

openINFRA ACTIVITIES IN NORWAY

TALLINN
11.09.2013
STEEN SUNESEN

Illustration ViaNova Systems

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buildingSMART NORWAY

Members:	72 organizations
Annual budget 2013:	EUR 500.000
Members turn-over vs. total national turn-over:	25%
One full-time employed Managing Director	
Seven part-time free-lance staff/projects:	buildingSMART Data Dictionary, Marketing, Events, IDMs, BIM Handbook
Established user groups:	7 (All disciplines) + 2 liaisons

Purpose

Contribute to sustainable build environment by SMARTER exchange of information and communication between all actors in building, construction and estate sectors

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CLUSTER: BA-NETTVERKET (building– construction network)

- 35 members (incl. buildingSMART Norway)
- Contribute to smarter, object based information exchange mainly in GIS (ISO 191xx) ecosystem.
- Organize civil industry, build bridges between civil domains, create/implement solutions based on TC211



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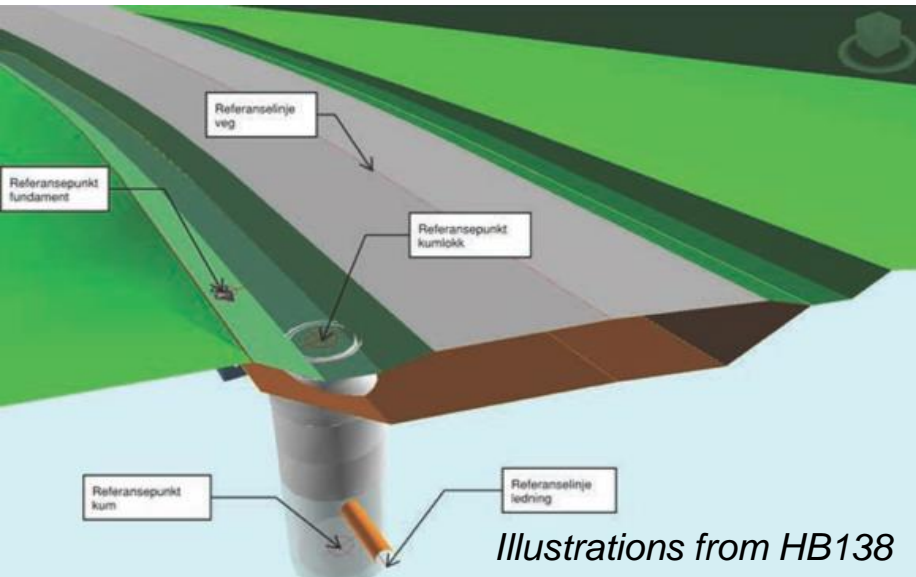
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HANDBOOK 138 – NATIONAL ROAD ADMINISTRATION

Released October 2012

Railway Administration to release a railway version of HB 138 - HB JBV

Translated to Finnish with adaption to Finnish requirements



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HANDBOOK 138 – REQUIREMENTS

- Standardize model practice and exchange deliveries.
- National Road Administration – Object based exchange and documentation optional (alternatively 2D drawings)
- Format requirements: Native formats AND LandXML AND SOSI (in lack of a standardized neutral data/model/exchange format as IFC)
- SOSI Data Model (UML) = Norwegian implementation of TC211

“The inclusive process of producing and hearing of the handbook 138 changed the business focus on potential of object based design and construction”, Inger Hokstad, BA-Network Leader

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KEY PUBLIC STAKEHOLDER - MINISTRY OF ENVIRONMENT

Reasons for require openBIM for infrastructure

- Increased reuse of public sector information, including spatial and thematic geotechnical data, planning data and cadastral data
- More efficient access to data in public and private sectors for update of public records
- Better protection of the environment perspective during construction. among others, through more effective monitoring of the environmental consequences by digital analysis and simulations.

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KEY PUBLIC STAKEHOLDER - MINISTRY OF ENVIRONMENT

Focus on wiring and piping in the ground

- Reduce earthwork by coordination – Digging releases CO₂, Interrupts traffic and is expensive.
- Eliminate damage on existing wiring/piping during digging

Establish requirements for digital information exchange and documentation

- Requirement proposal out on hearing now – BIM and open formats not specified as requirements (yet).

