

# JSCE2010

— Utilize JSCE's Technology and Human Resource to Contribute to  
National and International Societies —

May 2008



JAPAN SOCIETY OF CIVIL ENGINEERS

## Preface

JSCE shall contribute to the advancement of scientific culture and the development of society by promoting the field of civil engineering, developing civil engineering activities, and improving civil engineering skills (JSCE Constitution, Chapter 2, Article 4). In order to pursue this mission, we draw an action plan and goals “JSCE 20XX” every five years.

The first action plan “JSCE2000” was drawn up in 1998. In those days, there was the need for a paradigm shift anywhere in society toward the coming 21<sup>st</sup> century. In response to the need, we wrote up that action plan titled “Reform Plan for JSCE.” In it, JSCE’s functions and role to play as an engineering society were defined, and issues concerning the reform and each division’s undertakings were detailed, which were referred to as action guidelines, in order to establish a new system in which the defined functions and role would be performed. Since then, we have written up an action plan in the JSCE 20XX series periodically.

The second one, another reform/action plan “JSCE2005” was formulated in 2003. Considering the social environment surrounding JSCE in which various problems surfaced one after another, we, aiming at strengthening JSCE to possess the ability to solve those problems, set our minds to undertake continual reform of the organization.

This “JSCE2010”, seeing the present civil engineering, sorts out and summarizes common issues in the civil engineering field and also identifies major issues on the activities that JSCE should do, from the perspectives of national, International, civil engineering field, civil engineers and JSCE. Also, it sets forth four major goals to achieve: 1) efforts to solve urgent problems such as global warming phenomena and related environmental issues in a comprehensive and cross-disciplinary manner, 2) provision of objective and professional views, 3) support for civil engineers, and 4) improvement of effective and efficient business operations and lucidity. Under the title “Utilize JSCE’s Technology and Human Resource to Contribute to National and International Societies,” three tasks and nine functions to be performed are defined, and in accordance with them, “basic goals” targeting the next ten years, “2010 goals” for five fiscal years from 2008 to 2012, and each division’s action plans are laid out.

As for preparing for JSCE 2010, Planning Committee set up a working group (WG), and via the WG, collected divisions’ opinions and ideas about policies for the action plan and drafted an interim plan after hearings with outside experts and engineering societies taking into consideration the mid-term evaluation of JSCE2005. The committee took several steps before drafting the action plan: it held discussions during the JSCE Annual Meeting, listened to members’, divisions’ and local chapters’ ideas and suggestions, and further asked subscribers’ opinions in JSCE magazines. Then the committee submitted the draft to Management Committee, the Board of Directors and itself, and after obtaining an approval on it from them, formulated JSCE2010 in May 2008.

The JSCE 2010 is one of the action plans which are prepared every five years. This action plan sets forth “basic goals” targeting the next ten years in consideration of activity continuity. It also targets for five fiscal years from 2008 to 2012 and sets forth “2010 goals” as interim ones. Regarding action plans for every fiscal year, each division will draw up, implement and review their action plans, furthermore, based on the self-evaluation of the results, revise the action plans in next fiscal year referring to the PDCA management system.

Japan Society of Civil Engineers

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# 1. Policy and Procedures for Implementing JSCE2010

## 1.1 Background

*“JSCE shall contribute to the advancement of scientific culture and the development of society by promoting the field of civil engineering, developing civil engineering activities, and improving civil engineering skills (JSCE Constitution, Chapter 2, Article 4).*

Given the above, JSCE considers it essential to establish consensus among the citizens and in society for infrastructure development and maintenance which are carried out based on public funds. Concerning the execution of civil engineering projects, in which public welfare is prioritized and the security and safety of structures to be constructed must be ensured for an extended period of time, official design codes must be established, and planning, designing, constructions and maintenance must be done by certified engineers. Also, the impact of infrastructure development must be carefully examined in relation to the natural and social environments, geological features and cultures of the areas where the structures will be constructed. In other words, civil engineering and projects are highly expected to comply with social needs from social science and humanities perspectives.

In response to that needs, JSCE has been reviewing and improving its past activities. In 1986, the Planning Committee submitted the report “the Responses: New Path for the Civil Engineering Sector and JSCE Standing at the Crossroad.” The report proposed 1) establishment of a new technology study system and evaluation of study results by a cross-division task force, 2) development of JSCE Annual Conference & Meeting, 3) enhancement of public understanding of civil engineering projects and promoting the civil engineering profession among junior- high and high- school students, and 4) enhancement of office automation and effective operations. These are main elements of the reform that JSCE has been trying to achieve.

In 1998, “JSCE 2000: Reform Plan for JSCE” was assembled. This described the JSCE’s responses to various structural changes in society and also the entire engineering community’s functions and responsibilities to take for the society in the coming 21<sup>st</sup> century. It is notable that this action plan defined JSCE as an academic and engineering professionals group, and based on the report, the Bylaws were amended, which clarified JSCE’s tasks of strengthening communication and cooperation among the members, contributing to the development of civil engineering science and technology and making more direct contributions to society. And, in order to perform the tasks successfully, the establishment of effective management and operating systems was emphasized on; furthermore, each internal division was requested to first identify issues and strategies on organizational reforms, and then to take actions accordingly. Since then, an action plan title “JSCE 20XX” has been drawn up periodically.

In 2003, another action plan “JSCE 2005” was drawn up” to improve JSCE’s contributions to and relationship with society”. This plan was made in consideration of the contexts of JSCE, such as incomplete implementations of the reforms based on the JSCE 2000, the shift from the period of economic maturity to the one of population aging in society, arising issues on past social systems, insufficient realization of public’s expectations for JSCE and inadequate communication with the public.

In order to overcome the above issues, the JSCE 2005 was drawn up, introducing more effective and achievable goals: 1) establishing effective two-way communication between JSCE and the general public, 2) strengthening the communication among the members and across divisions, and 3) promoting effective and efficient office operating systems based on detailed objectives and corresponding management cycle proposed by each division.

## **1. 2 Target Year and Period of JSCE2010**

“JSCE2010” is a JSCE action plan including objectives which is drawn up every five years. In this report, for ensuring continuing activities toward the target year, “basic goals” are set for the next ten years from now, and “2010 Goals” are set to be achieved during the five-year target period from 2008 to 2012. We plan our activities in detail, perform accordingly and self-evaluate the performance twice (September and March) a fiscal year. Then we review the activities for next fiscal year and make necessary adjustments based on the results of the self-evaluations in Plan-Do-Check-Act (PDCA) cycle.

## **1.3 Policy for Formulating JSCE 2010**

In preparing for “JSCE2010”, we considered the following actions:

- (1) Improving member services and contributions to society in both direct and indirect manners taking into account a rapidly changing society. Thus, it is necessary to determine the activities to be more focused, to be reviewed and to be added to a mid- and long-term goals;
- (2) Continuing the PDCA management because of its effectiveness and usefulness, which was formulated in the JSCE 2005;
- (3) Confirming inter- and intra- division communication and collaboration. Figuratively speaking, horizontal and vertical relationship within JSCE is to be strengthened;
- (4) Re-examining the environments in which the society, the civil engineering community<sup>1)</sup>, engineers and JSCE has been placed since the formulation of “JSCE 2005” and identifying the issues and responsibilities which JSCE has to deal with in order to draw up mid- and long-term plans; and
- (5) Incorporating the ideas and opinions of the Special Committee on Presidential Proposals into a mid-term action plan and goals.

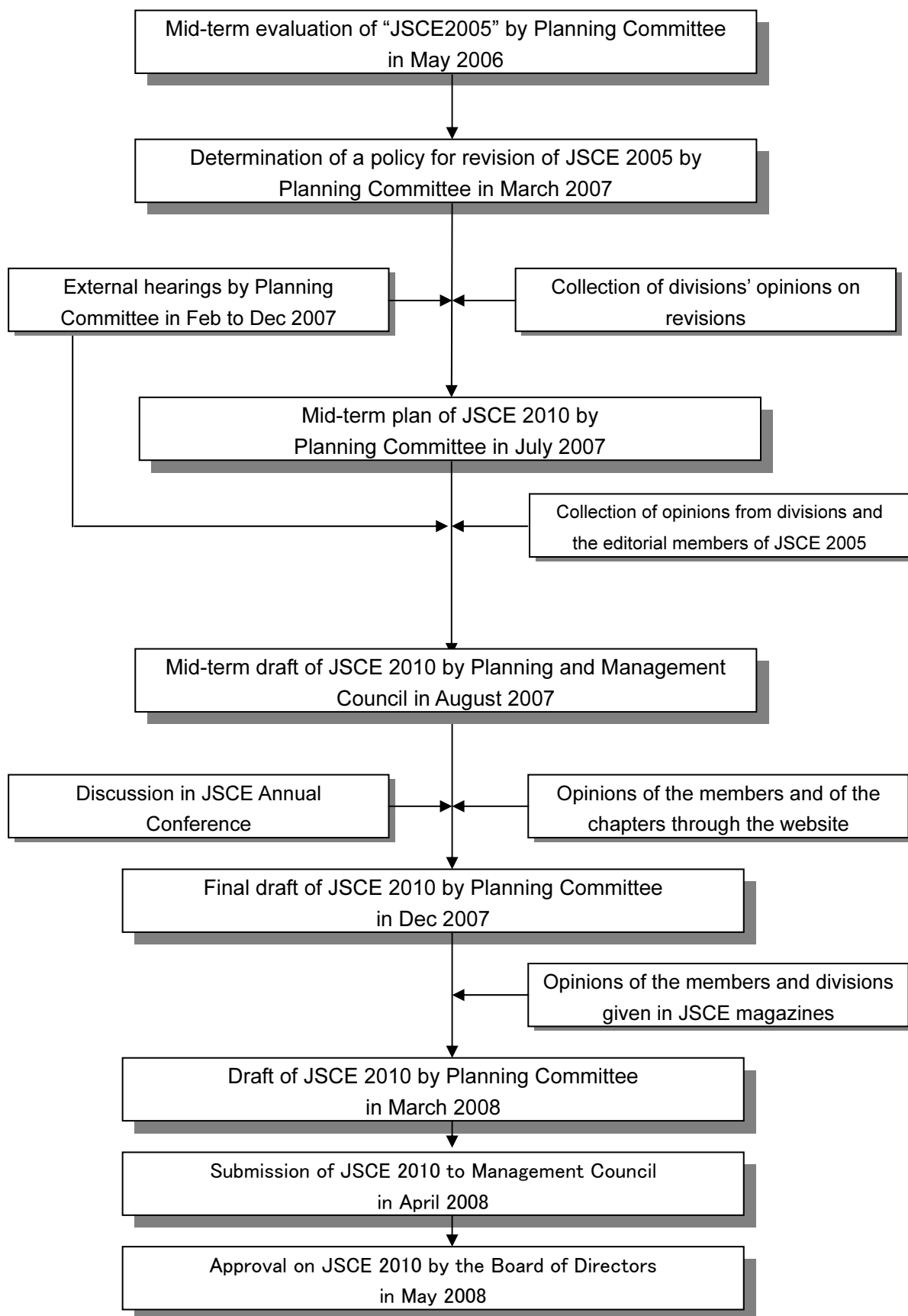
The above was focused in the course of formulating the JSCE 2010. Formulation methods and processes where “visible” data collection and sharing and transparency would be attained were chosen. In addition, open forums were held on the JSCE website, monthly magazines, a JSCE Annual Conference and other meetings. Opinions, ideas and suggestions on the action plan were also collected in the discussions with journalists, NPOs, experts and intellectuals from in and outside the civil engineering field.

