

**WORKING WEEK 2021 20-25 JUNE** 

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Site Plan for BIM? — A Free and Open Source Plug-In for As-Is Vicinity Models

24.06.2021, 11:45-12:00 CET







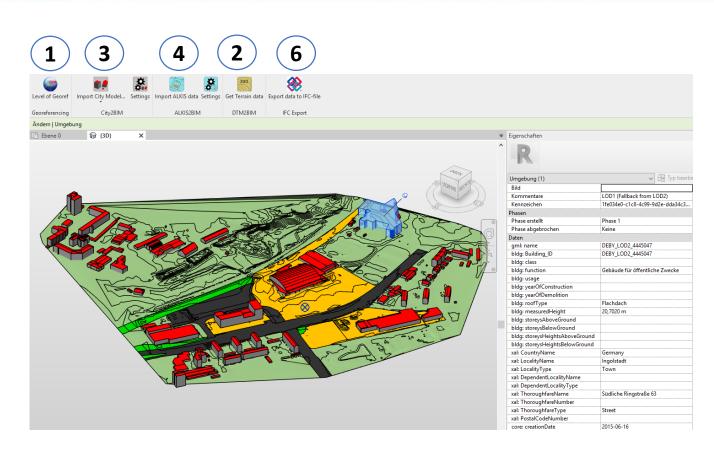








- 1. Georeferencing
- 2. DTM
- 3. CityModel
- 4. Land information
- 5. CAD2BIM
- 6. IFC-Export



















### (1) Georeferencing

- Use case: place geo-referenced models in the exact and coordinated position and elevation.
- Georeferencing **deficiencies** of **Revit**: very complicated
  - several dialogs
  - different possible coordinate systems
  - transformation parameter not consistent to geographic ccord.
  - scale of projection / height reduction missing
- Relation to IFC:
  - user defined IFC property sets for georeferencing (IFC2x3/IFC4)

















| R Georeferencin | g                     |                |                  |                | - 🗆 X                               |
|-----------------|-----------------------|----------------|------------------|----------------|-------------------------------------|
| Postal Address  |                       |                |                  |                |                                     |
|                 | Address lines:        | Projektadresse |                  |                |                                     |
|                 |                       | Projektadresse |                  |                |                                     |
|                 | Postal Code:          | Projektadresse | Town:            | Projektadresse |                                     |
|                 | Region:               | Projektadresse | Country:         | Projektadresse |                                     |
| Geographic site | coordinates           |                |                  |                |                                     |
| 0               | Latitude [°]:         | +48.75940030   | ● Deg ○ DMS      |                | UTM transformation                  |
|                 | Longitude [°]:        | +11.43917316   | True North [°]:  | 0.000000000    | Site (LatLon) to Projection (UTM)   |
| Projected coord | linates               |                |                  |                | O Projection (UTM) to Site (LatLon) |
| 1               | Eastings [m]:         | 679257.9999    | Northings [m]:   | 5403579.9995   | Calculate                           |
| /KA             | Scale:                | 0.999930308    | Grid North [°]:  | 358.165382875  |                                     |
|                 |                       |                | EPSG-Code (CRS): | EPSG:25832 ~   |                                     |
| Elevation       |                       |                |                  |                | Apply                               |
|                 | Orthometric Height [m | ]: 365.0000    | Vertical Datum:  | DHHN2016 ~     | Close                               |

- Scale of projection
- Consideration of meridian convergence
- Calculation between
  WGS84 (Lat. & Lon.) ←→ ETRS89 UTM

#### IfcMapConversion

| Parameter        | Value          |   |
|------------------|----------------|---|
| Data             |                | * |
| Eastings         | 679257,999900  |   |
| Northings        | 5403579,999500 |   |
| OrthogonalHeight | 365,000000     |   |
| XAxisAbscissa    | 1,000000       |   |
| XAxisOrdinate    | 0,000559       |   |
| Scale            | 0,999930       |   |
| Name             | EPSG:25832     |   |
| Description      |                |   |
| GeodeticDatum    |                |   |
| VerticalDatum    | DHHN92         |   |
| MapProjection    |                |   |
| MapZone          |                |   |

















