



# ECE CAD & IT Guideline

## Section 2:

## Layer Guideline

Revision 4.0

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Other available languages of this document: German

## Change Log

| <b><u>Revision #</u></b> | <b><u>Updated</u></b> | <b><u>Changed by</u></b> | <b><u>Changes made</u></b>                                                                                                                                      |
|--------------------------|-----------------------|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.0                      | n.a.                  | Marc Scherer             | Initial version: Annex to planning directory, English language only                                                                                             |
| 2.0                      | 04.05.2011            | Marc Scherer             | Changed layout, minor changes & additions, created a German version                                                                                             |
| 3.0                      | 06.06.2012            | Marc Scherer             | Changed the Layer-System. Expansion of the AIA layer system to another field. Changed the field lengths of all fields.                                          |
| 3.1                      | 03.07.2012            | Marc Scherer             | Minor formatting and spelling changes                                                                                                                           |
| 4.0                      | 06.12.2018            | Marc Scherer             | Changed AutoCAD Version to 2018, spell check corrections, corrected incorrect information, specified application information, integrated BIM method information |

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# General Introduction

The ECE CAD & IT Guideline has been developed to improve the quality of Computer-Aided Design (CAD) standardization efforts within ECE. The purpose of this manual is to set a basic CAD standard to ensure consistent electronic deliverables to and within ECE.

All externally produced documents delivered to ECE must be submitted in accordance with these standards.

The ECE CAD & IT Guideline is broken down into separate sections as follow:

- Section 0 defines the general CAD organizational structure.
- Section 1 addresses the general DWG Specifications for drawings.
- Section 2 addresses the Layer standard that will be used at ECE and that should be used when creating CAD files for ECE.
- Section 3 addresses the plan- and file naming convention and shows some examples (according to the requirement and rules for usage of a project room).
- Section 4 defines basic topics around BIM models

Each section was created to stand alone. Sections 0, 1 & 2 represent the complete ECE CAD Standard. It is expected that external architectural design firms use sections 0, 1 & 2 for general CAD rules and Section 3 for file naming and file organisation in general, especially if a project room is used for a project. Section 4 is to be considered in the case of project execution according to the BIM method.

This regulation does not specify any detailed definitions for projects conducted with the BIM method. For projects in which the BIM method is used, the project specific documents Client-Information Requirement (German: AIA, Auftraggeber Informationsanforderung) and BIM-Plan of Procedure (German: BAP, BIM-Ablaufplan) are created and provided to all project participants.

## Acronyms

|            |                                                                                                          |
|------------|----------------------------------------------------------------------------------------------------------|
| ACA        | AutoCAD Architecture                                                                                     |
| ACA 2018   | AutoCAD Architecture, Version 2018                                                                       |
| AEC        | Architecture, Engineering and Construction (or Civil)                                                    |
| AIA        | American Institute of Architects related to CAD/Layer-Context or                                         |
| AIA        | German: Auftraggeber Informationsanforderung in BIM-Context<br>(English: Client-Information Requirement) |
| BAP        | German: BIM-Ablaufplan<br>(English: BIM-Plan of Procedure)                                               |
| BIM        | Building Information Modeling (Method)                                                                   |
| CAD        | Computer aided Drafting / Design                                                                         |
| DWG        | Drawing (AutoCAD file format)                                                                            |
| ECE        | ECE Projektmanagement G.m.b.H. & Co. KG                                                                  |
| FM         | Facility Management                                                                                      |
| IAI        | International Alliance for Interoperability                                                              |
| IFC        | Industry Foundation Classes                                                                              |
| ISO        | International Organization for Standardization                                                           |
| LEED       | Leadership in Energy and Environmental Design                                                            |
| NCS, USNCS | United States National CAD Standard                                                                      |
| NIBS       | National Institute of Building Sciences                                                                  |
| UDS        | Uniform Drawing System                                                                                   |

# 1 Preamble

The basis of the ECE Layer system is an adoption of the “CAD Layer Guidelines Revision 4” (published by the American Institute of Architects (AIA)). This system is recommended by the United States National CAD Standard (NCS) and the buildingSmart alliance. AIA recommendations which have been adopted by ECE are included in this section. Where noted, ECE has supplemented the AIA guidelines with its own rules and standards, as necessary. A copy of the AIA guideline may be obtained from the internet at: <https://www.nationalcadstandard.org/ncs6/> .

