

Avoiding a Crisis in the Construction Industry: Guidelines for Internationalizing the Japanese Standard Conditions of Contract for Civil Works

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I. Introduction

The author extensively studied the characteristics of the Japanese domestic market and the global market for civil works infrastructure construction. The contract and conditions of contract which govern the execution of civil works infrastructure construction projects in each market generally are thought to be a reflection of the industry practices. These practices in turn drive and shape the skill sets engineers must learn and practice daily in order to fulfill the requirements demanded in such execution successfully.

Japanese civil works infrastructure is arguably the most extensive per capita in the world. It is civil works infrastructure that reflects the highest of technological and engineering competency. The construction contracting for civil works infrastructure projects is governed by the Construction Business Law. Under that Law, the Government contracts with contractors using the Contract and the Standard Conditions of Contract for Public Works. These contract documents are said to reflect the philosophy of the Japanese legal system, and the contracting approaches that it embraces. In order to understand and evaluate the Japanese civil works infrastructure construction market, the author studied the Japanese social, cultural and historical developments that have shaped the legal bases therefore and to understand what makes Japan and the Japanese market unique.

The author found that a unique contracting status bestowed by Construction Business Law allowed the Government to use the Contract and Standard Conditions of Contract for Public Works to fashion a civil works infrastructure construction industry that has developed characteristics that are different from the global market. The Japanese Contract and the Standard Conditions of Contract for Public Works, however, has not enabled the construction industry to develop either:

- An extensive understanding of construction execution for civil works infrastructure in the global market place.
- The project management skill sets (for example, contract administration to support a viable disputes resolution process) necessary to fully integrate the Japanese civil works infrastructures construction industry into the global market construction works.
- A domestic market that meets the criteria for entry to the World Trade Organization (WTO).

On the other hand, the Construction Business Law, the Contract and the Standard Conditions of Contract for Public Works, has enabled the Government through the uniqueness of the process of the contracting approach they represent to:

- Use the domestic civil works infrastructure construction industry to “prime the pump” whenever the economic conditions warrant.
- Exclude foreign contractor participation in the domestic construction civil works infrastructure market to accomplish its goal.

The result has been the development of an “insulated” domestic construction industry for civil works infrastructure that Japan can sustain no longer. The Government also can no longer afford civil works infrastructure as it has in the past. In fact, in light of the demographic issues that it faces, Japan has embarked on a long term reduction civil works infrastructure construction that has left the industry in a precarious position. For example, Japan faces the reality of a population that is declining and aging, while it continues to be the most

homogeneous population in the world. The current status of the domestic civil works infrastructure construction industry is one of crisis.

The crisis is the result of the Construction Business Law, the Contract and the Standard Conditions of Contract for Public Works and the realities of Japan today that do not meet:

- The intent of the legal changes that the Government is enacting.
- The demand of the electorate for the transparency in the process of awarding and executing civil works infrastructure construction projects.
- The commitment that the Japanese civil works infrastructure construction market will become a part of the global civil works infrastructure construction market.

In contrast, the financing and execution of civil works infrastructure globally is undertaken through the use of various types of contracts and standard conditions of contract that are understood and accepted by stakeholders that operate in the global market. For example, the most widely used forms of contract and conditions of contract for executing civil works infrastructure globally is the suite of contracts that is promulgated by Fédération Internationale des Ingénieurs-Conseils (FIDIC). The author identified the skill sets that are required in the global market and evaluated the Japanese civil works infrastructure construction industry's need to learn and use the project management skills under the current Construction Business Law, the Contract and the Standard Conditions of Contract for Public Works. The author also analyzed a comparable Asian market. China has elements of social and cultural development that are alleged to be similar to those of Japan. Yet, the Chinese have enacted recently laws that will allow it to develop the skill sets that stakeholders employ in the global market for civil works infrastructure construction and allow foreign competition in their domestic market.

In Japan, there exist no guidelines for change which would allow the use of contract and standard conditions of contract used in the global market to be used for the execution of domestic civil works infrastructure construction. Using the 1999 FIDIC Contracts and Standard Conditions of Contract (known as the 1999 FIDIC Books or the FIDIC Rainbow Series) as an example, the author demonstrates the characteristics that can guide the Japanese domestic civil works infrastructure construction industry. For example, it would force the necessary contractual experience comparable to what foreign contractors have. It also would allow the development of those contract administration skills that will enable it to function in the world economy. It would also allow the domestic civil works infrastructure construction market to develop in the transparent manner that the Japanese population is demanding.

Although Japan is culturally and socially unique with a set of business practices that have worked for over half a century, the author recommends from his studies guidelines for changes that are necessary to the Construction Business Law and using the global market standards for civil works infrastructure construction. The Contract and Standard Conditions of Contract for Public Works in conjunction with these guidelines can be used to develop a "New Japanese Standard." In addition, the recommendations will further enable Japan to meet its WTO commitments, open its domestic market to foreign competition and enable the domestic civil works infrastructure construction industry to compete effectively on much larger playing field—the global market. The result will enable Japan to avoid the crisis that is facing the domestic civil works infrastructure construction industry.

II. Japanese and Global Civil Works Infrastructure Construction Standard Conditions of Contract

A. The Real Issues Facing the Civil Works Infrastructure Construction Industry

Japan's emergence as a postwar economic power led to the unraveling of the national policy of consensus that smoothed over the divisions that existed within the national bureaucracy. The policy breakdown began in the 1970's because of the emergence of Japan as an economic and technology power. It seriously complicated the process of formulating industrial policy and made it more difficult to achieve cooperation and functionality, the two characteristics that allowed phenomenal growth.¹ The breakdown in a coordinated and managed economy did not happen in the construction industry. It was an instrument of keeping the ruling party in power. It was used to serve political needs and continued to stimulate the economy until the economic bubble burst in the mid 1980's. It did not allow a preparation the industry to function in the broader global market, as had other sectors of the economy. Japanese industrial prowess grew in many other sectors. Foreign competition was "controlled" by developing a keen edge in the competitiveness of the global market, especially industrial goods and consumer products.

Two Japanese political scientists studied the manner in which the ruling party manipulated certain economic policies to enhance its chances for victory at election time.² They examined government spending on construction projects targeted at Japan's numerous election districts for the 30-year period from 1955-1985. They found throughout this period that spending on construction projects increased dramatically in the month that an election took place. Over 99% percent of businesses qualified under the Construction Business Law represented in the voting districts were of small to medium companies, and they employed over 80% of the all Japanese construction workers therein. Over this period the ruling party enjoyed an average of 12% more support than it had nationally.

The ruling party sent discrete transfers of public resources to members of their support constituencies in the same month that an election was held. This largesse was in response to certain electoral imperatives. For example, if it is the case that a governing party holds a majority of seats in the lower house of its respective parliament that is not in imminent danger of being taken away in an upcoming election, then the principal challenge it faces at election time is getting its core supporters to turn out and vote. The ruling party needed only to remind its supporters that it was their benefactor, and that it was the party which had protected and advanced their interests by means of the dispensing public resources, and that it was in need of their electoral support. While individual-level changes occur in the governing parties support base over time, the ability to remain in ruling position occurs in two ways. First, is "sector change," which occurs when party specific shifts come about as a result of a substantial number of the electorate no longer were supporting the ruling party. The second change is "ecological change," which occurs when a large number of the ruling party's support group change relative to the size of the support group, especially when measured against other socioeconomic groups. The party that has ruled Japan for all but two of the last 55 years faced both changes as Japan entered the last decade of the twentieth century.

The best way of handling the kinds of dislocations that occur from such electoral support changes that necessitate policy adjustments that are required is to hide the social dislocation that results and sacrifice a specific sector of the economy. In the 1990's the ruling party faced a stagnating economy that had resulted from the end of the "bubble" economy. The Government chose to use the Construction Industry, and specifically the civil work infrastructure portion that it had historically employed to stave off their dwindling support. From 1990 to 1999 it announced ten stimulus packages aimed at forcing a rebound from the

resulting surge in civil works infrastructure construction spending. It was hoped that spending would do the same thing that it had accomplished from 1955 to 1985—guarantee the reelection of the ruling party. But, it required the Government to protect the civil works infrastructure construction industry at a time when the rest of the world was clamoring for entry and participation in that domestic market sector.

The legal foundation of Japan is based on Civil Codes of France and Germany, and the Common Law of the US (and to a lesser degree the United Kingdom). Europe, Australia, the Americas, Africa, and the rest of Asia generally have one or the other of these same legal foundations. Yet, civil works infrastructure contractors from these seemingly disparate legal traditions can compete against each other and function acceptably in the global market for civil works infrastructure construction projects. Japan's contractors, however, cannot compete in such a global market because the domestic market has a basic difference. Japan has created a form of industry practice that is based on the Construction Business Law that creates an exception to the basic forms of contract that are allowed under its Civil Code. The Construction Business Law recognizes the dominance of the Owner/Employer—the Government for essentially all of the civil works infrastructure construction market. The Construction Business Law requires the use of a written contract that incorporates the principle that: *"parties executing a contract for construction work shall conclude a fair and equitable agreement in mutual good faith"*³—a concept of "mutual trust" in the fairness of the dominant Government as Owner/Employer. The Construction Business Law gives the Government the authority to determine disputes unilaterally, but in practice the Owner/Employer frowns upon disputes in the civil works infrastructure construction industry. The Construction Business Law requires the contractors to engage in the subterfuge of pointing out changes and then awaiting the unilateral determination of Owner/Employer as to the value and time consequences of such changes. This principle has allowed the Government to manipulate the industry to its own ends, and in return it has protected the industry from foreign competition. Faced with the need to rebuild the Japanese economy recently, the Government under the guidance of the ruling party now has embarked in a program of legal restructuring in most sectors of the economy to better prepare Japan to better meet the situation and conditions that it now faces. It is doing so through changes in the laws that govern economic sectors except for the civil works infrastructure construction that is subject to the Construction Business Law from which almost all of the current issues originate.

The Japanese Contract and Standard Conditions of Contract for Public Works are based on and reflect the Construction Business Law. The Contract and Standard Conditions of Contract for Public Works have been used for over fifty years. The basic provisions have been altered only eight times, but the revisions have been relatively minor and reflect minor revisions. The efforts that the Government has made in the last decade to comply with the commitments under the WTO's Agreement on Government Procurement have been cosmetic, as described below, and the Government has not changed the Construction Business Law. The current Contract and Standard Conditions of Contract for Public Works are used to protect the domestic civil works infrastructure construction industry from foreign competition still. In the past, the system has been used for maintenance of the ruling party in power, used in ill-fated attempts at economic stimulus, and now in an attempt to save a significant sector of the economy from global competition. The Government and the domestic civil works infrastructure construction industry are "casting about" and bemoaning their future and that of the industry. The Government and the civil works infrastructure construction industry are attempting to use a varied composite of ideas that are used in various European and US infrastructure construction markets, but it is achieving little success. To define the problem, some of the issues that are characteristic of Japanese civil works infrastructure construction, which are at odds with the rest of the world, must be explored. Japan's response to the challenges and changes that began twenty years ago was first one of retreat and denial. Then it was of pragmatic utilization of new rules and

circumstances to continue policies of promotion and protection. Today it is one of accepting global standards and policies in general, but it is not doing so in the civil works infrastructure construction industry. The manner in which the domestic civil works infrastructure construction industry can change will be dependent on revisions Construction Business Law, and the Contract and the Standard Conditions of Contract for Public Works to reflect global standards and policies. Such change will avoid a crisis and can lead to results which will provide the domestic construction infrastructure construction industry with a future it so desperately needs.

B. The Fundamental Legal Basis for the Japanese Standard Conditions of Contract for Civil Works

In Japanese society, the law historically has a limited function. It becomes one small part of the mechanisms for social control. For example, where there are conflicts and/or disputes, societal resort to formal law and institutions is not usually the first course of action of the Japanese. Today, however, there is an astonishing amount of change afoot, and a considerable amount of uncertainty regarding the future. The Japanese Government and companies generally have become major players in global markets. The Japanese managers of companies go forth and strive to become masters of the cultures in which they compete. The Japanese people have become world travelers. They are regularly exposed to different ideas and cultures. Communications, the great equalizing influence of the new century, has led to a blending of cultures at an increasing and irreversible rate. Now that Japan is facing economic problems, a questioning and re-evaluation of the practices that it has cherished has commenced in a manner and depth that it never occurred before.

The uniqueness of Japanese law and the approach to doing things is formed by the broad belief of the Japanese in their “uniqueness.” The widely held view concerning the special and superior nature of “Japanese” is expressed in the word “Nihonjinron (日本人論).” At one level it represents racial purity and nationalism. At the opposite extreme, it is the social and cultural cohesion which binds the people together and it has an immense psychological power. More importantly, it represents a defensive ideology against foreign influence and intervention.⁴ These principles underlie the domestic civil works infrastructure construction industry—specifically the Construction Business Law—which the Government has used with provisions of other Japanese laws to govern civil works infrastructure construction market. Little has changed with respect to these laws. Foreign technology has been sought, and then improved upon, especially with respect to the desire to build a world class civil works infrastructure. But always such civil works infrastructure was guided by the application of these unique laws.

The Japanese Legal System appears familiar. The constitution has characteristics of the American constitution. The parliamentary system appears to blend the Anglo-American systems. The Japanese Code appears modeled after the French and German codes. Yet, the Japanese Legal System is a series of apparent contradictions that blends these apparent outside influences with Japanese traditions.⁵

Since the Japanese legal system is such an enigma to those brought up in other cultures, and especially so Western culture, it is important to consider ideas of culture and identity. Such is the case with the Japanese legal system. Understanding the Japanese legal system is illustrated by the use of cultural anthropology and the concept of “giri (義理)” in the work of Ruth Benedict,⁶ and the cultural aspects in Kawashima’s work on Japanese “legal consciousness.”⁷

The Japanese Legal System is a function of a recognizing the institutional context in which the construction industry must function. The presence of law as an object of interest rather than an instrument actively to be used implies the existence of some other rules for the management of society and settlement of disputes. In a broad sense these are the rules of “giri (義理).” These rules involve the individuals’ obligation and duty to the group (community), as well as, encompassing notions of reciprocity. Furthermore, *“they are rules of conduct, and do not presuppose the existence of any relationship of clearly defined and quantitatively delimited rights and duties between subjects whose conduct they regulate.”*⁸ Sanction is psychological and is found in the expression of “honor” and “loss of face.” As Ruth Benedict said, Japan is a “shame culture” and “not a guilt culture” characteristic of

Western cultures. She drew a distinction between a shame culture which “is a reaction to other people’s criticism” and a guilt culture which “have an internalized conviction of sin.” Thus, Japanese society maintains in harmony, “wa (和),” in the family and community by ignoring a person’s mistake rather than seek a formal sanction, as an individual’s shame is the group’s shame.

The traits of giri (“義理”) are decreasing with the ascendancy of a younger generation. Young engineers do not know the full detail of giri (“義理”), yet they profess to have the same mental outlook. The Japanese often have accepted Western ideas which have enriched the Japanese spirit, particularly with respect to rationality and objectivity. Adopting such approaches has not prevented the Japanese spirit from retaining its congenital characteristics. The Japanese spirit will change over time, but it will always be Japanese. The restructuring of government that is currently underway requires a change. Present indications are that the Japanese attitude on law is changing to become more westernized and it is showing signs of doing so.⁹ The Wall Street Journal recently reported the trend of firms to use the courts is growing. It reported:

“Japanese companies historically have negotiated their differences in closed door meetings, sometimes refereed by banks or business partners with stakes in the companies. That system worked well while companies held big chunks of each other. As the cross-shareholding system has unwound, companies started making use of the courts. Westerners have believed that that the Japanese people are not litigious. But once the Japanese become comfortable with the idea of fighting in court, which may be a function of the government re-structuring and court/legal services reforms that are underway, such as, speeding up the process, the Japanese will become very aggressive.”

Consistent with this concept, the Japanese Civil Code regulates the obligations under contracts in almost the same way as the French Civil Code, but in practice these contracts are not regulated as they are in France.¹⁰ For example, the practice is for the contractor to petition the Owner/Employer (the Government) in case of Civil Works infrastructure construction projects requesting the Owner/Employer (the Government) to fulfill the Owner/Employer’s (the Government’s) contractual duties, that is, consider the contractors’ petition for impacts from change in what the contractor agreed to provide by a date certain and for the lump sum amount.

To begin with, construction contract law is an amalgamation of several specific laws, the principal ones being:¹¹

- Civil Code, Articles 632 through 642 (Minpo “民法,” Law No. 89, 1896) covering the “Contract for Works” (Ukeoi-Keiyaku “請負契約”).
- Commercial Code (Sho Ho “商法,” Law No. 49, 1899) dealing with commercial transactions.
- Construction Business Law (Kensetsu Gyo Ho “建設業法,” Law No. 100, 1949) dealing with construction business, the contractual requirements and its licenses;
- Public Accounting Law (Kaikei Ho “会計法,” Law No. 35, 1947) setting forth the bidding requirements for public construction projects;
- Building Standards Law (Kenchiku Kijyun Ho “建築基準法,” Law No. 201, 1950) setting out the construction standards and practices;

- Budget Order: Order concerning Budget, Settlement of Account and Accounting (Yosan-Kessan oyobi Kaikei Rei “予算-決算および会計令,” Government Order No. 165, 1947) prohibiting undue restraints of trade and unfair business practices.

Although there are several forms of contract, construction contracts generally are considered Contract for Works (Ukeoi Keiyaku “請負契約”) under the Civil Code. Article 632 of the Civil Code provides that a “Contract for Works” shall become effective when the contractor agrees to complete certain works and the employer agrees to pay to the contractor remuneration for the *result* of such works. Unlike the most countries, either civil law or common law, Art. 633 of the Civil Code, provides that such remuneration shall be payable to the contractor in return for delivery of the completed works. Under most other jurisdictions, it is typically the commitment by the contractor to complete and deliver such works.

