

The COINS standard

Introduction November 2015

Agenda

- Summary
- Why COINS
- What is COINS
- Scope
- COINS container exchange format
- Integration examples
- Integration GIS
- Integration documents
- Integration IFC and CityGML
- In practice
- Documentation

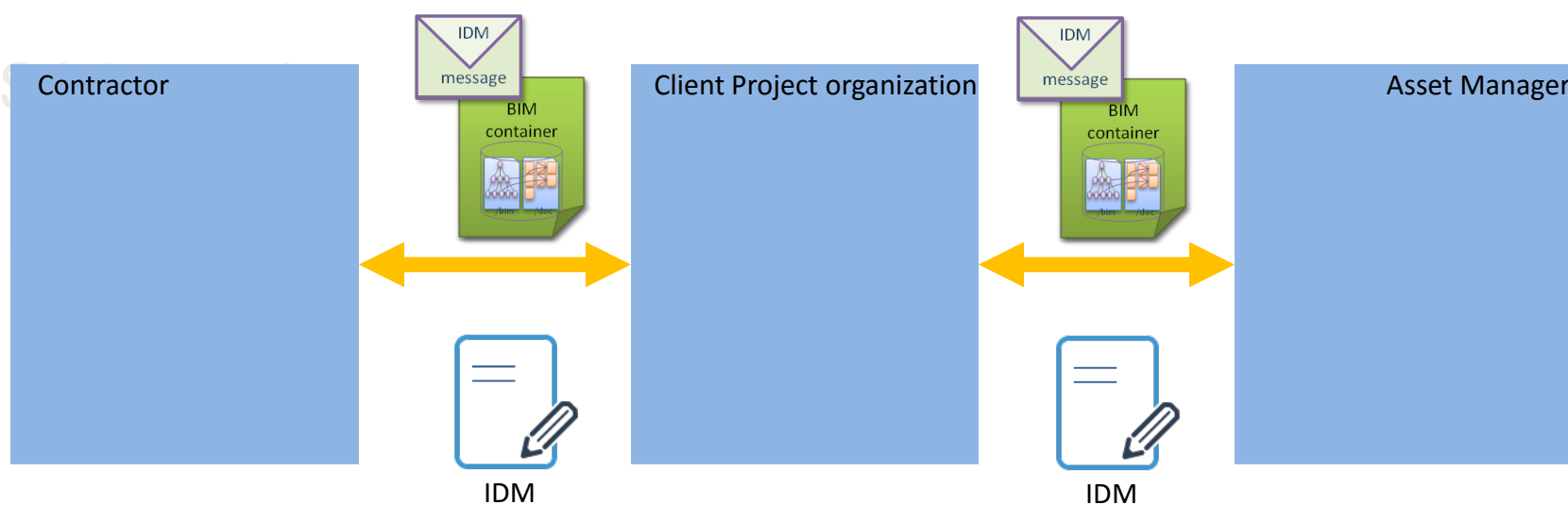
COINS

- A flexible standard for the exchange of BIM information making use of multiple existing standards
- It provides a data exchange and storage mechanism by means of a container or envelope for BIM related data/information

Why COINS

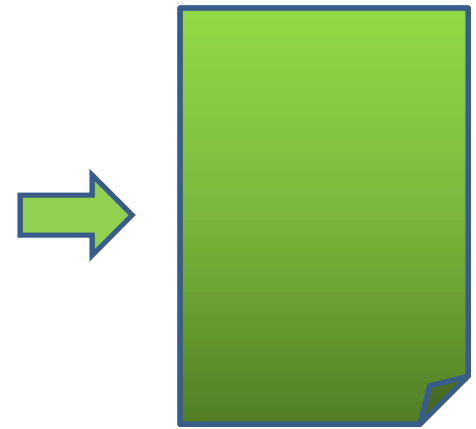
- BIM is more than 3D
- Is an answer to the needs of practice in which information delivery often consist of combinations of various data structures
- Is an answer to the need of practice to combine BIM, GIS, Systems engineering and Life Cycle Information
- Enables data drop as one information package with multiple data formats

Scope / data exchange

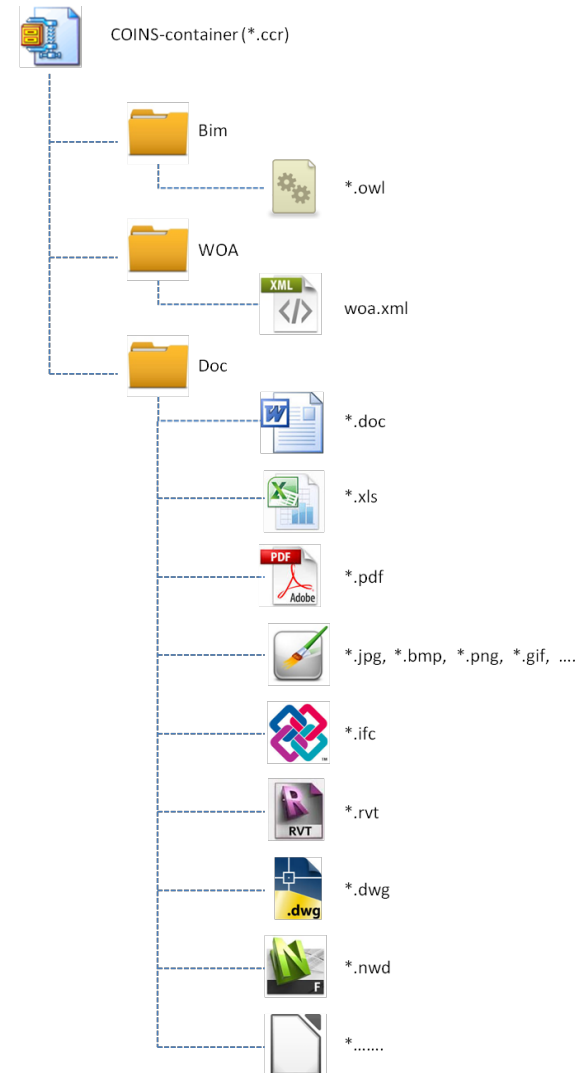


Information container for data drop

- Is a mix of:
 - Database structured information
 - GIS
 - Documents
 - Drawings
 - PDF
 - Text
 - Spreadsheets
 - Etc
 - 3D Models



