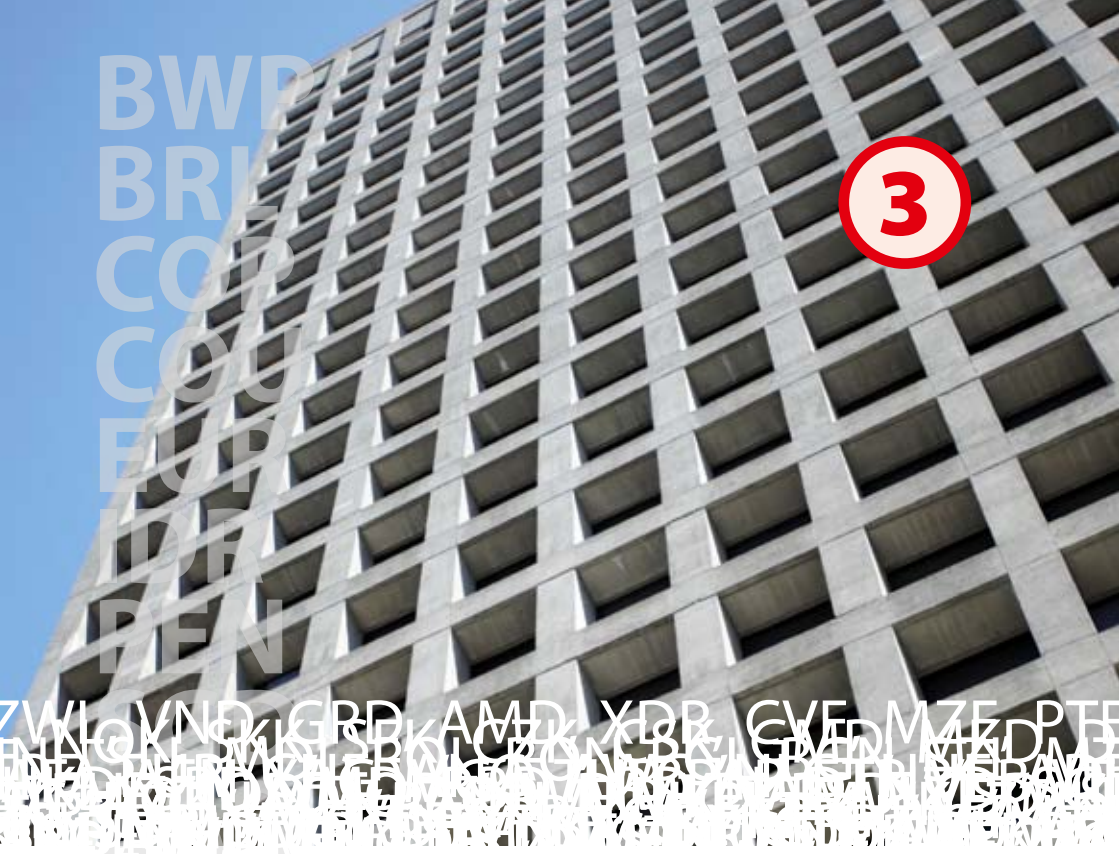


3

PT. Wijaya Karya (WIKA) Beton, Indonesia

Country : Indonesia
ISO member body : Badan Standardisasi Nasional (National Standardization Agency, Indonesia) (BSN)

Project team :
Project leader : Mr. I Nyoman Supriyatna (Head of R&D Center, BSN)
Co-leader : Mrs. Untari Padjiastuti (Deputy head)
Project assistant : Mr. Teguh Pribadi
PhD student, Trisakti University (Jakarta) : Mrs. Ida Busneti
ISO Central Secretariat support : Reinhard Weissinger
Duration of the study : November 2010 – March 2011

3.1 Background, objectives, and organization of the pilot project

3.1.1 Background

The National Standardization Agency of Indonesia (BSN) is a Non-Ministerial Government Institution responsible for the development of standardization at the national level, representing Indonesia in the International Organization for Standardization, ISO.

