			Layoutplanung			alle Filter				
		ausp0050, ausp0100						genp0100, genp0200			entp0100, entp0200, entp0500			lay0100			Modell				
		Grundriss			Schnitt			Grundriss/Schnitt			Grundriss/Schnitt			Grundriss/Schnitt							
Material	Code	von	bis	Neubau	Bestand	Abbruch	Neubau	Bestand	Abbruch	Neub.	Best.	Abbruch	Neub.	Best.	Abbruch	Neubau	Bestand	Abbruch	Neubau	Bestand	
MW		100	349																		
Gasbeton		350	399																		
Stahlbeton		400	459																		
Stb.-Fertigteil		460	499																		
Beton		500	599																		
Holzwerkstoffe		600	699																		
Stahl		700	789																		
Maschendraht		790	799																		
Gips/Gipskarton		800	849																		
Mineralfaser		850	859																		
Dämmung		860	869																		
Kunststoff		870	899																		
Dachziegel		900	999																		
Blech		1000	1699																		
Keramik		1700	1799																		
Glas		2000	2200																		
Begrünung		10001	10009																		
Bitumen		10010	10019																		
Gitterrost		10020	10029																		
Kies		10030	10039																		
Beschichtung		10040	10049																		
Estrich		10050	10099																		
Fliesen		10100	10199																		
Werkstein		10200	10299																		
Naturstein		10300	10399																		
Teppich/Textil		10400	10499																		

**Material/component combinations:**

	Masonry 100-349	Gas concrete 350-399	Reinforced concrete 400-459	Strut prefabricated part 460-499	Concrete 500-599	Wood materials 600-699	Steel 700-789	Wire mesh fence 790-799	Plasterboard/Gypsum 800-849	Mineral fiber 850-859	Insulation 860-869	Plastic 870-899	Roof tiles 900-999	Sheet metal 1000-1699	Ceramic 1700-1799	Glass 2000-2200	Greening 10001-10009	Blumen 10010-10019	Grid 10020-10029	Dial 10030-10039	Coating 10040-10049	Screed 10050-10099	Tiles 10100-10199	Workstone 10200-10299	Natural stone 10300-10399	Carpet/textile 10400-10499
Outgoing Ceiling (O)						X			X	X	X	X		X												
Roof		X	X	X	X	X					X	X	X	X		X	X	X	X	X		X		X		
Ceiling		X	X	X		X	X				X			X		X		X	X	X						
Window/door (O)/(O)				X		X	X	X				X		X		X										
floor					X	X			X		X	X	X	X		X		X		X	X	X	X	X	X	X
Lightweight wall (O)	X	X	X	X		X		X	X		X	X		X	X	X							X	X	X	X
Solid wall (O)	X	X	X	X																					X	
Support (O)	X		X	X		X	X							X											X	
Staircase (O)			X	X		X	X									X			X					X	X	
Toilet/shower wall (O)	X	X				X			X			X		X		X										
Carrier(O)		X	X	X		X	X							X												
Objects: Facade				X		X	X	X				X		X		X										
Objects: Fixed installations	X	X	X			X	X		X		X	X	X	X	X	X			X	X		X	X	X	X	X
Objects: Device*																										
Objects: Heating*																										
Objects: Furniture*																										
Objects: Sanitary				X										X	X	X										
Objects: Floor panels		X	X	X		X	X				X			X		X		X	X	X						
Objects: Room labeling	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Objects: Axle labeling	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

All other elements are not distinguished by material. (O) = objects also possible

\* Not included in basic scope

The individual components are to be created as follows:

Component	Commentaries
Supports	<p>The materials offered in the menu must be used.</p> <p>Only the uses “support” and “outer support” are permitted for the representation of supports above the base plate.</p> <p>“Ceiling support” and “Ceiling support, outside” must be used for the representation of supports below the floor plate (e.g. truss supports).</p>
Carrier/substructures	<p>Only the uses “ceiling support” and “bullet support” are permitted</p>
Walls	<p>Entry only possible with the following uses: “Solid wall outside”, “Solid wall inside”, “Light wall outside”, “Light wall inside” and “Toilet/shower wall”</p> <p>The preset uses are: “Load-bearing outer wall”, “Non-load-bearing outer wall”, “Load-bearing inner wall”, “Non-load-bearing inner wall” may <b>not</b> be used</p> <p>When selecting the material, it must be ensured that impossible combinations such as “lightweight interior wall” with “reinforced concrete” material are not supported.</p> <p>It is preferable to set the “reference top” to identifier 6 (adjust roof to wall)</p>

Component	Commentaries
Objects	are placed on the corresponding levels via the uses offered in the menu Material selection according to the specified materials of the respective component used
Stairs	Bottom floor: Placement with “lowest floor” display parameter
	Normal floor, if the staircase of the floor below is identical: Placement with display parameter “Normal floor”
	Normal floor, if the staircase of the <b>floor below is not</b> identical: Placement with display parameter “lowest floor” and additional Placement of a 2D object (use of “stairs”) of the stairs of the floor below seen from above
	Top floor (staircase) Placement of a 2D object, the staircase seen in the top view of the floor below
	The fault message “Cell not found” when generating the model can be ignored because no 3D cell is defined.
Fixed ladders	Entry only possible with the following uses: “Stairs”, “Fixed installations”
Steel railing	Entry only possible with the following uses: “Stairs”, “Fixed installations”
Steel stile stairs	Entry only with use: “Stairs” possible
Rooms	Assign the surfaces of DIN 277 and the type of enclosure as use
Ceilings, roofs, suspended ceilings, floors	Floor panels are placed down as ceilings with the associated “floor panel” prototype Openings in floor plates shall be designed in accordance with DIN 1956.
Expansion joints	Expansion joints between adjacent ceiling panels must be designed as flat steel ceiling supports 100 x10 (see example below). The label lands on the “SM2D_Expansion joints label” level.
Foundational	Foundations are on a separate floor, all Speedikon components can be used
Dimensional figures	Dimensions are placed over the labels as they are available for selection. “Axes”, “Building edges”, “External dimensions” are used for external dimensions. “Walls and stairs”, “Windows and doors”, “Cut-outs”, “Other” are used for internal dimensions.
Shelf support	To be used for complex truss constructions that cannot be created via the truss support module. A second Speedikon file is created containing only the design.
Restricted area	For the definition of an area or a room that should not be usable for other subsections.  The component is defined via 2D and 3D objects and placed via the use of “Restricted area”.

### 3.2.4.10 speedikon project standard (German language version)

The Speedikon project standard combines all project-specific macros, filters, cell libraries and special components (objects, object solids). The project standard contains all folders and files in the STD folder of a project directory.

#### Note for external processing:

The material assignments and the assignment of components and the uses of the FP HUB company standard may not be changed or supplemented. The file “dbmtypes.dat” and the tables “\*\_use.tbl” must not be stored, modified or exported from the project standard.

When processing the project, care must be taken to keep the speedikon project standard as small as possible with regard to its data volume. This is also supported by the project default filter file in the FP HUB standard, which only suggests selected file groups during import/export.

### 3.3 Conveyor technology

#### 3.3.1 Validity:

This chapter is valid for all FP Hub locations.

#### 3.3.2 Prescribed software

The following software in the currently prescribed version (see chapter 2.2.1.) with the corresponding current FP Hub settings files (see chapter 2.2) must be used:

- MicroStation
- CARF conveyor technology layout
- CARF setup layout (crane functions)

#### 3.3.3 Objective & Targets

The objective of factory planning within the production planning of FP HUB is to map the real factory in a digital factory. This requires integrated factory planning with 3D models.

The CARF equipment layout application is used to plan gantry cranes, lifting gear, crane construction kits and slewing jib cranes in the area of materials handling technology.

#### 3.3.4 Conveyor technology, single system

Faculty:	Conveyor technology
Discipline:	Setting/Settings
Application name:	CARF FT
Document code:	fairy
DGNLIB:	tri_conveying_technology_DC-level.dgnlib
Example of systems to be planned:	Conveyor systems

This type must be selected for each type of individual system. In the case of interlinked systems, the interfaces (e.g. transfers, lifters, etc.) must be defined appropriately.

- Each conveyor is drawn in a separate document.
- There is only 1 document for each conveyor system, which may extend over several floors of a building.

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal: fp-hub\\_ebenen-ft\\_mui.xlsx](#)

#### 3.3.5 Conveyor technology for crane systems

Faculty:	Conveyor technology
Discipline:	Crane systems
Application name:	CARF CRANE MODULE
Document code:	fk
DGNLIB:	tri_conveying_technology_DC-level.dgnlib
Example of systems to be planned:	Crane systems

This type must be selected for every type of crane system and handling equipment.