## **1. 4 Formulation Procedures**

Detailed process of formulating the JSCE 2010 is explained in Figure 1.1. In July 2007, we drew up a mid-term plan, based on the opinions and suggestions given by internal divisions and collected through several hearings with external experts and our agreement of cooperation societies. Then, regarding the mid-term plan drawn up, a discussion was held during the JSCE Annual Conference, opinions and suggestions were contributed by the members, the JSCE chapters and divisions through the JSCE website, and collected on the monthly magazines. The Planning Committee carefully reviewed those collected information, drafted the JSCE 2010 to submit the Planning and Management Council and the Board of Directors in March 2008 and then obtained an approval from them.

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1) The civil engineering community: all research, design, construction and management companies, public sectors, research institutes, universities, laboratories and agencies in the civil engineering field



**Chart. 1-1. JSCE 2010 Formulation Procedures**

## 2. Realization of JSCE's Current Situation and Major Issues

### 2.1 Realization of JSCE's Current Situation

#### (1) Japan's Relationship with the World

There are several environmental issues such as global warming and shortage of natural resources which require urgent attention in order to ensure people a safe society to live. Japan, which will play a host country of 2008 G-8 Summit to be held in Lake Toya in Hokkaido, has been dealing with global warming in particular by setting a goal of reducing CO<sub>2</sub> by half by 2050, and gained high expectation to keep performing a leadership to solve that issue.

In regards to natural resource issues, increasing population in developing countries has induced shortage of food, water and energy, creating an impact on the global economy and national and international conflicts. Our country, whose food and energy self-sufficiency ratios except nuclear energy are 40% and 4% respectively, needs to secure natural resources by offering various kinds of support to developing countries, at the same time, to take actions to realize a sustainable society in cooperation with other countries.

Looking at economic trends in the twenty first century, economic globalization is spreading quickly, under the influence of mainly USA; at the same time, private companies need to have strategies to survive fierce global competitions. While the automobile industry is one of the successful examples which are expanding its markets worldwide, riding the waves of globalization, the construction industry is not fully taking advantage of the globalization yet.

When narrowing a scope to see the Asian region, it is vulnerable to natural disasters such as earthquakes, tsunamis, torrential rains and floods. The number of casualties from these natural disasters in that region goes to about 90 % and the one from wind and water disasters does about 95% of the total number of casualties in the world. The huge damages to the people can be attributed to a high population density in urban areas, insufficient infrastructure maintenance and the destruction of nature induced by urban development.

Because sharing the issues such as natural disasters and deteriorating urban environment with its neighbors, Japan is expected to proactively contribute to them to solve their issues and to develop society utilizing its advanced civil engineering technology.

#### (2) The Japanese Society

The country is characterized by a densely populated land and highly civilized society in the context of four seasons a year, hot humid climate and fertile alluvial soil yielding abundant agricultural crops; however, it has been losing its momentum and getting vulnerable on the whole.

As population decline since 2005 suggests, there is a growing concern that one out of every four people will be over sixty-five year by 2015. The phenomena of aging population and low birth rate can make be obstacles to maintaining sound, well-balanced social function. Lack of human resources most capable of supporting the country' economic development and a decline of GDP and very slow or minus economic growth may appear ominously; in sum, economic viability may decline.

Amid economic uncertainty, it is urgent for such an earthquake-prone country to establish a safe and secure land and social systems to withstand natural disasters. In addition, aging infrastructures which were constructed at a high pace during the high economic growth period and declining economic viability have posed serious issues in society. Both central and local governments have encountered financial difficulty, but even so, they have to strategically and efficiently perform repair and renewal works by sorting out existing infrastructures which provide a foundation of people's safe, comfortable lives and also have to maintain those infrastructures considering their life extension to achieve a sustainable society.

In the business world, "strengthening local capacity" and "promoting 'monozukuri'- designing, and creating/ manufacturing" have drawn renewed attention in relation to the reinforcement of the

international competitiveness of Japan a resource-poor country. It is important for the country to realize the society where engineers feel pride in their work of creating things, the one where children and young adults become interested in and dream about working as an engineer, by building up the momentum to value “monozukuri” in the society. Responding to the momentum, the civil engineering community should make more efforts to improve engineers’ quality and civil engineering science and technology.

### (3) Civil Engineering and Civil Engineers

It is an undeniable fact that the Japanese civil engineering and engineers have made significant contributions to the establishment and development of the country through public works projects and other infrastructure development and management projects. Those engineers should be proud of their own efforts and achievements.

Their expertise has makes it possible for the society to achieve post-war reconstruction and high economic growth. For acquiring economic security and convenience in life, on the other hand, the society has to pay for the price of losing cultural and natural heritage. This loss is caused by the implementation of civil engineering projects. When creating a new environment in a society, civil engineers should not forget the impact of their works and their responsibility to maintain a better and healthier environment for next generations utilizing new ideas, knowledge and technology.

Bid-rigging on public works projects and other problems relating to civil engineering projects have captured the public’s attention; the society and people do not always appreciate the civil engineering profession and its contribution, or not see them with a friendly eye, either. While being aware of the influence of civil engineering technology on global environmental change, many of those who are responsible for business operations should realize that they are expected to abide by professional ethics and integrity.

Public investment in infrastructure has been declining since the peak in the mid-1990s to less than 60%, but there has been a rapid increase in spending on infrastructure in Asian countries. It is necessary to rapidly internationalize the construction industry in terms of securing a market outside Japan and making that industry more attractive nationally and internationally.

While that investment has continued to decline, being influenced by the public’s view that no further infrastructure is needed when there are sufficient infrastructures built, the systems for public works implementations have changed greatly. The change can be triggered by the issuance of Act for Promoting Quality Assurance in Public Works(April 1, 2005). Accordingly, bid-rigging has been regulated and free open competition has been accepted gradually. When the public’s concerns over quality of public procurement of goods, works and services are mounting, the above act emphasizes on quality technology, usages, levels and engineer’s qualifications as well as ensures transparency and fair competition in public procurement. That should be welcomed by private sectors and civil engineers as the best opportunity to develop their abilities, to improve public opinions of them and to expand their activities in society.

Although that the extension beyond the current retirement age and continued employment may provide solutions to the issues surrounding the civil engineering profession, there remains the so-called Year 2007 Issue<sup>1)</sup>, which includes shortage of engineers and discontinuity of knowledge and technology transfer due to baby-boomer retirement. The long-term trend of decreasing students to enter in science and engineering programs and in particular, civil engineering program in higher education has remained. Considering this, investing and cultivating young people to be future leaders as well as promoting equal participation of men and women in the engineering field has posed challenge in the present time.

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1) Year 2007 Issue: The baby-boomer generation which was born around 1947 reaches the retirement age of 60 in 2007. Its retirement will have a significant impact on society, the labor market and the economy.



In the aforesaid social context, “the 3<sup>rd</sup> Science and Technology Basic Plan” was drawn by the Cabinet in March 2006 to figure out future science and technology to be. This plan described the importance of enhancing accountability and strategies, and of aiming for science and technology to be understood by the people and society. That suggested that not only basic technology but also technologies able to solve social issues should be developed. Considering this, the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) has drawn the Technology Basic Plan for FY 2008-2012; it says that “it is essential to further enhance science and technology (social technologies) able to solve major social issues and return results to the people by polishing, integrating and upgrading various technologies in order to realize the society to be achieved<sup>1)</sup>.”

