# Quality Control

## Basic Principle

We will raise customer satisfaction and deliver new value for society by fully demonstrating the Sanki Engineering Group's comprehensive capabilities and proposal-making capabilities to provide products that meet customer needs in each business area and for high-quality systems.

## Initiatives for Ensuring Quality

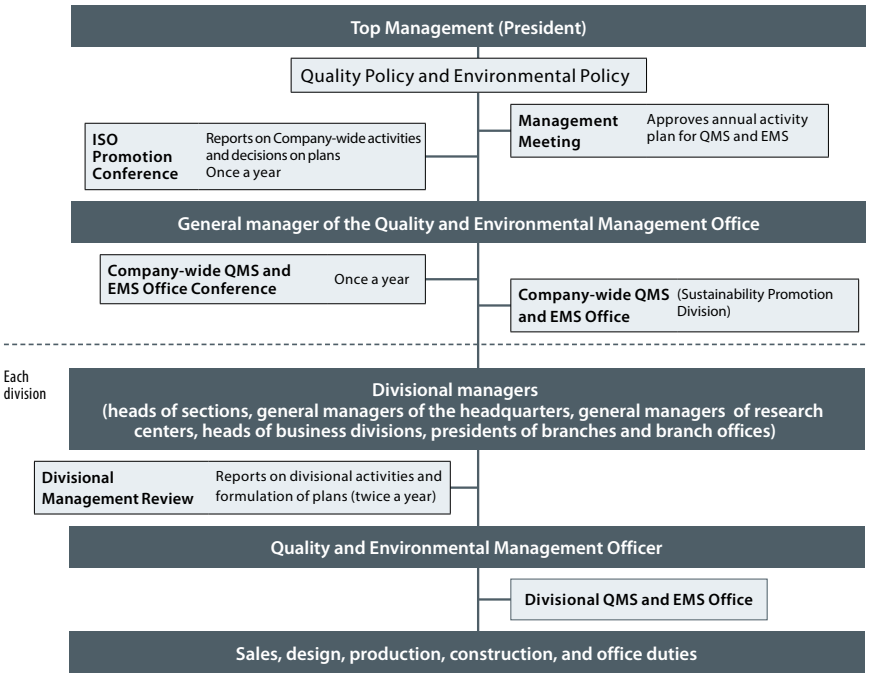
### Management System

We have integrated and implemented QMS (ISO 9001) and EMS (ISO 14001) at each division in the Facilities Construction Business, Plants & Machinery Systems Business, and Environmental Systems Business.

Risk management is conducted in advance of the actual work for construction and production to maintain and enhance quality. We also recognize that responding to problems and complaints promptly and appropriately is a fundamental aspect of quality management, and we take actions to consistently raise the standards of our management system.

In fiscal 2019, the quality management of the division in charge of a Sanki Engineering Group project was found to be out of compliance. Activities put in place to prevent recurrence are now practiced as standard procedure to maintain and improve our quality management system.

**Quality and Environmental Management System**




### Major Management System Strengthened in Fiscal 2022

The Facilities Construction Business worked on reducing the workload of site operations as well as on improving design and construction quality in accordance with the revision of operational flow carried out in fiscal 2021. These efforts helped improve design reviews, clarified quality targets, and led to fewer problems and complaints. Furthermore, we strengthened the quality management system by reviewing and

**Group Companies with ISO Certification**

- **ISO 9001**
  2 companies:
  Sanki Engineering Co., Ltd.
  Sanki Kankyo Service Co., Ltd.
- **ISO 14001**
  3 companies:
  Sanki Engineering Co., Ltd.
  Sanki Chemical Engineering & Construction Co., Ltd.
  Kankyo Service Co., Ltd.

**Scope of ISO 9001 Certification**

https://www.sanki.co.jp/en/csr/social/quality/

**Our Response to ISO 9001 and ISO 14001 Noncompliance (FY2019)**

- Voluntary suspension of ISO 9001 and ISO 14001 certifications
- Penalty for directors (reduced compensation)
- Conducted ethics seminars for relevant divisions

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Environmental Management System

standardizing the format for function test results provided to customers.

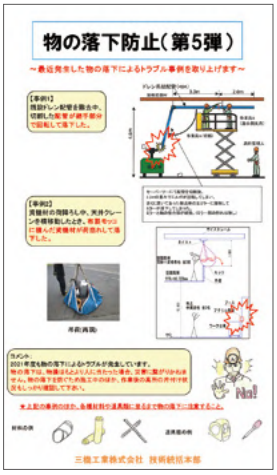
The Plants & Machinery Systems Business advanced its initiative to create a database of construction undertaken by the Company to boost the effectiveness of its quality control. As for the Environmental Systems Business, it continued to improve the checking system for each process, including stricter design reviews.