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal: fp-hub\\_ebenen-ft\\_mui.xlsx](#)

### **3.3.5.1 Construction Drawings**

Each design drawing must be filed in a separate document in the “Conveyor technology for special applications” discipline.

### **3.3.5.2 Detailed examinations**

Each detailed examination must be filed in a separate document in the “Conveyor technology for special applications” discipline.

## 3.4 Building services

### 3.4.1 Validity:

This chapter is valid for all FP Hub locations.

### 3.4.2 Prescribed software

The following software in the currently prescribed version (see chapter 2.2.1.) with the corresponding current FP Hub settings files (see chapter 2.2) must be used:

- MicroStation \*.dgn\*
- CARF TGA 3D Module
- CARF MS Schematic Module
- CARF chip disposal

### 3.4.3 Technical specifications for FP Hub

#### 3.4.3.1 Minimum requirement for documentation after conversions/modifications

##### 3.4.3.1.1 Introductory remarks

In general, all newly created systems, system parts and all line changes must be documented. Disassemblies must also be removed.

##### 3.4.3.1.2 Electrical equipments

###### Cable trays and risers

- |  |                      |
|--|----------------------|
| • Basic equipment                              | Revision required    |
| • Hanger and stand-up systems                  | Revision required    |
| • Branching for climbing routes on workbenches | No revision required |

###### Basic set up

- |   |  |
|---|--|
| • Lights  | Revision required                          |
| • Safety Lights   | Revision required                          |
| • Rescue sign lights                                    | Revision required                          |
| • Sockets, switches, EIB sensors and actuators          | Revision necessary, if the walls are moved |
| • Floor sockets   | Revision required                          |
| • Distribution List                                     | Revision required                          |
| • Lightning protection, equipotential bonding, earthing | Revision required                          |

###### Fire detection systems

- |                                |                   |
|--------------------------------|-------------------|
| • Detector plans               | Revision required |
| • Electrical cabinets          | Revision required |
| • Building cleaning system     | Revision required |
| • RAS                          | Revision required |
| • Control of Access            | Revision required |
| • Fire detection objects in 3D | Revision required |

###### Communication technology

- |                          |                      |
|--------------------------|----------------------|
| • Data sockets           | No revision required |
| • WLAN and base stations | Revision required    |

• Fire brigade radio	Revision required
<b>Power supply source voltage</b>	
• S-Stations	Revision required
• Switchgear	Revision required
• Busbars with brackets	Revision required
<b>3.4.3.1.3 Mechanical</b>	
<b>Ventilation (room air, process air)</b>	
• Duct and pipe network	Revision required
• Equipment	Revision required
• Air outlets	Revision required
• Extractions	Revision required
<b>Heating (heating, steam)</b>	
• Distribution stations, performance data	Revision required
• Substations	Revision required
• Line network, with nominal widths	Revision required
• heater radiator	Revision required
• Air heater unit	Revision required
• Controlling parts	Revision required
<b>Cold/cooling water</b>	
• Distribution stations, performance data	Revision required
• Substations	Revision required
• Cable network , with nominal widths	Revision required
• Recirculating air units	Revision required
• Refrigerators	Revision required
• Split devices	Revision required
• Controlling parts	Revision required
<b>Fire protection (fire protection, SHEV)</b>	
<b>Sprinklers</b>	
• Distribution stations	Revision required
• Cable harnesses	Revision required
• Sprinkler heads	Revision required
• Splitting into groups	Revision required
<b>Extinguishing water</b>	
• Distribution stations	Revision required
• Cable harnesses	Revision required
• Fire extinguisher boxes	Revision required
• Closing down	Revision required
<b>RWA</b>	
• Control cabinets	Revision required
• Coupling	Revision required
• Cable harnesses	No revision required
<b>Smoke control</b>	
• Cable harnesses	Revision required
• Ventilation fans	Revision required
<b>Sanitary</b>	
• Distribution stations	Revision required
• Pipe network up to last shut-off valve, with nominal widths	Revision required
• Lines behind wash gutters	No revision required
• Equipments	Revision required
<b>compressed air</b>	



• Distribution stations	Revision required
• Line network, with nominal widths	Revision required
• I-sections	Revision required
<b>Technical gasses and liquids</b>	
• Distribution stations	Revision required
• Pipe network up to last shut-off valve, with nominal widths	Revision required
• Equipments	Revision required
<b>Chip Disposal</b>	
• Conveyor systems	Revision required
• Facilities/equipment	Revision required
<b>Brackets and hangers</b>	
• Hanger and stand-up systems	Revision required

### 3.4.3.2 Minimum documentation requirements for new buildings

#### 3.4.3.2.1 Introductory remarks

In general, all systems, system parts and all lines must be documented.

#### 3.4.3.2.2 Implementation in

In principle, the distributor numbers, circuit numbers and physical addresses must be entered in the corresponding data mask fields of the CARF cells on all components and distributors.

All components shall be labeled with the corresponding DN/cross-section and height specifications.

#### 3.4.3.2.3 Electrical equipments

##### Cable trays and risers

• Basic equipment	Revision required
• Hanger and stand-up systems	Revision required
• Branching for climbing routes on workbenches	Revision required

##### Basic set up

• Lights	Revision required
• Safety Lights	Revision required
• Rescue sign lights	Revision required
• Sockets, switches, EIB sensors and actuators	Revision required
• Floor sockets	Revision required
• Distribution List	Revision required
• Lightning protection, equipotential bonding, earthing	Revision required

##### Fire detection systems

• Detector plans	Revision required
• Electrical cabinets	Revision required
• Building cleaning system	Revision required
• RAS	Revision required
• Control of Access	Revision required
• Fire detection objects in 3D	Revision required

##### Communication technology

• Data sockets	Revision required
• WLAN and base stations	Revision required

• Fire brigade radio	Revision required
<b>Power supply source voltage</b>	
• S-Stations	Revision required
• Switchgear	Revision required
• Busbars with brackets	Revision required

#### 3.4.3.2.4 Mechanical

##### Ventilation (room air, process air)

• Duct and pipe network	Revision required
• Equipment	Revision required
• Air outlets	Revision required
• Extractions	Revision required

##### Heating (heating, steam)

• Distribution stations, performance data	Revision required
• Substations	Revision required
• Line network, with nominal widths	Revision required
• heater radiator	Revision required
• Air heater unit	Revision required
• Controlling parts	Revision required

##### Cold/cooling water

• Distribution stations, performance data	Revision required
• Substations	Revision required
• Cable network , with nominal widths	Revision required
• Recirculating air units	Revision required
• Refrigerators	Revision required
• Split devices	Revision required
• Controlling parts	Revision required

##### Fire protection (fire protection, SHEV)

###### Sprinklers

• Distribution stations	Revision required
• Cable harnesses	Revision required
• Sprinkler heads	Revision required
• Splitting into groups	Revision required

###### Extinguishing water

• Distribution stations	Revision required
• Cable harnesses	Revision required
• Fire extinguisher boxes	Revision required
• Closing down	Revision required

###### RWA

• Control cabinets	Revision required
• Coupling	Revision required
• Cable harnesses	Revision required

###### Smoke control

• Cable harnesses	Revision required
• Ventilation fans	Revision required

##### Sanitary

• Distribution stations	Revision required
• Pipe network up to last shut-off valve, with nominal widths	Revision required
• Lines behind wash gutters	Revision required
• Equipments	Revision required

##### compressed air

• Distribution stations	Revision required
• Line network, with nominal widths	Revision required
• I-sections	Revision required
<b>Technical gasses and liquids</b>	
• Distribution stations	Revision required
• Pipe network up to last shut-off valve, with nominal widths	Revision required
• Equipments	Revision required
<b>Chip Disposal</b>	
• Conveyor systems	Revision required
• Facilities/equipment	Revision required
<b>Brackets and hangers</b>	
• Hanger and stand-up systems	Revision required

### 3.4.3.3 Manufacturer/material in preliminary planning

During preliminary planning – if no materials have yet been determined – the **"NEUTRAL"** material is used, with which all possibilities of all materials/manufacturers can be mapped. Pipe fittings such as sleeves, bends, T-pieces, flanges are shown in simplified form in accordance with CARF ENV of FP HUB.

## 3.4.4 Specifications FP HUB CAD technical

### 3.4.4.1 CARF Creation Regulations

In addition to the use of the CARF ENV from FP HUB, the following creation regulations must be observed when working with CARF.

### 3.4.4.2 Application Lock

In the FP Hub, the “Lock application” function has been switched on in the CARF GEBÄUDE services modules under CARF.