Information container



Scope / audience

- Includes software vendors en IT individuals, working in the field of buildings and infrastructure assets, offering software for:
 - Procurement
 - Design
 - Construction
 - Delivery
 - Operation and maintenance
- Suppliers of Project hotels could implement the software
- Suppliers of Asset management databases could implement the software

Current implementations

- CBIS data management software by Infostrait
- Multiple contractors in the Netherlands added support for this standard in their design and construct information systems

Current implementations

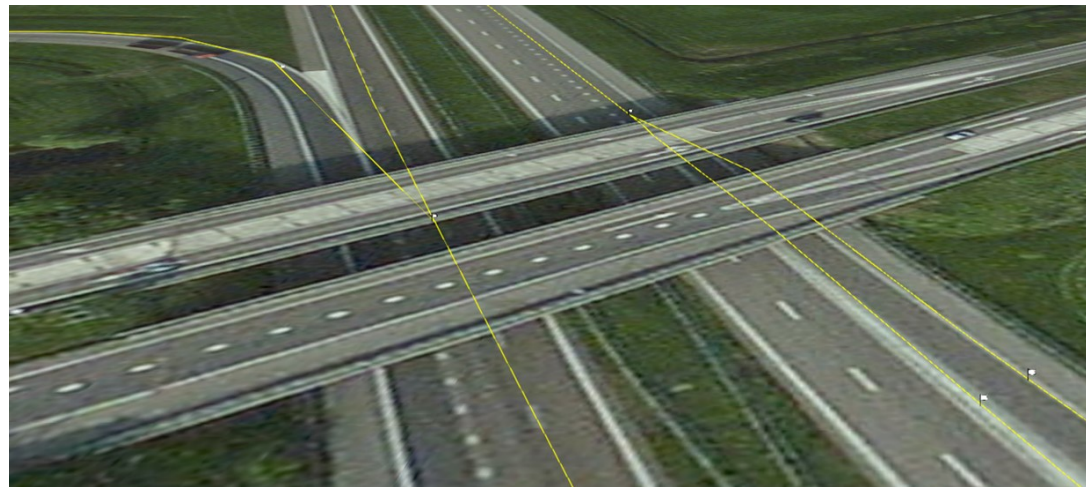
- Rijkswaterstaat – DBFM project highway A1-A6
- Rijkswaterstaat – DBFM project highway A9 GDW
- Rijkswaterstaat – DBFM project highway A6
- Rijkswaterstaat – DBFM project highway A9 AMS
- Rijkswaterstaat – D&C project N31
- Rijkswaterstaat - D&C project Maas: construction sluice Limmel
- Province of Gelderland – D&C project traverse Dieren
- Province of Gelderland – DBM provincial government buildings

Rijkswaterstaat is planning 18 new projects in the coming years to support the flow of asset information from contractors on the basis of the COINS standard

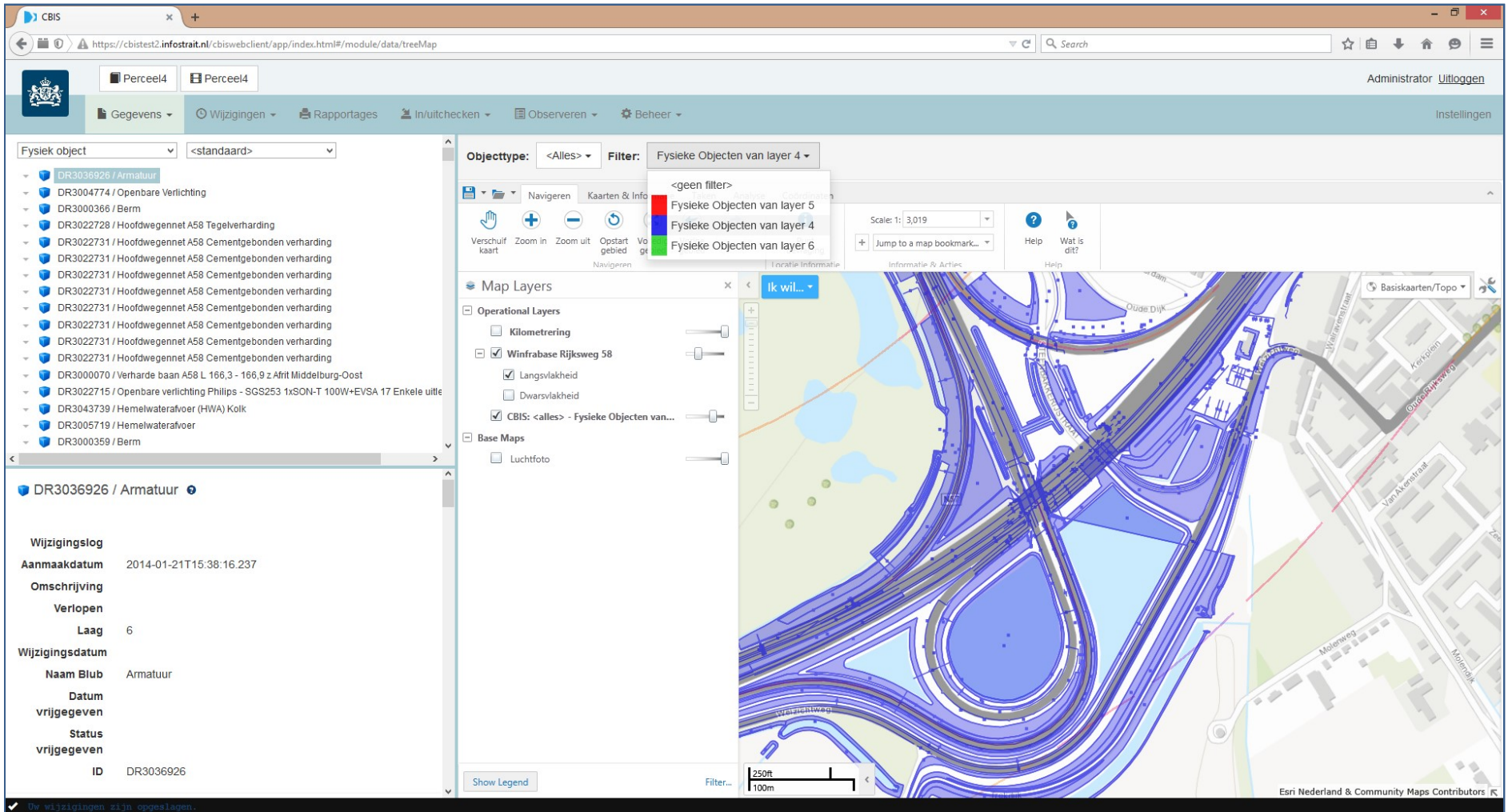
Integration examples

- Physical objects
- Object types
- Terrain
- Traffic network
- Requirements
- Performance
- Built environment
- Object geometry 3D
- GIS representation
- Documents