### Sharing Information and Preventing the Occurrence of Problems and Complaints

We accumulate and share our quality-related experiences across the Company by means of technical documents in order to prevent the occurrence of problems and complaints or, in the event they do occur, to handle them quickly and effectively. We strive to prevent recurrences by distributing information about problems and complaints to construction engineers through a flash bulletin, a weekly bulletin (a weekly meeting of the Problems and Complaints Review Committee, which is also attended by Group companies in and outside Japan), and a monthly bulletin, which not only reports the occurrence of issues but also discusses their causes, corrective measures, and preventive measures. In fiscal 2022, we revised the format for the flash bulletin and strengthened our engagements to identify the root cause of issues to implement the necessary measures.

In addition to efforts to share information, quality risk assessments are conducted by the Quality Risk Subcommittee set up under the Risk Management Committee. We also endeavor to prevent problems and complaints by identifying risks that may affect quality and quickly taking action.

We set a target to achieve zero problems and complaints attributable to us in the ongoing construction, and in fiscal 2022 we reduced them by 25% (down 18 cases) year-on-year thanks to various measures for providing onsite support. In fiscal 2023, we plan to reinforce the analysis and feedback procedure of our Quality Control Center to reduce initial errors.




A poster for raising awareness of preventing problems and complaints is created each month and displayed at worksites.

### Understanding Customer Satisfaction and Reflecting Feedback

In our work to improve construction quality, we conduct a customer satisfaction survey at the completion of construction work and reflect the feedback in our operations. In fiscal 2022, we received highly positive feedback from about 92%* of the 653 respondents. Looking ahead, we will continue to incorporate customer opinions into our operations to enhance construction quality.

*Calculated by regarding the following responses as "highly positive feedback." Facilities Construction Business: score of 4 ("Somewhat satisfied") or higher out of 5; Plants & Machinery Systems Business: score of 3 ("High") out of 3; Environmental Systems Business: score of 70 points or higher out of 100.

## Initiatives for Ensuring Quality at Construction Sites

### Operational Support to Improve Productivity and Maintain High Quality

Sanki Engineering implements the Smile Site Plan, intended to create a rewarding workplace that encourages staff to focus on their tasks by reducing workloads at construction sites and creating effective working environments, to satisfy both customers and the Company while maintaining high quality.

Under the Smile Site Plan, we are leveling operations by establishing and effectively implementing an operational support system for the processes of sales, design, procurement, construction management, and quality management to improve productivity while maintaining high quality. In an effort to simultaneously improve productivity and maintain high quality, we particularly emphasize design verification and pre-construction reviews before starting construction work, to raise productivity and avoid quality risks and to prevent rework, problems, and complaints. In addition, we are promoting digitalization, including the adoption of BIM, to further boost productivity.

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Promoting the Smile Project

## Initiatives for Improving Quality by Promoting DX

The BIM Promotion Center leads BIM efforts within the Company and subcontractors and in improving the usage rate of BIM-linked software as well as the participation rate in BIM education. In fiscal 2022, we conducted in-house education to encourage the use of BIM. We also implemented the M&A of a company that has proven expertise in BIM.

In April 2023, we established the DX Promotion Division. We will advance the application, research, and development of digital tools for planning, construction, and acceptance inspections to save labor in construction work while improving construction quality by alleviating the burden of management operations. By bolstering the application of DX to operations across the Company, including construction sites, we will establish more comfortable workplace environments.

**Digital Tools Developed by the Sanki Engineering Group**

- **Automated robotic air flow meter**
  Automatically measures the air flow from air conditioner vents. Expected to reduce manhours by 75% compared to the conventional process.

Air-flow measurement by an automated robot

Quality check by a quality assurance administrator

## Initiatives for Design and Technical Operations

We are working on improving quality throughout the construction process from planning and design to completion. In design, we identify and resolve issues at an early stage to ensure quality by enhancing design reviews and improving the design accuracy.

In technological management, we facilitate onsite operations after the start of construction work by holding commencement discussions to decide on construction methods, procedures, and policies that result in higher quality and productivity. Moreover, we avoid falsifications and deficiencies in quality across all processes by having line staff and the Quality Control Center conduct stringent checks and follow-ups. We will continue to improve quality and hand down technical expertise by having highly skilled quality assurance administrators and technical experts conduct audits during and after construction, implement quality confirmation and corrections, and mentor junior employees.

As a result of the revision of our quality manual and standards and reviewing of operational processes undertaken in fiscal 2021, the number of design reviews doubled in fiscal 2022. We also strengthened risk assessments at the upstream stage. These efforts have led to fewer problems, complaints, and corrections after construction and have helped prevent profitability from deteriorating.