The Civil Code does not favor contractors. Lawmakers, taking into account the situations where an individual-employer desires to build his own houses, assumed that the employer would be a layman and the contractor would be a professional. Before the Civil Code was enacted in 1896 at the start of the modern construction industry, the “Great Court of Judicature” (Daishinn In “大審院”), the predecessor to the Supreme Court, ruled in favor of the Owner/Employer in the Takenaka case, which involved one of the biggest contractors in Japan at the time.¹² The court denied the contractor’s claim for extra costs and damages caused to it by unusually rushed work, inflation and design variations. The case put the contractor in the even more awkward position of making a claim for extra costs by means of litigation, arbitration or any other third-party dispute resolution process relying on the variation clauses under either public or private construction contracts. Such one-sided construction contracts existed until the end of the World War II, especially in civil works infrastructure construction, where the contractor tended to rely on the Owner/Employer’s grace (onkei “恩恵”) in response to its petition (tangan “嘆願”) without any clear grounds. In 1949, The Construction Business Law was enacted to facilitate the making of construction contracts “*in a fair and reasonable manner*,” but the practice of relying on a making petition was retained for civil works infrastructure construction.¹³ The Construction Business Law also prescribed the preparation and use of standardized construction contracts,¹⁴ and the Contract and Standard conditions of Contract for Public Works was issued initially in 1950.

Chapter 3 of the Construction Business Law has modified the Civil Code provisions relating to “Contract for Works” to promote sound development of the Japanese construction industry. The Construction Business Law still holds construction contracts, however, within the basic framework of the “Contract for Works” concept in the Civil Code, but in practice the actual construction contract is different than the provisions of the Civil Code. Most authorities have expressed the opinion “*is that a customary construction contract in Japan does not fall within any of the thirteen kinds of typical contracts (tenkei keiyaku)*” defined in the Civil Code. It is neither a “Contract for Works” nor “Mandate Contract” (Inin Keiyaku “委任契約”), but should be considered as falling with another category of contract and is called “*sui generis*”.¹⁵ Thus, the form and process used in the civil works infrastructure construction is not a recognized contract under the Civil Code.

The “Lump-Sum” (Souka “総価”) construction contract is used for civil works infrastructure construction. With respect to the “Cost-Reimbursable” (Jippi-Seisan “実費精算”) construction

contract, most authorities suggest it is governed by the provisions regarding “Mandate” or “Quasi-mandate” under the Civil Code.¹⁶ A Cost Reimbursable Contract is different from “Contract for Works” in terms of payment conditions, allocation of risks between the contracting parties, extinctive prescription period for the right to claim damages, etc. The contract does not match actual practice. The “Unit-Price Contract” (Tanka Keiyak “単価契約”) and the “Cost-Reimbursable Contract” have rarely been used by Owner/Employers (the Government) for civil works infrastructure construction. Thus, 99% of civil works infrastructure construction projects are contracted as lump-sum.¹⁷

The Construction Business Law establishes the practice of the Owner/Employer paying for a substantial portion of the contract price to the civil works infrastructure contractor before the works are completed and turned over to the Owner/Employer, unlike the Civil Code requirements. The concept of *giri* (“義理”), however, is retained. The Construction Business Law, Chapter 3: Contract for Construction, Section 1: General Provisions, Article 18: Principle of Contracts for Construction Work states:

“Parties executing a contract for construction work shall conclude a fair and equitable agreement in mutual good faith.”

The resulting Contract and Standard Conditions of Contract for Public Works recognizes specifically that in effect the relationship arises from the Owner/Employer who is the contractor’s patron and the contract documents are a reflection of the fact. At the same time, the status of master or employer (the Government) is presumed patriarchal and is not to be despotic. In other words, the Government as the Owner/Employer is not only to dominate, but also to patronize, and therefore to consent to the request of its servant or employee. There is a strong expectation that a dispute should not and will not arise. Even when disputes do arise, it will be resolved by “mutual consultation or mutual understanding.” The concept is thus based on a presumption and belief that the Owner/Employer (the Government) and the contractor have a “mutual trust” in each other. Thus, there is no reason for the majority rule in the global market that the parties need to be governed by concepts of “mutual mistrust.”¹⁸ Under the Construction Business Law, parties are not expected to become involved in any serious differences in the future. This concept is consistent with the concepts of *giri* (“義理”) and premised on the belief that the parties are supposed to be friendly enough not to consider eventual disputes. The Contract and Standard Conditions of Contract for Public Works provides that in the case of disputes, parties must negotiate with each other. As provided specifically in the Construction Business Law in Chapter 3-2, only if negotiation fails then there is a prescribed process for settling disputes.

Reflecting the Construction Business Law, the two Contract forms and Standard Conditions of Contract for use with lump-sum construction were promulgated:

- (1) Contract and Standard Conditions of Contract for Construction Works (Koji Ukeoi Keiyaku Yakkan “工事請負契約約款”). These Conditions are mainly applied to private projects and were initially published in 1923 jointly by four organizations of contractors and architects (previously known as “Four Associations’ Unified General Conditions” (Shikai Rengo Kyotei Yakkan “四会連合協定約款”)) which had been influenced by the 1903’s text of R.I.B.A. (Royal Institute of British Architecture) and

during the subsequent six (6) revisions have been somewhat reflective of the A.I.A. (American Institute of Architecture) Forms. The most recent revision is the April 1, 2000 and is used for private works.

- (2) Contract and Standard Conditions of Contract for Public Works (Kokyo Koji Hyojun Ukeioi Keiyaku Yakkan “公共工事標準請負契約約款”), which was prepared using as reference the General Conditions of 1 above and initially published in 1950 by the Central Council on Construction Industry of the Ministry of Construction (Chuo Kensetsu-gyo Shingikai “中央建設業審議会”) and most recently revised as the 8th edition in 1995.

These Contracts and Standard Conditions of Contract are used for virtually all construction works in Japan, where the normal process is for the design to be provided by the Owner/Employer. In the Japanese construction industry as a whole, individual forms for Contract and Standard Conditions of Contract have been prepared and issued by the Government for civil works infrastructure construction. The first of these contract forms is the guide used by major private organizations for construction undertaken in the private sector.

Articles 19(1) and (2) of the Construction Business Act also require a formal written document for important provisions and amendments. The provisions cover the contract price, completion time, security for due performance, payment terms, variations, risk of loss, warranty, dispute resolution, etc., whenever a new public construction contract or its amendments is made, except where the contract amount does not exceed ¥1.5 million (¥2 million for a contract awarded outside Japan).¹⁹ The requirement for written contract is considered to be a non-mandatory part of the Law for the purpose of avoiding possible disputes on the contract conditions, and hence enforcement of the contract does not necessarily depend on the written document.²⁰ On the other hand, the Public Accounting Act mandates that the main contract between the Owner/Employer (the Government) and the successful bidder on civil works infrastructure construction does not become binding until executed by both parties.²¹ With respect to private construction contracts, no such specific law exists in practice. However, it has been a common practice for construction contracts to be formalized in writing.

For the past three (3) decades, joint venture contracting also has been promoted by the governmental agencies to enhance the technical and financial abilities of small or medium-sized contractors. As a result, approximately one-third of all construction projects in Japan are implemented as a joint venture or consortium (kensetsu kyodo kigyotai “建設共同企業”). The Ministry of Construction (now the Ministry of Land, Infrastructure and Transport—MLIT) published two model forms for joint ventures: (i) a joint venture or type A (ko-gata “甲型”) which is a consolidated type and (2) a consortium or type B (otsu-gata “乙型”) which is an unconsolidated type. In consolidated type arrangements, all partners contribute capital, personnel, materials, equipment, work and service which are consolidated under a single organization and all profits and losses are shared at a predetermined ratio. In unconsolidated type arrangements, the works are divided into two or more portions in which each partner undertakes to complete his pre-allocated portion of works and has his respective contract amounts at his own responsibility and risk. The Ministry of Construction, however, promoted the use of the joint venture or type A form of joint ventures. Because authorities²² and legal precedents²³ consider construction joint ventures a quasi-partnership

(kumiai “組合”) under the Civil Code,²⁴ joint venture partners do not owe a joint and several liability to creditors. This result is modified by the joint venture or type model form that is used. Thus, under a Type A model form each partner assumes joint and several liability (rentai sekinin “連帶責任”) to the Owner/Employer for their performance of the construction contract. Such joint and several liability owed to the Owner/Employer is independent from any internal liability relationship between the partners. In regards to civil works infrastructure construct, the MILT requires use three company joint ventures for a majority of civil works infrastructure construction projects.²⁵

Given this legal foundation, the Construction Business Law and the promotion activities of the Government that it accommodates, are out of sync with the rest of the Civil Code. Today, the public questions the “transparency” of the civil works infrastructure construction process because of decades of ruling party abuse. As has been stated by the authorities, the dominant and patronizing Owner/Employer for civil works infrastructure allowed by the Construction Business Law assumes: “*The Employer is always clean, fair, and right....[The Government] is far from being involved with collusion affairs of contractors.*”²⁶ The Construction Business Law requires the Owners/Employers (the Government) and the contractors to deal in a cooperative manner, that is, because it is believed that the Owner/Employer (the Government) has “*to make a fair and right selection, because [the Owner/Employer (the Government)] is bound by the logical restriction of actions or laws and regulations which always force the most suitable obligations and answers.*” This contracting approach is supposedly a furtherance of the concept of giri (“義理”), but in practice it has resulted in the abuses that are a part of the history and practice of the Japanese civil works infrastructure construction industry for the past fifty years.

For example, the Construction Business Law has been interpreted to allow use of a “Competition System by designated Tender,” in which the Government designates the bidders. Yet the Public Accounting Law, Article 29.3, provides that contracts for civil works infrastructure contracts require the use of general tenders to achieve a competitive system. A “Nominated Tender System” is only to be used in exceptional situations. In the case of civil works infrastructure construction contracts, the process of deciding the nominated bidders is not specifically defined, and only the result of the nominations are announced. Similarly, a tender and what goes into such a tender are not even defined. For civil works infrastructure construction the Government estimates its value or cost. The nominated tenders need only submit a single sheet of paper with the amount of its bid. If no nominated bidder submit a price that is equal or are less than the Governments estimated value, the nominated bidders are requested to give another number until the a the bid price is submitted by one of the bidders that is equal to or a lesser number than the Government’s estimated value. The system enables the perception and often the reality that the contractors ultimately bid what the Government desires, even though the estimate is not published in advance. Using the recently enacted electronic tendering system the MILT now accepts bid under its CALS system. The tender that is required is not much different than before, it just requires the bid submittal via the internet. The award of the contract in most cases still is made on the basis the resulting acceptable bid amount.

In case of Governmental projects, once the winning tender is accepted, 40% (in case of local government projects it will be 30% or 40%) of the accepted tender is paid as advance payment when the contract is executed for a civil works infrastructure construction project. The justification is that contractors need a certain amount of the contract amount which enables them to purchase necessary equipment and materials. Originally, such an advance

payment was indeed made to contractors for purchasing necessary equipment and materials. However in the Japanese domestic civil works infrastructure construction market of today, the reality is that construction equipment can be rented on a daily basis and materials are readily available from suppliers with little delay.

There is the fundamental difference of understanding regarding a claim between the Japanese and English languages, for example. The Japanese dictionary says that a claim has the same meaning as “a complaint,” but not meaning a demand for something that is rightfully due to a party. This language dichotomy results in a different basis for handling contractual matters, such as, claims. Even though the Construction Business Law allows the contractors to submit claims (called petitions), contractors seldom submit to the Owner/Employer (the Government) official claim letters and other documents during the project execution. Hiding behind the concepts of dominance and a patronizing superior, the contractors do not submit claims based on allegations that the Owner/Employer (the Government) is demanding something for which the contractor has not bargained. Instead the letters or petitions appeal to the pride and the defined role of authority to do what is “right.” Typically the petitions are couched in terms of suggested or offered changes to what the Owner/Employer (the Government) originally intended or desired. In essence, claims in the domestic civil infrastructure construction market are “sekei henkou” “設計変更” which originally meant “design changes”. The reason why contractors use the “design change” is to convey to the Owner/Employer (the Government) that it changed the original design unilaterally and thus it needs to give the contractor the additional cost (and a time extension, if necessary). Thus, there are not claim documents submitted. The Owner/Employer (the Government) then calculates the value of time and cost for such acceptable changes according to its own unilateral figures and notifies the contractors accordingly. Thus all matters are settled on or before the final payment is made when the contractor formally “delivers” the executed project. The contractors are “forced to accept” this payment given the “design changes” that resulted from the contractor’s “proposed changes.” Despite the Construction Business Law, and the Contract and Standard Conditions of Contract for Public Works providing that the Government and contractor will “mutually agree,” most cases of civil works infrastructure construction actually are one-sided and settled by “the intentions” of the Government, and the contractors are seldom invited to participate in an official negotiation processes. Everyone usually is “satisfied” with the result, especially, since the Owner/Employer (the Government) is the source of 99% of civil works infrastructure construction.

Stakeholders who are not part of the paternalistic arrangement do not have any assurance of the “Transparency” of the process. In an attempt to give stakeholders, namely the public, a sense of transparency, the Government since 1995 has issued “reformed” laws that govern the way the domestic construction industry operates. The reforms were enacted in:

- April 1995: the Construction Industry Policy Codes
- July 1999: the Construction Industry Revival Program
- April 2002: the Reorganization Plan for Construction Industry

These reforms have only been cosmetic at best for civil works infrastructure construction, as discussed later. Little progress has been made in “upgrading transparency.” Little discernable progress has been made in achieving a system that assures the actual abuses or the perception of stakeholders that abuses will not occur in the future. The Construction Business Law is unaffected. The US Trade Representative has asserted that the reformation actions that these laws provide have led to conditions that have not changed, and the practices have not flowed down to the local governments.²⁷

Even in the realm of enforcement of these cosmetic changes to the laws governing construction of civil works infrastructure projects, the efforts of Japan to properly and effectively enforce the Antimonopoly Law by the Japanese Fair Trade Commission (JFTC) still require change. Despite new laws that have allowed a more rigorous enforcement, the JFTC still has not exhibited a corresponding increase in enforcement. JFTC only initiated seven criminal prosecutions since 1990 (only one since 1999).²⁸ There is continued use of vertical administrative guidance to individual companies, but which has the effect of encouraging horizontal acts, is only given a verbal lashing. For more than 50 years, government agencies have covered the illegal activities of businesses to prevent intervention by the JFTC by serving as a neutral arbiter and enforcers of cartel behavior. Nowhere has this been as effective as in the construction industry. For example, there has been progress in curtailing bid rigging, so called dango “談合”, but not in the construction of civil works infrastructure construction. The MILT issued new rules on bid rigging requiring nationwide suspension, if a Board of Directors and/or a senior manager of a contractor are complicit in bid rigging activities (whether for the MILT or not). Suspension under was increased from 9 to 12 months by the Bid Rigging Involvement Prevention Act. Yet, harsher treatment has been provided in other government contexts under the Antimonopoly Act. A mandatory clause in all contracts for construction and design/consultation issued by the MILT states that a mandatory pre-established damages of 10% of the contract value to be paid to the MILT for bid rigging. Among the actions taken to assuage critics, the MILT recently took measures to prevent the Economic Research Association and the Construction Research Institute from engaging in bid rigging.²⁹ Yet, the source and abuse of administrative guidance in the construction industry is the MILT itself, even with the slight increase in the penalties, the results are not a deterrent and have not increased transparency in the civil works infrastructure construction market.

C. The Fundamental Legal Basis for Global Standard Conditions of Contract for Civil Works

Most countries have socio-economic systems that embody some form of Western legal philosophy. These systems have been adopted or forced on countries all over the world. Most of the revolution that has globalized commerce in the last two centuries is based on Western legal principles. When the global community or individual countries have funded or financed civil works infrastructure projects, contracts and conditions of contract are similarly based on principles that underlie Civil Law and Common Law. One can immerse himself or herself in the idiosyncrasies in the study of comparative law between the laws of one country that is based on the Civil Law and of another country that is based on the Common Law. There is certainly a role for those who do so. But to work in the global market and engage in commerce does not require an understanding of such idiosyncrasies. In most countries of the world, civil works infrastructure construction is governed by the contracts and conditions of contract which are based on Civil Law and Common law. Although there are differences in the manner that Civil Law and Common Law jurisdictions reflect the legal principles, there really are few differences that are meaningful, and contracts based on one or the other are recognized and administered the same. Thus, these principles have shaped the manner in which Owner/Employers and contractors expect the other to act. A body of practice and expectations has developed for civil works infrastructure construction, and has evolved into "industry standards."

There are a number of principles that underlie contracts and conditions of contract for civil works infrastructure construction. A fundamental one is that the parties to a contract are recognized as equal. One party is not more dominant than another. It underlies all contracts, particularly contracts for construction. Even where one of the contracting parties is a government, the contractor is recognized as being equal. Unlike the Japanese Construction Business Law, the one party is not superior to the other. One party is not to "dominate, but also be patronizing" at the same time. There may be some provisions, however, for the protection of one party, where the other possesses superior knowledge or has an inherent capacity to gain the knowledge. Such clauses, however, are the exception rather than the rule.

A contractor merely commits to executing and delivering the constructed project. The Owner/Employer has an obligation to see that it receives that for which it will pay. The contractor only has to deliver a project that the Owner/Employer or his agent (the Engineer) that was has defined, in other words, the scope and quality in the design documents, and time specified. The contractor can expect that the design on which it is asked to give a price is based on that scope, quality and desired time of performance. It is presumed "constructible." If that is in error, the contractor is entitled to a demand of change to the scope, quality, time of performance, and/or cost. The Owner/Employer and the contractor agree not to interfere with each other, purposely or not. The Owner/Employer will provide interim payments provided the contractor performs and meets the interim measure – normally either on a percentage completion or some other measurable milestone.

The fundamental basis of contracts in global market is a concept if "mutual mistrust." What is meant by "mutual mistrust" is the Owner/Employer believes that the contractor inherently will try and execute and deliver some less than that for which is obligated; that is, the contractor will provide less scope or quality and/or take longer. The contractor believes that Owner/Employer will demand more than the contractor has agreed to execute and deliver; that is, the owner wants more scope or quality and/or delivery in less time. The Owner/Employer and contractor are expected to "protect" the benefit of their "bargain," as there is not "anyone who will do so for it." The allegedly injured party has an obligation to the offending party to give reasonable notices of its failure or the presumed failure to "live up to

the bargain.” The noticed party can agree, negotiate a solution, or dispute the assertion. Because the Owner/Employer and the contractor may have different interpretations of what each committed in the consummation of their bargain, there is a presumption that the allegedly injured party may go to courts to recover the benefit of its bargain. When a party does so, it is entitled to the bargain to which it agreed, nothing more or nothing less. The civil works infrastructure construction industry, however, has substituted for “resort to the courts” various alternative means of resolving such disputes, whether that is negotiation, determination, mediation (conciliation) and/or arbitration. Also, there is often means in the contract and conditions of contract of guaranteeing the other party is capable of living up to its bargain, such as, performance and payment guarantees.