There are several ways in which ISO and BSN promote the development of standardization. One is to assess the most important benefits of standards by prioritizing standardization activities, raising awareness, promoting such benefits, and encouraging stakeholder participation.

Actual examples can be used to study the impact of standards and quantify these impacts in terms of their economic benefits. BSN has conducted studies and seminars on similar topics, such as an international seminar on *The Impact of Standarization on the Economy* held in 2009, with speakers from DIN, the German national standardization body.

3.1.2 Objectives

The main objective of this study is to determine the economic benefits that can be gained by a company implementing external standards in their business in a quantitative manner. The term "external standards" refers to all publicly available standards developed by consensus where participation in their development is open to interested parties, such as national, international or other standards development organizations or consortia, and where the criteria of public availability, consensus-based and open participation are met. Excluded from this study are company-internal specifications, and specifications developed and shared only between cooperating companies.

3.2 Introduction to the company : PT. Wijaya Karya (WIKA) Beton

3.2.1 Background on the selection of PT.WIKA Beton

The project team chose a company which has won the SNI Award given by BSN in recognition of the implementation of Indonesian National Standards (SNI), of the organization's commitment to standards development, and its good performance. Receiving the SNI Award is a proof of consistency in applying standards.

PT. Wijaya Karya (Persero) Tbk (WIKA) was the first winner of the SNI Award 2008 in the Large Service Business category. The subsidiary company PT. Wijaya Karya (WIKA) Concrete was chosen because it is a manufacturing company that uses a variety of product standards and test methods in its business operations, in addition to the quality management system widely used by large corporations. Based on the above criteria, PT. WIKA Beton, a subsidiary of PT. Wijaya Karya, Tbk was selected as a pilot project for the implementation of the ISO Methodology.

3.2.2 Overview of the company PT.WIKA Beton

Figure 1 Activities of PT.WIKA Beton

The head office of PT. WIKA Beton is based in Jakarta. It has 911 permanent employees in eight plants and ten sales offices. The plants

are located in Bogor (main factory), North Sumatra, Lampung, Majalengka, Boyolali, Pasuruan, South Sulawesi, and Algeria. The sales offices are located in Banda Aceh, Medan, Pekanbaru, Palembang, Lampung, Jakarta (head office), Semarang, Surabaya, Balikpapan and Makassar. Currently WIKA Beton contributes the largest profit of all WIKA subsidiaries.

Market structure

The precast concrete business in Indonesia, is dominated by a small number of companies that control their market share. As many as 40 large and small local companies, compete with PT. WIKA Beton, each producing one or more similar products. However, seven companies constitute the main competition.

PT. WIKA Beton has a market share of about 22.4 % for its major products, of which 22.6 % is piles, 23 % precast concrete retaining products, 21.8 % precast concrete products for bridges, 21.2 % railway concrete products, and 23 % power line products.

All suppliers of PT. WIKA Beton are domestic companies, while its customers are mostly domestic construction companies (with less than 1 % overseas). The company sells its products to customer order, that is, there is first an order and then follows the production in response.

3.2.2.1 Inputs : Raw materials used

Key raw materials used by PT. WIKA are aggregate (sand and gravel), cement, admixture, pre-stressed concrete wire and bar, spiral wire and rolled steel.

3.2.2.2 Products

As an industry with concrete as the main material, PT. WIKA Beton implements concrete standard SNI 03-2847-2002, *Indonesian Concrete*

Code extensively. As an example, in the following are the steps in the production of concrete piles :