Although ECE-specific changes to the AIA layer system are profound, there is at least a conceptual accordance. This similarity in the design enables AIA layer system users an easy start and a conversion between the systems can be done relatively easy.

## Note:

Each layer name that has not been predefined by the ECE, requires an explicit approval by the planning management of the ECE. The CAD-administration of ECE is the contact for verification of the conformity rule of newly created layer names.

## 2 General ways to organize drawings

The ECE layerstandard provides two main variants for structuring drawings through layers:

### 2.1 *Drawing organization by Major building system*

Normally used for ground-floor plan / plan views and Building models.

Basic organization through a combination of two fields:

Discipline / trade – Building component

e.g.: A~~-Walls (Architectural-Walls), S~~-Beams (Structural-Beams), I~-Furnishings (Interiors-Furnishings). Further specifications are made through optional field additions.

*NOTE: A major difference to other layer systems is that the assignment of the first field:*

Discipline / trade

*primarily defines not by whom the data were created, but which major building category is meant.*

### 2.2 *Drawing organization by Drawing type*

Normally used for the special drawing types: Detail-, Section-, Elevation-Plans.

The "Drawing View Field Codes" allow drawings not to be structured by major building system, but by drawing type. For this purpose the following groups are provided: Detail (details), Elevation (views) and Section (sections).

More information on organizing drawings by drawing type, see this document under item 6.

### 2.3 *Special case: Annotation*

Annotation consists of text, dimensions, notes, sheet borders, detail references and other elements on CAD drawings that do not represent physical aspects of a building. Use of the Major Group “Annotation” allows all annotation to be placed in a defined group of layers.

e.g: A~~-Annotation-RevisionCloud (Revision cloud for Architecture),  
S~~-Annotation-ReadMe (Important note about structural framework).

### 3 Hierarchy of Data Fields

The layer name format is organized as a hierarchy. This arrangement allows users to select from a number of options for naming layers according to the level of detailed information desired. Layer names consist of distinct data fields separated from one another by dashes. A detailed list of field codes is prescribed to define the content of layers. Most field codes are words based on typical construction terminology. If a word is too long, mnemonic English abbreviations are used for a field.

A detailed list of valid values for data fields is provided and maintained by ECE as database as well as an AutoCAD Library drawing ("AecLayerStd.dwg") containing the Layer-Standard "ECE-Layers-Revision-1".

The complete ECE layer name format, showing the Discipline Designator, the Major Group, three Minor Groups, and the Status field:

| Mandatory fields<br>(refer to item 4)              |   |                                    | Optional fields<br>(refer to item 5) |                                          |          |                                          |         |                                          |       |                                         |
|----------------------------------------------------|---|------------------------------------|--------------------------------------|------------------------------------------|----------|------------------------------------------|---------|------------------------------------------|-------|-----------------------------------------|
| A - Conveying Systems                              |   |                                    | - Elevators                          |                                          | - People |                                          | - Color |                                          | - New |                                         |
| Discipline Designator<br>(refer to item 4.1 & 4.2) | . | Major Group<br>(refer to item 4.3) | .                                    | Minor Group 1<br>(refer to item 5 & 5.1) | .        | Minor Group 2<br>(refer to item 5 & 5.1) | .       | Minor Group 3<br>(refer to item 5 & 5.1) | .     | Status field<br>(refer to item 5 & 5.2) |
|                                                    |   |                                    |                                      |                                          |          |                                          |         |                                          |       |                                         |
|                                                    |   |                                    |                                      |                                          |          |                                          |         |                                          |       |                                         |
|                                                    |   |                                    |                                      |                                          |          |                                          |         |                                          |       |                                         |

Figure 1 – this example denotes Architectural ECE, ConveyingSystems, Elevators, People, New

### 4 Mandatory fields (Minimum definition of a Layername)

|                       |                                                                                                                                           |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
| Discipline Designator | Always 3 characters long, defines the category of subject matter (and as an option the possibility to add information about the creator). |
| Major Group           | Maximum 22 characters long, defines major building system.                                                                                |