These legal principles are reflected then in the contract and are defined by the terms or conditions of such contract. Although there are many form contracts and standard conditions of contract that accompany them used in the global market, one of the most widely accepted are promulgated by the Fédération Internationale des Ingénieurs-Conseils or FIDIC. The World Bank and its affiliate banks (for example, the Asia Development Bank and Japan Bank for International Corporation) require the use of a version of FIDIC contract for civil works infrastructure construction projects for which it provides some or all of the funding. Thus, must civil works infrastructure construction projects built in developing countries use the FIDIC documents, but with slight modification. The Standard Conditions of Contract primarily applicable to the World Bank’s funding of construction and engineering of civil works infrastructure are those set out in its *Guidelines: Procurement under IBRD Loans and IDA Credits (“Procurement Guidelines”)*.³⁰ The form of contract required for Bank-financed projects, under the *Procurement Guidelines*, borrowers are required to use: “the appropriate Standard Bidding Documents (SBD’s) issued by the Bank with minimum changes, acceptable to the Bank, as necessary to address country and project specific issues.” As of January 2004, the SBD’s of primary relevance to the procurement of construction and engineering works were:

- “Procurement of Works” (January 1995; latest revision March 2003 (SBDW));
- “Procurement of Works – Smaller Contracts” (January 1995; latest revision March 2003); and
- “Supply and Installation of Plant and Equipment” (November 1997, latest revision March 2003).

The use of the FIDIC contract and accompanying Standard Conditions of Contract assures the bank that most countries (even the under-developed and the developing countries) and the contractors who operate in the global market have a familiarity with their requirements. The parties are assured of having the same legal/commercial culture of “mutual mistrust.”

Similarly, the World Bank is concerned with assuring “transparency” in the process of making and administering grants and loans that are used to finance civil works infrastructure construction projects globally. The concepts of “mutual mistrust” are equally used in assuring transparency among Owner/Employers and contractors. The fiscal year that ended June 30, 2004 culminated several years’ effort to mainstream new functions and a culture of “mutual mistrust” within the World Bank Group. This work was undertaken against the backdrop of concerns raised by events in the United States, such as, the corporate scandals of Enron and WorldCom, as well as, the Parmalat scandal in Europe. These events drew increased attention to corporate governance issues, money laundering, and terrorist financing, and resulted in legislation, such as, the Sarbanes-Oxley statute in the U.S. The World Bank is trying to assure transparency by vigilance and training. The World Bank and its affiliates assume there is corruption or bribery in financing and execution of projects. Internationally, anticorruption instruments, such as, the OECD’s Anti-Bribery Convention and the U.N. Convention Against Bribery have demonstrated the international community’s determination

to fight fraud and corruption. Transparency International and other organizations have also played a significant role in raising awareness of the issue of corruption in the political arena. All of these developments focus attention on the use of development funds. It is through efforts by the World Bank and others to engage in an atmosphere of “mutual mistrust” and empowerment of stakeholders to intervene, that assures a culture that combats fraud and corruption and increases “transparency” of the process itself.

The World Bank published an Annual Report which summarizes the nature and the volume of the institutional integrity activities and investigations of the World Bank Group. The most recent is the report for the fiscal year ending June 30, 2004.³¹ In that report, the World Bank reported it has made significant progress in its capacity building and execution of these activities over the past five years. The World Bank established in April 2001, the Department of Institutional Integrity (INT) has handled over 1,300 cases and currently has over 300 active cases. The Bank now has a budget of US\$10 million for work in this area, making it by far the leader in resources committed among international institutions in the fight against fraud and corruption. As a result of these activities, the Sanctions Committee heard 16 cases involving alleged fraud and/or corruption by parties involved in Bank projects, leading to the debarment of 55 firms and 71 individuals in fiscal 2004.

On the internal side, the World Bank continued vigilance to ensure that the Bank’s own house is in order. The World Bank said that its “*staff must be beyond reproach in their personal and professional conduct.*” In terms of the Bank’s lending activities, the diversion of funds from development projects through fraud and corruption is considered an injury to the ability of the Bank, its partners and its borrowers to achieve the goals that have been set for poverty reduction. Resources lost to fraud and corruption are considered an unacceptable drain on development effectiveness, not to mention the damage to the credibility of lending institutions, such as, the World Bank itself. The money to pay a bribe must come from some part of the civil works infrastructure construction project; as a result, prices may be raised, and/or quality and performance lowered. Less qualified bidders win by bid rigging while qualified bidders become discouraged and stop bidding. In addition, citizen awareness of unchallenged corruption undermines trust in government and public institutions leads to acquiescence to poor quality and performance in public services and civil works infrastructure construction projects – and to an unwillingness to report fraud and corruption. All of these effects must be considered in assessing the true impact of corruption on publicly financed civil works infrastructure construction projects.

The Japan Bank for International Cooperation (JBIC) likewise demands that contracts and conditions of contract which govern the use JBIC ODA funds for civil works infrastructure construction employ concepts of “mutual mistrust.” As of March 1, 2004 JBIC described mission as one “to contribute to the sound development of Japan and the international economy and community through undertaking lending and other financial operations; for the promotion of Japanese exports, imports or Japanese economic activities overseas; for the stability of international financial order; and for economic and social development or economic stability in developing areas.”³² The Bank in 2005 revisions to its Handbook for Procurement under JBIC ODA Loans, declared that the revisions “*will contribute to a transparent and stable operation of the system, facilitate procurement procedures, and enhance capacity building in borrower countries.*” Thus, JBIC is committed to the spreading the “transparency” goals that are a part of today’s emerging global market.

In the recommendations on the Standard Conditions of Contract that are to be used for civil works infrastructure projects, JBIC built in the principles of “mutual mistrust” by requiring the use of FIDIC Standard Conditions of Contract. The reasons proffered for the use was “to facilitate perusal by bidders and review by JBIC.” The Bank only lends in the global market. Thus, recipient countries and global contractors would either know or learn about these

principles. JBIC even goes so far as to state that the full Table of Contents of the FIDIC documents is to be used as presented and then exceptions reflected in a separate section.

The legal principle of “mutual mistrust” is thus inherent in the global market, essential to international commerce, and fundamental to civil works infrastructure construction. In addition the principles of “transparency” enable abuses in the global civil infrastructure construction market to be minimized by adherence to codes of conduct and the empowerment of stakeholder to challenge the processes that are used.

D. How Global Standard Conditions of Contract Establishes Principles of “Mutual Mistrust”

The required use of Standards Conditions of Contract that are based on legal principles of “mutual mistrust” in turn require users to become familiar with the processes and skill sets which enable parties to function under terms that are familiar. It forces parties, whether owner/employers or contractor, to behave in an expected manner. Where there are variances from that bargain reached, parties must learn to measure change and how to present a case for resolution.

The Standard Conditions of Contract almost universally reflect the principle of “mutual mistrust” by weaving into the fabric of the obligations set forth therein. For example, the contract is defined as being all the documents which define obligations, project scope, project quality, the time of performance and the price. A typical provision would read:

“Contract” means the Contract Award, the Letter of Acceptance, the Letter of Tender, these Conditions, the Specification, the Drawings, the Schedules, and the further documents (if any) which are listed in the Contract Agreement or in the Letter of Acceptance.”³³

The “Letter of Tender” typically requires extensive commitments by the contractor to demonstrate his understanding of what the Owner/Employer requires. The “Specifications” and the “Drawings” describe what the Owner/Employer desires in terms of the scope and the quality. The “Schedules” include the details on the pricing, such as, unit prices and/or the lump sum amount, and a programme or schedule which demonstrates how the Contractor plans to execute the works. These submittals document that the contractor has included all scope and will meet the Owner/Employers timing. The Owner/Employer will provide defined quantities, if the contract is based on unit prices. The various commitments are thus defined as the basis of commitment by both parties. The “Letter of Acceptance” is the Owner/Employer’s acknowledgement that all is as requested and acceptable. The documents include the “Conditions” of Contract defining the obligations of the parties. The total package on a large global civil works infrastructure project can total thousands of pages of documents as to define what the Owner/Employer desires and thousands of pages in response by the contractor. Defining the bargain is the basis for “mutual mistrust.” It is in the preparation of the documents by the Owner/Employer and the contractor respectively that defines the assumptions and to what each has committed and represents their “bargain.”

Most civil works infrastructure projects take an extended period of time. Despite the effort that has gone into the preparation of the documents, change will happen. Under “mutual mistrust” the parties are given various mechanisms to inform the other party of changes, knowingly or unknowingly committed or required, which affects the bargain that a party made or thinks that it has made. The change may affect scope, the quality required, the time to execute the work, or the cost that can be charged. So, for example, the “Conditions of Contract” allow the parties to give notice to the other party of alleged or actual deviations or change. The notices are required to be in writing:

“Whenever these Conditions provide for the giving or issuing of approvals, certificates, consents, determinations, notices and requests, these communications shall be: ... in writing and delivered ... as stated in the Appendix to Tender ...”

Written notice must contain sufficient detail to give the party receiving the notice sufficient detail to take action.

“The Contractor shall give notice to the Employer whenever the Works are likely to be delayed or disrupted if any necessary drawing or instruction is not issued to the

Contractor within a particular time, which shall be reasonable. The notice shall include details of the necessary drawing or instruction, details of why and by when it should be issued, and details of the nature and amount of the delay or disruption likely to be suffered if it is late."

Typical contract clauses address give the Owner/Employer rights and require monitoring of the contractors performance all through execution:

"If the Contractor fails to carry out any obligation under the Contract, the Employer may by notice require the Contractor to make good the failure and to remedy it within a specified reasonable time."

Similarly, the Contractor is given comparable rights:

"If the Contractor considers himself to be entitled to any extension of the Time for Completion and/or any additional payment, under any Clause of these conditions or otherwise in connection with the Contract, the Contractor shall give notice to the Employer, describing the event or circumstance giving rise to the claim. The notice shall be given as soon as practicable, and not later than 28 days after the Contractor became aware, or should have become aware of the event or circumstances."

This notice gives the other party the opportunity to respond and/or take actions that are appropriate. But, the party must be diligent or the right is extinguished. Thus, for example, the Owner/Employer can have restrictions equally on its ability to object the contractor's portrayal of its commitments if the Owner/Employer believes the contractor is changing the terms of bargain. Such a clause regarding the programme or schedule would state:

"Unless the Employer, within 21 days after receiving the programme [project schedule], gives notice to the Contractor stating the extent to which it does not comply with the Contract, the Contractor shall proceed in accordance with the programme, subject to his other obligation under the Contract."

Conversely, the Contractor will lose his right to costs and/or a time of performance adjustment if he does not give timely notice. Such a restriction is contained in clauses such as the following:

"If the Contractor fails to give notice of a claim within such period of 28 days, the Time for Completion shall not be extended, the Contractor shall not be entitled to additional payment, and the Employer shall be discharged from all liability in connection with the claim."

As can be seen in the above clause, the principle of "mutual mistrust" dictates that the party giving notice and the party receiving notice must do so in a prescribed time. The right is not unending, thus the party has to constantly monitor the assumption or desires that underlie his commitments. So even in cases where one party is given a right, it can also be contained by the actions of the injured party. In the following clause the contractor is given the right to claim additional time of performance and/or cost from an error in the Owner/Employers requirements. But, the right is only exercisable if the error could not be found or seen by a contractor of experience:

"If the Contractor suffers delay and/or incurs Cost from executing work which was necessitated by an error [in the Employers documents], and an experienced contractor could not reasonably have discovered such error and avoided this delay and/or Cost, the Contractor shall give notice to the Engineer and shall be entitled ... to

- (a) an extension of time for any such delay ...
- (b) payment of any such Cost plus reasonable profit”

Also, when a noticed party responds, a similar commitment is placed on the original noticing party, such as, in the following:

“The Contractor shall give notice to the Employer whenever any work is ready [for inspection] and before it is covered up, put out of site, or packaged for storage or transport. The Employer shall then either carry out the examination, inspection, measurement or testing without unreasonable delay or promptly give notice to the Contractor that the Employer does not required to do so. If the Contractor fails to give the notice, he shall, if and when required by the Employer, uncover the work and thereafter reinstate and make good, all at the Contractor’s cost.”

“Conditions of Contract” thus force the parties to be always alert to what the other party is doing with respect to its obligations and commitments. A party must protect its bargain at all times or it suffers the consequences. Vigilance is mandatory. The timing and associated actions are mutual and equal. The Owner/Employer and the Contractor is each assumed to be knowledgeable and capable to protect its interests. The “Conditions of Contract” thus create an actual execution context of “mutual mistrust.”

¹ Beason, D., and Dennis Patterson, The Japan That Never Was, Explaining the Rise and Decline of a Misunderstood Country, State University of New York Press, Albany, New York, US, 2004.

² Beason, D., and Dennis Patterson, The Japan That Never Was, Explaining the Rise and Decline of a Misunderstood Country, State University of New York Press, Albany, New York, US, 2004.

³ The Construction Business Law, Chapter 3: Contract for Construction, Section 1: General Provisions, Article 18: Principle of Contract for Construction Work.

⁴ Van Wolferen, K., The Enigma of Japanese Power, Macmillan, New York, New York, 1990.

⁵ Dean, M., Japanese Legal System: Text and Materials, Cavendish Publishing Limited, London, UK 1997.

⁶ Benedict, Ruth, The Chrysanthemum and the Sword, Houghton Mifflin, New York, New York, US, 1946; paper back, Houghton Mifflin, New York, New York, US, 1989.

⁷ Miyazawa, S., “Taking Kawashima Seriously: A Review of Japanese Research on Japanese Legal Consciousness and Disputing Behavior,” 21 Law and Society Review 219, 1987.

⁸ Noda, Y., Introduction to Japanese Law, University of Tokyo Press, Tokyo, Japan, 1976.

⁹ Dean, M., Japanese Legal System: Text and Materials, Cavendish Publishing Limited, London, UK 1997.

¹⁰ Noda, Y., Introduction to Japanese Law, University of Tokyo Press, Tokyo, Japan, 1976.

¹¹ There are quite a number of administrative laws and regulations issued by both central and local governments by means of Cabinet Order (“Seirei”), Ministerial Ordinance (Shorei”), Local Ordinance (“Jorei”). There are also numerous Administrative Guidances (“Gyosei Shido”) in the construction industry and related areas.

¹² Takenaka v. Ministry of War (Great Court of Judicature, June 28, 1978, Meiji Zenki Dashinin Minji Hanketsu-roku 324).

¹³ Construction Business Act, Art. 18.

¹⁴ Construction Business Act, Art. 34.

¹⁵ Kawashima, T., “Risk Undertaking under Construction Contract,” Keiyakuho Taikei, Vol. IV, Japan, 1963. There are generally four types of authorities that are classified according to there level of acceptance: (1) prevailing view (“tu-setu”), (2) majority view (“Tasu-setu”), (3) minority view (“syosu-setu”), and (4) influential view (“yuryoku-setu”).

¹⁶ Arai, H., Treatise on Construction Contract, Tokyo, Japan, 1967; N. Nakamura, Owner’s Obligations and Contractor’s Obligations, Tokyo, Japan, 1982.

¹⁷ Arai, H., Treatise on Construction Contract, Tokyo, Japan, 1967.

¹⁸ Kawashima, T., “Dispute Resolution in Contemporary Japan,” contained in A. von Mehren (ed), Law in Japan: The Legal Order in a Changing Society, Harvard University Press, Boston, MA, US, 1963.

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- ¹⁹ Art. 19(1) & (2); Public Accounting Act, Art. 29-8(1); Budget Order, Art. 100 (1); Art. 3 of the Act concerning Avoidance of Delayed Payment of Subcontract Price; Budget Order, Art. 100-2 (1) (i).
- ²⁰ Wagatsuma, S., Lectures on Civil Code-Rights Obligations, Japan, 1962; Nohu v. Inomata, Niigata District Court (Takada Branch), November 14, 1963, 4 Kaminshu No. 11.
- ²¹ Public Accounting Act, 29-8(2); the Municipal Government Act, Law No. 67 (1947) has the same principle with respect to the main contract between a Local Government and a successful bidder. Akimoto v. Japan, Supreme Court, May 24, 1960, 14-7 Minshu 1154, Supreme Court ruled that a successful bid results in the creation of a preliminary contract that obligates the parties to conclude the construction contract and that such contract is made by means of a *written* form.
- ²² Iwasaki, O., Research on Construction Contract, 1987, at 21-41.
- ²³ F. Teramoto v. Wakayama-ken, Supreme Court, December 11, 1970, 24-12 Minshu 1854; Katsura Kogyo v. Takagaki Gumi, supreme Court, April 1, 1998, 52-3 Minshu 813.
- ²⁴ The Civil Code, Art. 667 through 688.
- ²⁵ US Trade Representative, 2005 National Trade Estimate Report on Foreign Trade Barriers, Washington, DC, US, 2005.
- ²⁶ Kusayanagi, S., Build Up New Project Execution System for Up Grading Transparency of Construction Industry in Japan – Transfer from Two Actors Project Execution System into Three Actors System, Kochi, Japan, 2004.
- ²⁷ US Trade Representative, 2005 National Trade Estimate Report on Foreign Trade Barriers, Washington, DC, US, 2005.
- ²⁸ Beeman, M., “Japan’s Flawed Antitrust Regime,” The Friendship Commission Public Policy Series. Japan Information Access Project, November 11, 1999.
- ²⁹ Third Report to the Leaders of the US-Japan regulatory Reform and Competition Policy Initiative, June 8, 2004, page 29 and 30.
- ³⁰ Available from the World Bank, Washington, D.C., US.
- ³¹ The World Bank Group, “On Investigations and Sanctions of Staff Misconduct and Fraud And Corruption In Bank-Financed Projects Fiscal Year 2004,” Department of Institutional Integrity, The World Bank, Group, Washington. DC, USA, February, 2005, www.worldbank.org/integrity
- ³² Japan Bank for International Cooperation, “Profile,” Tokyo, Japan, 2004; www.jbic.go.jp.
- ³³ All clauses quoted are based on comparable clauses in FIDIC Conditions of Contract for Construction for Building and Engineering Works Designed by the Employer, General Conditions, First Edition 1999, ISBN 2-88432-022-g.

