

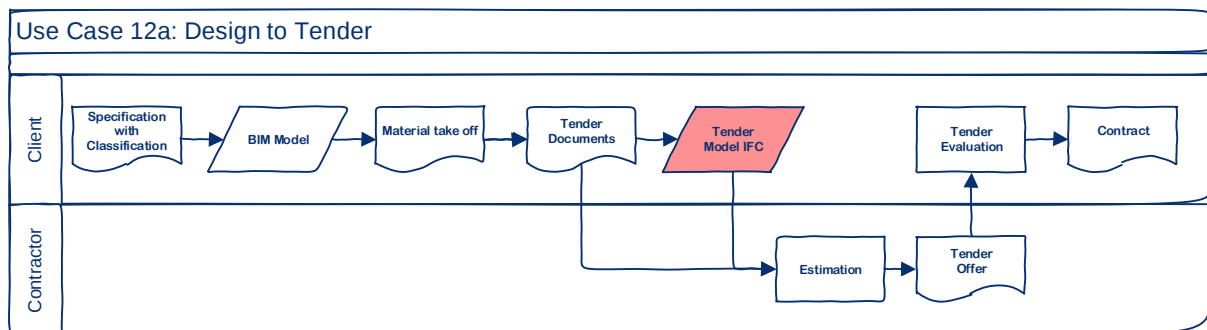
Use Case 12a: Design to Tender: Construction Model

Purpose

In current tunnel procurement procedures, the client issues the contractor a set of tender documents consisting typically of information to tenders, conditions of contracts, specifications, a bill of quantities and drawings. A BIM model can form a structured container for the underlying information and provide a clear picture of the works to be performed. Individual elements can contain references to specifications and bill items.

Clearly arranged, well defined information that can be easily visualised reduces the risk for the tenderer and encourages a better pricing process. A potential scenario could even be where the client issues a model in place of drawings. The underlying exchange scenario that IFC-Tunnel should support is the exchange of models from the client/designer to the contractor's model viewer and tendering applications. To support this exchange scenario, an appropriate geometric description is required as well as the applicability of a classification system and relevant descriptive parameters.

The use case is related to use case 5 (design coordination), 6a (design to design), 10 (quantity take off) and use case 12b (design to tender: geotechnical model). It has been separated from use case 12b which was considered a special case to be addressed on its own, but the two use cases will have to complement each other and should not be viewed in complete isolation.



Requirements for IFC-Tunnel:

The most important requirement is a well-structured, identifiable geometric and semantic representation of the major price relevant parts of the works. As a model will in most cases ideally (or anyway legally) form part of the contract, the client and designer are challenged to provide correct and comprehensive information and clearly state which parts are not yet finalised.

Geometry:

From a geometry point of view, it can be assumed that the existing geometry descriptions, in particular triangulated face sets, but also sweeps and extrusions are sufficient. Due to the nature of tunnels, with multiple repetitive objects, the size and complexity of the data should where possible be minimised. Here sweeps and extrusions are economic geometrical forms and repetitive geometry should be defined by simple rotations and translations of the original unique geometry and not new instances.

Semantics:

Elements should be classified by an appropriate (national) classification system that corresponds to or is linked to the specifications and bill of quantities. The elements should contain relevant

descriptive parameters, containing all information that would otherwise be included in the bill of quantities and tender drawings and should reference the relevant specifications. The elements should contain at least basic quantity information. In future use-cases, it is conceivable that the contractor could perform his own quantity take-off in which case the requirements of Use Case 10 would apply additionally.