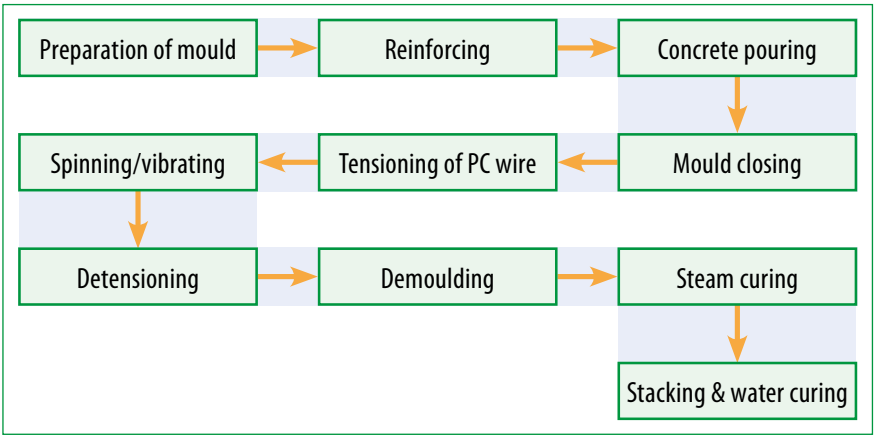


Figure 2 Example - Production of concrete piles

End products are :

1. Prestressed concrete poles
2. Prestressed concrete piles
3. Railway concrete products
4. Bridge concrete products
5. Retaining wall (sheet pile) concrete products
6. Hydro structure concrete products
7. Building and housing concrete products
8. Marine structure concrete products
9. Others concrete products

3.3 Company attitude towards standardization

As stated in Section 3.2, the main reason for selecting the company was that its parent, PT. Wijaya Karya, Tbk, was the first winner of the

SNI Award 2008 for the Large Business Services category. The SNI Award is a token of appreciation given by the national standardization agency BSN to an organization or company for implementing Indonesian National Standards (SNI) as well as for awareness of the development of standards, and good performance. The SNI Award is awarded as a proof of the consistency in implementing standards. Company experts participate actively in the national mirror committee to ISO/TC 71, *Concrete, reinforced concrete and pre-stressed concrete*.

3.4 Value chain analysis

3.4.1 Construction industry value chain

The construction industry value chain can be described as follows:

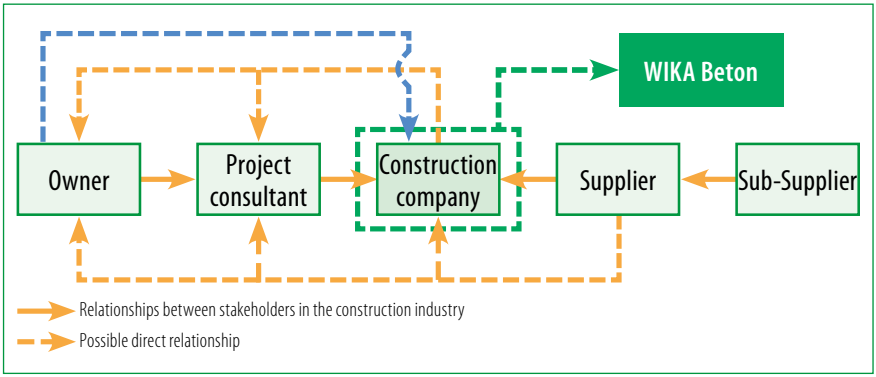


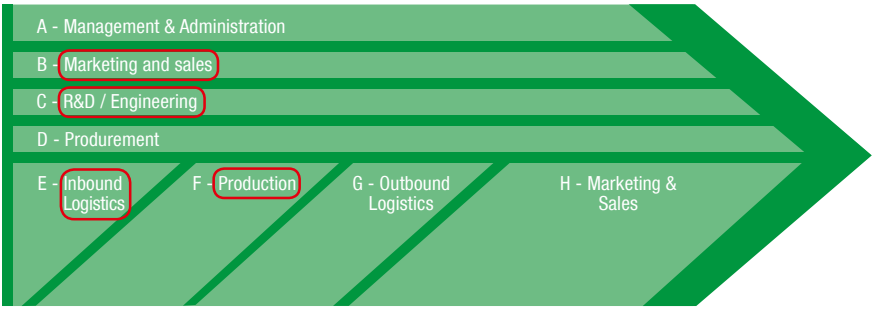
Figure 3 Construction industry value chain

In the construction industry value chain diagram, PT. WIKA Beton operates in the construction company supplier segment.