III. Project Management, Contract Administration and the Requirements of Standard Conditions of Contract for Civil Works in the Global Market

A. What Is Required and What Skill Sets Are Required of Personnel Operating in a Culture of "Mutual Mistrust"

When the "Conditions of Contract" are standardized, then both parties are aware of the "mutual mistrust" obligations from experience with the forms. Both parties can train personnel in the means of monitoring, controlling, and executing its performance to assure it receives the benefits of the bargain made. Also, the same is true in monitoring and notifying the other party of its failure to live up to the bargain, whether inconsequential or significant. The question then becomes, "given the requirements of 'mutual mistrust,' what are the proper skill sets for personnel in either the employ of the Owner/Employer or a Contactor to possess?" And the next question is then: "do personnel in the Japanese construction industry, and specifically the civil works infrastructure construction segment, possess these skills sets?"

In order for a party to monitor its bargain, the party must record the definitions and/or assumptions that its bargain represents in the contract that was consummated. The contract documents and/or the "source" documents that were "rolled up" must establish what it intended. Thus, the Owner/Employer relies upon the "drawings and specifications" in the Contract to define what it required as far as scope and quality. The Owner/Employer "source documents" will include documents that are "code" requirements. The code provisions are legal requirements that are defined by reference to the actual building or construction code, such as, a code for a particular concrete mix or its use in a particular circumstance. These code requirements are included by reference in the language of the specifications. The code requirements typically are used to define the quality that is expected. In addition, Conditions of Contract in international construction may require performance to "High International Standards" or some variation, such as, "good industry practice," "perform to internationally used practice," etc.¹ Contractual language for civil works infrastructure projects require that actual performance meet this standard, but with little additional definition or guidance. A recent global civil works infrastructure project provides typical language regarding such a performance standard:

"...the exercise of that degree of skill, diligence and care including compliance with all Directives which would reasonably and ordinarily be expected from a skilled and experienced contractor, equipment manufacturer or operator engaged in the same type of undertaking under the same or similar circumstances."

The standards are recognized internationally by the parties that are active in the global market, so that there is a metric against which performance is measured. The Contractor equally must have standards. They exist in the global market, are recognized internationally and are a basis for measurement or a "metric."

For the contract documents, the Contractor must respond to the requirements of the Invitation to Bid. For example, the Owner/Employer may require a schedule of unit prices be developed. The Contractor relies on the quantities that are given in the Invitation to Bid. Then the Contractor must define the "means and methods" and resources (equipment, materials, labor, etc.) that it will use to execute what the Owner/Employer has specified in the Drawings and Specifications. The costs that will be incurred to provide the resources must be related to the unit price quantities and to the time the Owner/Employer demands or that it plans to execute the works. The Contractor is typically required to produce a

programme or a schedule that logically records the timing of the resource use, and demonstrates what actions of the Owner/Employer are required and when in order to meet the scheduled dates. The costs are recorded in the unit prices based on the timing and the resources that are used. The “source documents” are the recordation of this information. This information may become part of the submittals that the Contractor submits in his tender, or become the records that the Contractor submits at various defined intervals in the Conditions of Contract. Either way, the documents record the assumptions that the Contractor assumed were necessary to meet the Owner/Employer’s scope, quality, or time of performance.

Once the bases of the bargain are recorded, then the process of executing the project begins. The systems of monitoring for conformance or change from that which either party defined or assumed must then be used during project execution to monitor the other parties performance. This monitoring becomes a metric for measuring the deviations from the project in a timely manner that is the essence of “mutual mistrust.” It also becomes the means for providing timely notice that is built into most civil work infrastructure project Conditions of Contract. Collectively, these two steps of preparing a base and monitoring are known as Contract Administration.

These techniques of Contract Administration became the backbone of a new international profession called “Project Management.” In the 1950’s project management was recognized as a separate management function and specialized management methodology different from management methods employed in government or corporate business. Now, half a century later, project management has evolved into global standards that are generally accepted and employed.²

With globalization, practitioners in all sectors, but especially civil works infrastructure construction projects, demanded the need for even greater project management development and standardization. This clamor was greatest in the areas of Contract Administration because it is fundamental to successfully operating under the principle of ‘mutual mistrust’ which is required in the global market. For example, standardization must follow a uniformity of a body of knowledge that can be employed in accomplishing suitable education and practical training, and most importantly project execution. The benefits of standardization are continued development of Contract Administration and project management knowledge, education, training and execution based thereon. There is, however, another tangible result is achieved. Parties of diverse cultural and commercial backgrounds develop common understandings and common execution-performance expectations. Both understandings and expectations lead to anticipatable management approaches, communication, and efforts. Ultimately, improved project management leads to reduced risk of execution problems and disputes. Management and commercial decision making becomes reasonably prudent and vastly improved. The result: Projects are successful and parties meet their goals.

A standard, as commonly defined by the International Standards Organization (ISO), is a non-mandatory and non-legal compilation of generally accepted and used practices. A standard assumes there is a generally common body of knowledge. Thus, the question first becomes: is there a global, generally accepted common body of knowledge for project management that reflects the Contract Administration needs of the global market for civil works infrastructure construction?

Project management professional organizations and the academic community globally have reached consensus on project management standards that flow from a body of knowledge. Although professional organizations have evolved in the last half century to serve the developing profession, only in the last two decades has there been effort to establish standards through development of a body of knowledge by such organizations. In 1999 the

Global Project Management Forum Steering Committee representing a growing group of such organizations began the laborious process of developing a global standard. Ultimately they formed the Global Working Group to develop a globally agreed body of knowledge for project management as the knowledge base for a transferable global competency standard for project management.

The Global Working Group identified existing generic standards after defining “attributes for being global.” The specific attributes included whether the standards were:

- Relevant
- Useful
- Acceptable
- Applicable
- Meaningful
- Used
- Valued.³

These criteria are “generally accepted industry practice” and as such represent the generally accepted civil works infrastructure construction practice in the global market – practice that is based on “mutual mistrust.”

The Global Working Group chose the PMBOK Guide (Project Management Body of Knowledge Guide published and updated by the Project Management Institute). The Project Management Institute (PMI) is composed of global members who engage in the management of projects, as distinct from general management of industrial functions. The PMI certifies members who are competent in these Contract Administration techniques and engage in the profession of Project Management. Since 1996 the certification of PMP's and its professional recognition have grown almost exponentially. As of April 2004 there were 140,000 PMP's⁴ around the world with new certifications growing currently by several thousand per month. The current PMBOK Guide is available in five languages.⁵ In September 2005 the PMP examination will expand to the next PMBOK Guide update which was released in late 2004.

Also, as noted in late 2001, the PMBOK Guide

“...is concerned with the processes and knowledge areas for managing a single project. That is very different from developing the organizational capabilities that underpin the enterprise wide processes for managing the totality of projects in an organization and linking those projects to the corporate strategy. To address this broader concern, PMI [issued] a group of projects organized as the Organizational Project Management Maturity Model (OPM3) as a PMI standard...[since] there is a growing recognition that project management involves more than the skillful and competent management of individual projects. It [is a] set of the systems, processes, structures and capabilities that enable an organization to undertake the right projects, and to support them organizationally.”⁶

This additional OPM3⁷ standard adds to the body of knowledge and expands global standards to include organizational aspects of those firms or organizations actually involved in the execution of multiple projects at any one time in the global market. Thus, there exists globally recognized and accepted body of knowledge that represents standards that will enhance the execution of projects globally within organizations and as an organization. OPM3 meets the key challenge facing parties in a “mutual mistrust” project execution world, that is, the availability and use of these standards provides metrics against which performance can be evaluated. The standards are used concurrently with execution or in

hindsight to judge whether project management contract administration meet required “high international standards.”

These standards are being used to certify professional competence of organizations and of personnel that are engaged in the global market. The author in 1984 was one the first 44 individuals to be certified as a Project Management Professional (PMP) based upon the standards that had been promulgated in the first edition of the PMBOK. Today, every PMP must continue to be certified every two years to the latest edition of the PMBOK. As of mid-2005, there are 120,000 PMP's globally, and the number is growing monthly. Today, PMI holds annual global congresses in Asia; North America; Europe, the Middle East and Africa; Latin America (Central and South America). The author has been involved in the global standards development through his peer reviewed papers and lectures. As a PMP, the author uses PMBOK standards and evaluates contract administration and project management practices in relation to civil works infrastructure construction projects globally. The author actively promotes PMBOK's use to improve the execution of projects on six continents and to see that these global standards of contract administration and project management in fact are generally accepted and used in global civil works infrastructure construction projects. These standards reflect best of global industry practice in fulfilling the needs of parties in the global market who are executing the projects in a “mutual mistrust” environment. In the following sections of this chapter, the use of these PMBOK standards to perform project management and contract administration is explained and developed through actual examples from the global market.

B. Project Management and Contract Administration Requirements

The standards for defining Project Management and Contract Administration define what is expected in the global market. The natural tension that must exist for parties to successfully manage a project under the conditions of contract results in expected behaviors which are existent and expected as a result. Thus, the Guide to the Project Management Body of Knowledge (PMBOK) is the generally accepted and internationally recognized basis for project organizational theory and project management philosophy in use today.⁸ The PMBOK establishes a general systems theory of project management and provides the global market's accepted framework for developing project management structures and practices for executing large, complex projects, such as, civil works infrastructure construction projects.

PMBOK provides the general and broad definition of project management:

“Project Management is the application of knowledge, skills, tools, and techniques to meet project requirements. Project management is accomplished through the use of the processes such as: initiating, planning, executing, controlling, and closing. The project management team manages the work of the projects, and the work typically involves:

- 1. Competing demands for: scope, time, cost, risk and quality.*
- 2. Stakeholders with differing needs and expectations.*
- 3. Identified requirements.”⁹*

Every project involves dynamic tension between parties. Each party enters the project with a preconceived set of assumptions, demands and expectations as to its own role in the project. Each party also enters a project with a preconceived idea of the roles that others will play in that project. These internal and external expectations tend to be somewhat competitive in nature. For example: an Owner/Employer's desire to contain or reduce cost yet the Owner/Employer specifies a code requirement that defines an acceptable level of quality for which the Contractor gave a fixed price. A potential conflict results over the bargain, namely, the Owner/Employer's desire to use higher grade materials than necessary without regard to the Contractor's cost. These competing demands and expectations must be kept in balance, if the project is to fulfill the expectations of any of the parties involved. It is the role of the project manager to establish and maintain a dynamic balance between the stakeholders. Without strong, competent project management, the natural tensions which exist within a project based on “mutual mistrust” will quickly lead to situations in which the balance between stakeholders and project constraints is broken.

Using PMBOK as the framework, discrete elements of project management are used to evaluate the development and application of project management procedures and project execution. The nine Project Management Knowledge Areas identified within the PMBOK are:

- Project Integration Management
- Project Scope Management
- Project Time Management
- Project Cost Management
- Project Quality Management
- Project Human Resource Management
- Project Communications Management
- Project Risk Management
- Project Procurement Management

PMBOK is thus a means of managing a particular stakeholder's role in a project, and in evaluating a stakeholder's performance. In all cases it establishes the expected behavior, and the parties are expected to protect the benefits of the bargain.

The process of protecting the benefits of a bargain begins with the project management personnel using the tools and the data to record and develop the assumptions for execution and for management of the project. Contract Administration under a culture of "mutual mistrust" is a process of continuously evaluating and trending of "how the project is doing" when measured against the plan. When the project is found to be trending or deviating from plan, the project management team must identify the potential causes and the party responsible. For example, if the Owner/Employer's project management team through its Contract Administration efforts finds the cause and responsible party to be the Owner/Employer, then it is up to the project management team to identify and implement actions to minimize the impacts, that is, manage the result. It is the function of Contract Administration to spot the trend or the issue as early as possible. If the application of Contract Administration leads the Owner/Employer project management team to conclude the Contractor is causing and is responsible for the potential impacts, proper notice as required by the Conditions of Contract, must be timely given to the Contractor. Further, the Owner/Employer's project management staff must prepare analyses that demonstrate the non-compliance with the Owner/Employer's requirements – the benefits of its bargain. The converse is equally true of the Contractor's project management team. Therefore, a primary responsibility in the global market for civil works infrastructure construction projects is Contract Administration throughout the project duration. The types of requirements for Project Management under PMBOK and the Contract Administration examples are organized by the nine PMBOK knowledge areas.

1. Project Integration Management

According to the PMBOK, Project Integration Management concerns processes intended to ensure that a project has been thoroughly defined, that an execution management plan is developed and implemented, and that changes are controlled according to set procedures at the onset of the work. PMBOK states:

*"The Project Integration Management Knowledge Area includes the processes and activities needed to identify, define, combine, unify, and coordinate the various processes and project management activities. ... integration includes characteristics of unification, consolidation, articulation, and integrative actions that are crucial to project completion, ...other stakeholder requirements and managing expectations."*¹⁰

The integration effort defines interactions and relationships among the project management processes. For instance, project scope changes may affect the budgeting, scheduling, quality and other management processes. Project integration requires that these processes are linked through established plans and procedures. Integration continues throughout the entire duration of the project as revisions to the integrated plans and systems are made in recognition of changes which occur in actual project conditions. It is an iterative endeavor that first involves creating a realistic and comprehensive project plan, and managing changes to the plan through a change management process. Adhering to the plan and following change control procedures developed during the project planning is essential to maintaining control of scope, cost, schedule, and product quality. For example, scope, time, cost and quality tradeoffs are often competing performance objectives that must be managed, controlled and weighted against each other to achieve project objectives. Balancing these competing objectives and tradeoffs, and building priorities into the project plan is essential at the onset of the Project.

PMBOK characterizes Project Integration Management as having seven discrete, but interconnected and overlapping management processes:

1. Develop Project Charter
2. Develop Preliminary Project Scope Statement
3. Develop Project Management Plan
4. Direct and Manage Project Execution
5. Monitor and Control Project Work
6. Integrated Change Control
7. Close Project

From a Contractor's perspective, the PMBOK notes that the Project Charter is concerned with documenting the Owner/Employer needs, the Contractor's current understanding of the product or service, and the intended project outcome. Regarding the Development of a Preliminary Project Scope statement, PMBOK requires the development of a preliminary initial project scope statement objectives; service requirements and characteristics; acceptance criteria; boundaries; requirements and deliverables; constraints; initial project organization; initial defined risks; schedule milestones; a Work Breakdown Structure (WBS); an order of magnitude cost estimate; configuration management requirements; approval requirements; etc. The contractor establishes all the assumptions that went in to its commitments or were necessary to define its bargain under the contract. The Owner/Employer may require these assumptions (not usually to the same level) in the tender documents to assure that the contractor is committing to deliver what it desires. The Development of a Project Management Plan assures the Owner/Employer and the Contractor respectively, it has the tools and processes established and that are necessary to execute the project and deliver required notices. Thus, for example, a typical Project Management Plan and its subsidiary plans will include:

- The project management processes selected by the project management team;
- The level of implement of each selected process;
- The descriptions of the tools and techniques to be used for accomplishing those processes;
- How the selected processes will be used to manage the specific project, including the dependencies and interactions among those processes, and the essential inputs and outputs;
- How work will be executed to accomplish the project objectives;
- How changes will be monitored and controlled;
- How configuration management will be performed;
- How integrity of the performance measurement baselines will be maintained and used;
- The need and techniques for communication among stakeholders;
- The selected project life cycle and, for multi-phase projects, the associated project phases; and
- Key management reviews for content, extent, and timing to facilitate addressing open issues and pending decisions.

The Owner/Employer and the Contractor will each prepare a Project Manual that contains procedures, etc. that it will use on the project. In fact, this requirement is what the PMBOK

OPM3 standard addresses: systems, processes, structures and capabilities that enable it as an organization to undertake the right projects, and to support them consistently as an organization. A Project Manual typically would define:

- Project Management Plan
- Project Orientation Package
- Vendor Document Management Plan
- Project Communications Control Program
- Project Quality Plan
- Project Engineering Execution Plan
- Procurement and Erection Specifications
- Computer-aided Design and an Information Technology Execution Plan
- Project Procurement Plan
- Material Management Plan
- Construction Execution Plan
- Site Safety and Health Plan
- Site Environmental Plan
- Startup Plan
- Project Controls Execution Plan
- Change Management
- Project Closeout Plan
- Requests for Change Order

The Project Execution Plan defines what the party expects to perform and what it will record to monitor its execution and the other parties' execution. Thus, PMBOK requires that a party define execution, such as, the following tasks:

- Perform activities to accomplish project objectives and supply project deliverables;
- Expend effort and spend funds to accomplish the project objectives;
- Staff, train and manage the project team members assigned to the project;
- Obtain quotations, bids, offers, or proposals as appropriate;
- Select sellers by choosing from among potential sellers;
- Obtain, manage and use resources including materials, tools, equipment, and facilities;
- Implement the planned methods and standards;
- Create, control, verify and validate project deliverables;
- Manage risks and implement risk response activities;
- Control project scope and requested changes;
- Implement change requests;

- Implement corrective action;
- Implement preventive action;
- Adapt approved changes into the project's scope, plans and environment;
- Establish and manage project communication channels, both external and internal to the project team;
- Collect project data and report cost, schedule, technical and quality progress and status information to facilitate forecasting;
- Collect and document lessons learned, and implement approved process improvement activities.

The Owner/Employer or the Contractor is required to similarly monitor such execution. PMBOK defines such monitoring processes to include:

- Comparing actual project performance against the project management plan;
- Assessing performance to determine whether any corrective or preventive actions are indicated, and then recommending those actions as necessary;
- Analyzing, tracking and monitoring project risks to make sure the risks are identified, their status is reported, and that appropriate risk response plans are being executed;
- Maintaining an accurate, timely information base concerning the project's products and their associated documentation through project completion;
- Providing forecasts to update current cost and current schedule information; and
- Monitoring implementation of approved changes when and as they occur.