Also Science Council of Japan lists, in the construction-related disciplines, 5 issues to be examined further in relation to infrastructure building and development as follows: ① assimilation and integration of science, engineering and humanities disciplines, ② policies and systems for complex infrastructure management, ③ design of social systems and policies considering laws and economics, ④ cultivation and education of talented and skilled engineers who are the monozukuri master, and ⑤ consideration and non-consideration to others in relation to the above issues<sup>2)</sup>.

JSCE and its members, in cooperation with its peer organizations and their members, are expected to keep working to enhance researches, studies and technologies, thereby contribute to solving important issues facing today’s society.

#### (4) Business Operations

JSCE will celebrate its 100<sup>th</sup> anniversary in 2014. Its activities revolve around two key pillars: researches and studies to be undertaken by mainly committees in Research and Studies Division and support for engineers to be made by mainly Organization for Promotion of Civil Engineering Technology (OPCET). As many as 75 committees were established as of December 2007, which is a 150-percent increase from fifteen years ago. This increase implies the expansion of the JSCE’s activity. The OPCET has strengthened and promoted the JSCE Civil Engineers’ Qualification (JCEQ) System as well as continuing professional development (CPD) program as its main tasks. The total number of successful examiners of the JCEQ system is as many as 3,800.

Meanwhile, JSCE has been facing a financial difficulty since 2006: it has being mired in these two years and will very likely remain so if no action is taken. That difficulty can attribute to decrease in membership revenue, which occupies more than half of the annual revenue, in relation to a long-term membership decline. As a temporal measure to alleviate the situation until internal reforms are done based on a new public-interest cooperation system, JSCE has carried out a three-year financial reform plan since FY 2008.

The total membership is 39,111 as of December 2007: 31,384 Individual Regular Members, 6,452 Student Members, Corporate Members and Special Members. JSCE, as many other engineering societies, is losing the Individual Regular members. Population aging has influence upon the membership composition and pushed up the median age. In addition, considering the impact of the FY 2007 Issue, it is necessary to take drastic measures by targeting each age group for halting and changing the downward trend to an upward one. As for the Student Members, because of the measures taken by Members and Chapters Division, it has taken an upward turn since 2005. However, when seeing that less and less universities are offering civil engineering programs, we should keep making efforts to maintain, or increase the membership by enhancing our member services and benefits and offering interactive and participatory events for example.

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1) MLIT. (2008, April). Science and Technology Basic Plan, p. 4.

2) Furusaka, S. (2008, March). Issues in the Construction-Related-Disciplines which contribute to Infrastructure Building and Development. Feature Articles 2: Tomorrow’s Social Assets - Major Assignments to the Construction-Related Disciplines. Trends in Sciences, p.65.

## **2. 2 Major Issues about Civil Engineering Profession and Engineers**

Considering the situations discussed so far, the issues concerning both the civil engineering profession and engineers are summarized as follows:

(1) Under conditions such as sluggish economic growth and global environmental problems, it is essential to develop necessary technologies and systems and to secure financial resources in order to conserve nature and cultural environment inherited from the past, to realize a sustainable society while maintaining international competitiveness and to efficiently manage necessary infrastructures.

(2) Although the public sees that no further infrastructure development is necessary, the needs for infrastructure development is still high in developing countries, in particular Asian countries for securing domestic security and safety and economic stability. When the Japanese civil engineering is highly recognized internationally, it is important to internationalize the construction industry without delay.

(3) It is necessary to enhance communication with the public based on the awareness of a public's low opinion of the civil engineering profession and the reasons in order to cultivate good engineers and to properly manage infrastructures for a future society. Also it is important for all of those who engage in the civil engineering profession to work together towards the establishment of an integrated system in the construction industry in which engineers' professional abilities and skills are fairly evaluated and long-term value judgments are employed, by building coordination among the systems of order placement and acceptance, construction operation and management.

(4) It is essential to enhance the "visibility" of the civil engineering profession to gain the public's trust. Considering this, that profession and professionals should be aware that the time has come to establish a transparent and intelligible system to the public so that they would learn who works in supervisory positions and who makes a valuable contribution to successful completion of a project.

## **2.3 Major Issues about JSCE**

JSCE has to take actions towards the above issues focusing on:

① Taking innovative and flexible approaches to enhance communication with the public and to respond to the needs of changing society.

As society changes everyday, JSCE should respond to it with innovative and flexible approaches while strengthening communication with the public under the leadership of the board members.

② Undertaking researches and studies on social technologies to be applied to solve problems and presenting results in society.

It is necessary to proactively seek out opportunities to present the results of researches and studies on social technologies to be applied to solve social problems. Focusing on the areas containing major issues such as global warming phenomenon, natural disasters and countermeasures, life extension of aging infrastructures, JSCE needs to undertake relevant researches and studies by coordinating across twenty-nine research and studies committees and in cooperation with its agreement of cooperation societies overseas. Another important action

is to promote industry-academia-government collaborative researches on engineering design education<sup>1)</sup> for the purpose of cultivating the engineers to have problem-solving abilities.

③ Direct contribution to society

Besides the above efforts, it is also important to enhance contributions to society in more direct and effective manners by namely working on disaster assessments and investigations, drawing disaster relief and reconstruction plans and relevant recommendations in collaboration with the cooperation agreement societies and with NPOs, and strengthening educational programs for primary and secondary schools in coordination between JSCE regional chapters and local education commissions. Furthermore, JSCE's leadership should be reinforced in taking the initiative in promoting gender equal participation in the civil engineering field.

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1) "... Specialized engineering knowledge in each applicable field, and an ability to apply such knowledge to provide solutions to actual problems, Design abilities to organize comprehensive solutions to societal needs by exploiting various disciplines of science, engineering and information..." in "Criteria for Accrediting Japanese Engineering Education Programs Leading to Bachelor's Degree" (JABEE)

#### ④ Proactive efforts towards Internationalization

To respond to globalization, JSCE should exert efforts to expand its activities more internationally. The International Activities Committee (IAC), which drew up “an action plan on globalization” in March, 2007, has since materialized it along with the slogan “develop activities across national borders and contribute to the development of global infrastructure.” As for the Asian region particularly, it is important to tackle various problem in the collaboration among the countries in that region, based on the Taipei Declaration<sup>1)</sup> issued at the 4<sup>th</sup> CECAR in July 2007<sup>2)</sup>, through improving international contributions like the establishment of international students network on the initiative of those countries.

#### ⑤ Regaining the public’s trust in civil engineers and their profession

The public’s little trust in the civil engineering profession attributes to their uncertainty about profession- “a group of invisible professionals.” In order to regain their trust, the first step to take is removing the uncertainty by making “the group more visible and approachable to the public.” Even though being part of the business community, that civil engineering community should reinforce its transparency and accessibility to the public by making a proposal of a system in which the engineers who are in a supervisory position at any stage of a project and those who have made significant achievements or contributions to a project are introduced and by introducing past projects and achievements to the public.

JSCE has diversified its activities as being aware of the importance of two-way communication with the public than ever. In order to regain the public’s trust, it should voluntarily send messages and information on civil engineering- and engineers- related issues, through mass media and the opportunities to meet with journalists regularly.

Moreover, the Code of Ethics for Civil Engineers was promulgated in 1999, which defined professional conduct and practice. To encourage the members to practice that code, Professional Ethics and Social Norms Committee has to strengthen its activities for better communication with the public as well as the JSCE members.

In the aging society with low birth rate, infrastructure management and maintenance is an urgent matter. Therefore, the above committee should take initiative and show the public the importance of proper infrastructure management and maintenance from a professional engineer’s point of view by utilizing infrastructure report cards and related data to be collected.

#### ⑥ Improvement of the public’s recognition and appreciation for civil engineering profession

One of the JSCE’s duties to perform is to improve the public’s recognition and appreciation for the civil engineering profession. To fulfill the duty, the following actions are essential: to recommend JSCE members to serve as expert witness in civil courts and to participate in the activities like disaster assessments and investigations which requires not only professional ability, but also professional ethics and morals. In addition, JSCE Civil Engineers’ Qualification System, in which civil engineers’ professional ability and ethics are assessed and the results are shown to the public, should be improved to the one in which an engineer’s practical ability, skills and performance are examined.

#### ⑦ Enhancement of the efficiency and effectiveness of JSCE activity

As discussed above, improving the efficiency and effectiveness of JSCE’s activities is fundamental for smooth business operations. In this regard, efforts in expanding membership should be continued, which would ensure a stable and growing stream of membership revenue; at the same time, financial reforms should be achieved by improving member services and

benefits, enhancing assistance to engineers, reviewing publishing projects, or streamlining committee operations. Furthermore, it is essential to do wise budget allocation based on the PDCA management, where transparent business operations should be refocused as a public-interest corporation which provides the public with better services and benefits.

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1) Taipei Declaration summarizes in ten items civil engineer's duties, efforts and actions to deal with global environmental problems such as global warming, shortage of natural resource and impacts on ecosystem in consideration of the responsibility and role of Asia.  
2) CECAR : The Civil Engineering Conference in the Asian Region

## 2. 4. Major Goals of JSCE 2010

Prior to drawing up JSCE2010, we examined the civil engineering profession in and outside Japan, JSCE's business and major issues, and then drafted the action plan in which the achievements and findings of the JSCE 2005 would be reflected. The following items are to be emphasized in this action plan.