3.4.2 Company value chain of PT. WIKA Beton

The general value chain model for manufacturing companies, developed by Michael Porter, consisting of nine business functions, was modified to suit PT. WIKA Beton's system of basing production on orders and engineering processes conducted after the conclusion of sales contracts.

The company's value chain can be described as follows (the circles indicate the focus of the assessment in this study) :



Source : Michael Porter, Economic Benefits of Standards-ISO Methodology Guide, Version 1, 2010 (modified)

Figure 4 Value chain model modified for PT.WIKA Beton

3.4.3 Key value drivers of PT. Wika Beton

Based on interviews, PT. WIKA Beton has several value drivers that became the key for the success of the company in accordance to its core business processes :

No.	CORE PROCESSES	VALUE DRIVERS
1.	Sales and marketing	Customer intimacy
2.	R&D/Engineering	Product leadership
3.	Production	Operational excellence

Table 1 PT. WIKA Beton core processes and value drivers

3.5 Scope of the pilot project assessment

The scope of the case study conducted on PT. WIKA Beton was limited to the following key business functions : (1) Research and development/engineering, (2) Inbound logistics, (3) Production and (4) Sales and marketing. A further limitation was to focus the assessment only on the main factory located in Bogor.

The selection of business functions was based on the company's core processes — engineering, production, and sales.

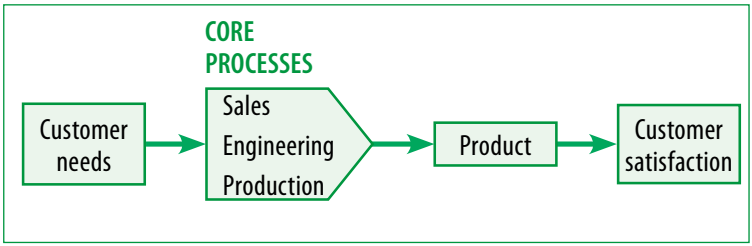


Figure 5 Core process diagram

Sales is part of the marketing and sales activity. Research and development and engineering cannot be separated and are considered as part of one business function. In this study the R&D function is chosen because it provides long-term results. The inbound logistics function was included in the study because the prior processes of production may affect/determine the quality of the final product.

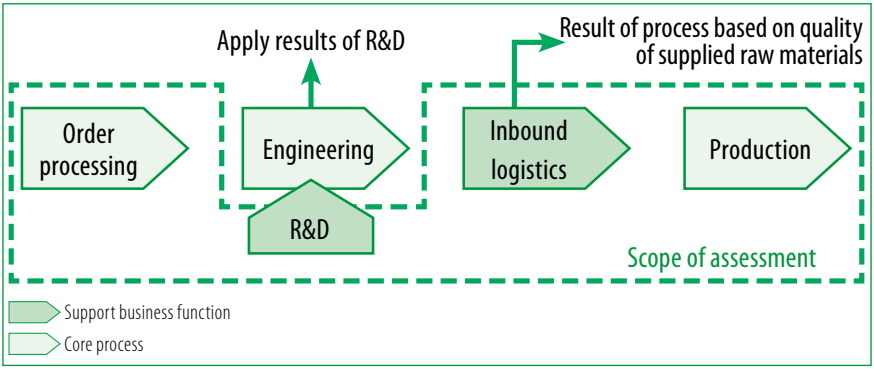


Figure 6 Selected business functions

3.6 Use of standards in the company value chain

External standards used by the company can be divided into three main application areas:

1. Standards for raw materials
2. Standards for the final product
3. Standards for management processes.

Standards identified in the selected business functions and their relationship in supporting the company's value drivers are described in more detail below:

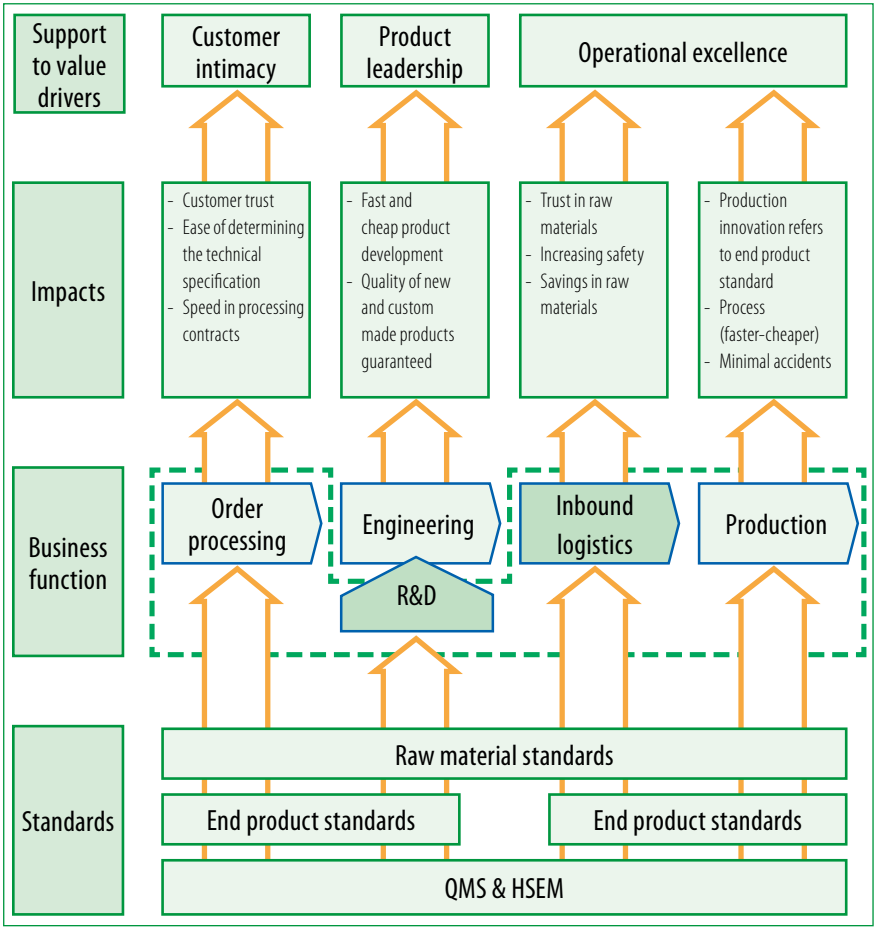


Figure 7 Relationship between types of standards, business functions, impacts and value drivers

A significant number of standards are used, the most important of which are listed in the Annex for each business function.

3.7 Operational indicators to calculate the impact of standards

To calculate the economic benefits of standards, we had to correlate business functions to the standards used. To do this we identified the impact of standards on the activities, then defined operational indicators so that the final economic benefits of the standards could be measured.

Where the operational indicators applied could not be calculated due to lack of data or limitation of project duration, any operational indicators and impacts were nevertheless still inventoried as described in Section 3.9.

Business functions being assessed	Related activities	Operational indicators
Research and development (= BF 1)	Collection of information about suppliers (in the product development process)	Savings in labour costs due to availability of qualified supplier information
	Product development research process	Savings in time due to the application of standards in research resulting in increased reliability
	Dissemination of research results and transfer of information (through the quality management system)	Saving of time through the dissemination of information due to the provision of standards indicators (e.g. for material specifications, process specification and standardization of the product, which are transformed into working instructions, operational procedures, brochures etc.)
Inbound logistic (= BF 2)	Raw material selection	Increased reliability in raw materials due to raw materials testing resulting in a reduction in their use
Production (= BF 3)	Removing steam curing in the production process	Savings due to increased efficiencies in production, in particular in the following processes : Steam curing Wire caging Simulant stressing
Marketing and sales (= BF 4)	Communication with purchasers	Time saving in negotiations : reference to standards in sales negotiations simplifies communication with purchasers
	Sales	Increase in customer reputation