Integration GIS - 1



Integration GIS - 2

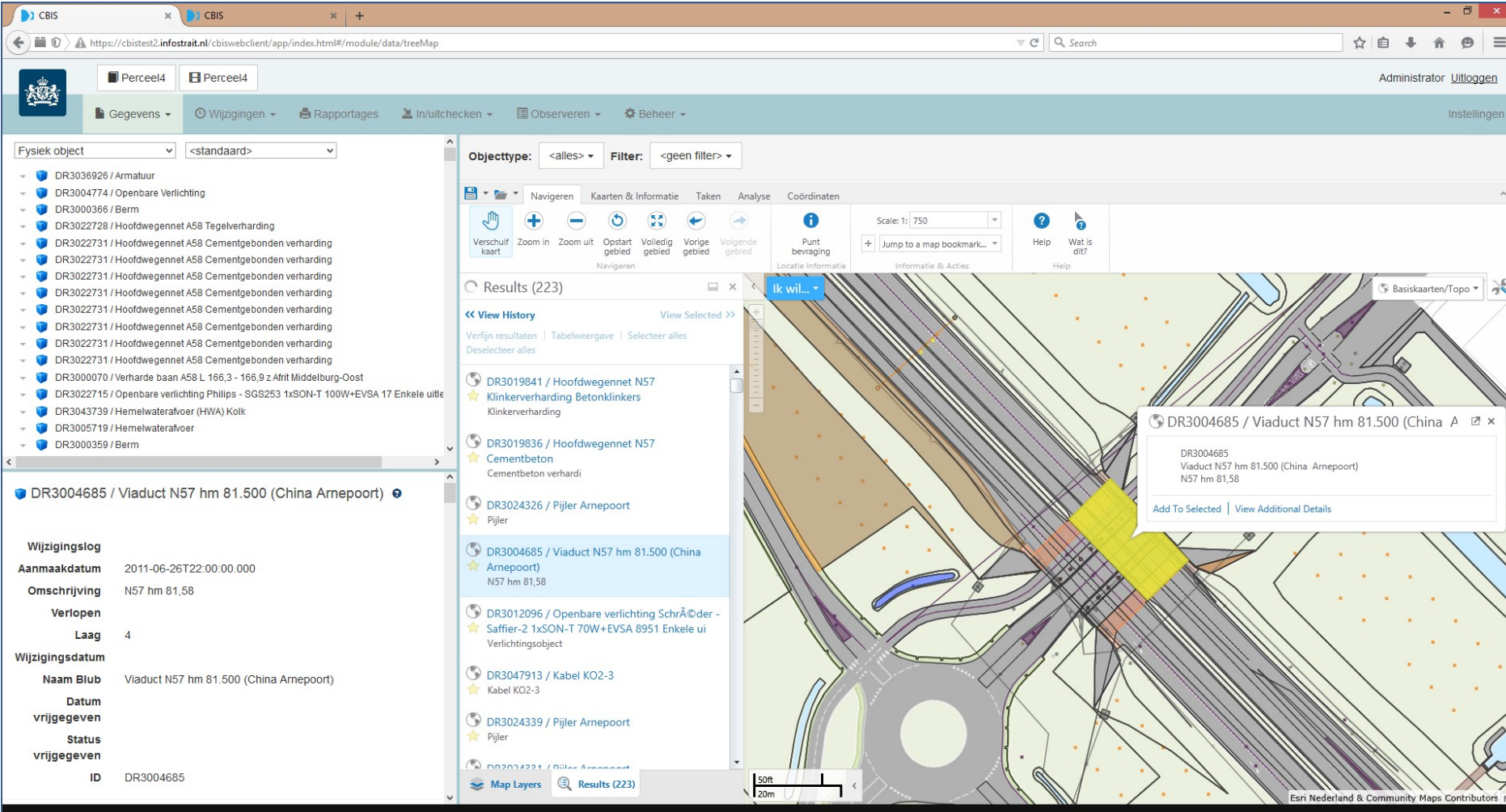


The screenshot displays the CBIS web application interface, which is a GIS tool for managing building information. The interface is divided into several sections:

- Top Bar:** Includes the CBIS logo, a search bar, and user navigation links like "Administrator" and "Uitloggen".
- Left Panel:** Contains a tree view of project data. The selected project is "DR3036926 / Armatuur". Below the tree, a "Wijzigingslog" (Change Log) is visible, showing details such as "Aanmaakdatum" (Creation Date), "Omschrijving" (Description), "Verlopen" (Status), "Laag" (Layer), "Wijzigingsdatum" (Modification Date), "Naam Blub" (Blub Name), "Datum vrijgegeven" (Release Date), "Status vrijgegeven" (Release Status), and "ID".
- Map Area:** The central part of the interface shows a map of a road network. A filter is applied: "Fysieke Objecten van layer 4". A legend on the right side of the map area shows the filter results: "Fysieke Objecten van layer 5" (red), "Fysieke Objecten van layer 4" (blue), and "Fysieke Objecten van layer 6" (green).
- Map Layers:** A panel on the right side of the map area lists the layers used in the map. It includes "Operational Layers" (Kilometrering, Winfrabase Rijksweg 58, Langsvlakheid, Dwarsvlakheid, CBIS: <alles> - Fysieke Objecten van...) and "Base Maps" (Luchtfoto).
- Bottom Bar:** Includes a "Show Legend" button and a scale bar (1:2500).

The interface is designed for users to interact with GIS data, apply filters, and view the resulting map. The bottom status bar indicates that "Wijzigingen zijn opgeslagen" (Changes are saved).

