

# Building Products in Building Codes and Inspection

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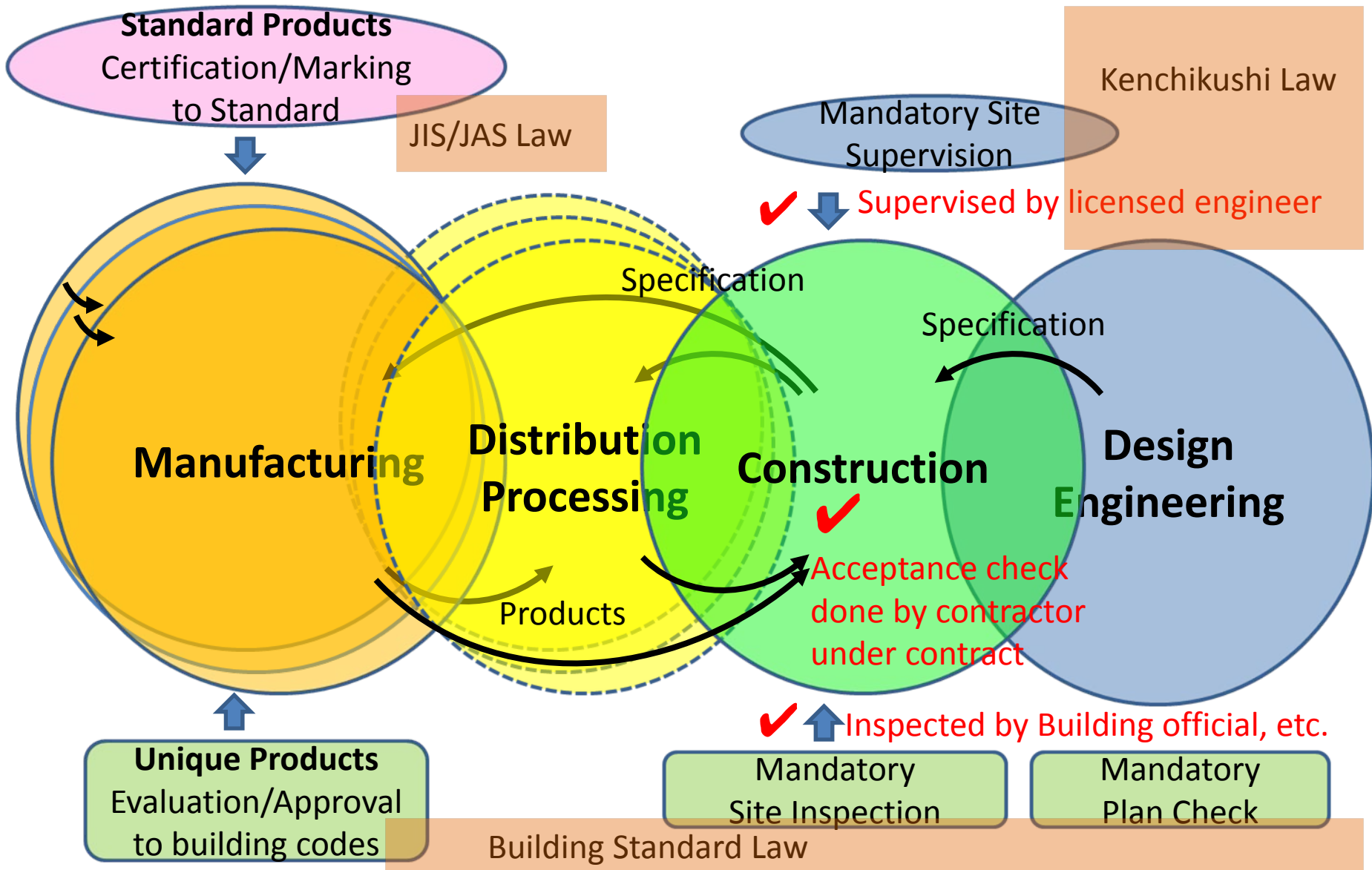
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# Issue

- Building is made of building products (parts or materials), design and construction.
- Suitable products are essential for life safety of buildings.
- Building Regulations/Codes covers mainly design and construction stages.
- Assurance of a product quality/performance is generally covered by different legislations.
- *Are not there any “missing rings” between products legislations and building regulations?*

# Japanese Legislation



# Products suitability check

## ◆ Designer/Engineer

- Develop building plans and specifications (including product specification)
- Get a confirmation of building codes conformity from a Building official, etc.

