



The Global Language of Business

# Transforming Construction

Building the foundation for greater efficiency and sustainability





Today's construction industry is large, growing and significantly impacts the world's natural resources. Construction-related spending accounts for 13 percent of the world's Gross Domestic Product (GDP).<sup>1</sup> The industry emits over one-third of greenhouse gasses and consumes 25 percent of the world's water.<sup>2</sup>

Consider that in the past 20 years, the global average for construction's value-add per hour has increased by only 1 percent a year, compared to 4 percent growth in manufacturing.<sup>3</sup> It is also estimated that 90 percent of the world's infrastructure projects are either late or over-budget.<sup>4</sup>

Recent studies in the U.S., Scandinavia and UK suggest that up to 30 percent of construction is rework, labour is used at only 40 to 60 percent of potential efficiency and at least 10 percent of materials is wasted.<sup>5</sup>

Construction is also faced with significant challenges to become much more efficient, improve productivity and lower costs throughout its global supply chain.

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According to McKinsey, action in specified areas can boost the construction industry's productivity by 50 to 60 percent. Three of these areas involve increasing transparency, improving procurement and supply chain management, and infusing digital technology and advanced automation.<sup>6</sup>

Manual, paper-based processes are predominately used with data about construction materials scattered throughout different databases. Documentation of construction products actually used in projects is not easily accessible, even less in digital form—if available at all.

Clearly, there is sizable opportunity to take the waste out of construction processes, making them highly efficient and sustainable.

## Digitalisation and BIM

Using Building Information Modeling (BIM), construction stakeholders are starting to invest in the digitalisation of their supply chain and circular economy processes. BIM is quickly emerging to become the “common template” from which all stakeholders can work, partly incentivised by national regulation for public building projects.

Yet, to effectively access and share information amongst stakeholders—and across the globe—GS1 standards are required as an essential element of BIM.

One GS1 standard—the Global Trade Item Number® (GTIN®)—uniquely identifies the physical construction product, acting as its “digital twin” to provide all the necessary data about the product to automate processes. The serialised GTIN or SGTIN identifies the individual or “instance” of the product.

Both identifiers are critical as building blocks for driving increased efficiencies in supply chain management processes when building, as well as life cycle processes during maintenance and repair.

The GTIN or SGTIN information can be encoded in a two-dimensional barcode (e.g., GS1 DataMatrix barcode), applied to or engraved on the building product, or in an RFID (radio frequency identification) tag that can be embedded in the product.

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“The leadership role played by GS1 in the construction industry is proving to be a significant catalyst in the drive for achieving better quality assurance in the product and materials supply chain of the building industry.”

**Bruce Kohn**  
CEO, New Zealand Building Industry Federation

To ensure that building materials get to the right place, construction locations can be uniquely identified by a GS1 Global Location Number (GLN).

Information carried by the GTIN and SGTIN about building materials and products—their identity, batch/lot number, serial number and expiry date—can all be stored in different master data management systems and then, using openBIM standards, can be accessed and shared between national and cross-border trading partners.

## Transforming processes

Most construction projects are quite complex—involving several contractors and sub-contractors, many suppliers from different countries, and an incredible number of building materials, products and components.

Products are typically ordered based on a required set of attributes, but not necessarily from specific manufacturers.

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**“The Global Trade Item Number (GTIN) is an essential key for meeting the future demands in terms of digitalisation, traceability and the entire life cycle process within the construction industry.”**

**Harri Savolainen**  
CPO, NCC

By identifying each building product with a GTIN and capturing the product’s information in a master database, suppliers can expand their brands’ visibility to include new construction partners and building projects.

And construction sites can greatly expand their choice of products, extending their reach to new suppliers. They can precisely order what’s needed for building projects to avoid material waste and schedule delays. The increased use of global business-to-business e-platforms in construction will certainly accelerate this trend.

By using GS1 standards, onsite logistics can be substantially enhanced by getting the right product to the right site, at the right time and in the right sequence. This is especially important since many large construction sites do not yet have specific postal addresses, yet rely heavily on adhering to a building schedule.