Objective monitoring to assess performance and implementation of corrective actions in a timely manner to bring Project performance in line with the Project plan, or make necessary revisions to the project plan is essential. According to PMBOK:

*"The project management plan, the project scope statement, and other deliverables must be maintained by carefully and continuously managing changes, either by rejecting changes or by approving changes so those approved changes are incorporated into a revised baseline."*¹¹

Finally, the PMBOK states in regards to Project Integration Management that:

*"The Close Project process involves performing the project closure portion of the project management plan."*¹²

The result for both the Owner/Employer's or the Contractor's project management personnel, Project Integration Management is assurance that it has recorded the basis of the bargain to which it committed, the means of monitoring its and the other parties compliance with the bargain, and managing the execution of the project as a result.

Thus, when a Contractor on a civil works infrastructure construction project presents a notice to the Owner/Employer the Contractor's project management staff has to establish what it assumed in his bid or tender documentation. For example, the author determined for the Contractor's project management staff in the preparation of a claim for extra compensation as a result of the actual execution conditions would that were experienced on a civil works

infrastructure construction project in Mexico¹³ submitted the following to demonstrate what it had anticipated and what the Owner/Employer actually had caused during the execution of the project:

The lump sum Engineer-Procure-Construct (EPC) approach to executing a civil works infrastructure project was an appropriate delivery method for this Project. Many of the characteristics of this Project reflect the reason a lump sum EPC approach was employed. The Owner/Employer's primary interest was to commence operation of the Project to incur the benefits as soon as possible in the geographic region. The lump sum EPC contract approach enabled the Owner/Employer to set its performance and quality criteria, to determine requirements and technologies, purchase long lead main equipment for its chosen technologies, and to have a single entity to which it looked to provide the completed Project with minimal oversight, interference and changes by the Owner/Employer. The Contractor's responsibility was to perform engineering, procurement and construction necessary to meet the contract criteria employing its professional judgments.

The Owner/Employer had engaged a separate engineering company to provide it with the necessary project management expertise. The Contract describes the consultant's project management role, called the 'Supervisor, as:

"14.2 Authorized Representatives of the Owner/Employer

14.2.1 Supervisor. Before commencement of the Work, Owner/Employer shall appoint the resident supervisor ("Supervisor"), who shall be directly responsible and who shall have full power and authority, either personally or through his designated deputies, to inspect, oversee, monitor, and review the Work and the compliance by the Contractor with its obligations under this Contract. The designation of the Supervisor may be made to a third party. Except as otherwise specified in this Contract or in a written notice issued by the Owner/Employer Project Management, The Supervisor shall serve as the direct representative of the Owner/Employer to the Contractor and to third parties for matters associated with the performance of the Work at the place where it is being carried out. The Contractor shall provide its full cooperation to the Supervisor or to the designated deputies of the Supervisor during any inspection of the Work, and shall provide any information or assistance reasonably requested by said Supervisor."

Using a matrix first presented at an international congress to assist Owner/Employers in selecting the proper project delivery method and project contract type for various execution conditions and contexts, the author presented what the parties expected by adding an additional column that was specific to the projects and shading various selection criteria that were similar. The selection criteria shaded demonstrated what the criteria used would communicate to the global civil works infrastructure construction industry about the projects characteristics and the execution conditions and context that could be expected. These considerations are set forth in the following Table III.B.1.1. The final column reflected the execution conditions and context that the Contractor reasonably would have expected from the Owner/Employer issued contract for preparing the contractor's bid and documents included in the Contractor's tender, and then indicated through the highlighting items that were common.

**TABLE III.B.1.1
PROJECT EXECUTION CONDITIONS AND CONTEXT EXPECTATIONS**

Choosing the Preferred <u>Project Delivery System</u> and <u>Contract Type</u> Resultant Industry Expectations ¹⁴						
	Project Delivery System		Contract Type			This Project's Expected Conditions and Context
	Conventional Tender on a Completed design	EPC	Lump Sum	Unit Price	Cost Reimbursable	
Owner Considerations and Requirements						
Cost Control is Major Consideration		✓	✓			✓
Owner to Control Contingency	✓	✓			✓	
Bid Competition Required	✓	✓	✓	✓		✓
Maximum Owner Involvement	✓				✓	
Minimum Owner Involvement		✓	✓			✓
Owner Has No Oversight Capabilities		✓	✓			
Single Source Responsibility		✓	✓	✓	✓	✓
Contractor Provides Project Funding		✓	✓			
Project Scope and Parameters						
Clear Scope Definition	✓	✓	✓			✓
Minimal Scope Definition	✓				✓	
Scope/Complexity Defined, Quantities Uncertain	✓			✓		
Minimal Scope Changes Expected	✓	✓	✓			✓
Potential for Large Scope Changes	✓			✓	✓	
Tight Schedule		✓	✓	✓	✓	✓
Volatile Project Environment	✓	✓			✓	
Stable Project Environment	✓	✓	✓			✓
Large Complex Project	✓	✓	✓	✓		✓
Primarily New Technology	✓	✓			✓	

The contractor was shown by the author to have expected a Lump Sum Turnkey, EPC contract. By using the actual Unit Prices, the contract was converted into a lump sum price. The contractor could only use the unit prices for 'extraordinary work' and for actual quantities that could only exceed those specified in the contract documents. Thus, the author showed the Owner/Employer had communicated to the contractor that it should assume that the Project was well defined, scope changes would be minimal, the aggressive schedule (programme) could be met, and the Owner/Employer and Supervisor involvement would be directed at assurance only and cooperating in achieving the result contracted – the bid documents suggested a basis for the bid that was consistent with the expectations

shown in the above table. Another words, the Contractor had the reasonable expectation that the characteristics set forth by the highlights in the Table III.B.1.1 would prevail during the project execution.

Based on industry practice, the nature of this delivery system and this type of contract, the author demonstrated that the Contractor would reasonably expect that:

- The Contract Documents it was asked to tender defined a complete and accurate scope of work.
- The obligation of the Contractor would be to provide only what was specified in the documents in a cooperative context with reasonable levels of the supervisors involvement.
- If the Owner/Employer or its Supervisor demanded changes, the Contractor would be granted time and compensation.
- The Contractor could use an approach to project execution that would not require a large project team, such as, would be necessary for reimbursable contract that inherently had a great amount of Owner/Employer or its Supervisor's involvement and consequent large contract administration needs.
- The Owner/Employer and the Supervisor would cooperate and not interfere with the completion of the work, and if it did interfere, the Contractor would be granted commensurate time extensions and compensation for the impacts that resulted.
- The Owner/Employer would timely provide all required information, Owner/Employer equipment, and other project interfaces required by the Conditions of Contract.

The Author then summarized the responsibilities the Owner/Employer had undertaken by the Conditions of the Contract and that they were consistent with industry practice, and further that the expectations of the contractor were consistent with the Table III.B.1.1 for a fixed price EPC contract. The Author prepared Table III.B.1.2 that listed all such responsibilities that the Owner/Employer failed to perform (presented in part below):

TABLE III.B.1.2 SUMMARY OF OWNER/EMPLOYER KEY RESPONSIBILITIES UNDER THE CONTRACT THAT WERE BREACHED			
Description of the Owner/Employer Responsibility	Responsibility of the Owner/Employer	Owner/Employer Assurance Role	Owner / Employer Information / Cooperation Role
<input checked="" type="checkbox"/> Responsibility Defined or Implied by Contract <input type="checkbox"/> Conditional upon Circumstances			
Accuracy of bid documents	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Inconsistencies between contract documents and instructions given to the Contractor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Discrepancies and divergence between contract documents	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

**TABLE III.B.1.2
SUMMARY OF OWNER/EMPLOYER KEY RESPONSIBILITIES
UNDER THE CONTRACT
THAT WERE BREACHED**

Description of the Owner/Employer Responsibility	Responsibility of the Owner/Employer	Owner/Employer Assurance Role	Owner / Employer Information / Cooperation Role
Divergence between contractually specified work and the Supervisor's instructions	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Errors and inconsistencies in the contract documents	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Divergence between international statutory requirements and the contract documents	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Discrepancies and divergence between the contract documents and descriptive schedules	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Obligation to modify the Contract as per Clause 5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Errors and omissions in information included in the specified work	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Errors in quantity or description, or omission in bills of quantity	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Discrepancies in Owner/Employer-specified requirements	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Ambiguities and discrepancies contained in drawings and documents	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Owner/Employer additions, omissions and substitutions of the work	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Owner/Employer and Supervisor failures to provide information, drawings and instructions to suit the Contractor's actual progress	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Failure to provide OFE in accordance to contractual dates	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Failure to ship OFE assembled as required by Contract	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Failure to issue OFE in good working order	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Failure of Owner/Employer or the Supervisor to reply to communication within specified time period	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

**TABLE III.B.1.2
SUMMARY OF OWNER/EMPLOYER KEY RESPONSIBILITIES
UNDER THE CONTRACT
THAT WERE BREACHED**

Description of the Owner/Employer Responsibility	Responsibility of the Owner/Employer	Owner/Employer Assurance Role	Owner / Employer Information / Cooperation Role
Owner/Employer or Supervisor delay issuing instructions, drawings, and other info	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Owner/Employer or the Supervisor's failure to provide information, drawings and instructions in accordance with the time schedule or at a time reasonable in all the circumstances	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Delay or cost caused by the Owner/Employer or others (e.g., Owner/Employer subcontractors) which impacted the Contractor and its suppliers and subcontractors	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>
Owner/Employer interference that precluded the Contractor's execution and completion of work in a specific order	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Owner/Employer restriction of access to any part of the site	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Unreasonably inaccurate approximated quantities, particularly in steel tonnage estimates	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Errors in position, levels, dimensions and alignment of the works	<input type="checkbox"/>		<input type="checkbox"/>
Necessary corrections and modifications to assumptions relied upon by the Contractor that defined the scope of work	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Alterations to standards of materials and goods	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Changes in position and dimensions of the platforms	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Changes imposed upon the Contractor's and its intended sequencing of works	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Necessary postponement and suspension of work for safety reasons due to the	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

TABLE III.B.1.2 SUMMARY OF OWNER/EMPLOYER KEY RESPONSIBILITIES UNDER THE CONTRACT THAT WERE BREACHED			
Description of the Owner/Employer Responsibility	Responsibility of the Owner/Employer	Owner/Employer Assurance Role	Owner / Employer Information / Cooperation Role
Owner/Employer or its subs			

As the contractor set forth in its claim document, ultimately the civil work infrastructure construction project execution conditions and context took on the characteristics of a cost reimbursable contract while the Owner/Employer demanded that the Contractor compliance that was consistent with a lump sum contract. The Contractor alleged the Owner/Employer used the lump sum contract as means for not compensating the Contractor fully for the time and cost impacts that the Owner/Employer's performance failures caused.

The Author then demonstrated through following Table III.B.1.3 that the conditions and context that the Contractor alleged matched a different delivery method and contract type, based upon the actual execution conditions and context, The Author employed the same original table as material that was used in Table III.B.1.1 and this time added a different last column and highlighting. The last column now reflects what actually occurred as the Project was executed. The actual conditions and context reflect the precise reasons and expectations that would have been the case if a reimbursable contract had been used, as is highlighted in Table III.B.1.3 below.

TABLE III.B.1.3 PROJECT ACTUAL EXECUTION CONDITIONS AND CONTEXT						
Choosing the Preferred <u>Project Delivery System</u> and <u>Contract Type</u> <u>Resultant Industry Expectations</u>						
	Project Delivery System		Contract Type			The Actual Project Conditions and Context Experienced
	Conventional Tender on a Completed design	EPC	Lump Sum	Unit Price	Cost Reimbursable	
Owner Considerations and Requirements						
Cost Control is Major Consideration		✓	✓			
Owner to Control Contingency	✓	✓			✓	✓
Bid Competition Required	✓	✓	✓	✓		✓
Maximum Owner Involvement	✓				✓	✓
Minimum Owner Involvement		✓	✓			
Owner Has No Oversight Capabilities		✓	✓			

<p align="center">TABLE III.B.1.3 PROJECT ACTUAL EXECUTION CONDITIONS AND CONTEXT</p>						
<p align="center">Choosing the Preferred Project Delivery System and Contract Type Resultant Industry Expectations</p>						
	Project Delivery System		Contract Type			The Actual Project Conditions and Context Experienced
	Conventional Tender on a Completed design	EPC	Lump Sum	Unit Price	Cost Reimbursable	
Single Source Responsibility		✓	✓	✓	✓	✓
Contractor Provides Project Funding		✓	✓			✓
Project Scope and Parameters						
Clear Scope Definition	✓	✓	✓			
Minimal Scope Definition	✓				✓	✓
Scope/Complexity Defined, Quantities Uncertain	✓			✓		✓
Minimal Scope Changes Expected	✓	✓	✓			
Potential for Large Scope Changes	✓			✓	✓	✓
Tight Schedule		✓	✓	✓	✓	✓
Volatile Project Environment	✓	✓			✓	✓
Stable Project Environment	✓	✓	✓			
Large Complex Project	✓	✓	✓	✓		✓
Primarily New Technology	✓	✓			✓	

As the Project unfolded, by the Author demonstrated the contractor correctly was asserting that its Project tender reflected reasonably expectations (see discussion re: Table III.B.1.1) that were not experienced as reflected in Table III.B.1.3 because of the Owner/Employer refused to abide by the bargain that the Contractor had assumed. The one party (the contractor) was giving notice that under a culture of “mutual mistrust” the other party (the Owner/Employer) had not lived up to bargain that had been reached and for which the parties had contracted.

2. Project Scope Management

Project Scope Management concerns with what is and is not within the project’s scope and then controlling it. Thus, whether project management is done for the Owner/Employer or the contractor, there is a natural tension in civil works infrastructure construction projects between the parties. The scope goes to the essence of the bargain between the parties. The PMBOK requires the following elements:

1. Scope Planning
2. Scope Definition
3. Creation of a Work Breakdown Structure (WBS)

4. Scope Verification
5. Scope Control

Scope Planning is the process for an Owner/Employer defining what the scope is desired, what will be included in a Work Breakdown Structure (WBS), and what is required for verification. For the contractor Scope Planning is how the scope required will be defined, how a WBS will be prepared, and how the verification of the scope will be provided. Scope Definition for an Owner/Employer sets forth the deliverables, and for the contractor sets forth what work will be required. The two efforts then are required or reflected in a detailed WBS that is used to organize the full scope of a civil works infrastructure construction project. The Owner/Employer may require a higher level WBS and the contractor will use a lower level (or more detailed level) of a WBS. Scope Verification is really the inspection required to assure that the Owner/Employer is getting delivered what is required and the contractor to assure that not only is it delivering what is required, but that the contractor is not delivering more than that for which it bargained. Scope Control is contained in both the reporting that the Owner/Employer requires and the monitoring that the contractor performs. Reporting and procedures relating thereto typically include: scope statement updates; WBS updates; WBS dictionary updates; scope baseline updates; change requests; recommended corrective actions; organizational process assets updates; and procedures or processes to monitor, measure, manage and report project scope.

The PMBOK thus requires a party's project management team to take the responsibility to control and manage changes in project scope. This requirement is placed upon the party under the "mutual mistrust" principle because the party is in the best position and has the incentive to protect the benefits of the bargain, or give notice with support, such as, the basis of his assumptions, to the other party where the other party's interpretation is deficient or exceeds what the complaining party believes such bargain required. Thus, Contract Administration becomes an essential focus in monitoring scope related issues.

As an example, the Author evaluated a series of civil works infrastructure construction projects in several locations globally for the contractor. Management of scope became a critical issue for the development of the multiple civil works infrastructure construction projects by an Owner/Employer who had entered into a contract with a major bank to provide several water treatment plants using the EPC format in both developed and developing countries for a fixed price per plant.¹⁵ The Owner/Employer was to operate the plants for an extended term. The Owner/Employer decided to engage a single contractor who would Engineer-Procure-Construct first project in a place called San Roque, Spain. The Owner/Engineer would then enter into a separate contract for up to eight additional plants in new locations for the same fixed scope and price, except for changes that were required by the local building code and for foundation conditions. The Owner/Employer decided upon a "replication" format for the projects that was based on a template design that the Contractor had completed and constructed in San Roque. Then the Contractor would reduce the price actually incurred on the San Roque project by 10%, subject to adjustments negotiated for the local building code and the ground conditions for the additional eight projects.

The concept of Contract Administration includes recognition by the Owner/Employer of nature of change on civil works infrastructure construction projects. It was widely accepted within the global industry that:

*"The additional cost of the changed work will ordinarily be covered by the changes clause or a similar contractual provision. But implementing a major change, or a large number of minor changes, will also frequently increase the contractor's cost of performing the unchanged work. The contractor may, for instance, find it necessary to disrupt or delay the unchanged work, or may be forced to perform the unchanged work in a different manner or in a different sequence than originally planned."*¹⁶

Additionally, change in a construction setting takes on an importance that is not readily understood in other industries:

“In most industries and business transactions, it would be unheard of to allow one of the contracting parties to unilaterally change the terms of the contract without the consent of the other party. In both the public and private sectors of the construction industry, unilateral change orders are widely accepted as part of almost every standard contract form.”

And that unilateral right to change the terms of the contract is restricted to only one of the parties:

“... the owner is given the right to issue changes within the general scope of the contract, by adding or deleting work, and this right is not dependent on the consent of the contractor to the change.”