## ◆ Contractor

- Construct a building in accordance with building plans and specifications.
- Carry out procurements and building product “acceptance check”.
- **First place liability** of used products suitability

## ◆ Site Supervisor

- Carry out site supervisions (checking conformity of construction works to building plan, specifications including a products suitability.).
- Building owner must nominate a licensed site supervisor (Kenchikushi).
- **Second place liability** of used products suitability

## ◆ Building officials, etc.

- Carry out a plan check and site inspection including products conformity to the building codes.
- **Third place liability** of used products suitability.

# Products suitability checking

## ◆ Manufacturer

- Almost no requirements in building regulations.
- There are schemes of certification/approval of manufacturers/products
- No responsibility to trade stage or processing stages.

## ◆ Distributer/Processor

- No requirements in building regulations
- Only general **Civil law** or **Fair trade legislation, etc.** applies

# Magnitude/Consequence

## ◆ Is this real issue?

- Most of building products are having enough information on products by markings, labels, invoices, etc. Therefore contractors are easy to identify on site.
- Most of essential building products are cover by “Standard “certifications.
- Most of product’s characteristics/performances will not change so much during distribution or processing.
- Building Codes should be developed in expectation of some tolerance in products quality and workmanship.
- However ...



# Trouble cases on building products

- Exfoliation of imported Structural Laminated Lumbar (2003, 2006)
- Formaldehyde emission from imported Flooring Board (2004)
- Lack of strength of Screw nail (2006)
- Lack of strength of Structural steel (2007)
- Substandard Fiber silicate-calcium board (2007)
- Substandard Ready-mixed concrete (2008)
- Substandard Window frame (2009)

# Trouble Case

- **Imported Structural Laminated Lumbar (2003)**
  - Exfoliation caused by a substandard glue (estimated)
  - JAS Standard Marking Products
    - Manufacturer has been certified by international accreditation scheme.
  - 330 thousand pieces of defective lumbers distributed during a year.
    - Used in several hundreds of housings
  - **Difficulty of tracing a sales route, specifying buildings actually used and repairing those buildings.**



# Trouble Case

- **Substandard Fiber silicate-calcium ceiling boards (2007)**
  - Manufacturer got a product approval of fire resistance by submitting different test specimens from actually selling products.
    - Intentionally deceived.
  - Resulted lack of fire resistance performance
  - **40 thousands housing** used that board in eaves ceiling, etc.

# Trouble Case

- **Lack of strength of Structural steel (2008)**
  - Distributor supplied wrong standard steel (less strength) from stocks.
    - Steel beams used for structural support of lift facilities
  - Thousands of building had to be re-calculated structural safety and some were reinforced.
  - Contractor found it by **internal auditing**.
  - This case also indicated that a **clarity of design specification** and contractor's **definite order to the supplier** is indispensable.
  - **Consciousness of designers and contractors** on building products are also essential.

# Trouble Case

- **Substandard Ready-mixed concrete (2008)**

- Manufacturer used slag made of incinerated waste ash as an aggregate of concrete. (Standard referred in building code prohibit to use.)
- More than 100 buildings suffered a pop-out problem on a surface of concrete.
  - External wall may drop off the concrete or finishing materials
- JIS standard certified manufacturer.
- Slag was mixed to sound aggregates in a stock-yard . It creates **difficulty of identifying the building actually used** that aggregate.