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KEY PUBLIC STAKEHOLDER - MINISTRY OF MUNICIPALITIES AND REGIONS (KRD)

openBIM ambitions – Whitepaper on building politics

1. Digital (?) processing of legal authorization processes
2. Public clients as key drivers of development of openBIM
3. ByggNett (BuildNet)

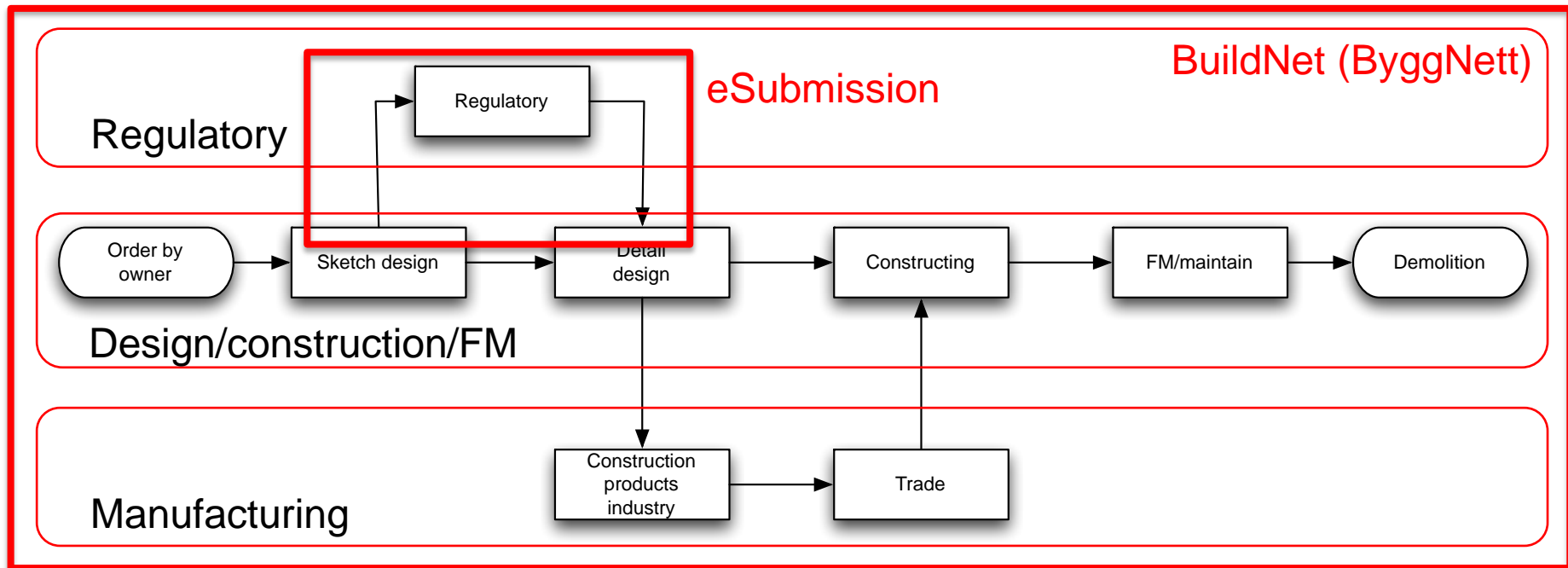
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ByggNett (BuildNet)

Directorate for Building Quality (DiBK) (under KR D)

Public portal for building and construction information (buildingSMART based)



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ByggNett (BuildNet)

Concept study	EUR 750K	Finished 2014
Main project	EUR 5M	Release 2017



Support better services

- Submission DIBK
- Submission archive DIBK + others
- FM Manual Library
- Tools for Design/Construction
- Procurement / trade