In the event the contract provides that the Owner/Employer has the unilateral right to direct changes to the work does not mean that the Owner/Employer is given carte blanche to make changes without accepting the responsibility for the cost of those changes or the cost of the impacts that the introduction of those changes might have on the contractor's time or budget. Under the various cost-reimbursable contracting formats, the Owner/Employer almost automatically pays the direct and indirect contractor costs of any change because the contractor is compensated for its actual direct costs plus overhead. Under any fixed price EPC contracting system, change is usually handled more formally:

*“... Most construction contracts contain changes clauses that give the contractor the **right** to be compensated (money or time, or both) for a change and the procedures (e.g., timing and manner of notice, submission of supporting information, etc.) for presenting the change to the owner.”*

The Contract for the projects between the Owner/Employer and the contractor provided that for the contracts for the individual projects during their execution contain a changes clause that stated:

“At any time during the course of the WORK, CONTRACTOR or the EMPLOYER REPRESENTATIVE may propose changes in the PROJECT scope together with a firm price adjustment to the lump sum CONTRACT PRICE or a fixed time adjustment to the project schedule. If such proposals are accepted by both parties, the change will be made and the lump sum price and/or project schedule adjusted accordingly. Such changes will be made only by numbered Change Orders in writing, with the necessary changes in drawings and specifications. Additionally, the EMPLOYER REPRESENTATIVE may authorize services to proceed on a reimbursable cost basis to develop cost estimates for complex proposed changes. Such cost shall become part of the lump sum cost of the change if accepted, but will be billed as reimbursable if rejected. WORK on changes or reimbursable change proposals shall not proceed without the written approval of the EMPLOYER REPRESENTATIVE. The CONTRACTOR will be notified in writing of all such changes.”

Because fixed price projects are based upon the understanding that the scope of work, price and schedule are firm and fixed, to introduce change into a fixed price contract requires that a formal procedure be followed. Since fixed price contracts are firm and fixed, the parties entering into fixed price contracts assume minimal change. When changes do occur in a fixed price project, both the Owner/Employer and the contractor assume those changes are discrete and, thus, can be priced on an individual basis. Fixed price projects are founded on

the basic concept that everything that was necessary to design, procure, and construct the project has already been identified by the Owner/Employer prior to having contractor's estimating, bidding, and receiving award of the project:

*"... [Fixed Price EPC Contract] success does depend upon the quality and completeness of the plans. Plans that are not sufficiently complete,... would not support the use of the lump-sum price. Thus, it is best used where the owner has completely defined the scope of work and the plans and specifications are complete."*¹⁷

Fixed price EPC contracting is not the best project execution methodology in any instance where changes to the scope of work are probable or expected. A study undertaken and published by The Construction Industry Institute (CII), which is the construction industry's research organization in the US, succinctly noted that:

*"Owners should not employ fixed-price contracting when they know the project will be subject to numerous changes. If they do, they can expect that excessive management attention will be consumed in change administration and claims."*¹⁸

In a later study, the CII also reported on what it identified as the "hidden costs" of changes on a project:

"Hidden costs are defined as costs not readily apparent or missed when evaluating project change implementation. A major problem with the execution of project change is failure to consider all the costs associated with implementation. Direct costs such as material, equipment and labor or established indirect costs in the form of overhead are fairly easy to identify and account for in project change estimates. The more difficult task is estimating or predicting the hidden cost associated with change implementation; i.e., delays, lowered productivity, poor communications or rework

*The first research objective was to identify and quantify the hidden cost of change. We quickly discovered that it was impossible to accurately estimate all hidden costs associated with implementing change prior to change implementation. Even after project change is implemented, it is difficult to capture and account for the "ripple effect" ..."*¹⁹

The CII then published a paper entitled "Quantitative Effects of Project Change," which discussed the cumulative effect of small changes:

"One possible explanation is that estimates and pricing for individual changes are produced under time pressure, and the scope definition of the change may not be complete. If each change estimate fails to identify items of work associated with a scope change, multiple changes will compound the difference between the adjusted budget and the actual requirements of the work....

However, many small changes accumulate, the project schedule is not adjusted, and the additional work is executed by means such as short-term hiring, overtime and double or split shifts, which are inherently less productive than normal, well-planned methods.

*... projects cannot endure numerous changes without suffering a decline in overall project cost performance."*²⁰

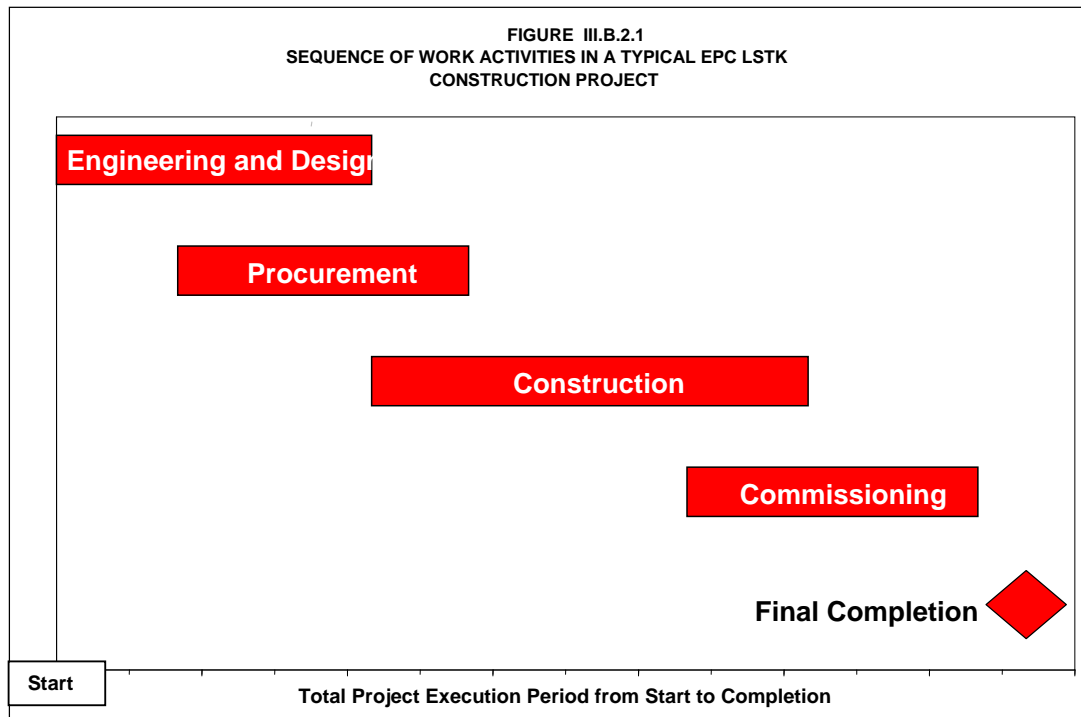
The Owner/Employer recognized that it could not let changes ruin the benefit of the bargain that it had negotiated for the eight additional projects. As a general rule, the Author found that the Owner/Employer recognized in a “replication white paper” it prepared, Owner/Employers and contractors both tend to underestimate the impact of change on a project. That is true for both parties for the same reason: the practical difficulty that exists in forecasting exactly how any particular change will disrupt the fixed scope of work upon which the price and schedule were planned.

A common statistic quoted is that a normal project should expect to encounter changes which amount to 5 percent and 10 percent change of the total value of the project. There are three immediate problems with that statistic:

1. The absolute value of an individual change may bear no direct relationship to the disruptive impact of the change. For example; a large standby diesel generator may cost many millions of Yen. However, because it is intended to be a stand-alone piece of equipment to be placed outside the primary operating center of the facility with only minimal connections to the primary operating system, it may have no direct disruption impact on the critical project systems. Conversely, a relatively inexpensive change to a control instrument, if made late in the project and in an area already too densely packed to accommodate the instrument change, may have a tremendous disruptive impact on the project.
2. Changes are not done in isolation from one another or in isolation from the original fixed scope of work. One must consider such things as the gross number of changes made; the fundamental nature of each change being made (an entire process subsystem or a simple change in wall color); and, the location of the change (in the heart of the process flow or in the parking lot). For example: it is entirely possible in complex civil works infrastructure construction projects to have multiple changes in the same area that each impact the Contractor’s ability to execute the original fixed scope of work, yet each of the individual changes may have a relatively minor direct cost.
3. Finally, the hard money value of a particular change does not address the type of change made. Neither does it address the timing of when the change is introduced into the project or of the total change flow rate when a particular change is initiated.

Of the three problems, the most often overlooked by Owner/Employers and contractors attempting to assess the disruptive impact of changes is Number 3 above, in particular the timing of a change in comparison to the current status of the project and the overall project change flow rate. Change flow involves the rate at which change is introduced into a fixed scope of work as charted over the full life cycle of the project. Thus, both parties in performing their Contract Administration in a “mutual mistrust” environment are required to monitor and measure the Change Flow Rate. In the first two projects that were a part of the replication of the water civil works infrastructure construction projects, Holland and Argentina, the parties had to measure the changes and judge the impacts. The timing of the changes relative to changes that the Owner/Employer made on the template project, San Roque, was critical. The Owner/Employer felt that the changes, although large in number, were not very significant. The contractor felt that the timing of the change introduction into the project scope meant that the changes had a significant effect and were very costly. The contractor gave notice, but could not determine the impacts other than the individual costs of each change. The Owner/Employer denied that the changes had any impact. At the end of the project, the contractor asserted a claim for the cumulative impacts. The Author first addressed the Contract Administration issue of what the contractor had planned by presenting the number of changes that occurred in what stage of the project execution, and

then related the timing of the Owner/Employer's template project and the two projects that flow relative to change flow. For a fixed price EPC contract the Author first defined the phases of an EPC project, as shown in Figure III.B.1.1:



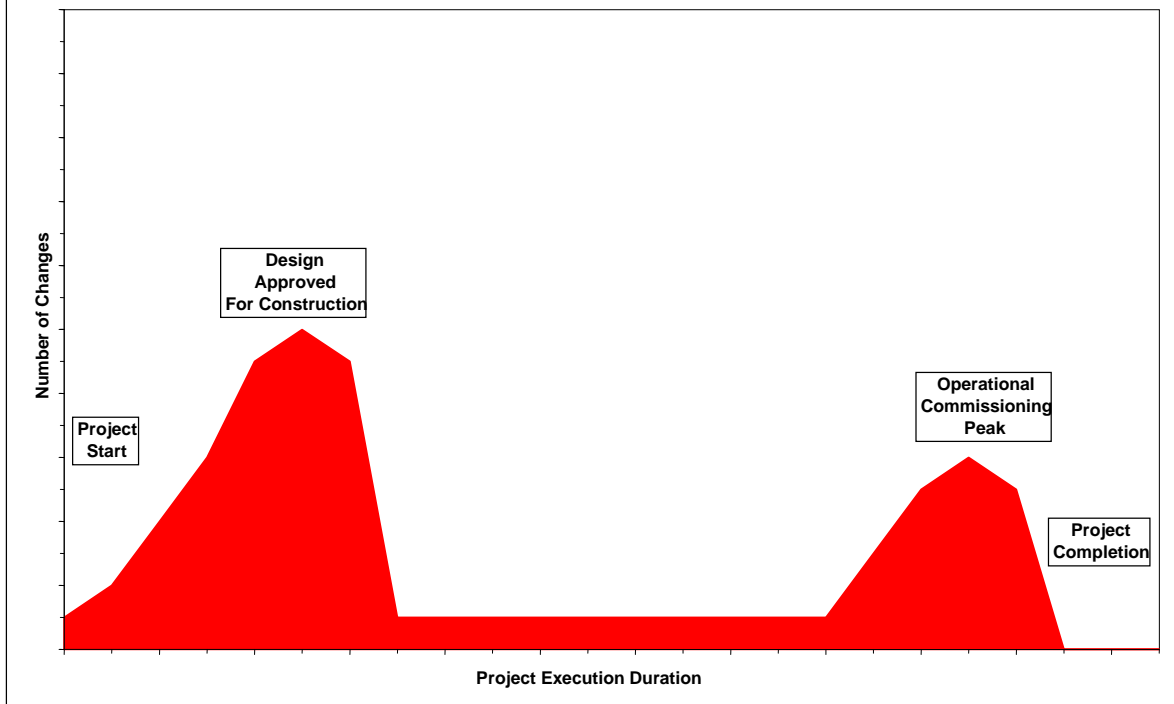
The change flow involves the rate at which change is introduced into a fixed scope of work project, as charted over the full life cycle of the project. If changes were initiated at a steady, constant pace (i.e., one change every three weeks for the full duration of the project) the impact of it would be a simple task to ascertain the disruption impact on a project by assessing a particular change through the remaining work on the project. However, change usually is not spread evenly along the entire project life cycle; at some points in the project there may be little or no change, while at other points in the project life cycle the number of changes initiated may be significant.

The CII studies on change impact during projects²¹ generally allude to two periods in time when changes are most prevalent during projects:

- During late design and engineering, when designs are finalized, reviewed and approved for construction (or procurement) by the Owner/Employer. Generally referred to as the “approved for construction” peak; and
- During final construction, testing, startup and commissioning, when the operational systems are undergoing in-service directed modifications to improve performance, generally referred to as the “operational commissioning” peak.

From the CII studies, the Author then constructed the Figure III.B.2.2 which represented the project overall execution duration from the combined phases in a typical EPC contract as previously shown Figure III.B.2.1 and superimposed from the CII data the two peaks described above.

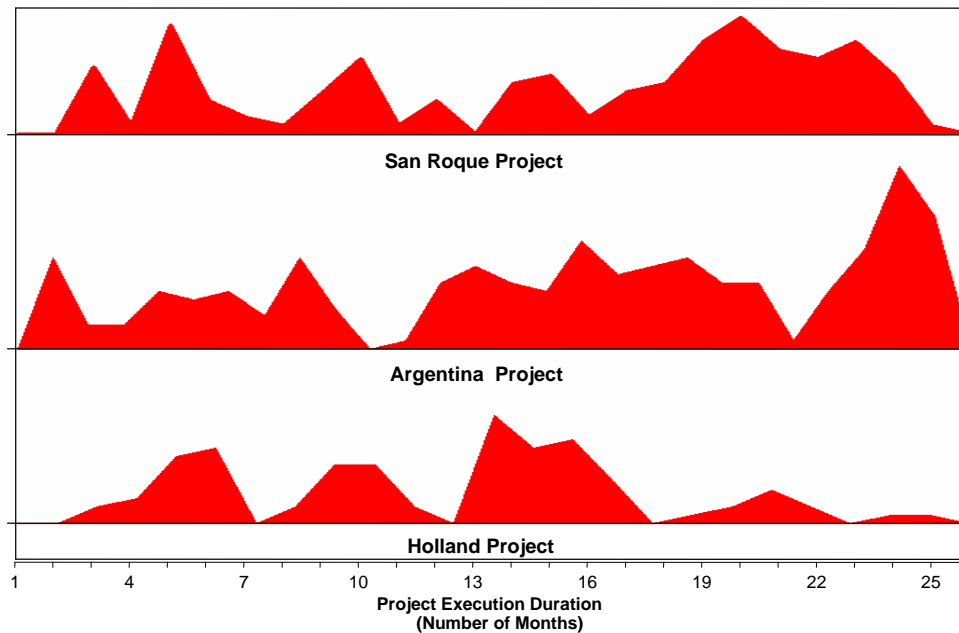
**FIGURE III.B.2.2
TYPICAL ANTICIPATED EPC PROJECT
CHANGE FLOW RATE PROFILE**



Each of the peak periods has its own associated problems. The approved for construction change peak is at a point of conjunction among several subsequent activities involving procurement of long lead equipment and materials and the initiation of construction activities. A hold on any particular design in order to accommodate a change made late in the design process can lead to a day-for-day disruption in either procurement or construction, or both, depending upon the nature of the change. Changes made during the approved for construction peak can have two disruptive impacts: (1) direct impact on the subsequent activities dependent upon the completion of that particular design (and rippling through that logic chain to even more subsequent dependent activities); and (2) the erosion of float from the project's schedule or programme. Because there is nothing tangible or physical in place, owners and contractors often have difficulty visualizing and forecasting disruption unless it happens to involve a primary piece of process equipment. In addition, as the bulk of the project time is still in the future, there is a tendency to assume that any time lost can be made up during construction. The fallacy with that assumption is that the EPC Contractor has less control over impact conditions in the field than in the office setting within which the design is prepared. If the EPC contractor cannot recover the time in the climate-controlled office, it is even more unlikely that it will be able to make the time up at the construction site.

The Author then plotted the calculated change flow rates and timing of the changes for the three projects as in Figure III.B.2.3 and the Author compared the plots with the generic plot as shown in Figure III.B.2.2:

**FIGURE III.B.2.3
COMPARISON OF SAN ROQUE, ARGENTINA, HOLLAND PROJECTS'
CHANGE FLOW RATE PROFILES**



The three profiles of the change flow were not typical for an EPC type contract as the CII data had established. The Author found that the three projects had no similar pattern of change, yet the projects were to have been identical, in other words, the projects should have exhibited a typical EPC project change flow profile and very little change because of the use of a replicated design. The Owner/Employer had directed changes and the contractor gave notice of such changes as indicated. Author thus proved through the use of the change flow rates for the projects and the timing of the changes that the contractor had incurred serious impacts for were different the conditions that it had based its bid upon. The Author then could relate the changes and the impacts that the contractor actually had incurred through the project records that the contractor had maintained during project execution. The result was that the contractor was shown to have sustained the impacts from the late changes, and further shown that it had been forced out of the basis and benefit of its bargain, that is, the basis of the replication concept for which the contractor had given its reduced fixed price.

3. Project Time Management

Project Time Management concerns the project schedule or programme development and control functions necessary to assure timely completion of the project. They can either be the requirements of the Owner/Employer or a means and method of the contractor to assure that it fulfills the timing requirements.²² The Owner/Employer either develops its own schedule or programme or more typically requires the contractor to submit an original or baseline schedule or programme and periodic updates. Today in the global market for civil works infrastructure construction projects, Project Time Management functions have become the predominant Contract Administration need. The functioning of their respective project management teams is tied to the use of Critical Path Method (CPM) scheduling.²³

The CPM scheduling is a standard project tool used on construction projects in the global market to plan and control the work in a manner that ensures that the contractors' activities

can be completed by a stipulated date, defined in the contract. CPM schedules identify and describe the activities to be performed and the time it will take to complete them. The schedule serves as a plan that indicates the date on which specific work must commence, the duration of the work, the sequence of the work and the date by which specific work must be completed to ensure timely completion of the project. It can be used to monitor progress by measuring actual work completed against the schedule as a baseline.

CPM methodology employs certain terms of art to describe schedule concepts. Among these are: “activities,” “duration,” “logic,” “early start,” “early finish,” “late finish,” “late start,” “critical path,” “float” and “baseline schedule.”