### (1) Efforts to Solve Urgent Problems such as Global Warming Phenomena and Related Environmental Issues in a Comprehensive and Cross-Disciplinary Manner

JSCE has carried out numerous researches and studies and made recommendations and suggestions to tackle environmental issues, on the basis of the achievements and contributions that civil engineers have made to the development of relevant countermeasures and technologies. Being aware of the G8 Hokkaido Toyako Summit to be held in July 2008, JSCE has set up Special Task Committee on Global Warming to propose and support relevant activities. As for earthquakes and water-related disasters, JSCE will keep working hard to deal with them in cooperation with its peers and non-profit organizations in disaster investigations, assessments and relief operations in comprehensive and cross-disciplinary manner.

### (2) Provision of professional knowledge from unbiased standpoint

JSCE understands the importance of providing the society with professional views and knowledge from unbiased standpoint because it is its task to regain the public's trust in civil engineers and the civil engineering community. In order to achieve this, the Society has set three major goals: 1) to contribute to the development of quality infrastructure, 2) to enhance the public's recognition and appreciation for civil engineers and their contributions to society, and 3) to enhance the public's understanding of the civil engineering profession. Among these goals, the first one is to be achieved by strengthening the JSCE Civil Engineers' Qualification System to be more referred to as accurate and reliable information on civil engineer's ability, making proposals for better public procurement bidding and contract systems in which quality is ensured, and 3) to offer adequate support and suggestions for decision-making processes on social issues.

As for the goal 3), it will be working on through clarifying JSCE's views to the public through information dissemination from Editorial Committee, Professional Ethics and Social Norms Committee, strengthening its interpreter role for the public to acquire better understanding of civil engineering, collaborating with NPOs and NGOs, developing civil engineering education in primary and secondary school levels particularly, improving the website content and having more meetings with the press.

### (3) Support for Civil Engineers

When the Japanese civil engineering is facing an uncertain future, JSCE considers it important to provide active and comprehensive support to enable civil engineers to deal with the uncertain future. Support is to be offered in several ways such as strengthening the Civil Engineers' Qualification System to be more practice-based qualification system, with which civil engineers can find the way to exert their best abilities to make a contribution directly to the development of society, improving the CPD program and qualification registration system, supporting civil engineering programs (e.g. support for civil engineering design programs on the basis of industry-government-academia collaboration) in higher education which will be approved in the world, improving contributions on a organizational level like networking among international students and promoting academic exchange.

#### (4) Improvement of Effective and Efficient Business Operations and Lucidity

Considering the circumstances surrounding the organization, to improve JSCE's business operations appears an urgent task. In this action plan, thus, "efficient and smooth business operations" and "lucidity to the public" are emphasized, and necessary reforms will proceed accordingly.

### 3. JSCE2010

#### 3.1 Three Tasks and Nine Functions to Have

The JSCE's goals are described in the Constitution, Chapter 2, Article 4, which is quoted on the first page of this document. In order to attain the goals, three tasks should be performed:

① Contributions to the Advancement of Civil Engineering Science and Technology

Making contributions to the advancement of civil engineering science and technology is the first and most important task for an academic society. It is requested to perform this task, reviewing and reforming past science and engineering systems, and to possess the functions to a) advance civil engineering science and technology, b) apply civil engineering science and technology to various enterprises, and c) make technology transfer and accumulation. When successfully performing these functions, JSCE should be recognized in the world for its high scientific and technological quality.

② Contribution to National and International Societies

In order to make contributions to national and International societies, direct communication with society is needed, which can be attained with the functions that d) provide professional views and information to the public, e) make international contributions, and f) communicate with society. Due to these functions, JSCE should be recognized as a key player in the world in terms of social contributions.

③ Improvement of Civil Engineers' Quality and Customer Services (CS)

Improvement of civil engineers' quality and customer services are related to support for civil engineers to enable them to work in and for society and quality customer services that members are supposed to receive. In other words, JSCE should g) offer active support for civil engineers, h) create more opportunities to collect information, and i) improve business operations in an efficient and effective manner. Then, JSCE will improve its customer services (CS) and the satisfaction of the public, the ultimate user of infrastructures.

**Table 1.1 Three Tasks and Nine Functions to Have**

Tasks	Functions to have
① Contributions to the advancement of civil engineering science and technology	a) Advance civil engineering science and technology b) Apply civil engineering science and technology to various enterprises c) Make technology transfer and accumulation
② Contribution to national and International societies	d) Provide professional views and information to the public e) Make international contributions f) Communicate with society
③ Improvement of civil engineers' quality and customer services (CS)	g) Offer active support for civil engineers h) Create more opportunities to collect information i) Improve business operations in an effective and efficient manner



### 3.2 Contribution to the Advancement of Scientific and Technological Fields

#### a) Up-to-dateness in science and technology

Basic Goal	2010 Goal
a 1) Innovation / accumulation /transmittance of science and technology	a 1-1) Promote advanced academic research
	a 1-2) Increase global recognition of scientific papers published in JSCE journals
a 2) Establishing the academic discipline that reflects the structural change in the society	a 2-1) Realign the academic discipline to reflect the structural changes in the economic society
	a 2-2) Promote innovative research through collaboration with other organizations
a 3) Establishing the disaster countermeasure technology	a 3-1) Systemize disaster countermeasure technologies
a 4) Establishing the technologies for urban-renewal	a 4-1) Establish plan, scheme, and elemental technologies such as maintenance of social infrastructure facilities
	a 4-2) Develop technology for urban space establishment
a 5) Establishing the technologies related to global environment sustainability	a 5-1) Set environmental targets/standards
	a 5-2) Conduct research on technologies that contribute to establishment of a sustainable society
	a 5-3) Establish technologies for alleviating and adapting to global warming
	a 5-4) Establish environmental assessment technologies

#### a 1) Innovation / accumulation /transmittance of science and technology (*Research and Studies Division*)

In order to respond to the needs of rapidly and structurally changing society, we must strive for incessant reforms to constantly maintain the most advanced scientific and technological level in each academic discipline, and to continuously accumulate and transmit knowledge gained through research.

#### a 1-1) Promote advanced academic research (*Research and Studies Division*)

In order to promote advanced academic research, the conventional single academic discipline approach does not always suffice, and it is important to create a new advanced and innovative academic discipline that includes multiple academic disciplines. Establish an advanced academic research framework and to conduct research, by setting specific themes for research grants of top priority research topics and establishing a cross-discipline special committee, etc.

#### a 1-2) Increase global recognition of scientific papers published in JSCE Journals (*Research and Studies Division*)

In preparation for publishing the JSCE English journal, the same firmness level of scientific paper publication standards used in JSCE Journals will be applied strictly for those in all JSCE published journals, for example, the committee published journals. At the same time, promote PR activities outside of JSCE to increase utilization of JSCE journals. In addition, establish a framework for disseminating high-quality papers globally and acquire international statures such as the impact factor.

#### a 2) Establishing the academic discipline that reflects the structural change in the society (*Research and Studies Division*)

In developing the social infrastructure, focus research studies on issues reflecting the society's structural change to address various accumulated topics such as the depopulating,

super-aging society and global environment issues. At the same time, promote realignment of academic disciplines and establish a brand new discipline by promoting innovative research in collaboration with other organizations of different disciplines as required.

a 2-1) Realign the academic discipline to reflect the structural changes in the economic society  
*(Research and Studies Division)*

In addition to the individual research and study committees, establish a research and study body involving multiple committees as needed to promote research on effective utilization of social infrastructure, and on maintaining and extending the life of civil structures, to address issues reflecting the structural changes in the economic society such as the declining birthrate, aging population, and globalization. Through this, engage in intensive information gathering and discussions from various angles to extract technological issues. Based on the result, draw up an action plan from an academic point of view based on the result, and thus aim to realign the academic discipline.

a 2-2) Promote innovative research in collaboration with other organizations  
*(Research and Studies Division)*

Widely identify technological and institutional issues to appropriately respond to the society's temporal and spatial structural changes, and propose an interdisciplinary research theme that takes advantage of JSCE's characteristics. In addition, through cooperation with construction, arts and social sciences, and other disciplines, search for solutions to the above and promote innovative research beyond the conventional civil engineering framework.

a 3) Establishing the disaster countermeasure technology  
*(Research and Studies Division)*

While coordinating with other organizations, aim to establish disaster countermeasures technology by enhancing individual technologies, and systemizing and synthesizing the technologies.

a 3-1) Systemize disaster countermeasure technologies  
*(Research and Studies Division)*

Cooperate with other organizations or promote joint research on the use of nation's surveillance technology, quake-resistant technology, disaster-relief measures, and information and telecommunication technology in minimizing disasters, aiming to contribute to the improvement of the disaster-resistant social infrastructure as well to the safe and worry-free lives of the Japanese citizens. Systemize disaster countermeasures technologies, including measures against occupational injuries which take into consideration the changes in the social structure and the natural environment.