Processes
Technology
Semantics

} buildingSMART

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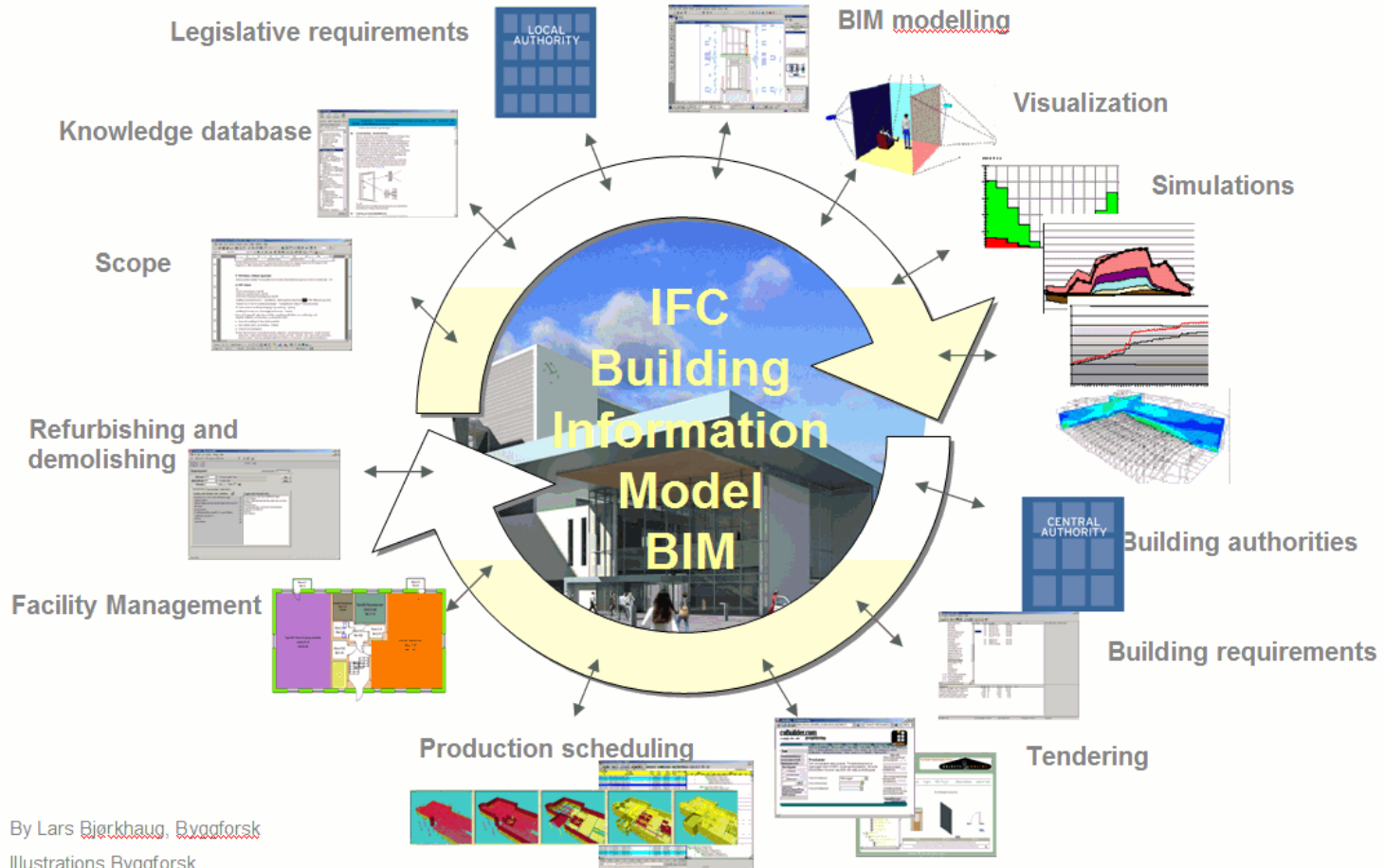
20 YEARS AGO

NO DIGITAL INTEROPERABILITY BETWEEN DOMAINS



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By Lars Bjerkhaug, Byggforsk
Illustrations Byggforsk,
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NBLN University of California,
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TODAY