A CPM schedule is a graphical network which identifies the work on a construction project by dividing the work into discrete tasks referred to as “activities.” Activities identified on a CPM schedule are often grouped together to show how a particular aspect of the work will be completed, i.e., excavation, concreting, etc. Although the grouping of activities is often natural, the most important goal is to define the activities in a manner that permits the work to be managed and controlled. The “duration” of an activity is the length of time, typically measured in days, that is required to complete the activity.

The “logic” of a CPM schedule describes how an activity is linked to other activities by determining those activities that must logically precede or follow it. Obviously, not all tasks can be performed at the same time; some activities must be completed before other activities can begin. For instance, if work on Activity B cannot commence until the work on Activity A has been completed, the relationship between Activity A and Activity B is defined as having a “finish-to-start” logic relationship. However, some activities are independent of others and can proceed concurrently. For example, if the work on Activity B can begin on the same day as Activity A, the logic between the two activities is described as “start-to-start.” The logical connection of activities then determines the sequence in which the activities will be performed.

A CPM schedule calculates four dates for each activity. The “early start” of an activity is the earliest date when it can possibly start, determined by the linked logic with its preceding activity. The “early finish” is the earliest possible date an activity can finish, and is determined by adding the activity’s duration to its early start date. The “late finish” of an activity is the latest date when it can finish and still allow the project to complete by its agreed date. The “late start” of an activity is the latest date an activity can be started, if the project completion date is to be met. The late start date is calculated by subtracting the activity’s duration from its latest finish date. A schedule’s “critical path” is the longest path of logically connected activities which, when the individual time durations of each activity are added, equals the overall duration of the project (or the agreed-upon time for completion). When an activity is critical, it must be completed within its allotted duration. If a critical activity is delayed, it delays the entire project by the exact same number of days.

“Float” is the amount of time the completion of an activity can be extended beyond its early finish date before it impacts the critical path. Float is determined by subtracting an activity’s early start date from its late start date. By definition, critical activities cannot be extended beyond their late finish date. They are, therefore, said to have zero float. Since critical activities that have been delayed actually add time to the critical path, these delays create negative float. Non-critical activities have additional days beyond their early finish date when they can be completed before they become critical. This additional time is referred to as total float. For example, if an activity has 10 days within which it can be completed before it becomes critical to the project, that activity’s total float is 10 days.

Although there are no formalized standards with regards to scheduling, it has become industry practice in the global market for civil works infrastructure projects that any float that

is reflected in a project schedule belongs to all the parties to the project in the absence of a specific and affirmative statement in the conditions of contract that the float belongs to a specific party. For many years there were arguments between Owner/Employers and contractors as to which of them “owned” the float. In the global market the argument has been settled in the last decade. Total float is always considered for the benefit of the project, as float results from calculations made to activity durations, sequences and logic that have already taken into account consideration of productivity, and other execution factors. Thus, any party involved in the execution of the project – including the contractor, engineer and owner – has use of the available float. All the standard contracts and conditions of contract used today in the global market for civil works infrastructure construction projects have taken this position.²⁴

Thus, the process of providing Contract Administration uses CPM scheduling as the detailed manifestation of impacts or definition of the project, it is the primary metric for establishing the details of what was planned and then the vehicle for monitoring performance, and ultimately measuring divergence from the plan.²⁵ Today, in the global market for civil works infrastructure construction projects, CPM scheduling or programming is the primary tool employed by both Owner/Employers and contractors to accomplish the Contract Administration that is required to successfully manage and protect the benefits of their bargain in an atmosphere of “mutual mistrust.” The logic, timing, scope, cost and resources required are “loaded” onto activities. It becomes the primary IT (information technology) tool for both parties. The project schedule or programme in effect becomes the source of defining the major requirements or assumptions initially and monitoring a party’s performance during execution. As a result, Project Time Management has become the controlling or managing function of both parties with respect to protecting their positions with regards to the bargain that is reflected by the contract.

There are six major processes in developing and controlling the project schedule or programme that interact with each other and also between the other PMBOK areas as well:

1. Activity Definition
2. Activity Sequencing
3. Activity Resource Estimating
4. Activity Duration Estimating
5. Schedule Development
6. Schedule Control

Activity Definition identifies the specific schedule or programme activities that need to be performed to produce the various project deliverables in a civil works infrastructure construction project. Usually the WBS is employed to create the lists. Activity Sequencing involves identifying and documenting the logical relationships among schedule activities. Proper activity sequencing is imperative for developing a realistic schedule. There are several methods for constructing a project network diagram, which can be performed manually or by using project management software. The inputs to the activity sequencing typically are:

- Project scope statement
- Activity list
- Milestone list
- Approved change requests

Five different methods can be used as tools and techniques to determine and represent the activity sequencing and construct a schedule network diagram for a project:

- Precedence Diagram Method (PDM) – PDM includes four types of dependencies or precedence relationships: Finish-to Start, Finish-to-Finish, Start-to-Start, Star-to-Finish;
- Arrow Diagram Method (ADM);
- Schedule Network Templates;
- Dependency Determination – three types of dependencies to determine the sequence among the activities: Mandatory, Discriminatory and External dependencies are typically recognized; and
- Applying Leads and Lags.

The outputs from the activity sequencing are:

- Project schedule network diagrams
- Activity list (updates)
- Activity attributes (updates)
- Requested changes

After the activity description process is complete, the relationship between the activities should be established, which will allow creation of the network diagram. The task of sequencing all activities in a civil works infrastructure construction project in the global market becomes critical for the contractor as it involves more coordination among multiple subcontractors and their individual schedules.

Estimating schedule activity resources involves determining what resource (persons, equipment, or materials) and what quantities of each resource will be used, and when each resource will be available to perform project activities. The Activity Resource Estimating process is closely coordinated with the Cost Estimating process that is part of Project Cost Management. According to the PMBOK the inputs for the Activity resource estimating are:

- Enterprise environmental factors
- Organizational process assets
- Activity list
- Activity attributes
- Resource availability
- Project management plan

The tools and techniques for activity resource estimating are:

- Expert judgment
- Alternative analysis
- Published estimating data
- Project management software
- Bottom-up estimating

The outputs from the activity resource estimating are:

- Activity resource requirements
- Activity attributes
- Resource breakdown structure
- Resource calendar
- Requested changes

Activity Duration Estimating involves typically includes:

- Activity list
- Constraints
- Assumptions
- Resource requirements
- Resource capabilities
- Historical information
- Identified risk

The outputs from the estimating of the activities durations are:

- Activity duration estimates
- Basis of estimates
- Activity list updates

Estimating the accurate duration of activities is another requirement to provide a realistic schedule. The activity duration is based on the estimated quantity and the resources applied to the activities, which is tied to Project Cost Management and Project Procurement Management. Using mathematical analysis from an IT system during schedule development of today's global civil works infrastructure construction project, the programmer or scheduler calculates early and late start and finish dates. There are ten tools and techniques used for schedule analysis: Schedule Network Analysis, Critical Path Method (CPM), Schedule Compression, What-If Scenario Analysis, Resource Leveling, Critical Chain Method, Project Management Software, Applying Calendars, Adjusting Leads and Lags, and Schedule Module.²⁶

The inputs for the schedule developing are:

- Organizational Process Assets
- Project Scope Statement
- Activity List
- Activity Attributes
- Project Schedule Network Diagram

- Activity Resource Requirements
- Resource Calendars
- Activity Duration Estimates
- Project Management Plan

The outputs from the schedule development are:

- Project schedule
- Schedule Model Data
- Schedule Baseline
- Resource requirements (Updates)
- Activity Attributes (Updates)
- Project Calendar (Updates)
- Requested Changes
- Project Management Plan (Updates)

According to the PMBOK,

“Schedule control is concerned with:

1. *Determining the current status of the project schedule*
2. *Influencing the factors that create schedule changes*
3. *Determining that the schedule has changed*
4. *Managing the actual changes when and as they occur”²⁷*

The inputs to the schedule control are:

- Schedule Management Plan
- Schedule Baseline
- Performance Reports
- Approved Change Requests

Due to known and unknown circumstances, every project schedule changes throughout the project execution. Therefore, it is very important to have an effective schedule control plan in place. Based upon the baseline schedule, performance reports, the various change requests, and the schedule management plans, the contractor should develop tools and techniques for Schedule Control. The Tools and Techniques for Schedule Control include:

- Progress Reporting
- Schedule change control system
- Performance measurement
- Project management software
- Variance analysis

- Schedule Comparison bar chart

As a result of the implementation of the tools and techniques, the contractor would be able to prepare schedule updates and revisions, take corrective actions and prepare “Lessons Learned” which will be used in the development of future projects and are part of the outputs from the schedule control:

- Schedule Model Data (Updates)
- Schedule Baseline (Updates)
- Performance Measurements
- Requested Changes
- Recommended Corrective Actions
- Organizational Process Assets (Updates)
- Activity List (Updates)
- Activity Attributes (Updates)
- Project Management Plan (Updates)

The project records kept in the “normal course of business” during project execution in the global market by the Owner/Employer and the contractor are used by their respective project management teams to demonstrate, as required, the deviations and/or changes from the detail of the bargain they had reached. Contract Administration is used measure divergence from plan, the cause for the deviations, required notice, and to demonstrate impacts. Since civil works infrastructure construction projects take place over an extended time, and the “loading” and measuring of plan and actual resources by activity on the CPM, project management teams use the schedule or programmes and related data to perform their roles using the Best Practices. Therefore, knowledge and the proper application of Project Time Management practices are essential to performing in the global market for civil works infrastructure construction markets.

Using the example of the of the Owner/Employer and contractor who contracted for the multiple water treatment plants based on the template San Roque plant described earlier, the Author evaluated the time (delay and acceleration) impacts the contractor alleged the Owner/Employer had caused through the use of all the tools and data it had gathered during project execution.²⁸ Under the Conditions of Contract the contractor prepared a CPM schedule and used the schedule to plan and execute project works and through submittal to the Owner/Employer allowed the Owner/Employer’s project management team to monitor, measure, and evaluate progress on it own.

Under the Conditions of Contract, the Author established that the contractor submitted a CPM schedule to the Owner/Employer shortly after the Notice to Proceed was issued. This schedule was the “baseline schedule” against which the contractor measured actual construction progress. This comparison process is referred to as updating the schedule. The contractor uses the CPM schedule to proactively plan and executes its work as described by the PMBOK. As noted above, the PMBOK core and facilitating processes that define programming, execution, duration and resources (for example, labor, equipment, construction materials, etc.) requirements planning include:

- *“Activity Definition – identifying the specific activities that must be performed to produce the various project deliverables.*
- *Activity Sequencing – identifying and documenting interactivity dependencies.*

- *Activity Duration Estimating – estimating the number of work periods that will be needed to complete individual activities.*
- *Schedule Development – analyzing activity sequences, activity durations, and resource requirements to create the project schedule.*
- *Schedule Control – controlling changes to the project schedule.”²⁹*

The evaluation process then results in a CPM schedule that becomes a management tool to enable the contractor to execute its work in a more effective manner, and is used by both the contractor and the owner to monitor progress on the project. As progress occurs, depending upon actual events, the planned schedule dates may change. Thus, it is important for the contractor's project management team to understand the project status at any point in time, in order to make timely decisions relative to the overall completion of the project. To determine the status, CPM schedules are “updated” by inputting the “actual start” and “actual finish” dates, and “percentages complete” of various activities into the scheduling software. The computer program then “reschedules” the project by recalculating the activities' early / late start and finish dates to identify the new total float for each activity, based upon actual progress to date.

Updating a schedule reveals whether activities on the critical path are proceeding as planned. Updated schedules indicate not only which activities are falling behind schedule, but also how far they are lagging at any given point. In addition, the actual progress information, once entered in the network and recalculated (rescheduled), may cause the critical path to change. Updating a schedule also depends on what was known at the time when the update was prepared and is thus based on contemporaneous events against a baseline which is again predicated on known parameters at the time the baseline is prepared.³⁰

For the Holland and Argentina projects, the Author demonstrated that the first project schedule was the Milestone Schedule SD-1 that the Contractor created as required by the Conditions of Contract to track progress and serve as a payment mechanism (discussed under Project Cost Management below). The Master Project schedule was a “bar-chart” form of the SD-1 schedule that the contractor used for summary purposes in one of the periodic reports the Contractor was required to submit to the Owner/Employer by the Conditions of Contract, the Monthly Progress Reports (MPRs). The Author then demonstrated from the project records maintained by the contractor that this schedule was based upon the San Roque schedule and served as the initial framework for the SD-2. For both the Holland and the Argentina projects, the Author found that the planned project durations were actually one month less than the planned duration of the San Roque Project. This created an initial project schedule with very little flexibility or float. The contractor also used the SD-2 schedule to track engineering and procurement and turnovers that were a part of the completion process. The first SD-2 schedule for the Argentina Project contained 9,106 activities and had details about individual drawings for example. The Author established that the contractor then used this schedule to develop the SD-3 schedule to track engineering, procurement, construction, mechanical completion and commissioning, thru the projects' completion with monthly updates.

During the period after the initial SD-1 schedule was issued and the Owner/Employer's approval of the SD-2 schedule, the Owner/Employer made changes to group completion dates as shown below for the Argentina project, as a sample. The Author established that by changing the turnover dates, the Owner/Employer was shown to have changed the Contractor's preliminary detailed planning. The Owner/Employer also was shown to have interfered with the contractor's initially chosen means and methods by adding functional checkout activities to the schedule and dictating logic changes. Analyzing these changes,

the Author demonstrated for the contractor that a consequential deviation from the San Roque project template.

The Author quantified the delay incurred by the contractor, including the specific time period of delay and to what activities the delay occurred using a Window Analysis methodology.³¹ Separate analyses for the Argentina and Holland projects' critical paths were performed, each project's respective system turnover dates and each project's evolution to independently identify and quantify the true project completion delays to each project. The Author was one of the original developers of the Window Analysis methodology, which is widely recognized and accepted in the global market for civil works infrastructure construction projects as a contemporaneous method of quantifying delay, and thus demonstrating the deviations and delay projects:

"In principle, there is no reason why window analysis methodology should not be used to analyse [sic] any delay, whether it be a delay to the critical path or otherwise. The essence of window analysis is not what is analysed [sic] or how, but in the point at which it is analysed [sic]. The methods of discovering the relationship between a delaying event and its effect previously discussed have been based on an appreciation of the effect on the total contract period. Window analysis is based not on the whole contract period but particular 'windows' in time. It is based on analysis of the effects of delays over the life of a project by looking at the events which have affected progress within each 'window' of the contract period sequentially.

*Because the 'window' method of analysis focuses on sequential periods of project performance and on the contemporaneous critical path, this method of analysis has significant benefits over those that deal with the project period as a whole. ..."*³²

And:

The clear weight of authority (case authority, contract clauses, and agency manuals) [for over 30 years] has been to give credence to the dynamic nature of the CPM process and require that the determination of delay affecting the critical path, as well as the quantum of such delays, should be developed contemporaneously as the project history unfolds, utilizing the updating process as the point of reference.

*[The authorities on Contract Administration best practices in the global market for civil works infrastructure construction projects] recognize the necessity to use CPM schedules which evaluate delays contemporaneous with the events as they occur on the project to establish time extensions."*³³

The Window Analysis methodology thus analyzes the delays at the moment each impacts the critical path of the schedule. In any project of the size, complexity and duration of the Argentina and Holland projects, the critical path may change through the course of time. As is inherent in any major project that spans a number of years, external and internal circumstances (not anticipated at the onset) may change the project schedule. These changes may necessitate revisions to the logic, elimination or addition of activities, and/or deletion or creation of activity dependencies on the schedule. Therefore, throughout the course of a civil works infrastructure construction project, schedule updates may be issued regardless of whether the overall completion dates change.

The Window Analysis methodology breaks the project into specific consecutive time periods known as "Windows," which are defined and bound by the major schedule changes or

events. The Window Analysis utilizes actual project schedules that were used as a basis to plan and monitor the work. Thus, this delay analysis methodology bases delay criteria upon contemporaneous project records. Each Window starts with a contemporaneous plan for the future and ends when that plan is significantly changed by a schedule update. A window is defined as the calendar period between these schedule changes. By utilizing a Window Analysis approach, the delays are identified on the then-current critical path. The Window Analysis approach best reflects the reality of the project at the time, based upon the contemporaneous project schedule and the delays that were occurring at that time. Thus, the Window Analysis approach compares the work planned versus actual, using the most current project schedule for each window.

The Author defined the window periods for the Holland and the Argentina Project by significant changes to the critical path in the Contractor's schedules as submitted to the Owner/Employer. The schedules were conveyed to the Owner/Employer at least monthly through the SD-1 milestone schedule included in the Monthly Progress Reports (MPRs). The delays and gains to the Project schedule were determined based upon the logic of the schedules according to four possibilities: Start Gain, Production Gain, Start Delay and Production Delay. Each is defined as follows:³⁴

- Start Gain: The number of days an activity actually started prior to its planned logic start.
- Start Delay: The number of days an activity actually started after its planned start (contingent upon the schedule logic, as other activities' actual starts or completions may alter this direct comparison). If an activity started prior to the start of the Window being analyzed, then there can be no start delay in the Window for that activity. If an activity is scheduled to start in the Window, and to continue through the end of the Window into the next Window, but has no actual start in this Window, the delay is calculated from the scheduled start only to the end of Window. Further delay is immaterial to this Window, as it would not further delay contract completion due to a new critical path framing the next Window period.
- Production Delay: The number of days an activity takes from start through completion in excess of the number of days allowed in the schedule during the Window. In other words, if the actual duration is greater than the planned duration (i.e., it may have been planned that an activity would take three days to complete, but if it actually takes five days, there would be a two-day production delay). Production delays are limited to, and contingent upon, only those portions of the planned and actual durations that are within the Window. Production delay can only be calculated when an activity is complete. If the activity is completed in the next Window, it will be analyzed there, but only if it is still on the critical path. Like start delay, production delay is contingent upon schedule logic as other activities' actual starts or completions may alter a direct comparison with the plan.
- Production Gain: The number of days for an activity, from start through completion (the duration), which is less than the scheduled number of days. In other words, a production gain is realized when the actual duration of an activity is to be less than the planned duration for the Window period being analyzed.