4) Establishing the technologies for urban renewal  
*(Research and Studies Division)*

Promote research on elemental technologies that contribute to urban renewal and to the creation of urban space. Aim to enrich above technologies, as well as to engage in cross-disciplinary joint research and to synthesize elemental technologies.

a 4-1) Establish plan, scheme, and elemental technologies such as maintenance of social infrastructure facilities  
*(Research and Studies Division)*

Promote studies on various elemental technologies pertaining to urban renewal, and enhance those technologies from perspectives of planning, scheme, disaster prevention, conservation and renewal of ecosystem, maintenance of social infrastructure, social

information management, and coordinating methods with the public. Also, toward the creation of a safe and pleasant urban space, promote a cross-disciplinary joint research such as between civil engineering planning and hydraulic engineering, by focusing on each basin zone which forms the basis of physical cycle process.

a 4-2) Develop technology for urban space establishment (*Research and Studies Division*)

Modern society's urban space is not merely a living space for urban citizens, but exists as a distinctly global space due to the numerous logistic, information and telecommunications network. In the development of social infrastructure in these urban spaces, promote research studies with consideration to a pluralistic time and space. Also, develop technologies for urban space establishment by focusing not only on the individual elemental technologies, but by synthesizing them as well.

a 5) Establishing the technologies related to global environmental sustainability (*Research and Studies Division*)

Rising global population and resource consumption is aggravating the various issues that endanger the earth's sustainability. Global-scale climate changes and the like raise concerns for further increased stress on water, health, ecosystem, and others due to environmental deterioration on a global and local scale. In order to prepare for above, it is necessary, including Japan, to cooperate with the Asian and other regions to establish a sustainable society. Thus, we will aim to establish technologies related to global environment sustainability.

a 5-1) Set environmental targets and standards (*Research and Studies Division*)

Promote research studies that support to set environmental targets and standards for the establishment of a safe and worry-free, quality society where global warming is no longer a concern, and is a recyclable society, and endorses coexistence with nature as well. By utilizing advanced technologies such as ICT (information and communications technology), bio-technology, and nano-technology, establish environmental technologies for observation, prediction, and increased efficiency in the accumulation of environmental information on global and local scales, as well as those that contribute to the assessment of people's health, living organisms, and ecology. Also, propose a future-oriented concept for sustainable society for Japan, Asia, and other regions.

a 5-2) Conduct research on technologies that contribute to establishment of a sustainable society (*Research and Studies Division*)

Establish elemental technologies pertaining to the recycling of waste material, environmental load assessment for concrete structures, environmentally-friendly structures built from new materials, eco-friendly water area management, transportation and regional planning for reduced environment loads, and establish standards for design and project evaluation. The above will form the foundation for proposing a concept toward reconstructing a self-sustaining and recycling urban framework.

a 5-3) Establish technologies for alleviating and adapting to global warming (*Research and Studies Division*)

Civil engineers are deeply engaged in actions that cause global warming, and in providing numerous solutions as well. Thus, from the perspective of social infrastructure development,

actively deliberate and develop from physical and intellectual standpoints, the technologies for alleviating and adapting to global warming and propose them to the society.

a 5-4) Establish environmental assessment technologies (*Research and Studies Division*)

In order to establish technologies for sustainable global environment, it is necessary to accurately grasp the effects of population change, economic growth, social infrastructure development, and others have on the environment, and to make assessments based on these. Thus, establish technologies to measure the impact of each factor on the environment as well as technologies for environmental assessment

b) Application of science and technology to various enterprises

Basic Goal	2010 Goal
b1) Establishing the system for the comprehensive and synchronized research and development	b1-1) Reorganization of committees under Research and Studies Division
	b1-2) Cooperation with academic and governmental institutions
b2) Raise social recognition and increase utilization of Technology Assessment System	b2-1) Establishment of Technology Assessment System

b 1) Establish framework for comprehensive and synchronized research and development (*Research and Studies Division*)

In order to actively tackle interdisciplinary issues that the society and world calls for, reorganize related committees and cooperate with academic and governmental institutions to establish a comprehensive and synchronized research and development scheme equipped with agility and problem solving ability. Also, aim to raise social recognition and increase utilization of Technology Assessment System.

b 1-1) Reorganization of committees under the Research and Studies Division (*Research and Studies Division*)

Under the Research and Studies Division, numerous research and study committees engage in their own individual activities. Establish a framework in which committees can tackle issues that lie outside the scope of a specific committee, for example, topics like global warming, longer lasting social infrastructure, and disaster control. At the same time, reorganize the committees by defining a deliberation framework for efficient and effective research and study activities.

b 1-2) Partnerships with academic and governmental institutions (*OPCET*)

In order to enhance civil engineering-related academic and technological system, deepen ties with academic and governmental institutions such as Science Council of Japan, The Japan Academy, and Council for Science and Technology Policy, to engage in research studies that lead to policy recommendations, and actively speak out.

b 2) Raise social recognition and increase utilization of Technology Assessment System (*OPCET*)

Widely engage in PR activities for JSCE's Technology Assessment System, and actively carry out assessments.

b 2-1) Establishment of Technology Assessment System (*OPCET*)

Further expand utilization of the Technology Assessment System regarding the elemental technologies and comprehensive technologies across the wide-ranging civil engineering discipline.

c) Accumulation and transfer of technology

Basic Goal	2010 Goal
c1) Creating the “platform for comprehensive civil engineering information”	c1-1) Compile and disclose technological information database
	c1-2) Enhance and utilize technical footage database
	c1-3) Provide digital archives for valuable civil engineering documents, drawings, etc.
	c1-4) Reorganize sectors in JSCE journals, publish English journals, and publish out-of-print books on on-demand basis
	c1-5) Establish civil engineering digital museum, and deploy interactive web function

c 1) Creating the “platform for comprehensive civil engineering information”(Academic Reference and Archives Division)

Accumulate information on JSCE’s accomplishments in a unified informational environment and create informational base for its utilization, such as the database, software, etc.

c 1-1) Compile and disclose technological information database (Academic Reference and Archives Division)

Expand, accumulate, and disclose JSCE’s technical literature database by providing incessant operation, easy access and multiple search methods. This database is JSCE’s asset which includes technical literatures since the first publication (currently 250,000 entries existing).

c 1-2) Enhance and utilize technical footage database (Academic Reference and Archives Division)

Find, collect, and compile a database for further footage of projects, people, and civil engineering technologies that contributed to the development of civil engineering (there are presently 600 such recordings). Then, develop a system for which the accumulated technological footage may be used as resource for civil engineering education, for understanding civil engineering, and for disaster prevention or regional development. In addition, new footage of civil engineering technology will be evaluated and awarded in review committees and film contests based on the selecting system. They will also be available for use through the Civil Engineering Library or may be shared with the public through such means as periodical screenings (evening theater).

c 1-3) Provide digital archives for valuable civil engineering documents, drawings, etc. (Academic Reference and Archives Division)

Increase items in publicly disclosed JSCE website that are utilized by a large number of its members and non-members, namely, valuable documents, postcards, and old photos from pre-war to post-war reconstruction period (currently 20,000 items posted). Also, collect drawings, specifications, and other resources with historical value concerning the fundamentals of establishments and structures, and disclose resources through digitalization.

c 1-4) Reorganize sectors in JSCE journals, publish English journals, and publish out-of-print books on on-demand basis (Publishing Division)

Organize and realign sectors in JSCE Journals and other technical publications. Establish a framework which flexibly accommodates the expansion and changes in the academic and technical disciplines. Introduce English journals representing the divisions to globally

disseminate quality technical and academic information. Consider use for out-of-print JSCE publications, such as publication on on-demand base.

c 1-5) Establish civil engineering digital museum, and deploy interactive web function (*Academic Reference and Archives Division*)

Use the Admiration of Civil Engineering Heritages by JSCE contents as a model to display on the web, in addition to the photos and general description, an information source list for further details, specialist referral, link and access to literature, and study tour information. Also, it will provide participation opportunities for those visiting the site to exchange information, and to upload timely information. Studies will be on-going to determine the role of Civil Engineering Library with its diversifying functions.

### 3. 3 Responsibility toward Japanese and International Society

#### d) Provision of professional knowledge from unbiased standpoint

Basic Goal	2010 Goal
d1) Contribution to quality social infrastructure development	d 1-1) Improve the qualification system to increase utilization
	d 1-2) Increase technological support toward quality-ensured public procurement system
	d 1-3) Support and propose adequate social infrastructure determination process
	d 1-4) Provide recommendations for improving bidding and contracting system
	d 1-5) Promote gender equality
d 2) Civil engineers' social contribution	d 2-1) Respond to social issues, such as providing judicial support
	d 2-2) Strengthen disaster emergency scheme
d 3) Promote public understanding toward civil engineering	d 3-1) Clarify JSCE's views
	d 3-2) Strengthen role as technological interpreter
	d 3-3) Cooperate and coordinate with the public and government, and contribute to social education, etc.
	d 3-4) Contribute to school education (primary and secondary education)
	d 3-5) Contribute to education at industrial high schools, technical colleges, universities, etc.

#### d 1) Contribution to quality social infrastructure development (*OPCET*)

Contribute to quality social infrastructure development by nurturing and utilizing good human resources. Improve JSCE-certified civil engineer qualification system to increase utilization in society. Present proposals toward use of certified engineers in public procurement, and toward improving bidding and contracting system.

#### d 1-1) Improve the qualification system to increase utilization (*OPCET*)

Improve JSCE's civil engineer qualification system to promote utilization by all civil engineers. For this, JSCE membership will no longer be a prerequisite to qualify for Senior Professional Civil Engineer, Professional Civil Engineer, and Associate Professional Civil Engineer. Also, for Senior Professional and Professional Civil Engineers, in addition to the conventional evaluation procedure that placed emphasis on analytical skills through written exams, a new evaluation procedure will be introduced that emphasizes skills acquired through actual work experience by conducting adequate and detailed oral interviews regarding the declared professional experience. Promote active utilization of Senior Professional Civil Engineers and Professional Civil Engineers as management engineers for the ordering party.

#### d 1-2) Increase technological support toward quality-ensured public procurement system (*OPCET*)

To support the promotion of public procurement based on the comprehensive evaluation method by local governments, each branch will coordinate with local governments to promote the use of JSCE-certified civil engineers in technology assessments under the comprehensive evaluation method.