NO DIGITAL INTEROPERABILITY BETWEEN SECTORS



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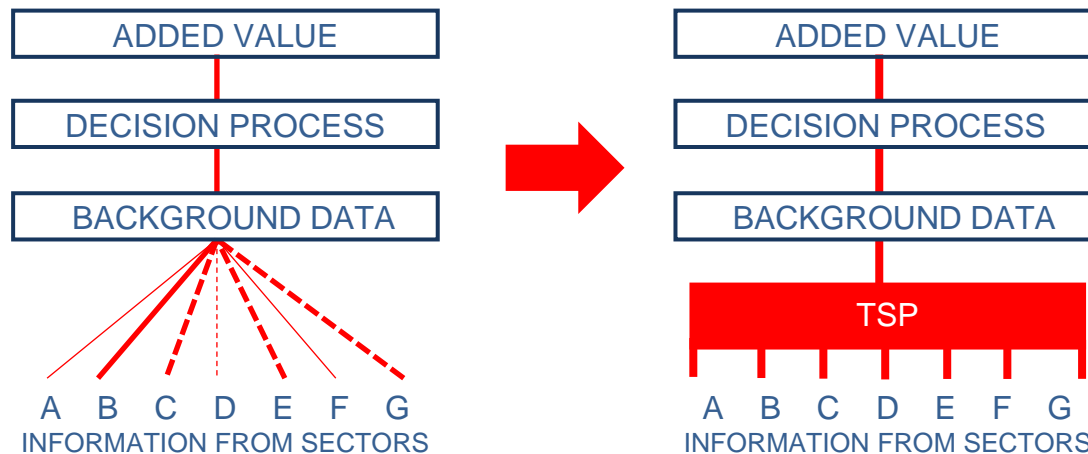
CLUSTER – MULTI-SECTOR PROJECT (TSP)

Pilot mid-2012 to mid-2013

37 Partner Organizations

7 Steering Committee members (included in partners)

Pilot project report – Main project recommendations



openINFRA OVERVIEW

Established interoperability standards/solutions

openINFRA interoperability standards/solutions

openINFRA

Inter-Domain Interoperability Standards

Domains/ Solutions

Standardized way of mapping information

- Data Dictionary
- Process Deliveries

buildingSMART
Buildings
IFC, IfcXML, SimpleIfcXML, BCF, IFC
Bridge, IFC Tunnel
(ISO 16739, 12006-3 and 29481 based)

POSC/Caesar
Plant Facilities
(ISO 15926 based)

OGC/INSPIRE/ISO 19100
Geospatial
LandXML, CityGML
(ISO 19100 based)

openBIM processes

- Design
- Construction
- FM
- Legal Authorities

Plant Facilities

- Design
- Construction
- Operation

Geospatial data processes

- Areal Planning
- Building Permissions
- ?

Interoperability based on ISO 16739, 12006-3 and 29481

Interoperability based on ISO 15926 standards

Interoperability based on ISO 19100 standards

Buildings

Transportation
Coastal, Roads,
Railroad, Aviation

Infrastructure
Wiring/Piping
ISO 19100

Cadastre

Area planning

Nature
(Topography,
biology..)

**Off/on-shore
Plants**

Wiring/piping
ISO 15926

Inter-Domain
process
Georefer.
Excavation

Inter-Domain
process
Design
Coordination

Inter-Domain
process
Code check
Submission

Inter-Domain
process

Inter-Domain
process
Building/
Plant
interopera-
bilitv

Inter-Domain
process
Building/
Infrastructure
interopera-
bilitv

Inter-Domain
process
Infrastructure/
interopera-
bilitv



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TSP – PILOT – IDENTIFIED SECTORS