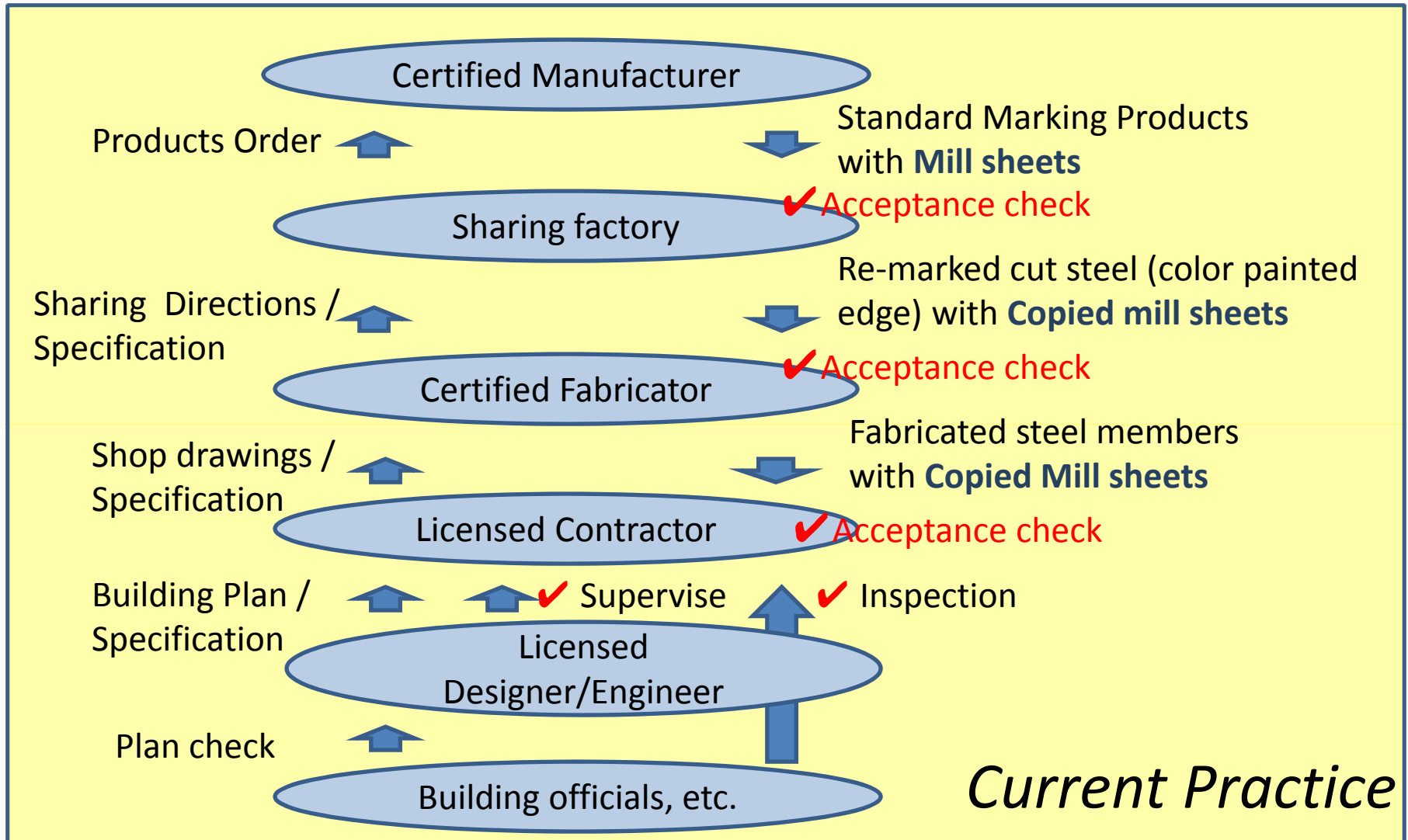
# Issue 2

- Need more traceability, accountability?
- Required a market surveillance ?
  - Deterrence to intentional cases and misunderstanding of product use
  - Maybe effective sampling check?
- Building regulation should cover manufacturing and distribution/processing stages more?
- Product Standard and its certification scheme should be extended to those stages more?
- Market should be autonomous as to be chosen a reliable, traceable, accountable distributors /processors/manufacturers ?

