ISO/TR 23262:2021 (E)

GIS (geospatial) / BIM interoperability

Contents

Foreword

Introduction

1 Scope

2 Normative references

3 Terms and definitions

4 Abbreviated terms

5 Specification of BIM and GIS interoperability issues

5.1 General
5.2 BIM and GIS interoperability levels
5.2.1 General
5.2.2 Data level
5.2.2.1 General considerations
5.2.2.2 BIM and GIS Conceptual Schema Languages
5.2.2.3 GIS data schemas
5.2.2.3.1 General
5.2.2.3.2 GIS metamodel standards
5.2.2.3.3 GIS abstract conceptual schemas
5.2.2.3.4 GIS Conceptual application schemas
5.2.2.3.5 GIS Implementation schemas
5.2.2.4 BIM data schemas
5.2.2.5 Comparing Schemas
5.2.2.5.1 General
5.2.2.5.2 Metamodels and core elements
5.2.2.5.3 Abstract conceptual schemas
5.2.2.5.4 Conceptual application schemas
5.2.2.5.5 Implementation schemas
5.2.3 Service level
5.2.3.1 General
5.2.3.2 GIS service model standards
5.2.3.3 BIM service model standards
5.2.3.4 Query languages
5.3 GIS/BIM incompatibilities
5.3.1 General
5.3.2 Incompatibilities
5.3.2.1 General
5.3.2.2 [Conceptual] Differences in underlying software design approach
5.3.2.3 [Technological] Differences in underlying architectures
5.3.2.4 [Technological] Differences in the geometric/topological dimension
5.3.2.5 [Technological] generation of watertight B-Reps for BIM
5.3.2.6 [Technological] Diversity in spatial representation
5.3.2.7 [Conceptual] Semantic incompatibility regarding the concept of "service"
5.3.2.8 [Conceptual] Semantic incompatibility regarding the concept of "product"
5.3.2.9 [Conceptual] Differences between conceptual schemas
5.3.2.10 [Conceptual] Differences in entity definition and interpretation
5.3.2.11 [Technological] Differences in extensions of the underlying architectures for addressing semantic interoperability issues
5.3.2.12 [Conceptual] and [Technological] Differences regarding how coordinate systems are used and specified

5.3.2.13 [Conceptual] and [Technological] Differences in usage and specification of object geometry and topology (features)
5.3.2.14 [Conceptual] and [Technological] The use and understanding of metadata is different between the domains
5.3.2.14.1 General
5.3.2.14.2 [Technological] Lack of consensus on information management practices
5.3.2.15 [Technological] Different techniques to spatially represent information
5.3.2.16 Limitations on type of object available within GIS

6 GIS/BIM interoperability opportunities

6.1 General
6.2 Data interoperability opportunities
6.3 Service interoperation opportunities
6.3.1 General
6.3.2 GIS-to-BIM
6.3.3 BIM-to-GIS

7 Suggestions for further work

7.1 General
7.2 Linking abstract concepts in BIM and GIS standards (opportunity 1 and 2)
7.3 Geospatial and BIM dictionary (opportunity 3)
7.4 Information exchange guidelines between BIM and GIS

Annex A Handling of information about construction objects (product handling)

A.1 Introduction
A.2 Use cases
A.3 Comparison of concepts and vocabulary

Annex B IFC and data templates

B.1 General
B.2 Challenges with IFC
B.3 Lack of machine-readable information for objects
B.4 Lack of exchange standards for single geo-objects
B.5 Lack of BIM-ready geo-web services

Annex C Georeferencing

C.1 General
C.2 LoGeoRef 10 (postal address, project management)
C.3 LoGeoRef 20 (geographic coordinate, point on map)
C.4 LoGeoRef 30 (3+1-parameter for IfcSite placement)
C.5 LoGeoRef 40 (3+1-parameter using GeometricRepresentationContext of IfcProject)
C.6 LoGeoRef 50 (3+1 parameter and CRS metadata)
C.7 LoGeoRef60 (set of common points in BIM and geospatial)
C.7.1 General
C.7.2 Comparison of concepts — Synthesis

Annex D Spatial representation

Page count: 60