#### 4.1 Discipline Designator, Level 1 – mandatory

The Discipline Designator denotes the category of subject matter contained on the specified layer. The Discipline Designator is a three-character field. The first character is the discipline character, the second and third character a modifier (for further details see next paragraph).

| Discipline Designator, Level 1 |                            |
|--------------------------------|----------------------------|
| A                              | Architectural              |
| B                              | Geotechnical               |
| C                              | Civil information          |
| D                              | Process                    |
| E                              | Electrical                 |
| F                              | Fire Protection            |
| G                              | General                    |
| H                              | Hazardous Materials        |
| I                              | Interior                   |
| L                              | Landscape                  |
| M                              | Mechanical                 |
| O                              | Operations                 |
| P                              | Plumbing                   |
| Q                              | Equipment                  |
| R                              | Resource                   |
| S                              | Structural                 |
| T                              | Telecommunications         |
| V                              | Survey / Mapping           |
| X                              | Other Disciplines          |
| Z                              | Contractor / Shop Drawings |

#### 4.2 Discipline Designator, Level 2 & 3– mandatory

The second and third characters are used to further define the discipline character. If it's not necessary use the “~” as placeholder. As an example, the Level 2 & 3 Discipline Designators for Architectural are shown:

| Discipline Designator, Level 2 |                         |
|--------------------------------|-------------------------|
| A~~                            | Architectural ECE       |
| A01                            | External Architect 01   |
| AE~                            | Architectural Elements  |
| AF~                            | Architectural Finishes  |
| AG~                            | Architectural Graphics  |
| AI~                            | Architectural Interiors |
| AS~                            | Architectural Site      |

#### 4.3 Major Group – mandatory

The major group is a maximum 22-character field that identifies a major building system. The prescribed Major Group field codes are logically grouped with specific discipline designators (refer to “AIA Layer Guidelines”). However, any Major Group may be combined with any prescribed Discipline Designator, provided that the definition of the Major Group remains unchanged. Therefore, any reasonable combination of the prescribed Discipline Designators and Major Groups is permitted.

***NOTE:** Discipline Designator and Major Group field codes correspond to a large extent to the AIA layering standard. However, ECE has supplemented them with ECE-specific values.*

## 5 Optional fields (to be used if necessary)

|               |                                                                                                                                                     |
|---------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Minor Group 1 | Maximum 16 characters long, further defines the meaning of the Major Group                                                                          |
| Minor Group 2 | Maximum 16 characters long, further defines the meaning of the previous combination of Major Group-Minor Group 1                                    |
| Minor Group 3 | Maximum 16 characters long, further defines the meaning of the previous combination of Major Group-Minor Group 2. This third group was added by ECE |
| Status field  | Maximum 6 characters long, allows to extend a layer with a status field                                                                             |

Mandatory and optional fields can be combined by the following rules:

- Valid combinations are:  
Discipline-MajorGroup-...  
  - MinorGroup1
  - MinorGroup1-MinorGroup2
  - MinorGroup1-MinorGroup2-MinorGroup3
  - MinorGroup1-MinorGroup2-MinorGroup3-Status
  - MinorGroup1-MinorGroup2-Status
  - MinorGroup1-Status
  - Status
- If two or three minor groups are used:  
The minor groups that modifies the meaning of a major building system directly or defines a Sub-building element must follow immediately after the Major Group (In logical order, "from coarse to fine" or "descending in importance").  
Example:  
Valid:  
Architecture-Walls-Concrete-Hatches = A~~-Walls-Concrete-Hatches  
Invalid:  
Architecture-Walls-Hatches-Concrete = A~~-Walls-Hatches-Concrete  
  
Valid:  
Architecture-Glazing-Sill-Concrete = A~~-Windows-WindowSills-Concrete  
Invalid:  
Architecture-Glazing-Concrete-Sill = A~~-Windows-Concrete-WindowSills
- The combination has to be consistent and reasonable  
Example:  
Invalid: ...-Dark-Bright = ...-Dark-Bright – Contrary field values

## 5.1 Minor Group(s) – optional field(s)

The minor group fields 1, 2 and 3 are optional, maximum 16-character fields to further define the meaning of a layer.