Integration GIS - 3



The screenshot displays the CBIS web application interface, which integrates GIS data with a database. The interface is divided into several sections:

- Top Bar:** Includes the CBIS logo, a search bar, and user navigation links like "Administrator" and "Uitloggen".
- Left Panel:** Contains a "Fysiek object" dropdown menu and a list of objects. The selected object is "DR3004685 / Viaduct N57 hm 81.500 (China Arnepoort)".
- Right Panel:** Displays a map of the selected object. The map shows a viaduct structure with a yellow highlighted area. A pop-up window provides details for the selected object: "DR3004685 / Viaduct N57 hm 81.500 (China Arnepoort)".
- Bottom Panel:** Shows a list of results (223) for the selected object. The list includes details such as "Objecttype", "Filter", and "Objecttype".

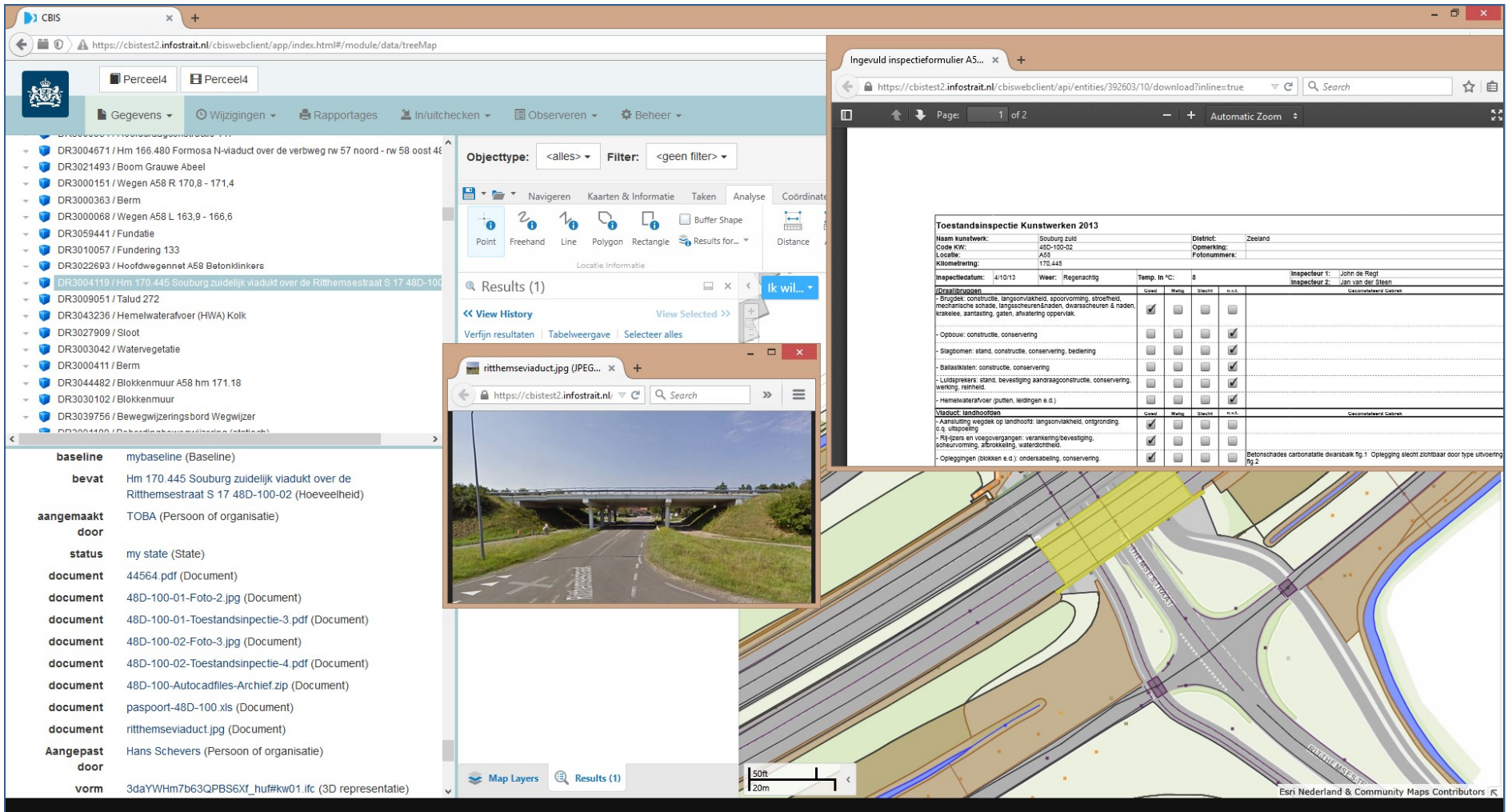
The map interface includes various tools for navigation and analysis, such as "Verschuif kaart", "Zoom in", "Zoom uit", "Opstart gebied", "Volledig gebied", "Vorige gebied", and "Volgende gebied". It also features a scale bar (1:750) and a "Jump to a map bookmark..." button.

The results list shows the following details for the selected object:

- Objecttype:** <alles>
- Filter:** <geen filter>
- Objecttype:** DR3019841 / Hoofdwegennet N57
- Objecttype:** DR3019836 / Hoofdwegennet N57
- Objecttype:** DR3024326 / Pijler Arnepoort
- Objecttype:** DR3004685 / Viaduct N57 hm 81.500 (China Arnepoort)
- Objecttype:** DR3012096 / Openbare verlichting SchrÃ©der - Saffier-2 1xSON-T 70W+EVSA 8951 Enkele ui
- Objecttype:** DR3047913 / Kabel KO2-3
- Objecttype:** DR3024339 / Pijler Arnepoort
- Objecttype:** DR3024321 / Pijler Arnepoort

The map interface also includes a "Map Layers" button and a "Results (223)" button. The bottom right corner of the map shows the text "Esri Nederland & Community Maps Contributors".

Integration documents



The screenshot displays the CBIS web application interface, which integrates various data sources for infrastructure management. The main window shows a project overview for 'DR3004119 / Hm 170.445 Souburg zuidelijk viaduct over de verbegweg nw 57 noord - nw oost 46'. The left sidebar lists project details, including the baseline, bevat, aangemaakt door, status, document, and vorm. The main area shows a map of the project location, with a detailed view of the viaduct structure. The right sidebar displays a detailed inspection report for 'Toestandsinspectie Kunstwerken 2013', including a table of inspection results and a list of inspection items.