Table 2 Impacts of standards on activities in business functions and selected operational indicators

3.8 Calculation of the economic benefits of standards

The method of identifying and calculating the impact of standards using operational indicators has been explained in Section 7. The results in the selected business functions are shown in **Table 3** below:

Business functions	Calculation of economic benefit per operational indicator (IDR/Year)	Percentage contribution to total revenue
Research & Development	201 010 271	0,08 %
Inbound logistics	341 716 540	0,14 %
Production	418 779 020	0,17 %
Marketing & Sales	90 202 415	0,04 %
Total Benefits	**1 051 708 246**	**0,43 %**

Table 3 Impacts of standards overall and by business function

3.9 Qualitative and semi-quantitative considerations

Other considerations resulting from the assessment study are as follows:

It is easier to implement external consensus-based standards than to develop internal standards (however, there are no data available on the costs of developing internal standards).

- By implementing widely used external standards, supplier's and company products will be more interoperable, cheaper, and faster to produce. Also, the variety of product types can be reduced more than would be possible by implementing internal standards. If producers and customers develop their own specifications for like products, then production overheads will increase.

- If the company's success in meeting customer quality requirements is based on external standards, the result is increased customer trust, improved corporate image and a basis for international competitiveness.
- There is better information transfer because communication between units is based on the same formats for data and documentation. This can reduce misunderstandings in communication that can cause errors or defects. It is also possible to reduce the frequency and cost of rework
- Unified management system : Integrating quality management and health and safety standards in one system covering key production stages can enhance quality control efficiency.
- Better competitor information : Competitive information is collected faster than before. Since competitor's product specifications are standardized, market research can be conducted more efficiently by reducing the costs for competitor screening activities.
- Quick response to complaints : Implementing standards can decrease repetitive complaints, and speed up response time.

3.10 Evaluation of results

Some important aspects that affect the calculation of the economic benefits of standards in this study (source of uncertainty, assumptions made) are as follows :

Data on the impact of standards on the four selected business functions are based on observations of benefits by key staff, and have been approved by the business development manager as top management representative. The method of expressing the impact of standards as economic benefits was discussed, and operational indicators associated with unit costs (monthly salary, materials prices, electricity costs per KWH, and others) were also identified.

- We identified as many as nine types of impacts on the four business functions, with a total economic benefit of IDR1 051 708 246, or 0,43 % of total revenue. This represents close to a 6 % contribution to the EBIT of PT. WIKA Beton, which is significant.
- Operational indicators in the study were based on a comparison between normal company operations using standards, and a hypothetical situation without the implementation of standards.
- This comparison was made because the company has implemented ISO 9001 and health and safety management standards, plus process and product standards, since its inception, so there was no period before the application of standards.
- We found that not all of the impacts (savings, for example) could be correlated with the use of standards. Therefore we made assumptions about the percentage of the contribution made by standards, which was based on a consensus within the project team and the company rather than a more quantitative method such as a weighting system.

3.11 Conclusions and recommendations

3.11.1 Conclusions

The conclusions summarize the overall findings of the analysis, and the key points learnt by the study/project team :

1. Implementation of the study through discussion with a standards user (company) creates awareness of the benefits of standards and demonstrates their contribution to company profits.
2. There were some difficulties due to the need for confidentiality of the company data. Even if a company has been willing to become the object of such a study, in some cases it might not be willing

to disclose all data to external parties, even if they are members of the project team.

3. The study team had some difficulty in understanding the benefits identified by the company's employees because the information was sometimes related to highly technical matters expressed in a very technical language.