#### d 1-3) Support and propose adequate social infrastructure determination process (*Research and Studies Division*)

Offer support and proposals to enable development, maintenance, and renewal of quality



social infrastructure required by society by establishing an adequate process starting from the social infrastructure planning stage. At the same time, actively participate in the consensus-building process from the social infrastructure development planning stage to the execution stage.

d 1-4) Provide recommendations for improving bidding and contracting system (*Research and Studies Division*)

To realize quality social infrastructure development, it is ideal for public procurement bidding and contracting system to be operated in such a way that the contract which is comprehensively superior in content in terms of price and quality is implemented under conditions where transparency and fairness is ensured, and where continuous effort is made to improve the quality of engineers and business management. Compile the wisdom of industry, government, and academia to draw up and announce proposals to improve the bidding and contracting system based on scientific, objective analysis, to contribute to the development of quality social infrastructure.

d 1-5) Promote gender equality (*Education Planning Division*)

Involvement of diverse human resources is an extremely important issue to our future country, especially the issue of gender equality. It is a high-priority issue in the civil engineering community as well, where undertakings based on the values and views of diverse human resources is becoming all the more important. Thus, engage in activities inside and outside of JSCE, and cooperate with other academic societies, associations, etc. in promoting gender equality. Increase the female ratio in the divisions related to membership, organization management, and planning and strategy. Promote investigations and PR activities for creating of an environment in which both males and females can continue their jobs.

d 2) Civil engineers' social contribution (*Social Assistance Division*)

Actively tackle society's issues like regional disaster control, as a part of JSCE's public-interest activities. Strengthen ties with society and fulfill the specialists' role in social contribution.

d 2-1) Respond to social issues, such as providing judicial support (*Social Assistance Division*)

Promote participation of civil engineers in activities that socially require a high degree of expertise and high moral sense. Recommending JSCE members as expert witnesses in civil courts, is one example.

d 2-2) Strengthen disaster emergency scheme (*Social Assistance Division*)

Cooperate with related academic societies, associations, and NPOs to promptly engage in investigations in the disaster-stricken areas, and based on the results, provide prompt recommendations for the restoration and reconstruction plans for those regions. Also, coordinate with such organizations as the media organizations in promptly conveying them to the society.

d 3) Promote public understanding toward civil engineering (*Planning Division*)

Actively convey JSCE's views on issues surrounding the civil engineering community, and provide simple, comprehensible explanations regarding technicalities for which the society is interested in. At the same time, promote understanding toward civil engineering through cooperation with the public, government, NPOs, and NGOs.

d 3-1) Clarify JSCE's views (*Planning Division*)

As civil engineers' commitment to society, JSCE's Advisory Committee on Engineering Profession and Practice will clearly express JSCE's views regarding the role of civil engineering, civil engineers, international contribution, social infrastructure development and construction industry, and the basic course of resolving related issues, as well as views on serious issues related to ethics and social norms in the civil engineering community. The Professional Ethics and Social Norms Committees will convey JSCE's views on issues related to JSCE members' ethics and social norms as well.

d 3-2) Strengthen role as technological interpreter (*Planning Division*)

JSCE takes on a role of an interpreter that breaks down the contents of such things as social infrastructures that are closely related to our daily lives, and explains it in non-technical terms so that the general public can understand. In order to further strengthen this role, JSCE will provide information that explains in simple terms, the civil engineering technologies that the society is interested in.

d 3-3) Cooperate and coordinate with the public and government, and contribute to social education, etc. (*Education Planning Division*)

Hold open symposiums on themes of high social concern, and provide technical insight, and cooperate with the general public, government official in charge of political affairs, and with specialists in other sectors through opinion exchange. Contribute to social education and continuing education by providing information, referring lecturers, offering on-site lectures, referring tour sites, etc. for open lectures, study sessions, site tours, etc. offered by citizens, government, NPOs, NGOs, etc. on topics related to urban and town development, disaster control, and the environment. Promote the creation of forums for exchanges and information provision with citizens, NPOs, NGOs, etc.

d 3-4) Contribute to school education (primary and secondary education) (*Educational Planning Division*)

The education objectives of our country of "public-mindedness", "environment conservation", "respect for tradition and culture" and others set forth in the latest Fundamental Law of Education are common with those of social infrastructure development and civil engineering work. Thus, actively coordinate with and support the primary and secondary education fields. Cooperate with members and branches to establish a scheme that enables smooth consulting and specialist referrals. Also, increase opportunities for human exchanges and information exchange between those involved in primary and secondary education and related organizations, in activities conducted by members and branches. Promote development, research, and classroom implementation of civil engineering educational programs that coincide with each subject under primary and secondary education (social studies, comprehensive study, science, math, etc.).

d 3-5) Contribute to education at industrial high schools, technical colleges, universities, etc. (*Educational Planning Division*)

Contribute to improvement of educational content for students majoring in civil engineering related fields in industrial high schools, technical colleges, and universities, to nurture human resources that flourish in the society. Also, provide information on career paths, and promote open lectures, on-site classes, and site tours for students to introduce attractive civil engineering jobs for their future career options. For this, actively conduct human and information exchanges with faculty members in related organizations.

e) International Contribution

Basic Goal	2010 Goal
e 1) Provide seamless activity arena for of domestic and overseas activities and contribute to global social infrastructure development	e 1-1) Expand JSCE network (build human network) and promote international cooperation
	e 1-2) Transmit information on Japanese civil engineering technologies overseas and promote worldwide application
	e 1-3) Transmit overseas information domestically
	e 1-4) Promote global mobility of engineers

e 1) Provide seamless activity arena<sup>1)</sup> for domestic and overseas activities and contribute to global social infrastructure development (*International Affairs Division*)

Lay the groundwork for providing equal opportunities for Japanese civil engineers to engage in academic activities, provide overseas aid, and conduct business activities inside and outside of Japan, thus aiming for Japanese civil engineering technologies to be utilized more widely and allowing Japanese civil engineers to take up a greater role in international contribution.

e 1-1) Expand JSCE network (build human network) and promote international cooperation (*International Affairs Division*)

Through JSCE's overseas chapters, integrate and expand in an organized manner the network created between members and overseas engineers acquired such as through exchange students or through Japanese members working overseas. In order to foster an environment that allows Japanese civil engineers to smoothly engage in overseas activities, technology exchanges with overseas societies and organizations that hold Agreements of Cooperation with JSCE, and international cooperation with civil engineers in other countries and regions will take place through ACECC<sup>2)</sup> and other forums.

e 1-2) Transmit information on Japanese civil engineering technologies overseas and promote worldwide application (*International Affairs Division*)

Develop and maintain the medium for transmitting information to enhance information transmission that coincides with overseas technical needs. Also, industry, government, and academia will make unified efforts to translate and introduce Japanese standards, guidelines, and others as well as hold overseas lectures based on the local technical needs. In addition, actively take part in investigations and reconstruction aid at times of disaster to further boost global utilization of Japanese civil engineering technology.

e 1-3) Transmit overseas information domestically (*International Affairs Division*)

While preparing a seamless activity arena for Japanese civil engineers both inside and outside of Japan, organize and enhance the means for obtaining overseas information to nurture civil engineers with interest in overseas activities. Provide information on success of overseas projects through JSCE magazines, seminars and symposiums. Also, introduce literature on overseas affairs, and create opportunities for exchanges with overseas students.

e 1-4) Promote global mobility of engineers (*OPCET*)

Support standardization and sharing of technology standards and engineer qualifications to enable engineers to widely engage in issues common to each country.

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1) Providing seamless activity arena for domestic and overseas activities: Look at various mechanisms in the construction sector such as public procurement, business execution, and technical standards, from a global perspective to narrow the gap between domestic and overseas mechanisms to enable the experience, knowledge, and human resources in one place to be more easily utilized in other places, vice versa. (JSCE "Civil Engineers' Challenge in the Globalizing World" 2006)

2) ACECC : The Asian Civil Engineering Coordinating Council

f) Communication function

Basic Goal	2010 Goal
f1) Strengthen interface function for closer links with society	f1-1) Analyze social awareness and demand toward civil engineering, and establish information transmission framework based on it

f1) Strengthen interface function for closer links with society (*Communications Division*)

Strengthen interface function with society for closer links, and establish a timely information transmission framework. Provide a knowledge base to enable the society to understand and assess the role of civil engineering by enhancing the contents of the website and utilizing the features of videos and printed materials to their fullest.

f1-1) Analyze social awareness and demand toward civil engineering, and establish information transmission framework based on it (*Communications Division*)

Continue to hold regular discussion meetings between JSCE president, an appropriate JSCE spokesperson and the media, continue to distribute civil engineering leaflets targeted for young people, to enhance the contents of JSCE website and JSCE magazine, and to hold Civil Engineering Day/ Civil Engineering Week. When enhancing the web contents, focus on topics that the public is interested in, namely, civil engineering technologies, facilities, and people.

### 3.4 Professional Development of the Engineers and the Fulfillment of the Customers' Satisfaction (CS)

#### g) Support for engineers

Basic Goal	2010 Goal
g1) Engineers' education support	g1-1) Provide educational support that can be applied globally g1-2) Enhance CPD Program and develop registration system
g2) Enhance support system for engineers	g2-1) Improve qualification system so that it leads to social contribution g2-2) Enhance engineer registration system based on the improved qualification system

#### g1) Engineers' education support (*OPCET*)

Support JABEE's engineer education program accreditation activities to ensure and improve engineers' quality so that they may be globally accepted. Enhance continuing education programs aimed for acquiring the latest technologies and peripheral technologies in the specialized fields, methods for resolving social issues, as well as maintaining and improving civil engineering skills. The above will equip civil engineers with moral values and technical competence for contributing to the society after graduating from advanced education facilities.

