ISO: Standards for BIM & Infrastructure

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ISO, a global system

- **164 national members**
  - 98% of world GNI
  - 97% of world population

- **229 active TG’s**
  - 3483 technical bodies
  - 4518 documents under development

- **Collection of 20’500 ISO Standards**

- **1103 standards produced in 2013**

- **Central Secretariat in Geneva**
  - 138 FTE staff from 19 countries

- **Over 649 organizations in liaison**

- **Vision and strategy**

- **Customer**

- **Internal process**

- **Learning and growth**

- **Financial**

- **Collection of 20’500 ISO Standards**

- **1103 standards produced in 2013**

- **Over 649 organizations in liaison**

- **Vision and strategy**
Breadth of ISO’s work in recent years

2009
- Fraud countermeasures and controls
- Traditional Chinese medicine
- Sustainability in event management
- Energy efficiency & renewable sources terminology
- Sustainability criteria for bioenergy

2010
- Asset management
- Natural gas fuelling stations
- Pigments, dyestuffs & extenders
- Safety amusement rides and devices
- Treated wastewater re-use for irrigation
- Biogas
- Energy savings

2011
- Project, programme & portfolio mgmt
- Additive manufacturing
- Facilities management
- Outsourcing
- Risk management
- Bionics
- Fireworks
- Coal bed methane Carbon capture and storage

2012
- Railway applications
- Sustainable development in communities
- Plastics and rubber machines
- Compliance programs
- Forensic sciences
- Customer contact centres
- Light and lighting

2013
- Sludge recovery, recycling, treatment and disposal
- Biotechnology
- Sustainable purchasing
- Anti-bribery management system – Requirements
- Innovation process: interaction, tools and methods
- Management consultancy
- Fine bubble technology
- Water re-use
- Occupational Health & Safety MS requirements
- Clean cookstoves and cooking solutions
- Collaborative business relationship management
- Chain of custody of wood and wood-based products
- Educational organizations management systems

2014
- Brand evaluation
- Online reputation
- Domestic gas cooking appliances

New ISO groups touching upon sustainability pillars of:
- Environment
- Economic
- Societal
International standards level the playing field
## Organizations shifting views on sustainability…

<table>
<thead>
<tr>
<th>From …</th>
<th>To…</th>
</tr>
</thead>
<tbody>
<tr>
<td>• An add-on</td>
<td>• Core to strategy</td>
</tr>
<tr>
<td>• Compliance driven</td>
<td>• Innovation focussed / transformative</td>
</tr>
<tr>
<td>• Value protection</td>
<td>• Value creation</td>
</tr>
<tr>
<td>• Boring – manage risks</td>
<td>• Exciting – new opportunities</td>
</tr>
<tr>
<td>• Issue only for the future</td>
<td>• A current concern with long-term impact</td>
</tr>
<tr>
<td>• Only about environment</td>
<td>• About creating a sustainable future</td>
</tr>
<tr>
<td>• Philanthropic / moral obligation</td>
<td>• Core issue reflecting values</td>
</tr>
<tr>
<td>• Challenge / obstacle</td>
<td>• Opportunity</td>
</tr>
<tr>
<td>• A rich country luxury</td>
<td>• A developed &amp; developing country imperative</td>
</tr>
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BIM & ISO committees

- TC 59/SC 17 Sustainability in buildings and civil engineering works
- TC 163 Thermal performance and energy use in the built environment
- TC 205 Building environment design
- TC 242 Energy management
- TC 268 Sustainable development in communities
- TC 268/SC 1 Smart community infrastructures
- JTC 1 Study Group on Smart Cities; etc.
ISO/TC 59/SC 13 Organization of information about construction works

Chairman and Secretary from Norway

21 P-members
11 O-members
Liaison with Open Geospatial Consortium
Liaison with buildingSMART International

Active working groups:

• WG 2 Classification of the information on the construction industry
• WG 8 Building information models - Information delivery manual
• WG 11 Product data for building services systems model
• WG 12 Development of building data related standards (joint with TC 184/SC 4 Industrial data)
• WG 13 Implementation of collaborative working over the asset lifecycle
Standards: publications


**ISO/TS 12911:2012** Framework for building information modelling (BIM) guidance

**ISO 16354:2013** Guidelines for knowledge libraries and object libraries

**ISO 22263:2008** Organization of information about construction works - Framework for management of project information

**ISO 29481-1:2010** Building information modelling - Information delivery manual - Part 1: Methodology and format

Standards: work in progress

**ISO/DIS 12006-2** Building construction - Organization of information about construction works - Part 2: Framework for classification

**ISO/DIS 16757-1** Product Data for Building Services System Models - Part 1: Concepts, architecture and model

**ISO/NP 16757-2** Product Data for Building Services System Models - Part 2: Geometry

**ISO/AWI 19650** Specification for information management for the capital/delivery phase of construction projects using building information modelling