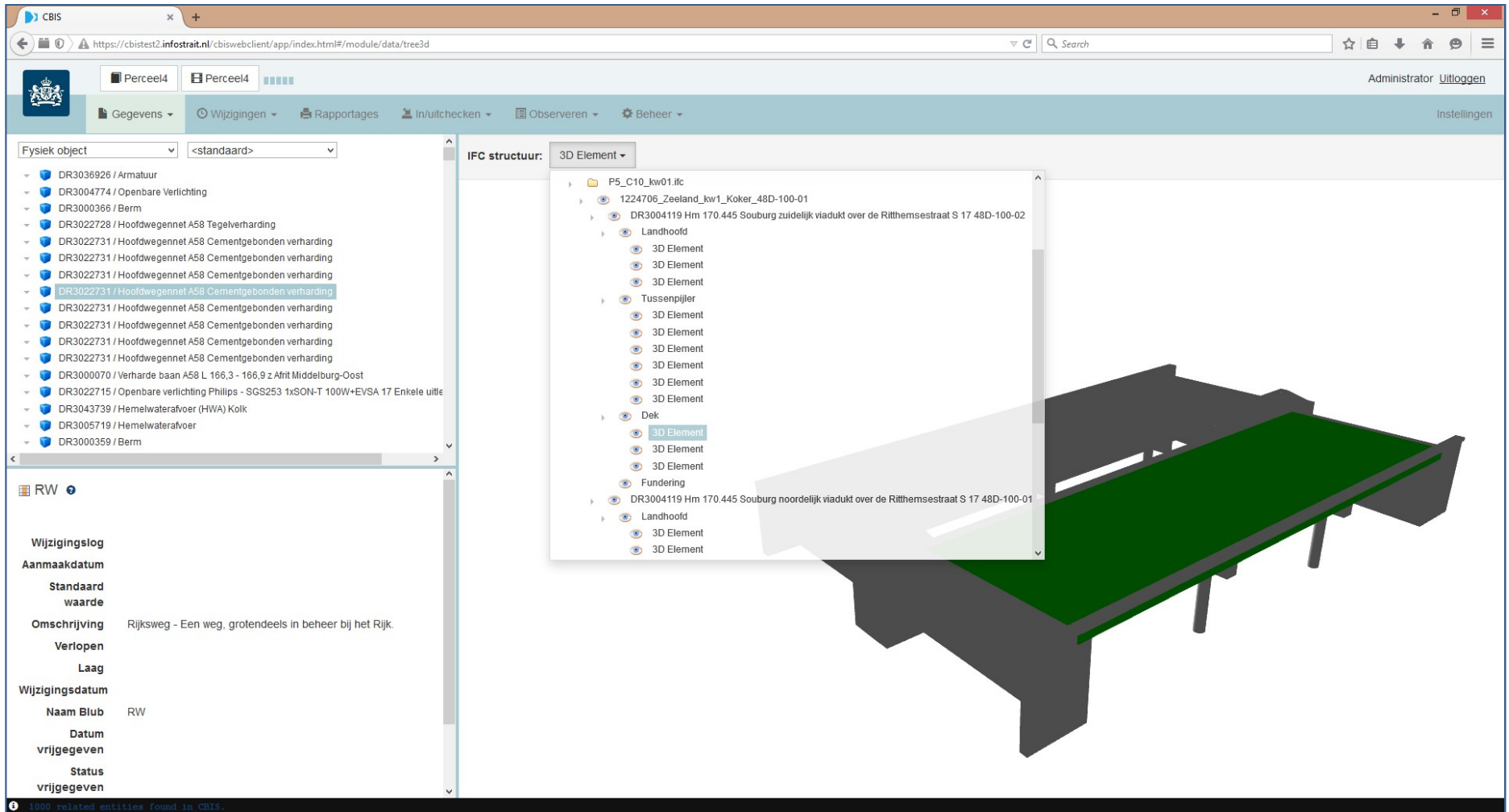
Project Overview:

- baseline:** mybaseline (Baseline)
- bevat:** Hm 170.445 Souburg zuidelijk viaduct over de Ritthemsestraat S 17 48D-100-02 (Hoeveelheid)
- aangemaakt door:** TOBA (Persoon of organisatie)
- status:** my state (State)
- document:** 44564.pdf (Document)
- document:** 48D-100-01-Foto-2.jpg (Document)
- document:** 48D-100-01-Toestandsinspectie-3.pdf (Document)
- document:** 48D-100-02-Foto-3.jpg (Document)
- document:** 48D-100-02-Toestandsinspectie-4.pdf (Document)
- document:** 48D-100-Autocadfiles-Archief.zip (Document)
- document:** paspoort-48D-100.xls (Document)
- document:** ritthemseviaduct.jpg (Document)
- Aangepast door:** Hans Schevers (Persoon of organisatie)
- vorm:** 3daYVhm7b63QPBS6Xf_huf#kw01.ifc (3D representatie)

Inspection Report: Toestandsinspectie Kunstwerken 2013

Inspectedatum:	4/10/13	Weer:	Regenachtig	Temp. In °C:	8	Inspecteur 1:	John de Regt	Inspecteur 2:	Jan van der Steen
Drainage									
- Grondwaterstand, langzaamvloed, spoorvorming, stroomafwaarts, mechanische schade, langzaamvloed, dwarschuren & rader, krakende, aantasting, gaten, afwatering oppervlakt.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
- Opbouw: constructie, conservering	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
- Slagbomen: stand, constructie, conservering, bediening	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
- Balastkassen: constructie, conservering	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
- Luidspresen: stand, bevestiging aandraagconstructie, conservering, werking, reinheid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
- Hemelwater/voer (putten, leidingen e.d.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
Viaduct: landhoofden									
- Aansluiting wegdek op landhoofd: langzaamvloed, omgroning, o.g. uitlopeling	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
- Rijlsporen en voegovergangen: verankering/bevestiging, spoorvorming, afbreuk, waterdichtheid.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
- Opleggingen (balken e.d.): onderaafdeling, conservering	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				