1. Building
2. Road
3. Railway
4. Geospatial
5. Legal Authority
Processes
6. Cadastral
7. Wiring & piping
8. Transport

		Recipient							
		1.	2.	3.	4.	5.	6.	7.	8.
Sender	1.	1.1	2.1	3.1	4.1	5.1	6.1	7.1	8.1
	2.	1.2	2.2	3.2	4.2	5.2	6.2	7.2	8.2
	3.	1.3	2.3	3.3	4.3	5.3	6.3	7.3	8.3
	4.	1.4	2.4	3.4	4.4	5.4	6.4	7.4	8.4
	5.	1.5	2.5	3.5	4.5	5.5	6.5	7.5	8.5
	6.	1.6	2.6	3.6	4.6	5.6	6.6	7.6	8.6
	7.	1.7	2.7	3.7	4.7	5.7	6.7	7.7	8.7
	8.	1.8	2.8	3.8	4.8	5.8	6.8	7.8	8.8

Sector Matrix

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TSP – PILOT – USE CASES

Requirements and planning (engineering)

Programming - Client brief

Context information as background for design

Simulation / analysis of environmental impact

Simulation / analysis of environmental and climate adaptation

Landscape excavation/filling

Geotechnical information in model

Visualization for stakeholders

IFC for Landscape architects

Submission and Legal Authority Processes

ByggSøk (BuildNet)

Construction

Construction Product Information

Context information as background for construction

Asset and Facility Management

AM/FM Documentation

Red/bold text = Prioritized use-cases

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TSP – PILOT – EXISTING REGISTRES OVERVIEW

Sectors as specified in TSP		
Nr.	Sector	Handled by register/database
1.	Building	TSP ByggNett (BuildNet)
2.	Road	NVDB (Norwegian Road Database)
3.	Railway	JDB (Railway Database)
4.	Geodata	Geoportal (Norway Digital)
5.	Legal Authority Processes	ByggNett (BuildNet) Municipal registers
6.	Cadastral	Matrikkelen (Cadastral Information Database)
7.	Wiring & Piping	Multiple network owners with their own NIS (Network Information and Management System)
8.	Transport	NVDB (Norwegian Road Database) ITS (Intelligent Transport System)
Black text = Existing register/database Red text = Planned register/database		

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TSP – MAIN PROJECT

Business model

Industry driven - Development driven by industry needs and potential

"Start in the corner" - Demonstrate value

Establish platform and method for standardizing exchange requirements one use-case at a time.

Recommended Use-cases

Context information as background for design and construction

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TSP – MAIN PROJECT

Develop (bits and pieces) multi-sector interoperability (From 1 sender to 1 recipient in 1 use-case).

Perspectives

- Data models -
- Exchange formats – Open international Formats (IFC, LandXML, GML...)
- Exchange requirements – IDMs/Product Specifications
- Data terminology – bS Data Dictionary (others?)
- Organizational – Responsibility for establishing and maintenance
- Financial – Business model
- Security – Access administration
- Maintenance

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TSP – GIS-BIM MAPPING WORKSHOP