This functionality is intended to help ensure the disciplinary purity of the DGN documents in the planning network between the FP HUB and the external planning partners.

In the CARF ENV of the FP Hub, the default settings are set so that only one application per module can be used in a DGN document with CARF. If a MicroStation project document is open and the wrong CARF module is started, a fault message appears, e.g.:



After starting the correct module, the selection of the application is locked and the correct media selection is automatically set (example sanitary/compressed air):



This ensures that planning is always carried out in the documents with the right module and the corresponding media.

#### 3.4.4.3 Pallets (cell set)

When setting cells in the CARF applications, the settings available in the CARF ENV of FP Hub for the pallets (settings from the cell set) must be used.

#### 3.4.4.4 Model body

The project data must be structured in such a way that the individual plant/pipeline systems are self-contained so that they can be processed in full with CARF. Components from different CARF modules must not be mixed.

#### 3.4.4.5 Cells, components, components

Within plant/pipe systems, only the cells, components and components from the respective CARF modules may be used. Missing information, such as manufacturer or type designations, must be entered as attributes with the same graphical representation option.

Missing components that do not belong to plant/pipe systems are to be designed as MicroStation 3D volume elements, defined as CARF cells and the corresponding attributes entered.

#### 3.4.4.6 Use of neutral media

The use of neutral media (e.g. DL\_neutral) is only permitted if the required medium is not included in these CAD guidelines.

#### 3.4.4.7 Dimensions and captions with CARF functions

The following drawing elements shall be dimensioned or labeled with the dimensioning functions (cross-sectional dimensioning/height dimensioning) of CARF:

- Pipes with diameter measurement and height measurement
- Ventilation ducts with cross-section and height measurements
- Cable trays with cross-section and height measurements
- Lights with height measurement

The heights are to be measured in relation to the FFB of the corresponding floor.

### 3.4.5 Application CARF Heating 3D

#### 3.4.5.1 Steam

Faculty:	MEP mechanical
Discipline:	Steam
Application name:	CARF HEATING DA
Document code:	da
DGNLIB:	Tri_heating_steam_DC-level.dgnlib
Example of systems to be planned:	Steam supply systems, steam boilers, steam lines, high-pressure steam systems

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal: https://supplier.daimlertruck.com/en/collaboration/factory-planning](https://supplier.daimlertruck.com/en/collaboration/factory-planning)

#### 3.4.5.2 Heating

Faculty:	MEP mechanical
Discipline:	Heater
Application name:	CARF HEATING HE
Document code:	he
DGNLIB:	Tri_heating_heating_DC-level.dgnlib
Example of systems to be planned:	Heating systems, boilers, heating pipes, heaters, radiators

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal: https://supplier.daimlertruck.com/en/collaboration/factory-planning](https://supplier.daimlertruck.com/en/collaboration/factory-planning)

### 3.4.6 CARF Ventilation 3D application

#### 3.4.6.1 Indoor air

Faculty:	MEP mechanical
Discipline:	Indoor air
Application name:	CARF VENTILATION LU
Document code:	lu
DGNLIB:	Tri_ventilation_room air_DC-level.dgnlib
Example of systems to be planned:	Ventilation systems, room air systems, painting ventilation systems, air outlets, Fire dampers

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal: https://supplier.daimlertruck.com/en/collaboration/factory-planning](https://supplier.daimlertruck.com/en/collaboration/factory-planning)

#### 3.4.6.2 Process air

Faculty:	MEP mechanical
Discipline:	Process air
Application name:	CARF VENTILATION PL
Document code:	pl
DGNLIB:	Tri_ventilation_process air_DC-level.dgnlib
Example of systems to be planned:	Machine and exhaust extraction systems

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal: https://supplier.daimlertruck.com/en/collaboration/factory-planning](https://supplier.daimlertruck.com/en/collaboration/factory-planning)

#### 3.4.6.3 RWA

Faculty:	MEP mechanical
Discipline:	SHE
Application name:	CARF VENTILATION RW
Document code:	rw
DGNLIB:	Tri_ventilation_RWA_DC-level.dgnlib
Example of systems to be planned:	Smoke and heat extraction systems

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal: https://supplier.daimlertruck.com/en/collaboration/factory-planning](https://supplier.daimlertruck.com/en/collaboration/factory-planning)

### 3.4.7 Application CARF Sanitary 3D

#### 3.4.7.1 compressed air

Faculty:	MEP mechanical
Discipline:	compressed air
Application name:	CARF SANITAER DL
Document code:	dl
DGNLIB:	Tri_sanitary_compressed_air_DC-level.dgnlib
Example of systems to be planned:	Compressed air generation systems, stationary compressors, l-lines

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal: fp-hub\\_ebenen-tga\\_mui.xlsx](#)

#### 3.4.7.2 Emulsions/washer fluid

Faculty:	MEP mechanical
Discipline:	Emulsions/washing fluid
Application name:	CARF SANITAER EM
Document code:	em
DGNLIB:	Tri_sanitas_emulsion_DC-level.dgnlib
Example of systems to be planned:	Plant-related piping systems for cutting emulsion

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal: fp-hub\\_ebenen-tga\\_mui.xlsx](#)

#### 3.4.7.3 Cold/cooling water

Faculty:	MEP mechanical
Discipline:	Cold water/cooling water
Application name:	CARF SANITAR KW
Document code:	Kw
DGNLIB:	Tri_sanitary_cold_water_DC-level.dgnlib
Example of systems to be planned:	Recooling systems, refrigeration systems, refrigeration production, refrigeration piping, pumps

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal: fp-hub\\_level-tga\\_mui.xlsx](#)



**3.4.7.4 Paints and adhesives**

Faculty:	MEP mechanical
Discipline:	Paints and adhesives
Application name:	CARF SANITAER LK
Document code:	lk
DGNLIB:	Tri_sanitaries_paints_adhesive_DC-level.dgnlib
Example of systems to be planned:	System-related paint piping

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal: fp-hub\\_ebenen-tga\\_mui.xlsx](#)

**3.4.7.5 Oils/Fats/Fuels**

Faculty:	MEP mechanical
Discipline:	Oils/Greases/Fuels
Application name:	CARF SANITARY OR
Document code:	of
DGNLIB:	Tri_sanitas_oele_grease_DC-level.dgnlib
Example of systems to be planned:	Tank systems and piping for technical Liquids and gasses

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal: fp-hub\\_level-tga\\_mui.xlsx](#)

**3.4.7.6 Sanitary**

Faculty:	MEP mechanical
Discipline:	Sanitation
Application name:	CARF SANITAER SA
Document code:	sa
DGNLIB:	Tri_sanitas_sanitas_DC-level.dgnlib
Example of systems to be planned:	Drinking water supply, wastewater systems, sanitary facilities

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal: fp-hub\\_ebenen-tga\\_mui.xlsx](#)

**3.4.7.7 Acids/alkali/chemicals**

Faculty:	MEP mechanical
Discipline:	Acids/alkalis/chemicals
Application name:	CARF SANITAER SL
Document code:	sl
DGNLIB:	Tri_sanitary_acid_alkaline_DC-level.dgnlib
Example of systems to be planned:	System-related paint piping

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_level-tga\\_mui.xlsx](#)

**3.4.7.8 Technical fluids**

Faculty:	MEP mechanical
Discipline:	Technical fluids
Application name:	CARF SANITAER TF
Document code:	tf
DGNLIB:	Tri_sanitary_technical_fluids_DC-level.dgnlib
Example of systems to be planned:	Supply lines and components for coolant, refrigerant

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_ebenen-tga\\_mui.xlsx](#)

**3.4.7.9 Technical gasses**

Faculty:	MEP mechanical
Discipline:	Technical gasses
Application name:	CARF SANITAER TG
Document code:	tg
DGNLIB:	Tri_sanitary_technical_gases_DC-level.dgnlib
Example of systems to be planned:	Supply lines and components for natural gas, nitrogen

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_ebenen-tga\\_mui.xlsx](#)

### 3.4.8 Application CARF Sprinkler 3D

#### 3.4.8.1 Fire-resilience

Faculty:	MEP mechanical
Discipline:	Fire protection
Application name:	CARF SPRINKLER BR
Document code:	br
DGNLIB:	Tri_sprinkler_fire protection_DC-level.dgnlib
Example of systems to be planned:	Supply lines and components Sprinkler systems, lines, sprinkler heads

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):

[fp-hub\\_level-tga\\_mui.xlsx](#)