### (2) Digital Terrain Model (DTM)

#### Use case:

- **DTM** consumed from: spatial data infrastructure (SDI) / surveyor has measured to create a high quality DTM (without BIM tools)
- Import of as-is terrain to BIM project & representation of actual terrain (clash detection)
- Projection surface (2D data points, lines, surfaces)

#### DTM deficiencies of Revit:

- only a few data formats for terrain import
- breaklines are not evaluated

#### Relation to IFC:

extended IFC export options (assign to IFC entities & IFC geometry types)















### (3) City Model

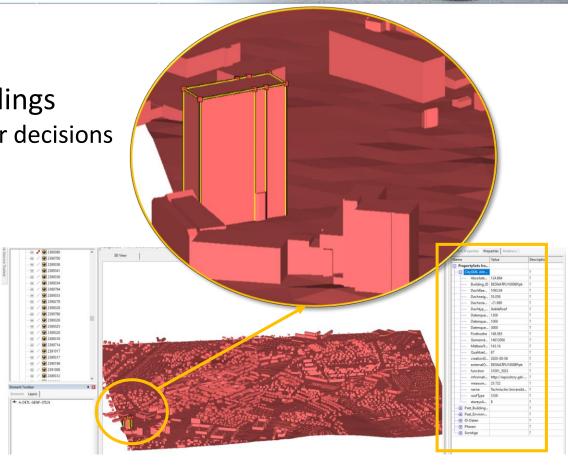
• Use case: geographic context for planning of buildings

aesthetics, shading and simulations – important role for decisions

building law, spacing areas

City model deficiencies of Revit:

- can not imported with native Revit
- via API solids or face geometries are possible
- Relation to IFC:
  - Buildung structures in vicinity can exported to IFC
  - semantic for environment models are created as IfcBuildingElementProxies
  - all semantic data transferred to IFC (IfcPropertySets)













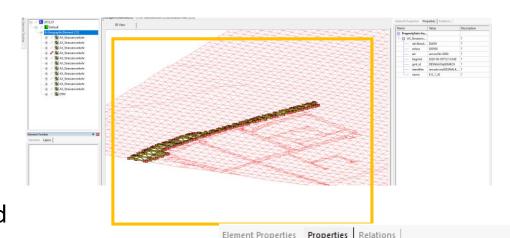






### (4) Land Information

- Use case: link logically property-related data
- Land Information deficiencies of Revit:
  - Geospatial data cannot be imported
  - restrictions of geographical topics such as property and land use
- Relation to IFC:
  - created sub-regions exported to IFC as IfcSite/ IfcGeographicElement
  - imported or edited properties are exported to IFC model



| Name         |            | Value                | Description |
|--------------|------------|----------------------|-------------|
| Prope        | tySets fro |                      |             |
| AX_Strassenv |            |                      | ?           |
|              | advStand   | DLKM                 | ?           |
|              | anlass     | 300500               | ?           |
|              | art        | urn:sn:fdv:3000      | ?           |
|              | beginnt    | 2020-06-05T12:13:54Z | ?           |
|              | gml_id     | DESNALK0q8004EOt     | ?           |
|              | identifier | urn:adv:oid:DESNALK  | ?           |
|              | name       | 612_1_20             | ?           |

















### (5) CAD2BIM – Measured Surveys

- Use case:
  - model of (measured) outside area can be used for checking collisions
  - quality assurance (completeness of the attribution, consistency with information requirement specifications)
- CAD2BIM deficiencies of Revit:
  - not supported CAD import with programmatically implemented object creation
  - Revit API support many possibilities to create object templates (parametric behaviour)
- Relation to IFC:
  - supported via normal IFC export (Revit, not our-plug-in)