#### g1-1) Provide educational support that can be applied globally (*OPCET*)

Review the role of future advanced education from the perspective of fostering globally competent engineers. Support in ensuring the quality of engineering education in the civil engineering field through accreditation of engineering education programs from the perspective of global mutual recognition.

In line with the importance of engineering design (ED), which is the ability to think and consolidate various technologies and disciplines to resolve issues, permeate and promote ED education in advanced education facilities under shared efforts of industry, government, and academia.

#### g1-2) Enhance CPD Program and develop registration system (*OPCET*)

Reinforce programs that contribute to elevate civil engineers' abilities, by creating on-line text materials that can be used in or out of classroom environment, and by providing business education for engineers. Also, improve the CPD registration system to boost utilization.

#### g2) Enhance support system for engineers (*OPCET*)

Improve the qualification system so that it may directly contribute to the society. It should be intended for possible future application toward global mutual recognition, and overseas utilization, mainly in the Asian region. The purpose is to nurture and utilize good human resources, from both public and private sectors, to further ensure the development of quality social infrastructure. Also, improve and enhance the engineer registration system in line with the engineer qualification system.

#### g2-1) Improve qualification system so that it leads to social contribution (*OPCET*)

In response to society's demands, the JSCE engineer qualification system will be enhanced to place further emphasis on actual work experience and ability during the screening process, so that this qualification may be utilized widely in the civil engineering community. At the same time, the above system will be linked to the CPD system and will be open to the civil engineering community in general (with exception of Executive Professional Engineer).

Further, promote and increase the number of qualification holders for the entry and training level engineers, namely students and young engineers.

g 2-2) Enhance engineer registration system based on the improved qualification system (*OPCET*)

Improve and enhance the system to enable effective utilization of registered engineers, for example, by establishing a database of certified engineers' technical fields based on the Engineer Qualification System.

h) Increasing opportunities for information acquisition

Basic Goal	2010 Goal
h1) Improving member service	h1-1) Strengthen interface functions between JSCE and its members, and among members
	h1-2) Establish scheme for accurate understanding and reflection of members' needs
	h1-3) Operate membership website to provide appropriate information in a timely manner
	h1-4) Promote fine-tuned branch activities, which include setting up new branches, and coordination with branch activities such as branch committee activities

h1) Improve member services (*Communications Division*)

Achieve greater member satisfaction through the below four measures.

h1-1) Strengthen interface functions between JSCE and its members, and among members  
(*Communications Division*)

Using the website, for example, strengthen interface functions for information exchange and information sharing between JSCE and its members, as well as among members.

h1-2) Establish system for accurate understanding and reflection of members' needs  
(*Communications Division*)

Using the member services website, for example, establish a system for understanding and reflecting the members' needs, making improvements as needed.

h1-3) Manage membership website to provide appropriate information in a timely manner  
(*Academic Reference and Archives Division*)

Implement official operation of "JSCE Repository" which utilizes the member authentication mechanism. Further improve and enhance its contents.

h1-4) Promote fine-tuned chapter activities, which include setting up new branches<sup>1)</sup>, and coordination with chapter activities such as chapter committee activities (*Members and Chapters Division*)

Promote setting up of new branches and student chapters and engage in fine-tuned chapter activities. Revitalize chapter activities, for example, by having committee activities related to a certain region led by the relevant chapter in charge of that region.

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1) Branch: Currently existing are the Niigata, Yamanashi, and Tochigi branches under the Kanto Chapter

i) Improving and raising efficiency of JSCE business operation

Basic Goal	2010 Goal
i1) Member recruitment and development	i1-1) Draw up member recruitment strategy that is linked to the qualification system, continuing education system, and committee activities
	i1-2) Enhance membership database management system, and utilize to establish scheme for maintaining and increasing members
i2) Reviewing the membership system	i2-1) Effective utilization of membership status, and review of membership type and service
i3) Efficient JSCE operation	i3-1) Improve JSCE operation
	i3-2) Sound financial administration
	i3-3) Effective, efficient, and focused budget allocation to revitalize JSCE activities
	i3-4) Effective asset utilization
i4) Improve lucidity of explanations	i4-1) Explanation of financial condition

i1) Member recruitment and development (*Members and Chapters Division*)

Widely publicize JSCE activities throughout society and halt the decreasing trend of membership through joint efforts of JSCE Headquarters, Chapters, and Divisions, to ultimately increase membership.

i1-1) Draw up member recruitment strategy that is linked to the qualification system, continuing education system, and committee activities (*Members and Chapters Division*)

Maintaining and increasing membership is JSCE's critical issue, and requires member recruitment strategy that is linked to all divisions. Draw up member recruitment strategy especially linked to the qualification system, continuing education system, committee activities, and chapter activities.

Enhance membership database management system, and utilize to establish scheme for maintaining and increasing members (*Members and Chapters Division*)

Ensure safe and accurate management of membership database. Improve system to enable further detailed analysis, for example, to maintain and increase membership. Enhance JSCE member website and improve service level to help maintain and increase membership.

i2) Reviewing the membership system (*Members and Chapters Division*)

Review membership system and member service, pursuing member services from the members' standpoint.

i2-1) Effective utilization of membership status, and review of membership type and service (*Members and Chapters Division*)

Understand members' needs, and closely work with necessary divisions to improve member service. Deliberate and introduce Silver Membership (tentative) system for seniors, and a system that enables smooth transition from Student Membership to Regular Membership.

i3) Efficient JSCE operation (*Financial Affairs Division*)

Promote JSCE's sound financial administration and effective/efficient/focused budget allocation to revitalize JSCE activities based on PDCA. Increase investment profit through effective asset management.



i3-1) Improve JSCE operation (*General Affairs Division*)

Improve JSCE operation by engaging in speedy operation. Prepare for smooth transition toward the new corporation.

i3-2) Sound financial administration (*Financial Affairs Division*)

Engage in appropriate accounting activities for each fiscal year through cooperation from each division, and achieve targets set forth in the 3-year financial plan. Whenever drawing up a budget, consider not only the single-year earnings, but the mid- and long-term earnings as well.

i3-3) Effective, efficient, and focused budget allocation for revitalizing JSCE activities (*Financial Affairs Division*)

Prepare focused budget allocation based on PDCA. As an organization, strategically select the budget items to be focused based on self-evaluation of each division and verification of effectiveness. Promote smooth transition toward the public interest corporation accounting standard based on the new public interest corporation system.

i3-4) Effective asset utilization (*Financial Affairs Division*)

Aim for effective mid- and short-term asset management. For this purpose, deliberate asset management policy determination method, etc. and seek early implementation.

i4) Improve lucidity of explanations (*Financial Affairs Division*)

Provide lucid explanations to members and contributors regarding how membership fees and donated funds were used.

i4-1) Explanation of financial condition (*Financial Affairs Division*)

Prepare lucid financial documents to provide lucid explanations to members and contributor regarding how membership fees and donated funds were used.