Example:

Interiors-Floor-Tiling = I~~-Floor-Tiles

Interiors-Floor-Tiling-Marble = I~~-Floor-Tiles-Marble

Possible values for all three optional minor groups are identical. There is only one list of valid values for all fields.

**NOTE:** user-defined Minor Group field codes are permitted only in coordination with ECE. They must contain maximum 16 alphabetic and/or numeric characters and must be fully documented (e.g. as part of a project guide / manual). Other characters such as the reserved “-” etc. are not allowed.

The prescribed Minor Group field codes (maximum 16 characters long) are logically grouped with specific Major Groups (refer to “AIA Layer Guidelines”). However, any Minor Group may be used to modify any Major Group, provided that the definition of the Minor Group remains unchanged. Therefore, any reasonable combination of the prescribed Major and Minor Groups is permitted.

**NOTE:** Minor Group field codes correspond to a large extent to the AIA layering standard. However, ECE has supplemented them with ECE-specific values.

## 5.2 Status (Phase) – optional

The status field is an optional maximum 6-character field that distinguishes the data contained on the layer according to the status of the work or the construction phase. The prescribed field codes for this field are as follows:

| Status Field Codes |                               |
|--------------------|-------------------------------|
| Demol              | Existing to demolish          |
| Remain             | Existing to remain            |
| New                | New work (currently planned)  |
| Move               | Items to be moved             |
| Temp               | Temporary work                |
| Future             | Future work (“optional work”) |
| NICont             | Not in contract               |
| P01                | Phase 1                       |
| P02                | Phase 2                       |
| P03                | Phase 3                       |
| P04                | Phase 4                       |
| P05                | Phase 5                       |
| P06                | Phase 6                       |
| P07                | Phase 7                       |
| P08                | Phase 8                       |
| P09                | Phase 9                       |

## 6 Special case: Drawing View Field Codes

The Drawing View field codes are specialized codes for layers that are organized primarily by drawing type, rather than by major building system. The field codes Detail, Elevation and Section may also be used as Minor Group field codes to modify a major building system.

If the project is carried out using the BIM method, it must be agreed with all project participants whether this special case can be applied. In detail, cases such as these are taken into account or excluded in the BIM-Plan of Procedure (German: BAP, BIM-Ablaufplan) on a project-specific basis.

For data sets that are organized by drawing type, like details, section drawings or elevation drawings, an optional alphanumeric Minor Group field code, ANNN, is prescribed to further distinguish drawings within a single CAD file.

This Minor Group may be used PREFERABLE to modify the prescribed Drawing View Major Groups.

The format of ANNN is also prescribed. It must consist of a single alphabetic character followed by a three-digit number between 001 and 999. The definition of ANNN is not prescribed; it must be defined by the user. If used, the definition must be fully documented (e.g. as part of a project guide / manual) and the resulting Layer must be approved by ECE.

| Layer Name                     | Description                                                                              |
|--------------------------------|------------------------------------------------------------------------------------------|
| □□□-Detail                     | Detail                                                                                   |
| □□□-Elevation                  | Elevation                                                                                |
| □□□-Section                    | Section                                                                                  |
| □□□-□□□□-ANNN                  | Drawing View Major Group: optional number (A = letter, NNN = number between 001 and 999) |
| □□□-□□□□-ANNN-IdentificatnTags | Drawing View Major Group: optional number: Identification tags                           |
| □□□-□□□□-ANNN-MaterialBeyndCut | Drawing View Major Group: optional number: material beyond cut                           |
| □□□-□□□□-ANNN-MaterialCutBView | Drawing View Major Group: optional number: material cut by the view                      |
| □□□-□□□□-ANNN-Outline          | Drawing View Major Group: optional number: outline                                       |
| □□□-□□□□-ANNN-Hatches          | Drawing View Major Group: optional number: textures and hatch patterns                   |

*Example: Scheme of drawing view field codes*

| Layer Name                      | Description                                 |
|---------------------------------|---------------------------------------------|
| A~-Section-A001-Outline         | Section 001: outline                        |
| A~-Section-A001-Hatches         | Section 001: textures and hatch patterns    |
| A~-Detail-D468-MaterialCutBView | Detail No. 468: material cut by the view    |
| A~-Detail-D468-Hatches          | Detail No. 468: textures and hatch patterns |

*Examples of drawing view field codes*

The Minor Group field codes IdentificatnTags, MaterialBeyndCut, MaterialCutBView, Outline and Hatches may be used to modify any Major or Minor Group in the Layer List. The definitions of these prescribed field codes cannot be changed.