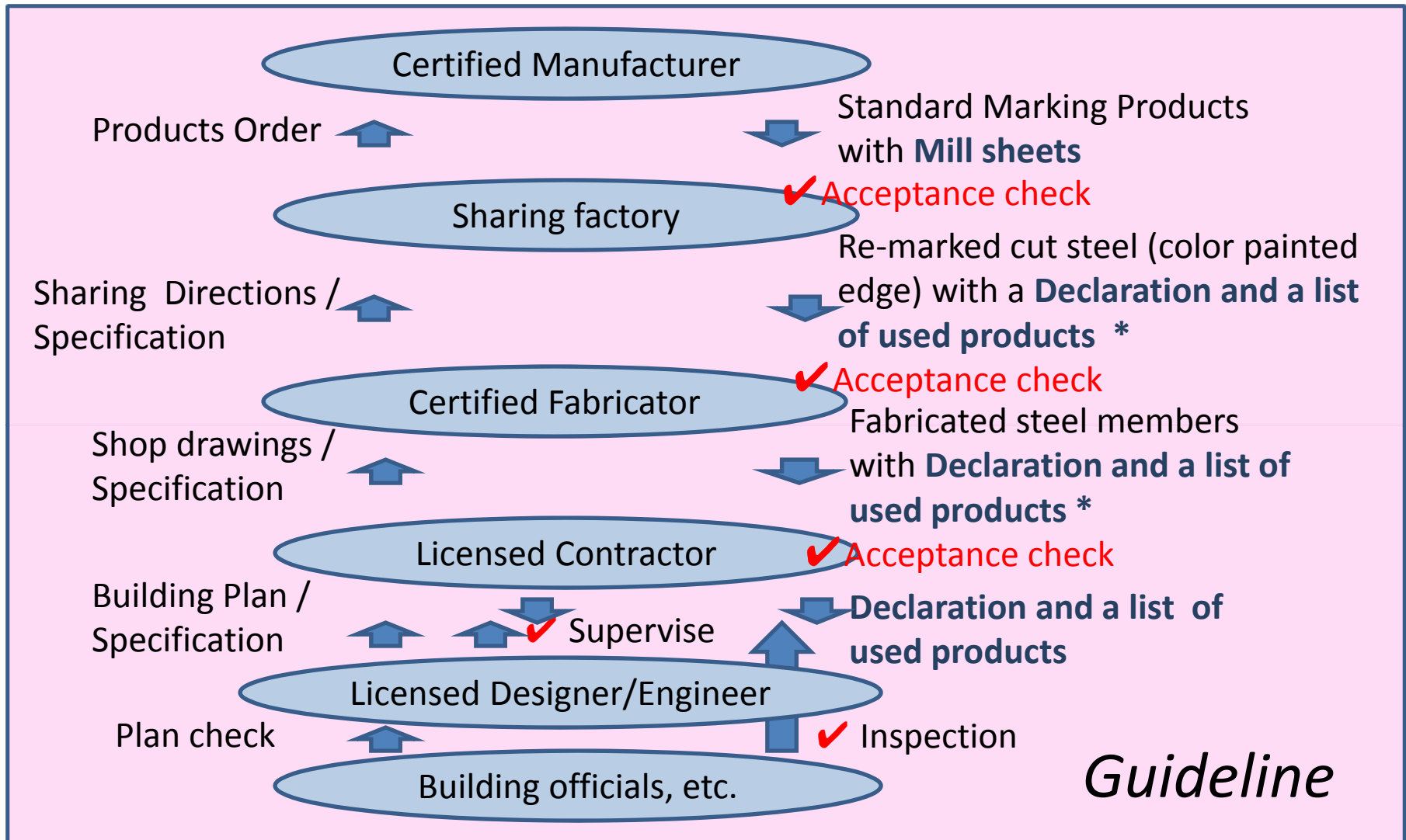
# Good practice to prove suitability of Structural steel

- Standard Marking on products is easy to disappeared.
- Distributer/Processor lies between manufacturer and contractor
- Actual trouble occurrence
- Mill sheet system is losing substances
  - Nobody can check a sheaf of papers.
- Lack of accountability on products
- N I L I M supported relative industry and Japanese Society of Steel Construction (JSSC) for developing a guidelines.

# A Guideline for a practice of Structural steel Suitability Proofing (2009.12)



# A Guideline for a Practice of Structural steel Suitability Proofing (2009.12)



*Guideline*

\* "Copied mill sheet" is option

# A Guideline for a Practice of Structural steel Suitability Proofing (2009.12)

## 5. 原品証明書の作成例 (ミルシートが) 5.1 鋼板、形鋼の例

Name of  
Manufacturer

Portion  
(Ex. Column,  
Beam, etc.)

Standard  
Number  
(Ex. SS400)

List of used  
products

工事名：〇〇新築工事

整理番号	部位・部材	規格	確認欄	寸法	数量(Kg)	メーカー名	証明書番号	製品番号
1	柱	SN490B	(JIS) 大臣	PL-25	1345	JFE	Y-1234	1234567
2	梁	SS400	(JIS) 大臣	H-700*300*13*24	1400	新日鉄	Z-5678	XYZ1234
3	ゲイブラム	SN490C	(JIS) 大臣	PL-32	2000	神戸製鋼	X-4567	ABC5678

規格品証明書ページ P.1

新日本製鐵株式会社  
Nippon Steel Corporation  
鋼材検査証明書  
INSPECTION CERTIFICATE

①

①

規格品証明書の各行、あるいは各ページに番号を付ける⇒整理番号とする

Inspection Certificate  
(Mill Sheet)



# Issue 3

- Building code developments may be reconsidered about that:
  - how can do an acceptance check or an inspection
  - how can leave the evidence to prove a suitability of building products
  - what sort of evidence should be left
  - a clarity and consistency of from design specification to all stages evidence of products suitability

Thank you

Questions/Comments ?