The Constitution (Objectives of JSCE)	Missions	Necessary Functions		2010 Goal	Action Plan				
Promotion of the field of civil engineering and development of civil engineering projects  Professional development of the civil engineers  Progress of scientific culture/Development of the society  Contribute to ~	1. Contribution to the advancement of scientific and technological fields	a) Up-to-datedness in science and technology	a1) Innovation / Accumulation / Transmittance of science and technology [ Continued ]	a1-1) Promote advanced academic research [Continued]	Establish research framework and conduct research [Enhanced]				
				a1-2) Increase global recognition of scientific papers published in JSCE journals [Enhanced]	Strict application of scientific paper publication standard and promotion of PR activities outside JSCE [Enhanced]				
			a2) Establishing the academic discipline that reflects the structural change in the society [ Enhanced ]	a2-1) Realign the academic discipline to reflect the structural changes in the economic society [Enhanced]	Promote research on effective utilization of social infrastructure and maintaining and extending the life of civil structures [Enhanced]				
				a2-2) Promote innovative research through collaboration with other organizations [Enhanced]	Propose an interdisciplinary research theme that takes advantage of JSCE's characteristics [Enhanced]				
			a3) Establishing the disaster countermeasure technology [Continued]	a3-1) Systemize disaster countermeasure technologies [Continued]	Cooperate with other organizations or promote joint research [Enhanced]				
			a4) Establishing the technologies for urban renewal [Continued]	a4-1) Establish plan, scheme, and elemental technologies such as maintenance of social infrastructure facilities [Continued]	Promote research on related elemental technologies [Enhanced]				
				a4-2) Develop technology for urban space establishment [Continued]	Promote research studies with consideration to a pluralistic time and space [Enhanced]				
			a5) Establishing the technologies related to global environmental sustainability [ Continued ]	a5-1) Set environmental targets/standards [Continued]	Promote research studies that support to set environmental targets and standards [Enhanced]				
				a5-2) Conduct research on technologies that contribute to establishment of a sustainable society [Continued]	Propose a concept toward a self-sustaining and recycling urban framework [Continued]				
				a5-3) Establish technologies for alleviating and adapting to global warming [New]	Propose technologies for alleviating and adapting to global warming [New]				
				a5-4) Establish environmental assessment technologies [Continued]	Establish technologies to measure the impact of each factor on the environment as well as technologies for environmental assessment [Enhanced]				
			b) Application of science and technology to various enterprises	b1) Establishing the system for the comprehensive and synchronized research and development [ Continued ]	b1-1) Reorganization of committees under Research and Studies Division [Continued]	Defining a deliberation framework [Continued]			
					b1-2) Cooperation with academic and governmental institutions [Continued]	Announce policy recommendations [Continued]			
				b2) Raise social recognition and increase utilization of Technology Assessment System [Enhanced]	b2-1) Establishment of Technology Assessment System [Enhanced]	Increase utilization and raise social recognition of Technology Assessment System [Enhanced]			
						Conduct technology assessments to improve utilization record [Enhanced]			
				c) Accumulation and transfer of technology	c1) Creating the "platform for comprehensive civil engineering information" [ Continued ]	c1-1) Compile and disclose technological information database [Enhanced]	Establish system with easy access [Continued]		
						c1-2) Enhance and utilize technical footage database [Enhanced]	Collect and provide digital files containing images and footage [Continued]		
						c1-3) Provide digital archives for valuable civil engineering documents, drawings, etc. [Enhanced]	Enhance functions for easy digital processing and easy access [Continued]		
		c1-4) Reorganize sectors in JSCE journals, publish English journals, and publish out-of-print books on on-demand basis [Enhanced]			Prepare for English journal publication and reorganization of sectors within JSCE journals [New]				
		c1-5) Establish civil engineering digital museum, and deploy interactive web function [Enhanced]			Provide (publish) out-of-print literature on on-demand basis [New]				
					Create model contents based on the formulated scheme [New]				
					Defining a deliberation framework [Continued]				
					Consider integration of library's digital - reality space (function) [New]				
	2. Responsibility toward Japanese and international society	d) Provision of professional knowledge from unbiased standpoint			d1) Contribution to quality social infrastructure development [New]	d1-1) Improve the qualification system to increase utilization [New]	Improve qualification system [Enhanced]		
						d1-2) Increase technological support toward quality-ensured public procurement system [New]	Coordinate with local governments to actively utilize JSCE-certified civil engineers in technology assessments under the comprehensive evaluation method [New]		
						d1-3) Support and propose adequate social infrastructure determination process [New]	Actively participate in the consensus-building process [Continued]		
						d1-4) Provide recommendations for improving bidding and contracting system [New]	Improve bidding and contracting system [New]		
						d1-5) Promote gender equality [New]	Actively promote gender equality in JSCE by increasing female members, promoting female participation in JSCE activities, etc. [New]		
					d2) Civil engineers' social contribution [Continued]	d2-1) Respond to social issues, such as providing judicial support [Enhanced]	Promote participation in activities requiring socially high moral sense [Enhanced]		
					d2-2) Strengthen disaster emergency scheme [Enhanced]	Prompt response at times of disaster, and strengthen ties with NPOs and mass media [Enhanced]			
			d3) Promote public understanding toward civil engineering [New]		d3-1) Clarify JSCE's views	Communicate JSCE's views on serious social issues, etc. through Advisory Committee on Engineering Profession and Practice [New]			
					d3-2) Strengthen role as technological interpreter [New]	Communicate JSCE's views on issues related to JSCE members' ethics and social norms through Professional Ethics and Social Norms Committees [New]			
					d3-3) Cooperate and coordinate with the public and government, and contribute to social education, etc. [Enhanced]	Provide information that explains in simple terms, the civil engineering technologies that the society is interested in [New]			
				d3-4) Cooperate and coordinate with the public and government, and contribute to social education, etc. [Enhanced]	Hold open symposiums on themes of high social concern [Enhanced]				
				d3-4) Contribute to school education (primary and secondary education) [Enhanced]	Promote interactions with NPOs and NGOs, create opportunities for interactions with the public and information provision [Enhanced]				
				d3-5) Contribute to education at industrial high schools, technical colleges, universities, etc. [Enhanced]	Promote understanding toward civil engineering in primary and secondary education, cultivate interest. Promote human exchange and information exchange with those involved in primary and secondary education, develop education				
			d3-5) Contribute to education at industrial high schools, technical colleges, universities, etc. [Enhanced]	Propose improvements toward advanced education in civil engineering-related industrial high schools, universities, etc. Provide career path information. Hold					
e) International contribution			e1) Provide seamless activity arena for of domestic and overseas activities and contribute to global social infrastructure development - From International Affairs Division's new action plan - [New]	e1-1) Expand JSCE network (build human network) and promote international cooperation [New]	Strengthen support and enhance overseas chapters. Promote technical exchange with academic societies and associations holding Agreements of Cooperation with				
				e1-2) Transmit information on Japanese civil engineering technologies overseas and promote worldwide application [New]	Develop medium for information transmission and increase information transmission. Support globalization of construction industry. [New]				
				e1-3) Transmit overseas information domestically [New]	Organize and enhance the means for obtaining overseas information. Efficient information transmission. [New]				
				e1-4) Promote global mobility of engineers [New]	Support standardization and sharing of technology standards and engineer qualifications [New]				
	f1) Strengthen interface function for closer links with society [Continued]	f1-1) Analyze social awareness and demand toward civil engineering, and establish information transmission framework based on it [Continued]		Information transmission through press releases, publication of PR magazines [Continued]					
				Enhance JSCE website [Continued]					
				Revise JSCE magazine [Continued]					
				Hold Civil Engineering Day/Civil Engineering Week [Continued]					
		3. Professional development of the engineers and the fulfillment of the customers' satisfaction		g) Support for engineers	g1) Support for Engineers [Continued]	g1-1) Provide educational support that can be applied globally [Continued]	Continue to conduct evaluations for JABEE's accreditation system [Continued]		
							Support education for engineering design under shared efforts of industry, government, and academia. [Enhanced]		
							Strengthen ties with Research and Studies Division and Chapters [Enhanced]		
							Enhance activities of CPD Consortium in Construction Engineering Societies and Associations [Enhanced]		
						g2) Enhance support system for engineers [New]	g2-1) Improve qualification system so that it leads to social contribution [Enhanced]	Sequentially adopt improvement measures that can be implemented into the current system. [Enhanced]	
							g2-2) Enhance engineer registration system based on the improved qualification system [Enhanced]	Consider engineer database [Enhanced]	
						h) Increasing opportunities for information acquisition	h1) Improving member service [Enhanced]	h1-1) Strengthen interface functions between JSCE and its members, and among members [Continued]	Strengthen interface function for information exchange and information sharing [Continued]
									Establish service framework [Continued]
									Enhance information gathering function through introduction of authentication function based on the membership database. [Continued]
									Promote information transmission through sharing of membership information, etc. [Continued]
i) Member recruitment and development [ Continued ]			i1-1) Draw up member recruitment strategy that is linked to the qualification system, continuing education system, and committee activities [Enhanced]					Consider introduction of membership system which allows for some flexibility in terms of type and membership fees. [Continued]	
								Deliberate measures to further increase student members [New]	
								Deliberate methods for PR and for distributing JSCE information toward non-members in the related peripheral fields [Continued]	
								Promote data sharing and consolidation [Continued]	
	i2) Reviewing the membership system [ Continued ]		i2-1) Effective utilization of membership status, and review of membership type and service [Enhanced]					Review member privileges and solicit members of related academic societies [Continued]	
	i3) Efficient JSCE operation [New]		i3-1) Improve JSCE operation [New]					Smooth transition to the new corporation [New]	
								Improve balance of payments from JSCE operation [New]	
								Improve balance of payments from JSCE operation [New]	
			Improve balance of payments from JSCE operation [New]						
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		Improve balance of payments from JSCE operation [New]							
		Improve balance of payments from JSCE operation [New]							
i4) Improve lucidity of explanations [New]		i4-1) Explanation of financial condition [New]	Explain financial condition [New]						

## **Closing – toward subsequent plan preparation-**

### (1) Procedures for reviewing JSCE2010, and preparing subsequent plan

JSCE2010 sets out targets for five fiscal years, from 2008 to 2012. To ensure the basic goals are reached, PDCA management system is to be put into effect for each fiscal year. In doing so, the action plans for 2010 goals will be reviewed as needed.

The review of JSCE2010, or preparation of succeeding plan will start with the following:

- Planning Committee will decide the policy for preparing JSCE2010 by around Sep. 2010
- Planning Committee will prepare “JSCE2010 Interim Assessment” by around May 2011, based on the results of each division’s self-evaluation of Sep.2010.

The subsequent preparation process will be based on page 3 of this document.

“JSCE2010 Interim Assessment” should be assessed quantitatively and multilaterally especially for the four high-priority goals.

### (2) Points to consider in preparing new plan

JSCE will mark its 100<sup>th</sup> anniversary in 2014. Therefore, the succeeding plan will hold a significant meaning in the sense of reviewing the first 100 years and taking the first step into the second century. For this, the next points should be taken into consideration in preparing the subsequent plan.

#### ① Define the roles of civil engineers and JSCE using the “backcast” method.

The roles of civil engineers and JSCE in the preparing JSCE2010 are defined based on the current perception of the society and the world. Since the subsequent plan will mark the first step into the second century, it is best to define these roles through the “backcast” method by predicting the circumstances surrounding the society and the world in the super long-run, namely, in 2050 and 2100.

#### ② Place emphasis on external hearings

In order for JSCE’s activities to comply with the society’s needs, it is important to listen to voices of student members, and non-members, or the general public. Thus, in preparing JSCE2010, an external hearing was conducted for the first time in the JSCE20XX series. This brought about numerous thought-provoking opinions. Therefore, it is beneficial to collect even larger number of non-member opinions in preparing the subsequent plan.