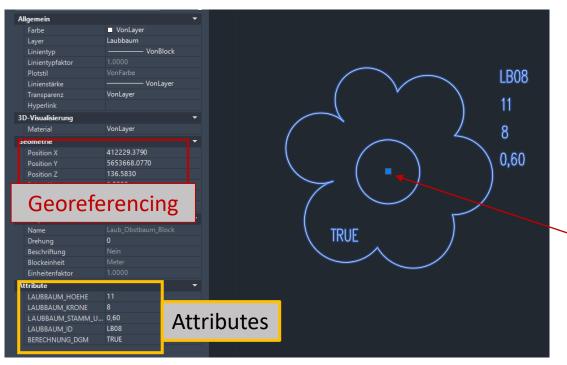


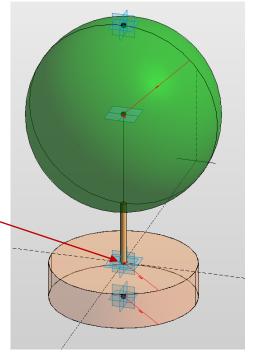












| Materialien und Oberflächen     |                        |                             | * |
|---------------------------------|------------------------|-----------------------------|---|
| Information_unscharf (Vorgabe)  | Information - unscharf | =                           |   |
| Material_Krone                  | Laub                   | =                           |   |
| Daten                           |                        |                             | * |
| Art (Vorgabe)                   |                        | =                           |   |
| LB_Hoehe (Vorgabe)              | 16000,0                | =                           |   |
| LB_Kronen_Durchmesser (Vorgabe) | 12000,0                | =                           |   |
| Kronenlagepunkt (Vorgabe)       | 10000,0                | = LB_Hoehe - LB_K_Radius    |   |
| LB_K_Radius (Vorgabe)           | 6000,0                 | = LB_Kronen_Durchmesser / 2 |   |
| LB_Stamm_Durchmesser (Vorgabe)  | 382,0                  | = LB_Stamm_Umfang / pi()    |   |
| LB_Stamm_Radius (Vorgabe)       | 191,0                  | = LB_Stamm_Durchmesser / 2  |   |
| LB_Stamm_Umfang (Vorgabe)       | 1200,1                 | =                           |   |
| Radius_Wurzel (Vorgabe)         | 4584,0                 | = LB_Stamm_Durchmesser * 12 |   |
| Wurzel_Tiefe (Vorgabe)          | 2292,0                 | = Radius_Wurzel / 2         |   |
| ID-Daten                        |                        |                             |   |







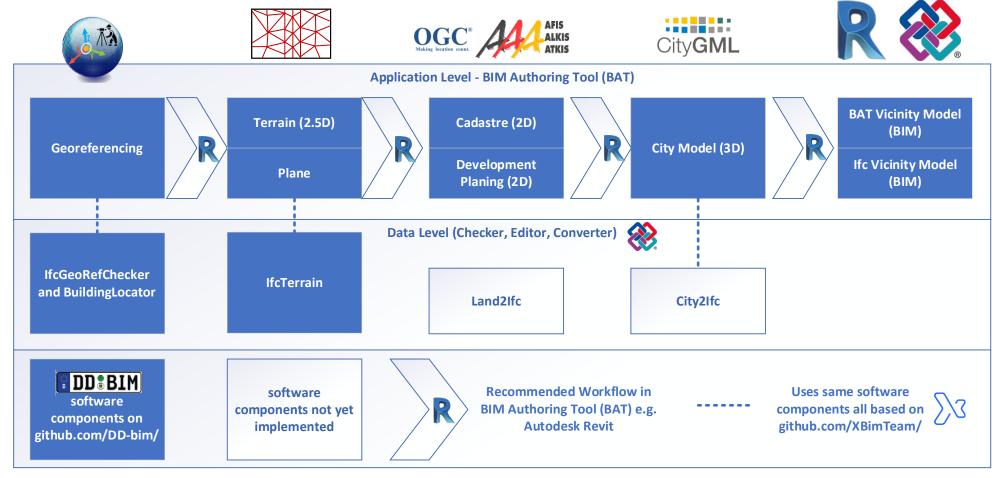




























#### **Contact:**

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### Link to our GitHub Repository:

https://github.com/dd-bim/City2BIM











