

Use Case 13: Design to Construction

Purpose

It is already current practice to for georeferenced model data to be used for setting out construction projects and for controlling earthmoving equipment. Modern robotic total stations can extract accurate setting out from models on handheld tablets using laser measuring systems to tighter tolerances than any existing manual methods and thus minimizing errors. Using models on site improves proper understanding of the project by all involved. The site staff can effectively view the information they require, rapidly extract additional dimensions, directly mark-up models and generate sections where they want them on demand.



In addition, sites are becoming paperless, with model information used directly for construction.

The main exchange scenario is the model-based transfer of information from the designer to the contractor in site.

Requirements for IFC-Tunnel:

Current applications use a variety of data formats although IFC is establishing itself in BIM to Field applications. IFC-Tunnel should extend this capability to the tunnel domain and provide a common data format for a variety of applications.

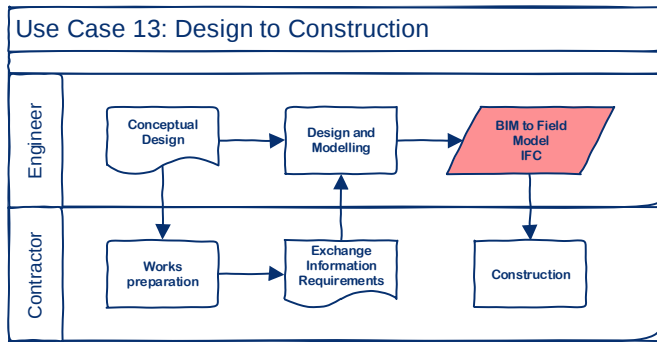
There are actually several use cases contained in this use case and in many cases the requirements need to be determined mutually between the designer and the contractor.

The most important requirement is accurate (within project specific tolerances), georeferenced (for setting out) geometry and parameters as required by the specific application.

The goal is a structured information container that can be used to exchange design and construction information relevant to construction components and functional systems parts.

Geometry:

From a geometry point of view, it can be assumed that the existing geometry descriptions, particular triangulated face sets, sweeps and extrusions are sufficient. Models should be geo-referenced.



Semantics:

Elements should contain the information required by the specific application. The structure of the data including its containment should allow relevant elements to be easily identified and located. Generally, the information to be transferred will be determined mutually between the designer and the contractor. In the case of setting out highlighting the relevant points, or for instance for reinforcement placement, the information required by steel fixer; for rock anchors or pipe umbrellas, the size, length, start point and inclination.

This might be handled through existing IFC elements, and the tunnel specific elements need to be completed.