**ISO/CD 29481-1** Building information modelling - Information delivery manual - Part 1: Methodology and format
Sustainable Cities and communities - PUBLISHED STANDARDS

• ISO 37120 Sustainable development and resilience of communities - Indicators for city services and quality of life

• ISO/TR 37150 Smart community infrastructures - Review of existing activities relevant to metrics

STANDARDS UNDER DEVELOPMENT

• ISO 37101 Sustainable development and resilience of communities - Management systems - General principles and requirements

• ISO 37102 Sustainable development and resilience of communities – Vocabulary

• ISO/TR 37121 Inventory and review of existing indicators on sustainable development and resilience in cities

• ISO/TS 37151 Smart community infrastructure metrics - General principles and requirements

• ISO/TR 37152 Smart community infrastructures -- Common framework for development and operation
Topics for the future

(from ISO/TC 59 Business plan)

• standards aimed at reducing the use and expenditure of resources and further streamlining of processes in buildings and civil engineering projects,

• standards with further guidance on the information management requirements associated with projects delivered using building information modeling, from design and procurement to maintenance and demolition,

• standards providing frameworks for specification, analysis and assessment of performance in buildings,

• standards covering various aspects of resilience in the context of buildings and civil engineering works,

• standards providing indicators for assessment of sustainability and functionality,

• standards providing vocabularies and taxonomies allowing for further use in object libraries, product catalogues and classification systems related to buildings and civil engineering works,

• standards providing environmental declarations of building products,

• standards covering script language and functions, methodologies and information exchange formats,

• standards providing classification systems and requirements for products,

• standards establishing the standard conditions for design competitions,

• standards establishing the implementer’s procurement and delivery management system comprising processes, procedures and methods for the implementation of infrastructure projects.
Business environment…

(from ISO/TC 59 Business plan)

Organization of information / IT

In building construction, the standardization of products (goods and services) requires the standardization of the digital exchange of documentation and data. The standardization of digital basics to allow progress in this field is now taking place. Building information modeling, in particular, is about exchange of information of all types, along the project time line, and between participants and applications. Information types include geometrical data, functional and technical data, cost data and maintenance data.

An important task of ISO/TC 59 has been to establish a common grammar and terminology, making it possible to understand construction documentation across borders. Standards under ISO/TC 59/SC 13, like ISO 12006-3:2007, which specifies a language-independent information model that can be used for the development of dictionaries used to store or provide information about construction works, have to be based on a common grammar to enable classification systems, information models, object models and process models to be referenced from within a common framework.
Cooperation with buildingSMART International

bSI has an A category liaison with TC 59/SC 13

bSI standards are reflected into ISO standards on organization of information:

• Data model -> Industry Foundation Classes (IFC) -> ISO 16739
• Data dictionary -> BuildingSMART Data Dictionary (bSDD) -> ISO 12006-3
• Data processes -> Information Delivery Manual (IDM) -> ISO 29481-1
Arup has more than 35 years’ experience in Asia, combining local insight with global expertise to deliver a wide range of landmark projects.
A new report from the Greater London Authority (GLA) reveals the capital’s strategic infrastructure investment requirements to 2050 aimed at meeting the needs of London’s population, which is growing at a rate of two-thousand people every eight days. Investment activity will be needed on an industrial scale not seen since Victorian times. But it is not all about tunnels, railways and power transmission. Cleaner air, natural flood protection and places for Londoners to walk and cycle are central to the city’s quality of life and urban sustainability. And a major increase in housing provision would address one of the most pressing needs of Londoners.”

— Alexander Jan, project director, Arup

The Mott MacDonald-Arup Joint Venture has won an award at the Autodesk Hong Kong BIM Awards 2013. Building Information Modelling (BIM) was applied to facilitate the design of the Midfield Concourse at Hong Kong Internal Airport. The joint venture is providing full design consultancy and construction support for a new Midfield Concourse to be built by the third quarter of 2015. With an area of 110,000m², this will provide an additional 20 aircraft parking stands.

Arup has been appointed by CERN to undertake conceptual design studies for both the tunnel engineering and geotechnical aspects in the scope of the Future Circular Collider (FCC) study. A key element of this stage has been the development of an early stage Building Information Modelling (BIM) tool to inform performance, risk and cost optimized options for a 100 km long, circular particle-accelerator tunnel.
Terry Hill, appointed in 2010 to chair the Infrastructure UK steering group. The group will oversee an investigation into ways of reducing the cost of delivery of civil engineering works for major infrastructure projects in the UK.

Crossrail, currently Europe’s biggest civil engineering project, is being built under central London. It will provide rail services from Maidenhead and Heathrow to the west of the capital, through to Shenfield and Abbey Wood in the east.

- Up to 24 trains per hour in each direction will travel through the central underground section
- Nine major new stations are being built
- Intensive construction involves 21km of new twin bored tunnels under the centre of London
Thank you!