### 3.4.9 Application CARF Schematics

Faculty:	MEP mechanical
Discipline:	Automation/ICA/P&ID scheme
Application name:	CARF SCHEMA
Document code:	rt
DGNLIB:	Tri_msr_automation_DC-level.dgnlib
Example of systems to be planned:	two-dimensional representation of building systems diagrams, line diagrams, <b>Drainage diagrams</b> , no electrical diagrams

Faculty:	MEP mechanical
Discipline:	Steam
Application name:	CARF SCHEMA
Document code:	da
DGNLIB:	Tri_heating_steam_DC-level.dgnlib
Example of systems to be planned:	Two-dimensional representation of building systems diagrams

Faculty:	MEP mechanical
Discipline:	Heater
Application name:	CARF SCHEMA
Document code:	he
DGNLIB:	Tri_heating_heating_DC-level.dgnlib
Example of systems to be planned:	Two-dimensional representation of building systems diagrams

Faculty:	MEP mechanical
Discipline:	Indoor air
Application name:	CARF SCHEMA
Document code:	lu
DGNLIB:	Tri_ventilation_room air_DC-level.dgnlib
Example of systems to be planned:	Two-dimensional representation of building systems diagrams

Faculty:	MEP mechanical
Discipline:	Process air
Application name:	CARF SCHEMA
Document code:	pl
DGNLIB:	Tri_ventilation_process air_DC-level.dgnlib
Example of systems to be planned:	Two-dimensional representation of building systems diagrams

Faculty:	MEP mechanical
Discipline:	RWA
Application name:	CARF SCHEMA
Document code:	rw
DGNLIB:	Tri_ventilation_RWA_DC-level.dgnlib
Example of systems to be planned:	Two-dimensional representation of building systems diagrams
Faculty:	MEP mechanical
Discipline:	compressed air
Application name:	CARF SCHEMA
Document code:	dl
DGNLIB:	Tri_sanitary_compressed_air_DC-level.dgnlib
Example of systems to be planned:	Two-dimensional representation of building systems diagrams
Faculty:	MEP mechanical
Discipline:	Emulsions/washing fluid
Application name:	CARF SCHEMA
Document code:	em
DGNLIB:	Tri_sanitas_emulsion_DC-level.dgnlib
Example of systems to be planned:	Two-dimensional representation of building systems diagrams
Faculty:	MEP mechanical
Discipline:	Cold water/cooling water
Application name:	CARF SCHEMA
Document code:	kw
DGNLIB:	Tri_sanitary_cold_water_DC-level.dgnlib
Example of systems to be planned:	Two-dimensional representation of building systems diagrams
Faculty:	MEP mechanical
Discipline:	Paints and adhesives
Application name:	CARF SCHEMA
Document code:	lk
DGNLIB:	Tri_sanitaries_paints_adhesive_DC-level.dgnlib
Example of systems to be planned:	Two-dimensional representation of building systems diagrams
Faculty:	MEP mechanical
Discipline:	Oils/greases/Fuels
Application name:	CARF SCHEMA
Document code:	of
DGNLIB:	Tri_sanitas_oele_grease_DC-level.dgnlib
Example of systems to be planned:	Two-dimensional representation of building systems diagrams
Faculty:	MEP mechanical
Discipline:	Sanitation
Application name:	CARF SCHEMA
Document code:	sa
DGNLIB:	Tri_sanitas_sanitas_DC-level.dgnlib
Example of systems to be planned:	Two-dimensional representation of building systems diagrams
Faculty:	MEP mechanical
Discipline:	Acids/alkalis/chemicals
Application name:	CARF SCHEMA

Document code: sl  
 DGNLIB: Tri\_sanitary\_acid\_alkaline\_DC-level.dgnlib  
 Example of systems to be planned: Two-dimensional representation of building systems diagrams

Faculty: MEP mechanical  
 Discipline: Technical fluids  
 Application name: CARF SCHEMA  
 Document code: tf  
 DGNLIB: Tri\_sanitary\_technical\_fluids\_DC-level.dgnlib  
 Example of systems to be planned: Two-dimensional representation of building systems diagrams

Faculty: MEP mechanical  
 Discipline: Technical gases  
 Application name: CARF SCHEMA  
 Document code: tg  
 DGNLIB: Tri\_sanitary\_technical\_gases\_DC-level.dgnlib  
 Example of systems to be planned: Two-dimensional representation of building systems diagrams

Faculty: MEP mechanical  
 Discipline: Fire-resilience  
 Application name: CARF SCHEMA  
 Document code: br  
 DGNLIB: Tri\_sprinkler\_fire\_protection\_DC-level.dgnlib  
 Example of systems to be planned: Two-dimensional representation of building systems diagrams

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_level-tga\\_mui.xlsx](#)

### 3.4.10 CARF splinter disposal application

Faculty: MEP mechanical  
 Discipline: splinter Disposal  
 Application name: CARF SPAENE  
 Document code: sf  
 DGNLIB: Tri\_shavings\_disposal\_DC-level.dgnlib  
 Example of systems to be planned: Chip disposal systems, chip conveyors

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_level-tga\\_mui.xlsx](#)

### 3.4.11 CARF Elektro 3D application

#### 3.4.11.1 Common, General

In the planning for MEP Electrical, the following installations must be positioned correctly in 3D using the current CARF version:

- Main distribution board/power supply
- Sub-distributor

- Power busbars
- Routing of cables
- Lights
- Power sockets

Only these installations are collision-relevant. All other installations are to be placed 2D as a symbol at the correct height. The same applies in this case for the assigned labeling.

Busbars are to be placed as parametric elements in the CARF electric 3D module with the busbar function. Data imported from other systems is not allowed.

The CARF cell selector is used in the CARF Electrical 3D application.

### 3.4.11.2 Using the cell selector

Working with the CARF ENV FP HUB specifies a cell stock of FP HUB. Only these cells are to be used.

Placement of cells is only permitted in the intended application groups. Cells from other application groups lead to incorrect layers in the document.

### 3.4.11.3 Basic installations

Faculty:	MEP Electrical
Discipline:	Basic installations
Application name:	CARF ELEKTRO EG
Document code:	eg
DGNLIB:	tri_electro7_basic_installation_DC-level.dgnlib
Example of systems to be planned:	Building electrical system, electrical installation, KHV, KUV, uninterruptible power supply Emergency power backup systems, S stations, transformer stations, busbars, lighting, luminaire supporting rails

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_level-tga\\_mui.xlsx](#)

### 3.4.11.4 Telecommunications

Faculty:	MEP Electrical
Discipline:	Telecommunications
Application name:	CARF ELEKTRO EN
Document code:	en
DGNLIB:	tri_electro7_messaging_DC-level.dgnlib
Example of systems to be planned:	automation stations, intelligent substations, control stations, substations, Weather stations, feeders

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_level-tga\\_mui.xlsx](#)

### 3.4.11.5 Security technology

Faculty:	MEP Electrical
Discipline:	Security technology
Application name:	CARF ELEKTRO AND
Document code:	et
DGNLIB:	tri_electro7_safety_technology_DC-level.dgnlib
Example of systems to be planned:	Fire detectors, smoke detectors, burglary alarm systems, access controls

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_level-tga\\_mui.xlsx](#)

### 3.4.11.6 Building overviews

Faculty:	MEP Electrical
Discipline:	Building overviews
Application name:	CARF ELECTRIC EG
Document code:	ea
DGNLIB:	tri_electro7_basic_installation_DC-level.dgnlib
Example of systems to be planned:	General plans for buildings, diagrams

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_level-tga\\_mui.xlsx](#)

### 3.4.11.7 Plant overviews

Faculty:	MEP Electrical
Discipline:	Plant overviews
Application name:	CARF ELECTRIC EG
Document code:	ew
DGNLIB:	tri_electro7_basic_installation_DC-level.dgnlib
Example of systems to be planned:	Overview plans for plant areas, diagrams

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_level-tga\\_mui.xlsx](#)

### 3.4.11.8 ICA floor plan

Faculty:	MEP Electrical
Discipline:	ICA floor plan
Application name:	CARF ELEKTRO IS
Document code:	er
DGNLIB:	Tri_electro7_msr_DC-level.dgnlib
Example of systems to be planned:	Two-dimensional symbol displays for location-related MSR <b>display, no</b> Three-dimensional representation of distributors or cable trays (these are to be drawn in TGA-Electric basic installation)

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_level-tga\\_mui.xlsx](#)

### 3.4.12 Application CARF plan creation

Faculty:	Plans/Overview
Discipline:	CARF plan generation
Application name:	CARF PLANNENGERIERUNG
Document code:	za
DGNLIB:	drawing documentation_DC-level.dgnlib

The document is used for the creation of plans with floor plans and/or sectional views. Deviating from the basic guidelines, 3 models are permitted:

- Coordination model-000 (preset available)
- PLAN-000
- Hatch-000

In the coordination model, the work documents required for the plan are referenced together and the fixed views required for plan creation are created.