## 7 Special purpose: Annotation Field Codes

Annotation consists of text, dimensions, notes, sheet borders, detail references and other elements on CAD drawings that do not represent physical aspects of a building. Use of the Major Group Annotation allows all annotation to be placed in a defined group of layers.

If the project is carried out using the BIM method, it must be agreed with all project participants whether this special case can be applied. In detail, cases such as these are taken into account or excluded in the BIM-Plan of Procedure (German: BAP, BIM-Ablaufplan) on a project-specific basis.

The Layer Names shown below provide the use of Minor Group field codes for annotation. These Minor Groups may be used to modify any other Major or Minor Group in the Layer List.

| LayerName                        | Description                                       |
|----------------------------------|---------------------------------------------------|
| □□□-Annotation                   | Annotation                                        |
| □□□-Annotation-BearingsDistLabl  | Bearings and distance labels (survey coordinates) |
| □□□-Annotation-Dimensions        | Dimensions                                        |
| □□□-Annotation-IdentificatnTags  | Identification tags                               |
| □□□-Annotation-Keynotes          | Keynotes                                          |
| □□□-Annotation-Labels            | Labels                                            |
| □□□-Annotation-Legend            | Legends, symbol keys                              |
| □□□-Annotation-CompanyLogo       | Company logo                                      |
| □□□-Annotation-MarkersLeaders    | Markers, break marks, leaders                     |
| □□□-Annotation-MatchLines        | Match lines                                       |
| □□□-Annotation-Notes             | Notes                                             |
| □□□-Annotation-NonPlotting       | Non-plotting graphic information                  |
| □□□-Annotation-DateFileStamp     | Date/Time/File name stamp                         |
| □□□-Annotation-ReadMe            | Read-me layer (not plotted)                       |
| □□□-Annotation-Redlines          | Redlines                                          |
| □□□-Annotation-ReferencedFiles   | Reference, external files                         |
| □□□-Annotation-RevisionCloud     | Revision clouds                                   |
| □□□-Annotation-Revisions         | Revisions                                         |
| □□□-Annotation-Schedules         | Schedules                                         |
| □□□-Annotation-ProfessionalStamp | Professional stamps                               |
| □□□-Annotation-Symbols           | Reference symbols                                 |
| □□□-Annotation-DataTables        | Data tables                                       |
| □□□-Annotation-Text              | Text                                              |
| □□□-Annotation-DrawingTitles     | Drawing or detail titles                          |
| □□□-Annotation-Titleblock        | Border and title block                            |

## 8 Example Layer List

This section contains a partial of AIA recommended layers to be used when producing construction drawings for ECE, along with special layers.

The list presents the some commonly used layers by ECE.

| New Layername                   | Layer content             |
|---------------------------------|---------------------------|
|                                 | <b>Annotations/Layout</b> |
| A~~-Annotation                  | Annotations general       |
| A~~-Annotation-Text             | Text general              |
| A~~-Annotation-Dimensions       | Dimensions                |
| A~~-Annotation-EscapeRouteRdius | Escape route radius       |