The purpose of the workshop

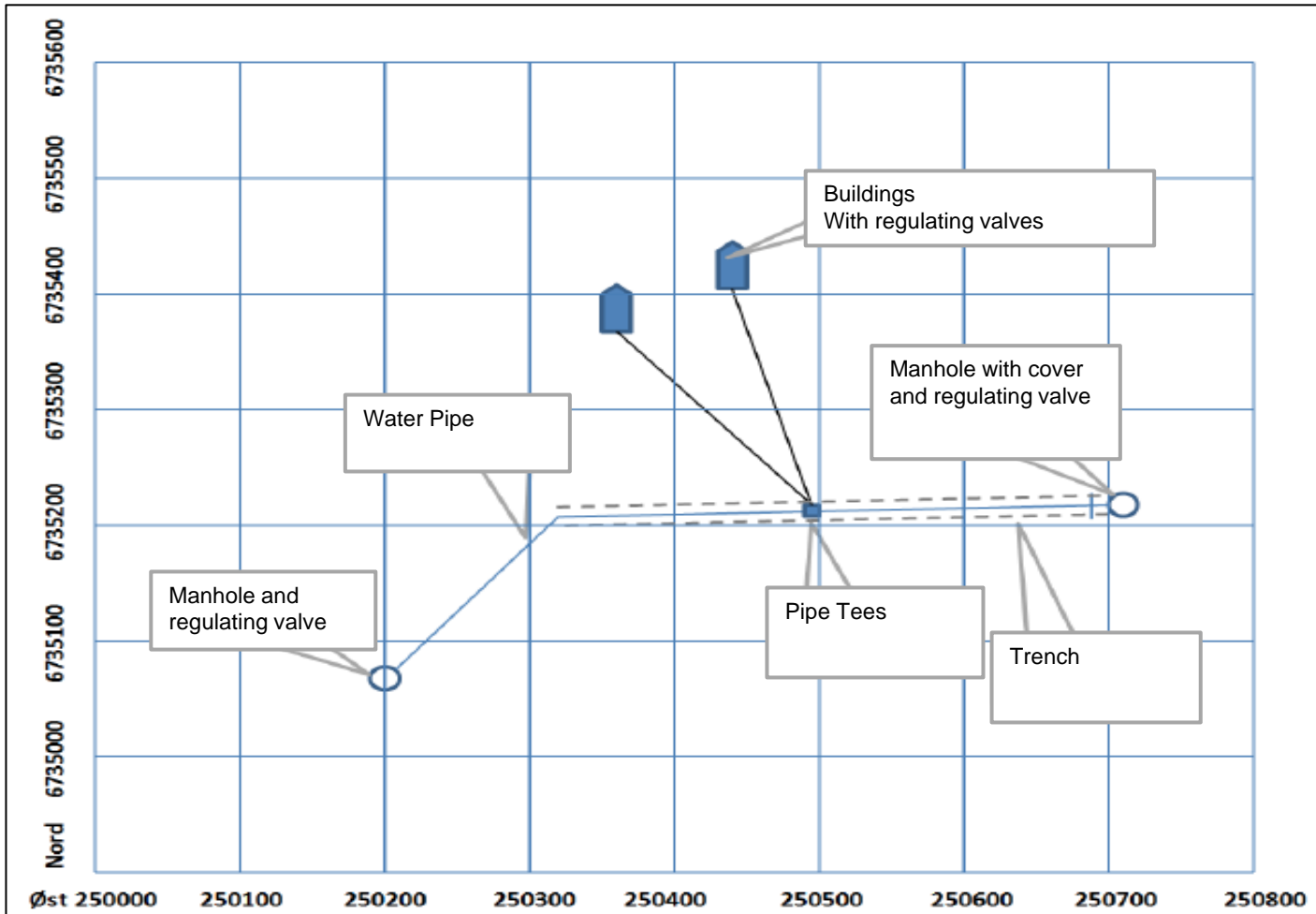
- Start “do something”
- Establish a common understanding of how the/a GIS Model (ISO 191XX) and IFC4 Model (ISO 16739) is structured and works.
- Investigate potential mapping between the two model.

The goal of the workshop

- Present the two models
- Define a couple of similar, relevant objects in each system and compare similarities and lack of such.