In the PLAN-000 model (sheet type 3D), the fixed views are placed for drawing output and the hidden edges or hatching are created as required.

The Hatch-000 model contains the hatching created by the CARF plan creation module.

Layer assignment for microstation:

The plan creation uses the level assignment of the specialist area: Plans, discipline: Plans/overviews (see chapter 5.5.).



## 3.5 Painting technology

### 3.5.1 Validity Period

This chapter is valid for all FP Hub locations.

### 3.5.2 Prescribed software

The following software in the currently prescribed version (see chapter 2.2.1.) with the corresponding current FP HUB settings files (see chapter 2.2) must be used:

- MicroStation
- CARF layout paint module

### 3.5.3 CARF painting technology

#### 3.5.3.1 Color assignments in CARF painting technology

The color assignments specified by the CARF FP HUB ENV must be adhered to. A deviation from the specified settings is not permitted.

#### 3.5.3.2 Placement of cells with CARF painting technology

The cell libraries supplied with the CARF ENV from FP HUB must be used. The cells are to be placed in the original color as defined in the CARF ENV of FP HUB. A deviation from the specified settings is not permitted.

#### 3.5.3.3 Accompanying 2D system diagrams

Unless otherwise defined in the tender, the following regulation applies to the creation of **accompanying** 2D system diagrams for painting technology:

Since no standard is currently prescribed by FP HUB for these scopes, it is sufficient if the supplier supplies DGNs that correspond to the CAD guideline part 1. The DGNs may only be used for levels from the level libraries 1\_bis\_63\_DC-level.dgnlib and global\_DC-level.dgnlib. As an accompanying document, the supplier must create a list of level assignments in Excel format. The supplied diagrams must be filed as described in Chapter 5.5.

#### 3.5.3.4 Stages

Accompanying plant platforms must be created in accordance with Chapter 3.8.

#### 3.5.3.5 Accompanying conveying technology

Accompanying conveyor technology must be created in accordance with Chapter 3.3.

#### 3.5.3.6 Accompanying system technology

Accompanying plant engineering must be created in accordance with Chapter 3.4.

### 3.5.3.7 Level assignment for CARF painting technology

The **main models created** with CARF painting technology must be created in FP Hub with the following structural elements:

Faculty:	Equipment
Discipline:	Paint shop equipment
Application name:	CARF painting technology
Document, model name:	3D modeling
Document code:	ao
DGNLIB:	tri_painting_technology_DC-level.dgnlib

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):

[fp-hub\\_level-tga\\_mui.xlsx](#)

## 3.6 Layout

### 3.6.1 Validity:

This chapter is valid for all FP Hub locations.

### 3.6.2 Prescribed software

The following software in the currently prescribed version (see chapter 2.2.1.) with the corresponding current FP HUB settings files (see chapter 2.2.) must be used:

- MicroStation
- CARF module layout
- CARF module fire protection layout

### 3.6.3 Technical specifications for FP HUB

#### 3.6.3.1 3D planning

Newly created 3D elements must be merged into cells. For this purpose, only the cell creation process under CARF Furnishing layout and outdoor facilities is to be used. In addition to the DGN created by the contractor, the user cell libraries and assemblies exported from the CARF layout module shall be made available to the client.

#### 3.6.3.2 Minimum requirement for documentation after conversions/modifications

In general, all newly created and changed facilities must be documented. Disassemblies must also be removed.

The planning must be divided into 3 documents:

- Setting/Settings
- Building proposal (optional)
- Plan creation (optional)

### 3.6.4 Specifications FP HUB CAD technical

#### 3.6.4.1 CARF

#### 3.6.4.2 The FP HUB CARF ENV

The FP HUB CARF ENV contains all configuration files and cell libraries that must be used when working with FP HUB. The cells provided may only be used and passed on within the framework of the order. Any other use is not permitted.

#### 3.6.4.3 Creation Notes

In addition to using the CARF ENV from FP HUB, the following creation instructions must be observed when working with CARF.

### 3.6.4.4 The structure tree in the CARFFITTINGS LAYOUT/EXTERNAL SYSTEMS

The structure tree provided by FP HUB within the framework of the CARF ENV may not be modified. Deleting, modifying or adding structures is not permitted.

### 3.6.4.5 Use and handling of the delivered cell libraries

The cells of the delivered cell libraries may not be set with MicroStation cell placement but must only be placed via the applications of the layout specialist area.

Background story: The delivered cell libraries have a neutral level assignment and symbols. These only become intelligent and guideline-compliant objects when they are placed via the application.

### 3.6.4.6 Body of the level structure

The levels have meaningful level names, which are divided into different units, e.g.

- Generalities:
- Global
- logistics
- Production of film
- Proposal
- .....

The levels of the individual units start with their initial letters (A, G, L, P, V, ...). This is followed by a three-digit number, the last of which is either a 2 or a 3. This indicates whether it is a 2D or a 3D plane. Next, the descriptive name of the layer follows, followed by the dimension label "2D" or "3D".

In the layer display in MicroStation, the Description column lists in detail what content can be located on the corresponding layer.

Each of the blocks has up to 5 general levels starting with the three-digit number 9.

These are:

902 – 2D interference contour

903 – 3D disturbance volume

912 – Text 2D

922 – Object attribute 2D

933 – Material assignment 3D



### 3.6.4.7 2D/3D display

Documents from the Layout department must always be edited in 3D format with standardized cells.

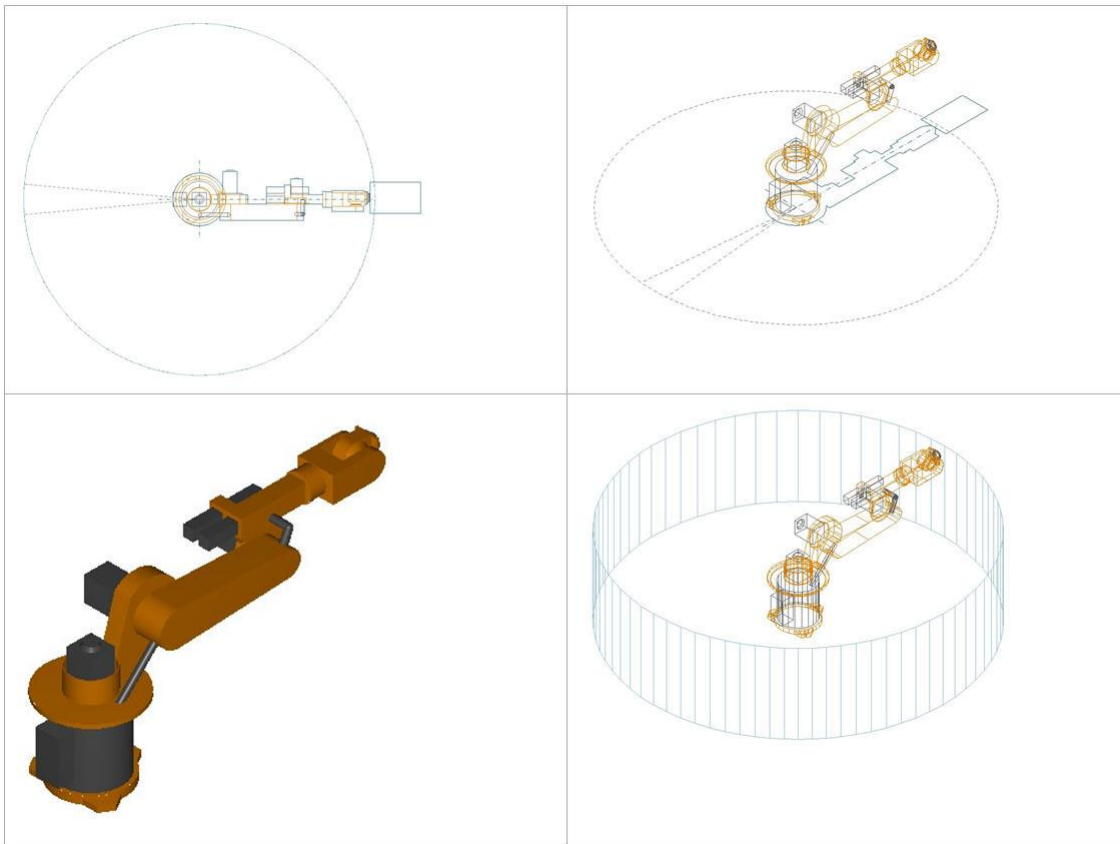
Each cell consists of a 3D part with corresponding 2D representation, 2D interference contour and 3D interference volume.