Integration IFC

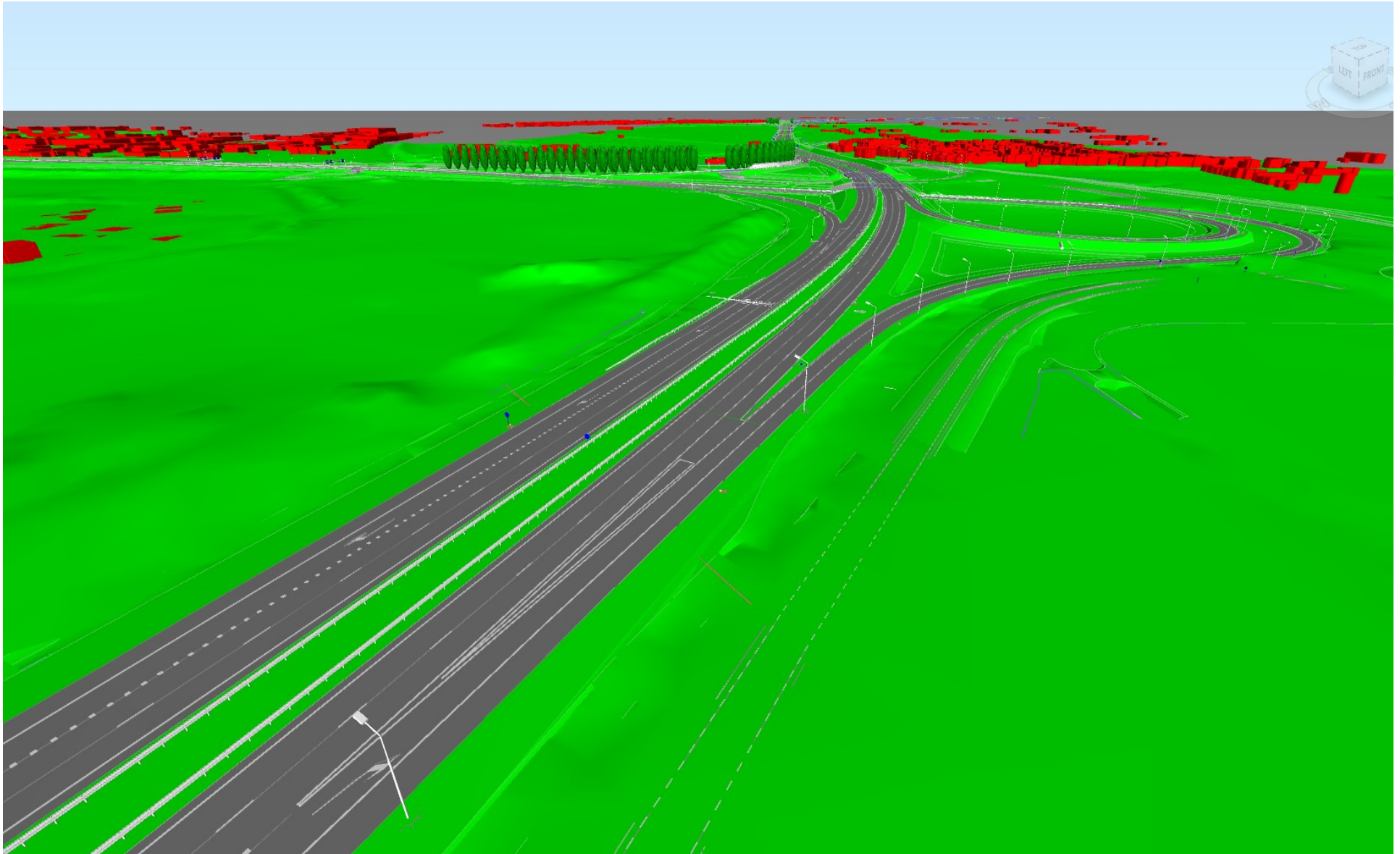


The screenshot displays the CBIS web application interface. The top navigation bar includes the CBIS logo, a search bar, and user information (Administrator, Uitloggen). The main content area is divided into three sections:

- Left Sidebar:** A tree view of physical objects (Fysiek object) under the category '<standaard>'. The tree lists various objects, including 'DR3036926 / Armatuur', 'DR3004774 / Openbare Verlichting', and several 'DR3022731 / Hoofdwegennet A58 Cementgebonden verharding' entries. The 'RW' (Rijksweg) section is expanded, showing details like 'Wijzigingslog', 'Aanmaakdatum', 'Standaard waarde', 'Omschrijving', 'Verlopen', 'Laag', 'Wijzigingsdatum', 'Naam Blub', 'Datum vrijgegeven', and 'Status vrijgegeven'.
- Central Panel:** A panel titled 'IFC structuur:' showing a hierarchical tree of IFC elements. The tree includes 'P5_C10_kw01.ifc', '1224706_Zeeland_kw1_Koker_48D-100-01', and 'DR3004119 Hm 170.445 Souburg zuidelijk viadukt over de Ritthemsestraat S 17 48D-100-02'. The '3D Element' dropdown is selected, showing a list of elements like 'Landhoofd', 'Tussenpijler', 'Dek', and 'Fundering'.
- Right Panel:** A 3D model of a building structure, showing a green roof and grey walls, representing the IFC data.

At the bottom of the interface, a status bar indicates '1000 related entities found in CBIS.'

Integration IFC and CityGML



What is COINS -1

COINS is an open standard that provides a data exchange format by means of a container. This format enables the exchange of various datasets annotated by an OWL ontology with the following features:

- *Extendibility*. The kernel model can be extended with specialized models (reference frameworks) for various disciplines. These sub-models may address various areas of interest (company-wide, building sector, national) and therefore can be regarded as semi-standards in itself. A reference framework can also function as an incubation project to prototype new model concepts.

An example of an extension is Systems engineering

Instances of Reference frameworks are not included the COINS standard, only the mechanism