3.11.2 Recommendations for next steps

1. Communicate the results of the study to stakeholders through seminars or workshops in order to raise awareness of, and interest in, the application of consensus-based external standards.
2. Disseminate methods to standards users so they can perform their own assessments of the impact of standards through training, since it is more difficult when such assessments are made by parties outside of the company.
3. There is a need for a similar study by BSN/ISO on companies in a different sector to disseminate knowledge about the methodology, increase awareness of the economic benefits of standards in other sectors, improve personnel skills of BSN, and refine the results of the study.
4. Similar studies carried out in future by BSN/ISO should take a personal approach to top management to explain the purpose and objectives of the study and the company data required.
5. Produce a pocket book/leaflet/brochure containing key steps about the methodology in a compact form.
6. Individuals should be included in study teams that have knowledge of the technological aspects of the participant company's industry sector and who understand the technical terms used.
7. Teleconferencing, as exemplified by ISO, could be used by BSN as an efficient and effective means of communicating standardization activities.

8. The ISO Central Secretariat should conduct regional or international workshops on the results of the ISO EBS methodology in order to share the outcomes with other ISO members.

ANNEX : Business functions and standards used

No.	Standards used			Business functions			
	Standard	Title	Type	Marketing and sales	R&D	Inbound logistics	Production
1.	ISO 9001:2008	Quality management systems – Requirements	CS	X	X	X	X
2.	–	Safety, health, and environmental management	CS	X	X	X	X
3.	ASTM C33 – 1999	Standard specification for concrete aggregates	PdS	X	X	X	–
4.	SNI 15-2049-2004	Portland cement	PdS	X	X	X	–
5.	ASTM C494-1985	Standard specification for chemical admixture for concrete	PdS	X	X	X	–
6.	JIS G 3536-1999	Uncoated stress-relieved steel wire and strand for prestressed concrete	PdS	X	X	X	–
7.	JIS G 3137-1994	Small size deformed steel bars for prestressed concrete	PdS	X	X	X	–
8.	JIS G 3532-2000	Low carbon steel wire	PdS	X	X	X	–
9.	JIS G 3101-2004	Rolled steel for general structures	PdS	X	X	X	–
10.	ANSI / AWS D1.1-1990	Structural welding code-steel	PdS	X	X	X	–
11.	SNI 03-2847-2002	Indonesian concrete code	PdS	X	X	X	X
12.	SNI 03-1752-1989	Recommendation for design loading of highway bridges	PcS	X	X	–	X
13.	JIS A 5309-1981	Prestressed spun concrete poles	PdS	X	X	–	X

No.	Standards used			Business functions			
	Standard	Title	Type	Marketing and sales	R&D	Inbound logistics	Production
14.	JIS A 5335-1987	Prestressed spun concrete piles	PdS	X	X	–	X
15.	JIS A 5326-1988	Prestressed concrete sheet piles	PdS	X	X	–	X
16.	JIS A 5325-1983	Reinforced concrete sheet piles	PdS	X	X	–	X
17.	JIS A 5332-1980	Core type prestressed concrete pipes	PdS	X	X	–	X
18.	EN 642-1994	Prestressed concrete pressure pipes	PdS	X	X	–	X
19.	ACI 318 – 2002	Building code requirements for structural concrete	PcS	X	X	–	X
20.	ACI 543R-00	Design, manufacture and installation of concrete piles	PcS	X	X	–	X
21.	SPLN 93:1991	Prestressed concrete poles for distribution line	PdS	X	X	–	X
22.	PD No.10 Perumka	Railway design	PcS	X	X	–	X
23.	American Railway Engineering Association (AREA) Chapter 10 – 1996	Manual for railway engineering	PcS	X	X	–	X
24.	GOST 10629 – 1988	Prestressed concrete sleepers for railway wide 1520 mm	PdS	X	X	–	X
25.	TB/T 3080 – 2003	-	–	X	X	–	X
26.	BMS 7 – 1992	Bridge design code	PcS	X	X	–	X
27.	AASHTO – 1992	Standard specification for highway bridges	PcS	X	X	–	X

X → used

- → not used

CS → Compliance standard

PdS → Product standard

PcS → Process standard