|                                           |                                                 |
|-------------------------------------------|-------------------------------------------------|
| G~~-Layout-Titleblock                     | Title Block, Layout borders                     |
| G~~-Layout-Viewport                       | AutoCAD Viewport                                |
| G~~-Layout-Legend                         | Legend, symbol keys                             |
|                                           | <b>Other graphical info</b>                     |
| A~~-Annotation-NonPlotting                | non-plotting information                        |
| A~~-Graphics-Shadows                      | Shadows                                         |
| A~~-SiteFeatures-Trees                    | Landscaping Trees                               |
| A~~-Graphics-CarsAndVehicles              | Cars                                            |
|                                           | <b>Grid</b>                                     |
| A~~-Grid                                  | Grid                                            |
| A~~-Grid-NonPlotting                      | Grid, non plotting information, explanations    |
|                                           | <b>Traffic</b>                                  |
| A~~-Roadways                              | Roads general                                   |
| A~~-Roadways-Center                       | Center line                                     |
| A~~-Roadways-Ramps                        | Ramps                                           |
| A~~-Roadways-Symbols                      | Road symbols                                    |
| A~~-Roadways-Sidewalks                    | Sidewalks                                       |
|                                           | <b>Surrounding Information (various source)</b> |
| X~~-Annotation                            | Text                                            |
| X~~-BuildingsPrimaryStruct-Outline        | existing buildings                              |
| X~~-BuildingsPrimaryStruct-Color          | exist. Bldg. colored                            |
| X~~-BuildingsPrimaryStruct-Outline-Future | proposed buildings                              |
| X~~-Parking                               | Parking                                         |
| X~~-Railroad                              | Railway info (not confirmed)                    |
| X~~-Roadways                              | Roads general                                   |
| X~~-Roadways-0001                         | external plan info A                            |
| X~~-Roadways-0002                         | external plan info B                            |
|                                           | <b>Survey Information of official surveyor</b>  |
| V~~-BuildingsPrimaryStruct-Outline        | existing buildings                              |
| V~~-BuildingsPrimaryStruct-Color          | existing buildings colored                      |
| V~~-BuildingsPrimaryStruct-Outline-Demol  | existing buildings to demolish                  |
| V~~-BuildingsPrimaryStruct-Color-Demol    | existing buildings Colored (demolish)           |
| V~~-PropertyBoundary                      | Site boundary (current)                         |
| V~~-PropertyBoundary-0001                 | Site boundary (old)                             |
| V~~-PropertyBoundary-0002                 | Site boundary (special info)                    |
| V~~-PropertyBoundary-SubdivisionLines     | parcels, lines on property (Subdivision)        |
| V~~-Railroad                              | railway information                             |
| V~~-SiteFeatures-Trees                    | existing trees                                  |
| V~~-TopographicFeature                    | topographical information                       |
| V~~-UnidentifiedSiteObject                | additional information (Unidentified)           |
|                                           | <b>Architectural Concept</b>                    |
|                                           | <b>Areas</b>                                    |
| A~~-Area-Ancillary                        | Ancillary areas                                 |
| A~~-Area-Ancillary-Color                  | Ancillary color                                 |
| A~~-Area-CirculationArea                  | Circulation area                                |
| A~~-Area-CirculationArea-Color            | Circulation color                               |
| A~~-Area-Delivery                         | Delivery area                                   |
| A~~-Area-Delivery-Color                   | Delivery color                                  |