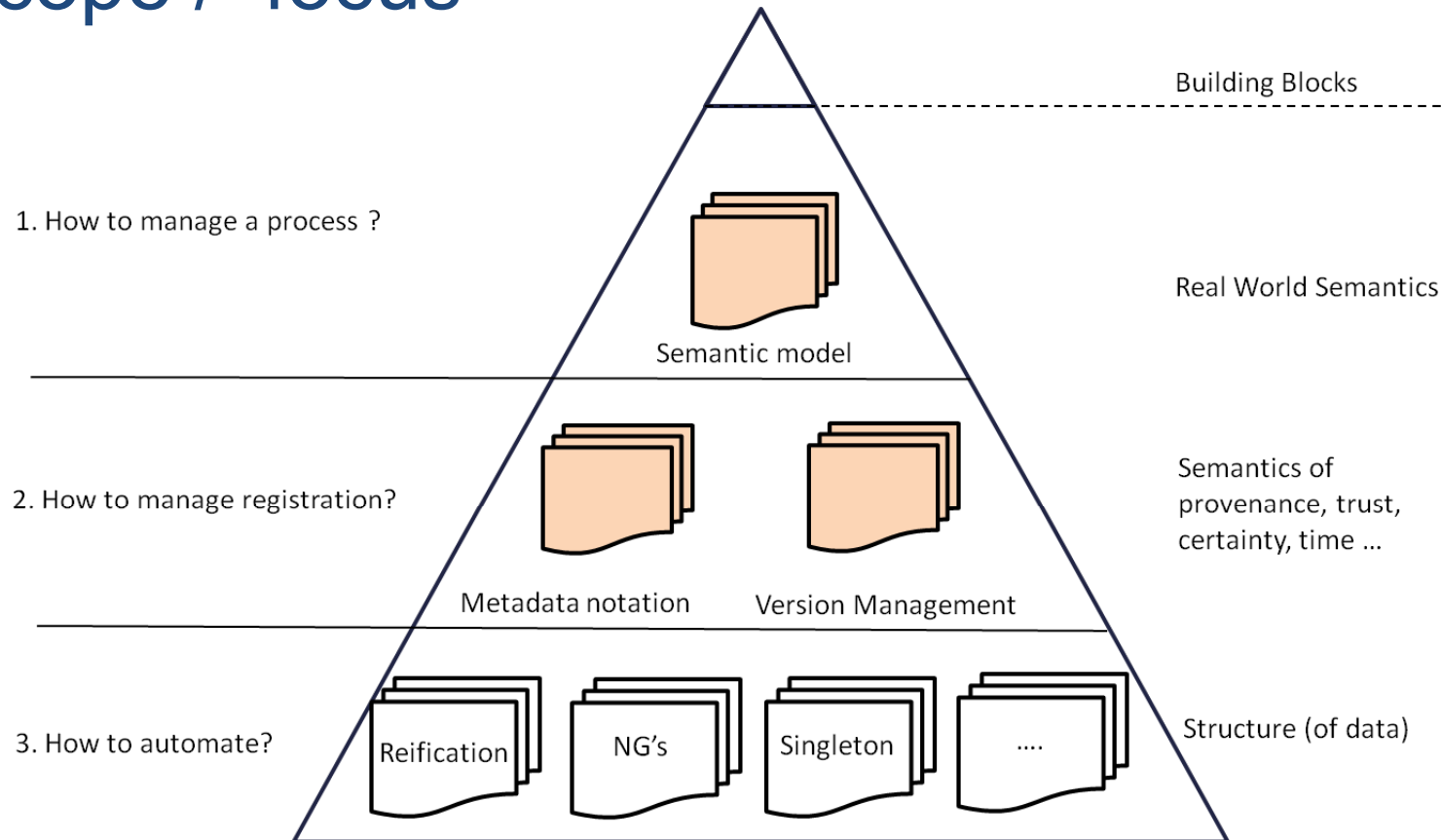
What is COINS -2

- *Dynamic semantics.* Semantics are typically recorded in libraries forming a dynamic means to add semantics to instance models. Since version 1.0 library structuring mechanisms form an integral part of COINS.
- *Integrating document oriented information with object oriented information.* The boundary between document oriented information and object oriented information areas can be moved over time. Offering parties an evolutionary path to develop in BIM maturity level.
- *Integrating adjacent standards.* COINS delegates specific modelling areas to existing standards as GML (GIS data) and IFC (3D building data). More general every relevant standard (open or not) may be used if parties involved agree mutually on using it in data exchanges.

What is COINS - 3

- *Library model.* The COINS 2.0 library model is fully OWL-class based and in line with standard OWL modeling features.
- *An off-line transaction-based information exchange.* COINS information exchange can be integrated with transaction-based information exchange as for instance supported by the IDM part 2 standard for process modelling.
- *Version management.* COINS offers features to record the history of the BIM

Scope / focus



The focus of the COINS standard is on the semantic model comprising the core model and a mechanism for flexible extensions and object libraries. Also support is provided for meta data notation and version management.

Documentation

www.coinsweb.nl/wiki



Welcome to CoinsWiki,

The open standard for management and exchange of BIM data

- About COINS
- Participants
- Membership
- Working groups
- News
- COINS 1.1 specs (Release 15/12/2014)

COINS is an open BIM standard. It is complementary to standards issued by buildingSMART such as IFC, IFD Library and IDM. COINS supports the exchange of Systems Engineering information and ensures that an object tree, GIS data, 2D drawings, 3D models, IFC models and object type library can be stored in association in a database. It also provides a BIM-container interchange format. It is used by partners in building construction projects for the purpose of exchanging building information and managing building information. Use the links below to explore the site contents. It is made available as an [open standard](#). The first edition was published in 2010 as COINS 1.0. A first update was released as COINS 1.1 in December 2014.

Use the links on this page to explore the contents of the site. Part of this site is in English. For general questions with regard to COINS, see the [communication](#) page.

This site offers information for project managers/users applying the COINS system in their project, for BIM specialists responsible for project implementation and support and for IT specialists charged with software implementation. The following table features useful links for the various target groups.

Projectmanager/user	BIM Specialist	IT specialist
<ul style="list-style-type: none">■ Essentials■ Introduction to the COINS-system■ Reference frameworks■ Terms and definitions	<ul style="list-style-type: none">■ Introduction to the COINS-system■ Reference frameworks■ Tools■ BIM-Lab■ Terms and definitions	<ul style="list-style-type: none">■ Introduction to the COINS-system■ Reference Manual<ul style="list-style-type: none">■ COINS 1.0 specs (Release 01/07/2010)■ COINS 1.1 specs (Release 15/12/2014)■ Tools■ Terms and definitions



COINS 1.1 (2014) technical specifications

- [link](#)

COINS 1.1 (2014) Specification

December 15, 2014

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- Peter Willems (TNO)

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Preferences set up

COINS version

☐ COINS 1.0

☒ COINS 1.1

☐ COINS 2.0

Abstract

This specification defines the 1.1 (2014) release of the COINS systematics including the COINS Building Information Model schema, the COINS Schema Architecture, the COINS semantics, the expected behavior of COINS compatible software and the COINS Container exchange format.