In the setup discipline, the following points must be observed when creating combined 2D/3D cells and when placing elements/objects:

- 3D cell components are located on the levels specified in the level structure. The level symbols (color, line thickness and line type) of the 3D cell components shall be selected in such a way that the graphic is represented realistically without the use of materials. There is therefore no specification for the symbolism of the 3D cell components.
- 2D cell components and texts are to be placed on the levels specified by the level structure and with the symbols defined there.
- 3D interference volumes and 2D interference contours are to be placed on the levels specified by the level structure and with the symbols defined there.

The following example is intended to help explain the procedure shown.

Example robot:



- The complete 3D object is located at level “P-002 – Production plant 3D”.
- The 3D objects are displayed realistically in the colors black, gray and orange.
- The corresponding 2D representation is at level “P-002 – Production plant 2D”. The layer symbols of the 2D elements as specified in the layer definition.
- The 3D interference volume is at the level “P-903 – interference volume 3D”
- The 2D interference contour is at the level “P-902 – interference contour 2D”

Name /	Nummer
Default	0
P-002 - Produktionsanlage 2D	93002
P-003 - Produktionsanlage 3D	93003
P-902 - Stoerkontur 2D	93902
P-903 - Stoervolumen 3D	93903

The differentiated 2D/3D level structure enables the targeted display of the drawing content according to certain selection criteria, e.g. basic information for reviewing the 2D layout, plots of partial drawings, 3D collision investigations and visualization.

#### 3.6.4.8 Size of cell

In the layout area, the size of the cells created by the user is limited to 200 kb pro cell.

#### 3.6.4.9 Colors

Changes to the colors are only permitted with the -intelligent coloring- function.

### 3.6.5 Application CARF EINRICHTUNG

#### 3.6.5.1 Setting/Settings

Faculty:	Layout
Discipline:	Equipment
Application name:	CARF EINRICHTUNG
Document code:	ly
DGNLIB:	tri_layout_DC-level.dgnlib delmia_FP Hub_DAIMLER level.dgnlib
Example of scopes to be planned:	Production, logistics, workshop, social and office facilities, infrastructure

#### 3.6.5.2 Building

Faculty:	Layout
Discipline:	Building
Application name:	CARF GEBÄUDE
Document code:	lg
DGNLIB:	tri_layout_DC-level.dgnlib
Example of scopes to be planned:	Building layouts

#### 3.6.5.3 Axis grid

Faculty:	Layout
Discipline:	Axis grid
Application name:	VB CARF MAPPING
Document code:	lc
DGNLIB:	tri_mapping_200_construction_DC-level.dgnlib
Example of scopes to be planned:	Axis grid for XML creation

#### 3.6.5.4 Proposal Data

The levels in the “Proposal” block are reserved for the creation of planning proposals for the specialist planners of other subsections involved in planning:

- Building services (electrical, mechanical)
- Crane, KBK rails
- Conveyor technology
- Building

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_plane-layout\\_mui.xlsx](#)

### 3.6.6 CARF outdoor systems application

#### 3.6.6.1 Outside areas

Faculty:	Layout
Discipline:	Outdoor facilities
Application name:	CARF AUSSENANLAGEN
Document code:	la
DGNLIB:	tri_outdoor_systems_DC-level.dgnlib

Example of scopes to be planned: Plant buildings, traffic routes, plant boundaries (e.g. fences), green areas, signage, occupancy area

#### 3.6.6.2 Proposal Data

The levels in the “Proposal” block are reserved for the creation of planning proposals for the specialist planners of other subsections involved in planning:

- Building
- Building services (electrical, mechanical)
- Track systems
- Areas

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_plane-layout\\_mui.xlsx](#)

### 3.6.7 Application CARF fire protection layout

#### 3.6.7.1 Fire-resilience

Faculty:	Layout
Discipline:	Fire protection
Application name:	CARF BRANDSCHUTZLAYOUT LB
Document code:	lb
DGNLIB:	layout_fire_protection_DC-level.dgnlib
Example of scopes to be planned:	Escape and rescue plans, fire protection plans for approval procedures, installation plans for fire protection equipment and signage, fire service deployment plans and route maps, plot composition for fire protection layout

The levels have meaningful level names, which are divided into different units, e.g.

- Timetables
- Global
- Preventive Action
- Technical fire protection
- Drawing output

The levels of the individual units start with their initial letters (E, G, P, T, Z). This is followed by a three-digit number.



You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_plane-layout\\_mui.xlsx](#)

## 3.7 Drag curve simulation

### 3.7.1 Validity:

This chapter is valid for all FP Hub locations.

### 3.7.2 Prescribed software

The following software in the currently prescribed version (see chapter 2.2.1.) with the corresponding current FP Hub settings files (see chapter 2.2) must be used:

- MicroStation
- CARF module drag curves

### 3.7.3 Simulation of vehicles and conveyor technology with CARF drag curves

#### 3.7.3.1 Structure of the Document

The simulation must be stored in separate DGN documents separate from the building models. This is due to the very large amount of data, depending on the simulation representation, which should not be found in layout documents or (FT) conveyor system documents and can unnecessarily hinder CAD coordination.

The necessary background information, i.e. layout/external systems for vehicles and FT systems for FT objects, must be referenced.

#### 3.7.4 Data structure and levels

Faculty:	Layout
Discipline:	Tracking patterns
Application name:	CARF SCHLEPPKURVEN
Document code:	Is
DGNLIB:	tri_drag curves_DC-level.dgnlib

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_plane-layout\\_mui.xlsx](#)

## 3.8 Steel structure platform

### 3.8.1 Validity:

This chapter is valid for all FP Hub locations.

### 3.8.2 Prescribed software

The following software in the currently prescribed version (see chapter 2.2.1.) with the corresponding current FP Hub settings files (see chapter 2.2) must be used:

- MicroStation
- CARF module stage/steel construction

### 3.8.3 Structuring and managing the stage model

Faculty:	Building construction
Discipline:	Steel platforms
Application name:	CARF BUEHNE
Document code:	sb
DGNLIB:	Tri_bench_DC-level.dgnlib
Example of systems to be planned:	Steel construction systems

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_level-building\\_mui.xlsx](#)

### 3.8.4 FP HUB specific steel construction profile libraries

The following FP HUB-specific steel construction profile files are available in FP HUB's CARF ENV.

FP HUB	
DSTVPROFIL.STD	German steel construction profiles
CHINESEESTVPROFIL.STD	Chinese steel construction profiles
USPROFIL.STD	US steel profiles

## 3.9 Infrastructure planning

### 3.9.1 Validity:

This chapter is valid for all FP Hub locations.

### 3.9.2 Prescribed software

The following software in the currently prescribed version (see chapter 2.2.1.) with the corresponding current FP Hub settings files (see chapter 2.2) must be used:

- MicroStation

- CARF infrastructure module
- CARF Infrabeamer

### 3.9.3 Structuring and management

#### 3.9.3.1 Sewage

Faculty:	Infrastructureplanning
Discipline:	Sewage
Application name:	CARF INFRASTRUKTUR IA
Document code:	ia
DGNLIB:	Tri_infrastructure_wastewater_DC-level.dgnlib

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_levels-infrastructure\\_mui.xlsx](#)

#### 3.9.3.2 Electric

Faculty:	Infrastructureplanning
Discipline:	Electric
Application name:	CARF INFRASTRUKTUR IE
Document code:	ie
DGNLIB:	Tri_infrastructure_electrical_DC-level.dgnlib

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_levels-infrastructure\\_mui.xlsx](#)

#### 3.9.3.3 Utilities

Faculty:	Infrastructureplanning
Discipline:	utilities
Application name:	CARF INFRASTRUKTUR IM
Document code:	im
DGNLIB:	Tri_infrastructure_media_DC-level.dgnlib

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_levels-infrastructure\\_mui.xlsx](#)

#### 3.9.3.4 Sewage projector 3D

Faculty:	Infrastructure planning
Discipline:	Sewgae
Application name:	CARF INFRASTRUKTUR IA
Document code:	ia
DGNLIB:	Tri_infrastructure_wastewater_DC-level.dgnlib

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_levels-infrastructure\\_mui.xlsx](#)

### 3.9.3.5 3D electric projector

Faculty:	Infrastructure planning
Discipline:	Electric
Application name:	CARF INFRASTRUKTUR IE
Document code:	ie
DGNLIB:	Tri_infrastructure_electrical_DC-level.dgnlib

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_levels-infrastructure\\_mui.xlsx](#)

### 3.9.3.6 Utility projector 3D

Faculty:	Infrastructure planning
Discipline:	Utilities
Application name:	CARF INFRASTRUKTUR IM
Document code:	im
DGNLIB:	Tri_infrastructure_media_DC-level.dgnlib

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_levels-infrastructure\\_mui.xlsx](#)

## 3.10 Measurement mapping

### 3.10.1 Validity:

This chapter is valid for all FP Hub locations.