**Initiatives on Design and Technical Operations at Construction Sites**

| Upon Receiving Orders | At Start of Construction | During Construction |
|---|---|---|
| **Design Review**<br>The Design Division's Design Center and Quality Control Center lead the design reviews to confirm whether the required level of quality is met, by scrutinizing construction operations from the aspects of quality and cost. Also, design drawings will be more accurate.<br>**Quality Risk Assessment**<br>The Quality Risk Subcommittee of the Risk Management Committee assesses quality risk. Divisions related to technology and the Quality Control Center set the quality targets and identify and address quality risks. | **Commencement Discussions**<br>Divisions related to technology, onsite managers, and divisions related to branches and branch offices determine the construction method (procedures) and quality targets. The Quality Control Center checks aspects concerning quality, construction work, costs, processes, and safety; identifies items requiring changes in specifications and plans; instructs on concrete measures; and considers design changes. | **Construction Audits**<br>Confirmation of construction work, including design changes, is led by divisions related to technology, onsite managers, divisions related to branches including branch offices, and the Quality Control Center.<br>**Completion Audits**<br>Check whether quality targets for the design are being achieved and offer instructions for corrections as needed. |

# Enhancing Our Technologies

## Technical Awards for Improving Construction Methods and Operational Processes

We have been presenting awards for excellent ideas that improve operational processes, such as raising efficiency, in addition to ideas that improve construction work. In fiscal 2022, we received 2,087 applications.

## Fostering Human Resources to Sustain Our Technological Competence

The Sanki Techno Center provides training to help employees acquire basic skills, brush up on their skills, and attain qualifications. New employee training was conducted in person by implementing tighter infection prevention measures in the accommodation area, lecture area, and experience area. We also conduct training for construction managers every three years, with content corresponding to number of years of experience. We develop the skills of our engineers through hands-on practice and drills using actual machinery and facilities at the Sanki Techno Center.

Training for new employees

21st conference on electrical construction quality

**Number of Personnel with Quality-Related Qualifications (as of April 1 of each fiscal year)**

| Qualification | FY2022 | | FY2023 | |
|---|---|---|---|---|
| | Non-consolidated | Consolidated | Non-consolidated | Consolidated |
| Professional engineers | 92 | 102 | 80 | 93 |
| Construction managing engineers (civil works, construction, electrical construction, pipe-laying works) | 1,125 | 1,277 | 1,061 | 1,225 |
| Architect | 37 | 42 | 38 | 42 |
| Facilities construction architect | 201 | 210 | 179 | 190 |
| Electrical engineers | 162 | 236 | 150 | 230 |
| Chief electrical engineers | 26 | 34 | 24 | 36 |
| First class instrument engineers | 297 | 306 | 284 | 294 |
| Fire protection engineers | 699 | 783 | 662 | 722 |
| Qualified managing engineers | 1,635 | 1,921 | 1,529 | 1,806 |

Note: Cumulative figures are shown for all qualifications.

**Major Skill Development Activities for Fiscal 2022**

| Initiatives | Training | Description of Training | Results |
|---|---|---|---|
| Initiatives at the Sanki Techno Center | Training for new employees | • Seminar for new employees, basic skills training | 64 participants |
| | Correspondence course for attaining qualifications | • Preparation for qualification exams for construction managing engineers and fire protection engineers | 125 participants |
| | Training based on operational experience<br>Third (fourth) year in construction work<br>Sixth (seventh) year in construction work<br>Ninth (tenth) year in construction work | • 3- to 5-day training sessions that are held 2 to 5 times per year at 3-year intervals<br>• Standardized group-based training according to operational experience<br>• Technical training using actual equipment and mock-ups<br>• Drills for preventing problems and complaints required in construction management | Held 8 times<br>114 participants |
| Initiatives for passing on technology | On-the-job training by technical experts | • Practical on-the-job training offered by technical experts selected from all branches who participate in onsite commencement discussions and construction audits | 25 technical experts made 1,343 site visits (cumulative total) |
| Initiatives for Group companies and subcontractors | Conference on electrical construction quality | • Test of practical skills for electrical technicians from subcontractors of all branches, written exam based on past cases. Participants receive the Sanki Engineering-certified Class A Electrical Engineer qualification | 17 participating technicians from 18 subcontractors |
| | Explanation of problems and complaints | • Case studies at liaison meetings held at branches and branch offices | Number of sessions<br>Tokyo branch: 12, Kansai branch: 25, Chubu branch: 11, Kyushu branch office: 43, Hokkaido branch office: 5, Chugoku branch office: 10, Tohoku branch office: 12, Hokuriku branch office: 3 |

## Collaborating in the Industry through Open Technology

Construction instructions for the Aluminger®* aluminum refrigerant piping method developed by Sanki Engineering have been made available to the Aluminum Plumbing Equipment Association. By promoting the adoption of our method, which reduces labor by 25% compared to conventional methods, we are contributing to standardizing environmentally sound technology across the entire industry.

*A new construction method whereby lightweight aluminum pipes, instead of copper pipes, are connected with specialized tools to save labor.