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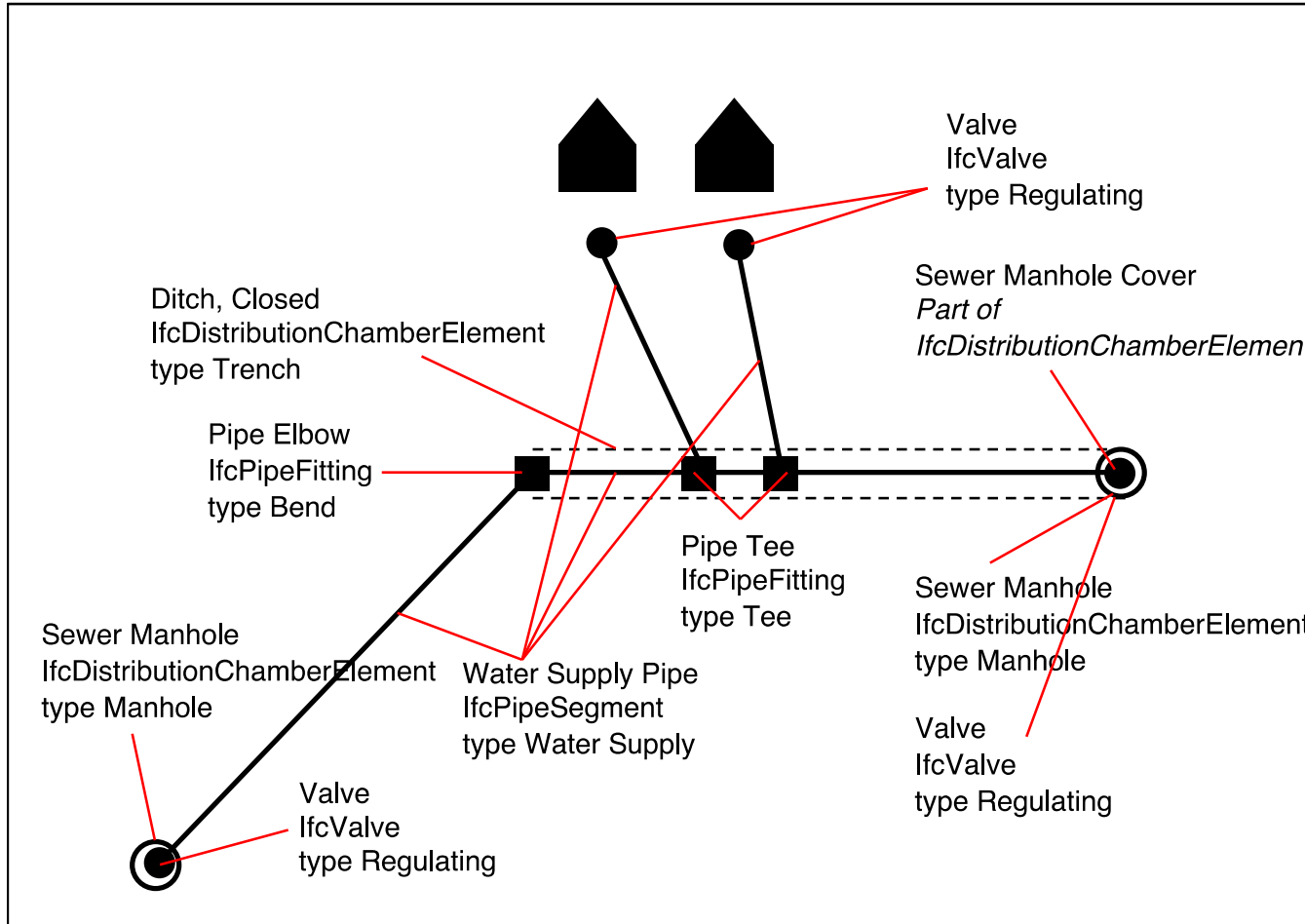
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Workshop test case: SOSI (UML)

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Workshop test case: (Partially) translated to IFC4

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MAPPING BTW. GIS (SOSI) AND IFC4

GIS - SOSI Wiring/Piping	BIM - IFC4
<i>System</i>	
Pipe System (Ledningsnettverk)	IfcDistributionSystem
Identification (Identifikasjon) = UID	GUID
Name (Navn) = Character String	Longname
Domain (Fagområde) = LedningsFagområde	IfcHvacDomain
System Type (Ledningsnettverkstype)	Type: WaterSupply
<i>Entities</i>	
Water Supply Pipe (Vannrør)	IfcPipeSegment
Regulating Valve, main flow (Stoppekran)	IfcValve, type Regulating
Regulating Valve, at house (Bakkekran)	IfcValve, type Regulating
Pipe Tee (Anboring)	IfcPipeFitting, type Tee
<i>defined by a point where the pipebends</i>	IfcPipeFitting, type Bend
Sewer Manhole (Kum)	IfcDistributionChamberElement, type Manhole
Sewer Manhole Cover (Kumlukk)	Part of IfcDistributionChamberElement
Ditch, Covered (lukket grøft)	IfcDistributionChamberElement, type Trench

Table, mapping between selected entities and attributes/properties in the given example

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MANY THANKS FOR THE ATTENTION

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