### 3.10.2 Prescribed software

The following software in the currently prescribed version (see chapter 2.2.1.) with the corresponding current FP Hub settings files (see chapter 2.2) must be used:

- CARF mapping module
- MicroStation

### 3.10.3 Prohibited drawing elements from MicroStation

In principle, MicroStation 2D elements may be converted into mapping objects – with the exception of the elements contained in the table below. Conversion of the elements listed in the table into mapping elements is not allowed.

- Type 21 B-spline pole
- Type 22 Point String
- Type 23 3D Circular Truncated Cone
- Type 24 3D B-Spline Surface Header
- Type 25 3D B-Spline Surface Boundary
- Type 26 B-spline node
- Type 27 B-Spline Curve Header
- Type 28 B-spindles weight factor

### 3.10.4 Introductory notes

In FP Hub, the “Measurement Mapping” Faculty includes various disciplines. The individual disciplines and their document abbreviations are listed in the following tables.

The rules for the level assignment of the “object classes” and the “points” are listed below.

#### Object categories

<i>Designation</i>	<i>Document code</i>
General	va
Building	vb
Realty	vc
Topography	vd
Sewage	ve
Water – Gas – Misc	vf
Electric - Ventilation	vg
Ducts heating	vh
Water - Hazardous Fluids	vi
Channel Renovation	Vk
Coordinates meshes	vn
Planning	vp
Plotting	vz

### 3.10.5 General

Faculty:	Mapping
Discipline:	General
Application name:	CARF MAPPING VA
Document code:	va
DGNLIB:	tri_mapping_100_general_DC-level.dgnlib tri_mapping_200_construction_DC-level.dgnlib tri_mapping_300_couch_DC-level.dgnlib tri_mapping_400_topo_DC-level.dgnlib tri_mapping_500_wastewater_DC-level.dgnlib tri_mapping_600_media_DC-level.dgnlib tri_mapping_700_electric_ventilation_DC-level.dgnlib tri_mapping_800_bautech_duct_heating_DC-level.dgnlib tri_mapping_900_waterborne_liquids_DC-level.dgnlib tri_mapping_1000_coordinates_networks_DC-level.dgnlib
Different model names:	3D modeling

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_plane-measurement\\_mui.xlsx](#)

### 3.10.6 Building

Faculty:	Mapping
Discipline:	Building
Application name:	CARF MAPPING VB
Document code:	vb
DGNLIB:	tri_mapping_200_construction_DC-level.dgnlib
Different model names:	3D modeling

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_plane-measurement\\_mui.xlsx](#)

### 3.10.7 Realty

Faculty:	Mapping
Discipline:	Realty
Application name:	CARF MAPPING VC
Document code:	Vc
DGNLIB:	tri_mapping_300_couch_DC-level.dgnlib
Different model names:	3D modeling

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_plane-measurement\\_mui.xlsx](#)

### 3.10.8 Topography

Faculty:	Mapping
Discipline:	Topography
Application name:	VD CARF MAPPING
Document code:	vd
DGNLIB:	tri_mapping_400_topo_DC-level.dgnlib
Different model names:	3D modeling

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_plane-measurement\\_mui.xlsx](#)

### 3.10.9 Sewage

Faculty:	Mapping
Discipline:	Sewage
Application name:	CARF MAPPING VE
Document code:	ve
DGNLIB:	tri_mapping_500_wastewater_DC-level.dgnlib
Different model names:	3D modeling

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_plane-measurement\\_mui.xlsx](#)

### 3.10.10 Water – Gas – Misc

Faculty:	Mapping
Discipline:	Water – Gas – Misc
Application name:	CARF MAPPING VF
Document code:	vf
DGNLIB:	tri_mapping_600_media_DC-level.dgnlib
Different model names:	3D modeling

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_plane-measurement\\_mui.xlsx](#)

### 3.10.11 Electric - Ventilation

Faculty:	Mapping
Discipline:	Electric - Ventilation
Application name:	CARF MAPPING VG
Document code:	vg
DGNLIB:	tri_mapping_700_electric_ventilation_DC-level.dgnlib
Different model names:	3D modeling

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_plane-measurement\\_mui.xlsx](#)

**3.10.12 Ducting and heating**

Faculty:	Mapping
Discipline:	Ducts heating
Application name:	CARF MAPPING VH
Document code:	vh
DGNLIB:	tri_mapping_800_bautech_duct_heating_DC-level.dgnlib
Different model names:	3D modeling

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_plane-measurement\\_mui.xlsx](#)

**3.10.13 Water – Hazardous Fluids**

Faculty:	Mapping
Discipline:	Water – Hazardous Fluids
Application name:	CARF MAPPING VI
Document code:	vi
DGNLIB:	tri_mapping_900_waterborne_liquids_DC-level.dgnlib
Different model names:	3D modeling

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_plane-measurement\\_mui.xlsx](#)

**3.10.14 Channel renovation**

Faculty:	Mapping
Discipline:	Channel renovation
Application name:	MICROSTATION
Document code:	vk
DGNLIB:	1_to_63_DC-level.dgnlib
Different model names:	3D modeling

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_plane-measurement\\_mui.xlsx](#)

**3.10.15 Coordinates meshes**

Faculty:	Mapping
Discipline:	Coordinates meshes
Application name:	CARF MAPPING VN
Document code:	vn
DGNLIB:	tri_mapping_1000_coordinates_networks_DC-level.dgnlib
Different model names:	3D modeling

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_plane-measurement\\_mui.xlsx](#)



### 3.10.16 Planning

Faculty:	Mapping
Discipline:	Topographical area
Application name:	MICROSTATION
Document code:	vo
DGNLIB:	1_to_63_DC-level.dgnlib
Different model names:	3D modeling

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_plane-measurement\\_mui.xlsx](#)

### 3.10.17 Planning output

Faculty:	Mapping
Discipline:	Plotting
Application name:	MICROSTATION
Document code:	vz
DGNLIB:	1_to_63_DC-level.dgnlib
Different model names:	3D modeling

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_plane-measurement\\_mui.xlsx](#)

## 4 Application-specific guides for internally available applications only

### 4.1 Introductory notes

All applications described in this chapter are intended for internal use of FP HUB only.

### 4.2 Area documentation

#### 4.2.1 Validity:

This chapter is valid for all FP Hub locations.

#### 4.2.2 Prescribed software

The following software in the currently prescribed version (see chapter 2.2.1.) with the corresponding current FP HUB settings files (see chapter 2.2.) must be used:

- MicroStation
- CARF surface module

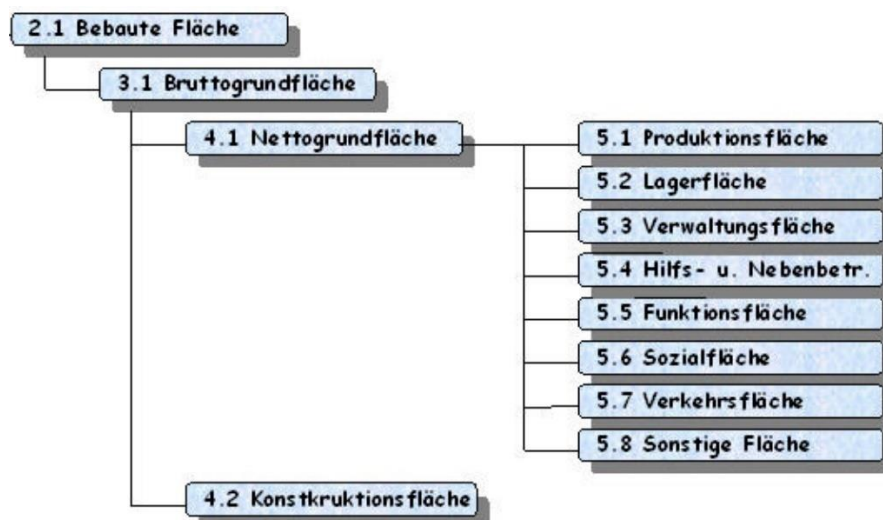
#### 4.2.3 Common, General

- The CARF Fläche microstation application is used for CAD-supported area planning and documentation.
- CARF area is an order development of FP HUB and is currently only used internally.
- Area documentation and planning use the same layer structure, unbuilt areas and building floor plan have their own DGN-Libs.