Status of this document

This section describes the status of this document at the time of its publication. Other documents may supersede this document.

If you wish to make comments or report errors regarding this document, please send them to <mailto:peter.willems@tno.nl> and/or <mailto:h.schaap@gobar.nl>.

Introduction

Normative References

Terms and definitions

Schema architecture

Release notes 1.1

Special topics

- Identification of CBIM information objects
- Object Tree
- Systems Engineering
- Topological relations
- Version management
- States

Exchange

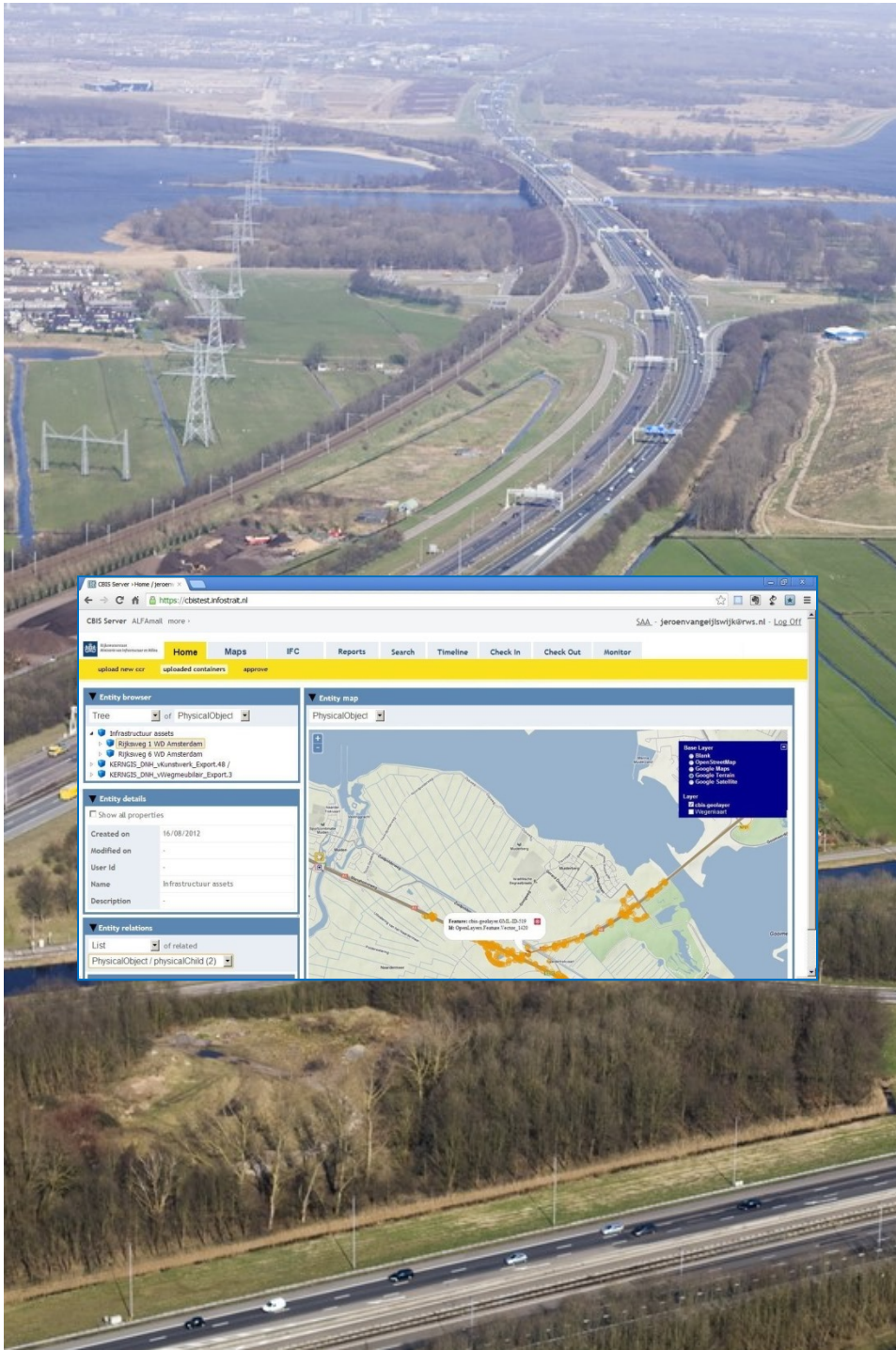
- COINS container
 - COINS Delta container (Dutch)
 - COINS Delta container (English)
- Checksum for attached documents
- Window of Authorization
- Document linking

CBIM Schema <http://www.coinsweb.nl/cbim-1.1.owl>

Classes	Object Properties	Datatype Properties
■ Amount	■ affects	■ baseline status
■ Baseline	■ amount property type	■ change log file
■ Building	■ baseline object	■ checksum file
■ C-BIM Object	■ catalogue part	■ checksum URI
■ Catalogue Part	■ child	■ checksum URI
■ Connection	■ contains	■ algorithm
■ Document	■ creator	■ creation date
■ Explicit 3D Representation	■ current state	■ default value
■ Function	■ document URI	■ description
■ Function Filler	■ document	■ document alias file path
■ Library	■ female terminal	■ document fragment type
■ Reference	■ first parameter	■ end date
■ Locator	■ fulfills	■ actual
■ Parameter	■ is affected by	
■ Performance	■ is fulfilled by	
■ Person or Organisation	■ is situated in	
■ Physical Object	■ locator	
■ Property Type	■ male	
■ Property Value		
■ Requirement		
■ Space		
■ State		
■ Task		
■ Task Type		

Summary

- COINS is a flexible standard for the exchange of BIM information making use of existing multiple ISO-IEC standards and semantic web technology
- It provides a data exchange and storage mechanism by means of a container or envelope for BIM related data/information
- The standard provides a semantic model comprising a small core information model which can be extended with reference information models and object libraries for specific domains
- The standard provides functionality to integrate data structures which are a combination of RDF formatted, non geometric data structures and standardize data structures like IFC and GML, object type libraries and non structured documents
- It is developed by a Dutch consortium of governmental bodies, contractors, consultants, ICT-providers and educational institutes.
- Its first edition (version 1.0) was released in 2010, followed with a minor maintenance update in 2014. Version 2.0 will be released early 2016.



Dutch
Building
Information
Council

The COINS standard

Thank you