EPCIS, a GS1 standard, can provide all stakeholders with the needed visibility of building materials (and information about these materials) as they travel from manufacturers’ warehouses to construction sites.

This access to information allows onsite and facility managers to make more informed decisions about work and maintenance schedules, while better controlling costs.

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**“For over 15 years, GS1 standards, especially the GTIN, have been critical in Liberty Steel Australia’s efforts to facilitate electronic trading and product traceability. Now, as the construction market increasingly demands full traceability of products throughout the supply chain, for both compliance and sustainability, the serialised GTIN and its integration into BIM is a logical and essential part of that journey.”**

**David McNeil**  
Customer Experience Manager, Liberty Steel

## Driving sustainability

Globally, the construction industry uses 40 percent of resources, it produces 40 percent of waste and it consumes 40 percent of energy production.<sup>6</sup> Gaining efficiencies in construction can clearly have a significant impact on the health of the planet. Yet, in order to reuse, refurbish and recycle products and buildings, builders need to know which products were used in the construction of these buildings.

As a globally unique identifier, the GTIN provides the needed visibility of all products, parts and components used in building projects, making it a critical piece of any sustainability strategy. As efficiencies grow in construction processes, waste can be minimised and a more sustainable supply chain—down to the construction site—can be realised.

Construction, like many industries today, must guard against counterfeit building materials that can infiltrate their factories, facility management, and maintenance and repair operations (MRO).

By using an SGTIN to uniquely identify an individual building product, all construction partners can verify the authenticity of the product and exchange data in real-time on its attributes, performance and MRO activities. Throughout the building product’s life cycle, construction stakeholders can track the product’s raw materials back to their origins as well as trace the product to its final building destination.

## Building a better future today

The use of GS1 standards in construction is gaining momentum. Projects in Australia, France, New Zealand, Norway and Sweden are underway that are using GS1 standards in BIM, as well as in logistics processes to streamline operations, increase sustainability and lower costs.

Many of the industry’s challenges can be solved with support from GS1 standards that identify building products and help stakeholders share valuable information about them. By enriching the BIM model, GS1 standards can build the needed foundation for the industry’s successful digital transformation.

## Contact us

For more information about GS1 standards in construction, visit [www.gs1.org/technical-industries/construction](http://www.gs1.org/technical-industries/construction).

You can also contact your local GS1 Member Organisation listed at [www.gs1.org/contact](http://www.gs1.org/contact) to learn more about how GS1 standards can help you build a better future in construction.

“GS1 standards for the identification of building products (GTIN and SGTIN) are well suited to provide full traceability, from design to disposal—today, for the physical and digital flow of goods and tomorrow, for smart products using RFID and sensors. Combined with GS1 standards for identification of locations (GLN and SGLN), this will enable better logistic flows throughout the lifespan of the building.”

**Inge Aarseth**

Project Manager, Construction Department, Vestfold Hospital Trust

## About GS1

GS1 is a neutral, not-for-profit organisation that develops and maintains the most widely used global standards for efficient business communication. We are best known for the barcode, named by the BBC as one of “the 50 things that made the world economy”. GS1 standards improve the efficiency, safety and visibility of supply chains across physical and digital channels in 25 sectors. Our scale and reach – local Member Organisations in 112 countries, 1.5 million user companies and 6 billion transactions every day – help ensure that GS1 standards create a common language that supports systems and processes across the globe. Find out more at [www.gs1.org](http://www.gs1.org).

## Endnotes

- 1 McKinsey. (2017 February). *Reinventing Construction: A Route to Higher Productivity*.
- 2 Source: Cobuilder
- 3 McKinsey. (2017 February). *Reinventing Construction: A Route to Higher Productivity*.
- 4 The Economist. (17 August 2017). Efficiency eludes the construction industry.
- 5 Lean Construction Blog, London: HMSO. (2015 January 20). *Rethinking Construction: Report of the Construction Task Force*.
- 6 Source: Cobuilder

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