#### 4.2.4 Area allocation process



#### 4.2.5 Functional area classification (FFG) of the area documentation according to DIN 277



## 4.2.6 Data structure of the area documentation

### 4.2.6.1 Data structure for built-up areas/area planning

Faculty:	Objects
Discipline:	Area documentation/area planning
Application name:	CARF FLAECHEEN_DOKU/CARF FLAECHEEN_PLANUNG
Document code:	od / op
DGNLIB:	tri_area_document_DC-level.dgnlib / tri_area_planning_DC-level.dgnlib

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_level-surface\\_mui.xlsx](#)

### 4.2.6.2 Data structure for unbuilt areas

Faculty:	Objects
Discipline:	Outdoor area
Application name:	CARF FLAECHEEN_UNBEBAUT
Document code:	ou
DGNLIB:	tri_area_unconstructed_DC-level.dgnlib

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_level-surface\\_mui.xlsx](#)

### 4.2.6.3 Data structure for floor plans

Faculty:	Objects
Discipline:	Area floor plan
Application name:	CARF FLAECHEEN_GRUNDRIS
Document code:	og
DGNLIB:	tri_area_layout_DC-level.dgnlib

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_level-surface\\_mui.xlsx](#)

## 4.3 Cleaning Procedures

### 4.3.1 Validity:

This chapter is valid for all FP Hub locations.

### 4.3.2 Prescribed software

The following software in the currently prescribed version (see chapter 2.2.1.) with the corresponding current FP Hub settings files (see chapter 2.2) must be used:

- MicroStation
- CARF surface module

### 4.3.3 Common, General

- The MicroStation CARF Surface application is used for CAD-supported occupancy documentation of cleaning areas.
- FP Hub cleaning is divided into building cleaning and outdoor system cleaning. This is particularly important for MicroStation version 8, as a separate level library is used here for building cleaning and outdoor system cleaning.

## 4.3.4 Data structure of the cleaning documentation

### 4.3.4.1 Cleaning data structure

Faculty:	Objects
Discipline:	Cleaning
Application name:	CARF FLAECHEN_REINGEB
Document code:	Gb
DGNLIB:	building_cleaning_DC-level.dgnlib

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_level-surface\\_mui.xlsx](#)

### 4.3.4.2 Data structure for Cleaning Outside

Faculty:	Objects
Discipline:	Cleaning outside
Application name:	CARF FLAECHEN_REINAUS
Document code:	ra
DGNLIB:	cleaning_exterior_DC-level.dgnlib

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_level-surface\\_mui.xlsx](#)

## 4.4 Measurement areas

### 4.4.1 Validity:

This chapter is valid for all FP Hub locations.

### 4.4.2 Prescribed software

The following software in the currently prescribed version (see chapter 2.2.1.) with the corresponding current FP Hub settings files (see chapter 2.2) must be used:

- CARF surfaces modules
- MicroStation

### 4.4.3 Building area

Faculty:	Mapping
Discipline:	Building areas
Application name:	CARF FLAECHEN_BAU
Document code:	vj
DGNLIB:	tri_area_verm_construction_DC-level.dgnlib
Different model names:	3D modeling

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_plane-measurement\\_mui.xlsx](#)

#### 4.4.4 Realty

Faculty:	Mapping
Discipline:	Realty
Application name:	CARF FLAECHEEN_LIEGEN
Document code:	vl
DGNLIB:	tri_area_verm_corridor_DC-level.dgnlib
Different model names:	3D modeling

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_plane-measurement\\_mui.xlsx](#)

#### 4.4.5 Topographical area

Faculty:	Mapping
Discipline:	Topographical area
Application name:	CARF FLAECHEEN_TOPO
Document code:	vo
DGNLIB:	tri_area_verm_topo_DC-level.dgnlib
Different model names:	3D modeling

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_plane-measurement\\_mui.xlsx](#)

### 4.5 Drawing output

#### 4.5.1 Validity:

This chapter is valid for all FP Hub locations.

#### 4.5.2 Prescribed software

The following software in the currently prescribed version (see chapter 2.2.1.) with the corresponding current FP Hub settings files (see chapter 2.2) must be used:

- MicroStation

### 4.5.3 Plans/overviews

Here, all plan types such as overviews, sections, drawing outputs, etc. stored, regardless of the referenced trades. The view types are each derived in their own models, whereby all models are in a DGN. Multiple models are allowed for this application pro DGN. The type of derived representation should be described in the description field of the respective model.

The CAD data is created in FP Hub under the following structure:

Faculty:	Plans
Discipline:	Plans/overviews
Application name:	Plandokumentation
Document code:	za
DGNLIB:	zeichnungsdokumentation_DC-level.dgnlib

The document is used for the creation of plans with floor plan, section, overview and detailed representations. Deviating from the basic guidelines, several models and model types are permitted:

- |                          |                      |
|--------------------------|----------------------|
| - Coordination-model-XXX | - View-XXX           |
| - 3D-model XXX           | - Section-XXX        |
| - Overview-XXX           | - Cross-section-XXX  |
| - Top-view-XXX           | - Length-profile-XXX |
| - Detail-XXX             | - Schedule-XXX       |

XXX: Up to 999 models are allowed pro model type

In the coordination model, the work documents required for the plan are referenced together and the fixed views required for plan creation are created. The derived views or details are stored in the other models.

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_levels-base\\_mui.xlsx](#)

Faculty:	Plans
Discipline:	R+I diagram
Application name:	MICROSTATION
Document code:	za
DGNLIB:	1_to_63_DC-level.dgnlib
Permitted models:	Default, Schema

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_levels-base\\_mui.xlsx](#)

Faculty:	Plans
Discipline:	Isometrics
Application name:	MICROSTATION
Document code:	za
DGNLIB:	1_to_63_DC-level.dgnlib
Permitted models:	Default, Schema

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_levels-base\\_mui.xlsx](#)



Faculty:	Plans
Discipline:	Others
Application name:	MICROSTATION
Document code:	za
DGNLIB:	1_to_63_DC-level.dgnlib
Permitted models:	Default, Schema

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_levels-base\\_mui.xlsx](#)

## 4.6 Coordination model

### 4.6.1 Validity:

This chapter is valid for all FP Hub locations.

### 4.6.2 Prescribed software

The following software in the currently prescribed version (see chapter 2.2.1.) with the corresponding current FP HUB settings files (see chapter 2.2.) must be used:

- MicroStation
- CARF applications
- Speed icon

### 4.6.3 Overall model/shop model

To enable all planning participants to have quick and easy access to the complete project status, shop models are to be created in which the individual 3D models of the respective planning discipline are summarized by reference.

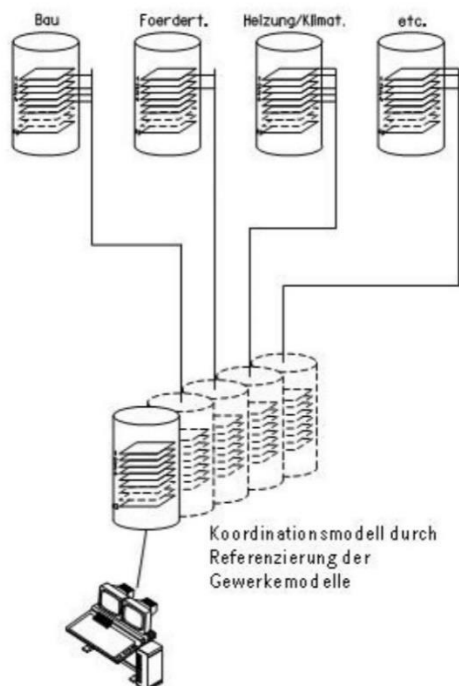


Illustration:: Trade models of the specialist units with reference documents (1.2 ... n documents)

Planning records must be created under the structure folder of the building or sub-building. A distinction must be made between shop models and coordination models in the planning record description.

The CAD documents are created in FP Hub under the following structure:

Faculty:	CAD-Coordination
Discipline:	Model
Application name:	PLANDOKUMENTATION
Document code:	ko
Model type:	3D Model 000
DGNLIB:	global_DC-level.dgnlib, drawingdocumentation_DC-level.dgnlib

You can find the level assignment for this application on the Internet in the [Daimler Truck Supplier Portal](#):  
[fp-hub\\_levels-base\\_mui.xlsx](#)