|                                            |                                          |
|--------------------------------------------|------------------------------------------|
| A~~-Area-Equipment                         | Technical equipment                      |
| A~~-Area-Equipment-Color                   | Technical equip. color                   |
| A~~-Area-BGF                               | GFA (BGF) outline (BGF - German for GFA) |
| A~~-Special-Branch-Gastronomy              | Leasable, Gastronomy (Food Court)        |
| A~~-Special-Operations-MajorTenants        | Leasable, LRA areas                      |
| A~~-Special-Branch-Services                | Leasable, Services                       |
| A~~-Special-Operations-Shop                | Leasable, Shops                          |
| A~~-Special-Operations-Storage             | Leasable, Storage area                   |
| A~~-Mall-Boundary                          | Mall area                                |
| A~~-Mall-Boundary-Color                    | Mall color                               |
| A~~-Special-Operations-Office              | Office area                              |
| A~~-Mall-VoidSpace                         | Openings (Air space)                     |
| A~~-Area-Roadways                          | Roads                                    |
| A~~-Area-Roof-Color                        | Roof color                               |
|                                            | <b>Building elements</b>                 |
| A~~-Ceiling-Openings                       | Ceiling openings (mall)                  |
| A~~-Ceiling-Openings-Overhead              | Ceiling openings overhead                |
| A~~-Doors                                  | Doors                                    |
| A~~-Furnishings                            | Furniture                                |
| A~~-Parking                                | Parking lots                             |
| A~~-Parking-Color                          | Parking lots - color                     |
| A~~-Stairs                                 | Stairs                                   |
| A~~-Stairs-Overhead                        | Stairs overhead                          |
| A~~-Wall-Exterior                          | External walls                           |
| A~~-Wall-Interior                          | Internal walls                           |
| A~~-Wall-Openings                          | Wall openings                            |
|                                            | <b>Elevation / Section</b>               |
| A~~-Elevation-WideLines                    | Elevation wide lines                     |
| A~~-Elevation-MediumLines                  | Elevation medium lines                   |
| A~~-Elevation-ThinLines                    | Elevation thin lines                     |
| A~~-Elevation-Color-0001                   | Elevation color 1                        |
| A~~-Elevation-Color-0002                   | Elevation color 2                        |
| A~~-Elevation-Color-0003                   | Elevation color 3                        |
| A~~-Elevation-Symbols                      | Elevation symbols                        |
| A~~-Section-DefinitionLines                | Section line                             |
|                                            | <b>Landscape planning</b>                |
| L~~-BuildingsPrimaryStruct-Outline         | Buildings, outline                       |
| L~~-BuildingsPrimaryStruct-Color           | Buildings, color                         |
| L~~-PlantLandscapeMaterial-Furnishing      | landscape furniture                      |
| L~~-PlantLandscapeMaterial-DefinitionLines | Plants, line                             |
| L~~-PlantLandscapeMaterial-LawnAreas       | Lawn areas                               |
| L~~-PlantLandscapeMaterial-Trees           | Trees                                    |
| L~~-PlantLandscapeMaterial-Trees-Shadows   | Shadow / hatch of trees                  |
| L~~-PlantLandscapeMaterial-RetentionPond   | Retention pond                           |
| L~~-Roadways-Color                         | Roads                                    |
| L~~-Sidewalks                              | Sidewalk                                 |

## 9 Layer properties

Layer properties that have not been pre-defined by ECE (f.i. within a project drawing template file) may be assigned at the discretion of the user. Nevertheless the Layer properties must be set following some rules.

### 9.1 Linetypes

The default linetype of each layer is typically “Continuous” unless otherwise specified. The linetype “Ausgezogen” is INVALID and has to be replaced with “Continuous” in ANY case.

More information about valid linetypes can be found in the separate document “ECE CAD & IT Guideline, Section 1: DWG Specifications”.

### 9.2 Lineweight and color

The default lineweight of each layer is typically “Default”. Lineweights will be defined through following techniques at ECE:

- AutoCAD Index Color =  
Lineweight according to Standard AutoCAD Plotstyle-Color-Tables.
- Non-AutoCAD Index Color (True color, Color books) =  
Non-AutoCAD Index color layers should have a defined lineweight. The lineweight of such layers won't be affected by a plotstyle table.

More information about the relation of lineweights & colors and how this should be handled can be found in the separate document “ECE CAD & IT Guideline, Section 1: DWG Specifications”.

### 9.3 Colors

ECE recommends the use of specific colors for layers. AutoCAD Index colors are controlling the printed lineweight of entities at ECE. All AutoCAD Index colors are printed black (No.: 250 to 255 printed in 50% black).

As a general rule for all projects, drawing entities should assume the color property of the layer on which they reside. This means that the color of individual entities should be assigned ‘ByLayer.’ Entities which have been translated from non-AutoCAD based CAD systems often fail to meet this requirement, nevertheless this has to be done by the contractor.

### 9.4 Transparency

The default transparency value of each layer is typically 0. Transparency should be used very carefully and only if really necessary.

## **10 List of all valid Field Codes of the ECE Layer system**

Starting from the fields and field values of the AIA Layer, ECE has expanded the permissible values. A complete list of valid values for each field can be obtained from the ECE in various forms:

- As structured, filterable and searchable list in Excel format with translations into German
- As AutoCAD Architecture Layerkeystyle / layer standard in an AutoCAD library file

It is also possible to obtain an example layer list for the ECE-layers. Deployment can be delivered as:

- Structured Excel spreadsheet and/or
- AutoCAD drawing / drawing template