Only delays to critical activities on the project have an impact on the overall schedule. Therefore, the Conditions of Contract required "extensions of time" had to be shown to have

delayed critical activities and thus the project completion date. The Window Analysis depicts not only the critical activities, but the near critical activities, within in a time period or window, because non-critical activities can become critical and/or draw resources away from critical work, which can be significant to the completion of the project – those activities that could have an impact on project completion within each Window were analyzed by the Author with the assistance of the contractor's project management team. After the identification of which critical activities experienced delay or gain in the consecutive windows, and how much the amount of delay or gain was for each critical activity, the Author then determined and presented the cause for the delay or gain, and the party responsible for the impacts. The Conditions of Contract required the use of Primavera³⁵ programming software by the contractor, which is a common requirement because the software is the most widely used in the global market for civil works infrastructure construction projects. The schedules and their updates thus used Primavera as the basis of the Author's analysis. Additionally, the Author supported analysis of causation and responsibility with the contractor actual project records kept in the normal course of project execution.

To illustrate the Contract Administration required, the Argentina project is used as an example. The Author continued presentation of the impacts and determination of the responsible party from the project records. On May 17, 1995, the Owner/Employer supplied the contractor with the preliminary schedules and scope definitions for the Argentina project, noting that the only difference between the proposed plant and the San Roque project was that the contractor would be responsible for the Basic Engineering Package (BEP), as well as the lump sum E-P-C contract. Within the scope definition, the Owner/Employer stated that the majority of the design for the plant would be a duplication of San Roque project design. The Author found that the contractor accordingly created and submitted to the Owner/Employer the preliminary "Project Execution Program" for the Argentina project in July 1995 as required by the Conditions of Contact. This contractor-produced program outlined assumptions that were fundamental to the success of the Project:

- Same process technology as San Roque project
- Same utilities conditions as San Roque project
- Optimize the overall Plot Plan assuming no space limitations in the Site
- Maintain same Plot Plan and layout as the San Roque project for individual areas
- The Plant will have different raw water chemistry than the San Roque project

Based upon these requirements, the Author demonstrated that the contractor began work on the Argentina project.

On October 2, 1995, the contractor presented the "Project Execution" plan to Owner/Employer at which time the Owner/Employer affirmed the high degree of replication that the Contract required. The Contractor also divided the plant into systems and equipment that could be duplicated from San Roque project by varying degrees and detailed the equipment to be included in each category:

Category A

Systems/Equipment which were composed of duplicated equipment that a minimum or no variations.

Category B

Systems/Equipment that had to be modified to meet the local conditions.

Category C

Systems which did not exist in the San Roque project, or required a complete new design.

The Job Specification grouped the defined systems into areas of the project:

TABLE III.B.3.1 ARGENTINA PROJECT SYSTEM GROUPS DEFINED	
Area	Group
Area A	Electrical Systems
Area B	Utilities Distribution
Area C	Tank Farm
Area D	Water Processing Phase 1
Area E	Water Processing Phase 2
Area F	Water Conveyance
Area G	Miscellaneous Systems
Area H	Water Processing Phase 3

The date of the turnover of the last system in each of the above groups defined the Group Completion Dates and the Conditions of Contract provided that the Contractor was responsible to achieve specific Group Completion Dates and the Project Final Acceptance Date or risk Liquidated Damages (LDs), on or before January 12, 1997. Thus, the systems turnover sequence was critical information that would define the completion dates for each system, which in turn would establish the eight Group Completion Date milestones. These dates defined the completion of the schedule and determined which activities would be on the critical path. Missing or changing parameters would change the planned schedule or programme which the contractor had submitted the Owner/Employer as required by the Conditions of Contract. The Author found that ultimately the Argentina project was delayed by three primary reasons: Force Majeure events, changes in the Customs procedures and untimely, constant and pervasive changes made by the Owner/Employer. For illustrative purposes, the Author will focus on only the last reason in illustrating the extent of Contract Administration required. The other two causes were adequately rebutted by the Owner/Employer's project management team.

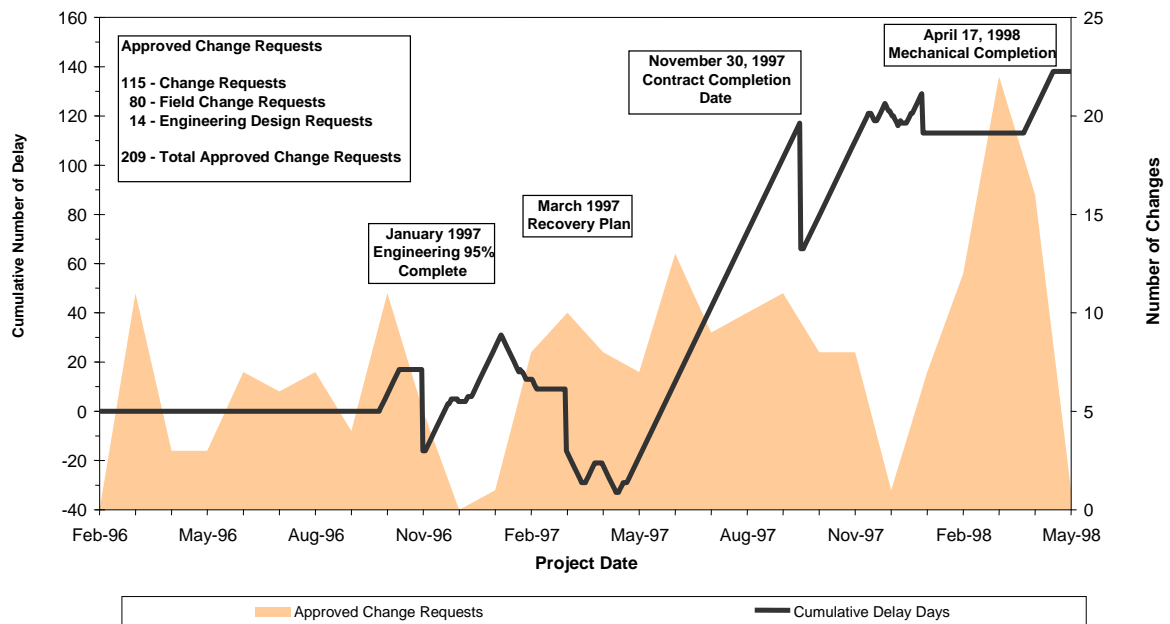
By the time the Notice to Proceed for the Argentina project was given on March 1, 1996, the San Roque project had reported detailed engineering to be 97.4 percent complete. At that level of engineering completion, the contractor considered that the "template" upon which the Argentina project had been based was fixed, and that the assumptions it had presented to Owner/Employer and used as the basis for the Argentina project estimate, schedule and execution plan were correct. What the contractor did not know, and could not have known at the time, was that there were still 93 changes that would be made by Owner/Employer to the San Roque project before it was complete, commissioned and in production. Each of those 93 changes would, when implemented, necessitate changes in the Argentina project. Every change in the San Roque project template made subsequent to the contractor's contractually set cost and schedule estimates for the Argentina project reduced the probability that the

contractor would meet the cost and schedule requirements. The Author on behalf of the contractor had to demonstrate to the Owner/Employer the impacts. As presented above in regards to Project Change Management, the fundamental basis of the bargain from the contractor's and Owner/Employer's perspective was replication of the San Roque project.

At the end of the San Roque project, Owner/Employer and the contractor created an "End of Project Report" that detailed some of the lessons that were learned regarding the project management of the Project. It noted that there were very many scope changes introduced by Owner/Employer at the end of the San Roque project construction because Owner/Employer wanted to incorporate its latest technology and lessons learned from previous projects – some 83% of the total scope changes affecting the completion of systems were made during the last four months of construction. The report further noted that Owner/Employer's operations experts' recommendations were also incorporated in the last months of construction and had the contractor had to dismantle and rebuild many parts of the project. The Author concluded that the formal changes to the San Roque project template, combined with the "Lessons Learned," created a moving target for the contractor and never allowed the Owner/Employer's concept of replication to be implemented or employed on the Argentina project. The effect of the continuous stream of changes made by Owner/Employer at the San Roque project was an immense impact on the Argentina project that the Author on behalf of the contractor had to demonstrate with the data and records maintained in the exercise of Contract Administration during project execution the contractor's project management team.

The Author constructed Figure III.B.3.1, Argentina Project Delay Days vs. Change Flow Rate Profile, to illustrate the eventual the cumulative delay versus the number of approved changes. Figure III.B.3.1 has the same profile of the change flow rate calculated for Argentina that was constructed for Figure III.B.2.3 – the shading. The number of days that the Argentina project schedule was showing delay is superimposed on the graphic. The Author found that when changes to the Argentina project were initiated at the beginning of the project, the contractor executed the changes by absorbing them into the schedule without impact to the project completion date, but at the expense of additional engineering hours. This result was shown by the horizontal cumulative delay line through September 1996. When combined with the monthly reports on resource use submitted by the contractor's project management team, the impact on engineering hours was obvious. The Author found there was slight delay in October 1996 and the contractor's project management team developed a plan to save project time (illustrated by the vertical line for that month). Engineering was thought to be essentially complete (95 %) in January 1997, and although there was delay reported. Even though the Project completion date was not affected by these early changes, the available float in the schedule was eroded until the schedule could not absorb any additional changes. By March 1997, the schedule had reached the point that each change from that date forward had a direct impact on construction and on the Argentina project completion date. The figure further shows that when a large number of changes were initiated by Owner/Employer, after an appropriate implementation period, those changes caused delays. It also shows the high volume of changes that occurred on the Project after the planned engineering 95 percent completion date of January 1997. The Owner/Employer's project management team, however, continued to make a vast number of changes. The contractor continued to report cumulative delay until November 1997, when the Owner/Employer demanded that the contractor employ additional resources. Despite these additional resources, the period of commissioning exhibited continued changes and a slight worsening of the delay.

**FIGURE III.B.3.1
ARGENTINA PROJECT
DELAY DAYS VS. CHANGE FLOW RATE PROFILE**



Based on the Project Time Management records from the Argentina project, the prepared four Windows reported in Table III.B.3.2 in its analysis:

Window No.	Schedule	Start Date	End Date	Number of Calendar Days
1	SD-1 - Milestone schedule	Mar 1, 1996	Oct 30, 1996	244
2	71AG - Network schedule	Oct 31, 1996	Feb 28, 1997	121
3	71AL - Network update recovery plan	Mar 1, 1997	Sep 14, 1997	198
4	71AJ - Network update	Sep 15, 1997	Dec 26, 1997	103
5	71AE - Network update	Dec 27, 1997	Apr 17, 1998	112

Using Window No. 3, for example, the Contractor concluded that from March 1, 1997, to September 14, 1997, it experienced a total of 132 calendar days of delay to the Project during the 198 calendar days of Window No. 3. The delay for Window No. 3 was found to be

primarily a result of the changes introduced by the Owner/Employer that continued to disrupt productivity. During the Window No. 3 period the contractor decided that, to finish the Argentina project by the Contract completion date, a recovery schedule was necessary as a result of the high number of disruptive changes occurring on the project. Using the analysis illustrated above under the Project Change Management, as of March 1, 1997, 66 changes had been approved on the Argentina project and 129 on the San Roque project. During Window No. 3, Owner/Employer approved an additional 62 changes on the Argentina project and eight changes to the San Roque project template. The Author demonstrated first that engineering was planned to reach the 95 percent before January 1997, so the number of changes on the Argentina project should have been diminishing or non-existent, not increasing.

The Author then demonstrated through the same figure, Figure III.B.3.1, Argentina Project Delay Days vs. Total Approved Changes, that multiple changes initiated and approved by Owner/Employer during Window No. 3 contributed to the 132 days of delay for the Project. Also shown in Figure III.B.3.1, there are 24 days of recovery at the beginning of Window No. 3 (shown by the vertical direction of the Cumulative Number of Delay Days), which indicate that initially the recovery schedule was performing as expected until the next wave of changes occurred. The Author then analyzed every activity that was critical during the 198 calendar days, the results of which were presented in Tabular form as Table III.B.3.3 as follows:

TABLE III.B.3.3 ARGENTINA PROJECT WINDOW NO. 3 CRITICAL ACTIVITIES							
Activity ID	Activity Description	Planned Start	Planned Finish	Actual Start	Actual Finish	Start Delay / (Gain)	Production Delay / (Gain)
00007110	1712b L.V. Power Cables -Fabr & Deliv (P126)	Feb 22,1997	Jun 03,1997	Feb 22,1997	Jun 03,1997	0	0
00000492	1464b/C Expansion Joints - Fab&Deliv Bap(P127)	Feb 26,1997	May 18,1997	Feb 26,1997	Jul 05,1997	-	46
00000493	1464b/C Expansion Joints - Customs & Tz(P127)	May 19,1997	Jun 01,1997	Jul 07,1997	Jul 18,1997	1	(2)
F01410260	Off Class - Electrical Installation	Jun 04,1997	Jul 28,1997	Outside Window	Outside Window	58	-
00007302	1781a Electrical Tracing -Fabr & Deliv (P)	Mar 05,1997	Jul 02,1997	Feb 10,1997	Sep 16,1997	(4)	75
E01280135	Regeneration Syst. - Electrical Installation	Jul 03,1997	Aug 21,1997	Aug 18,1997	Outside Window	(28)	-

**TABLE III.B.3.3
ARGENTINA PROJECT
WINDOW NO. 3 CRITICAL ACTIVITIES**

Activity ID	Activity Description	Planned Start	Planned Finish	Actual Start	Actual Finish	Start Delay / (Gain)	Production Delay / (Gain)
00005011	1591za Process Steam Traps - Bid And Award(P)	Jan 22,1997	Mar 04,1997	Jan 22,1997	Mar 25,1997	-	17
00005012	1591za Process Steam Traps - Fabric& Deliv(P)	Mar 05,1997	May 28,1997	Mar 26,1997	Jul 16,1997	0	28
00005052	1592zf Arrestors - Bid And Award(P)	Nov 21,1996	Mar 02,1997	Nov 21,1996	Mar 03,1997	-	0
00005054	1592zf Arrestors - Fabrication & Deliv	Mar 03,1997	Jul 05,1997	Mar 04,1997	Jul 04,1997	0	-2
D00040090	Feed./Screen.- Instrument Installation	Jul 13,1997	Sep 10,1997	Sep 27,1997	Outside Window	46	-
00005121	1599a Three Way Valves - Fabric&Deliv Bap(P121)	Feb 06,1997	Jun 13,1997	Feb 06,1997	Jul 04,1997	-	21
00005122	1599a Three Way Valves - Customs & Tz(P121)	Jun 14,1997	Jun 27,1997	Jul 05,1997	Jul 16,1997	-	(2)
D00190095	Mix/Feed Tks- Piping Erection	Jun 24,1997	Jul 07,1997	Aug 05,1997	Outside Window	23	27
D20190110	Feed Tks - Instrument Installation	Jul 19,1997	Sep 01,1997	Outside Window	Outside Window	36	-
B0950090	Nitrg. 7.0 Distrib.- lin Line Instruments Install	Jul 08,1997	Aug 06,1997	Outside Window	Outside Window	45	-
G0810010	HVAC Process - Equipment & Mtls Procu& Deliv	Feb 24,1997	May 08,1997	Feb 24,1997	Apr 18,1997	0	(20)
G0810016	HVAC Process - Control Room Coils Install	May 09,1997	May 29,1997	May 01,1997	Jul 04,1997	9	0
G0810023	HVAC Process - C. Room Duct Install(EI107.320)	May 09,1997	May 29,1997	May 19,1997	Jul 25,1997	18	0
G0810027	HVAC Process - Break Off. Duct Install(EI111.130)	May 16,1997	Jun 05,1997	May 26,1997	Jul 18,1997	0	33

**TABLE III.B.3.3
ARGENTINA PROJECT
WINDOW NO. 3 CRITICAL ACTIVITIES**

Activity ID	Activity Description	Planned Start	Planned Finish	Actual Start	Actual Finish	Start Delay / (Gain)	Production Delay / (Gain)
G0810031	HVAC Process - MCC Room Duct Install(EI115.390)	Jun 06,1997	Jun 19,1997	May 19,1997	Jul 25,1997	(61)	0
G0810033	HVAC Process - MCC Room Climate Install(EI115.390)	Jun 06,1997	Jun 26,1997	May 26,1997	Jul 25,1997	7	0
G0810035	HVAC Process - MCC Room Vct1200 Inst (EI115.390)	Jun 06,1997	Jun 19,1997	May 26,1997	Jul 25,1997	0	47
G0810037	HVAC Process - MCC Room Tve-18 Inst (EI115.390)	Jun 20,1997	Jul 03,1997	Jul 21,1997	Outside Window	(5)	42
G0810039	HVAC Process - S.G.Room Duct Install(EI119.215)	Jun 20,1997	Jul 03,1997	Jul 21,1997	Outside Window	63	0
G0810041	HVAC Process - S.G.Room Fan Install(EI119.215)	Jun 20,1997	Jul 03,1997	Jul 21,1997	Outside Window	0	42
G0750006	U/G Industr.W. - Yu-G-19 Fabric & Deliv.(P6)	Feb 05,1997	Jun 21,1997	Feb 05,1997	Sep 24,1997	-	85
00007126	M.V.Capacitor Bank -Fabr & Deliv (P)	Mar 18,1997	Jun 25,1997	Sep 23,1996	Jun 24,1997	(18)	15
A0600022	Sub2 (6600) - M.V. Capacitor Bank Installation	Jun 26,1997	Jul 09,1997	Jul 01,1997	Jul 02,1997	6	(12)
A0600050	Begin T/O For - Sub 2 (6600)	Jul 10,1997	Jul 10,1997	Jul 18,1997	Jul 18,1997	15	0
A0600052	Joint Punchlist Walk	Jul 11,1997	Jul 12,1997	Jul 18,1997	Jul 21,1997	(1)	2
A0600054	Complete Punch List Work	Jul 13,1997	Jul 19,1997	Jul 23,1997	Aug 22,1997	1	24
A0600056	Punch List Verification Walk	Jul 20,1997	Jul 20,1997	Aug 25,1997	Aug 25,1997	2	0
A0600058	Electrical & Instrument Testing	Jul 21,1997	Aug 03,1997	Aug 26,1997	Aug 27,1997	0	(12)

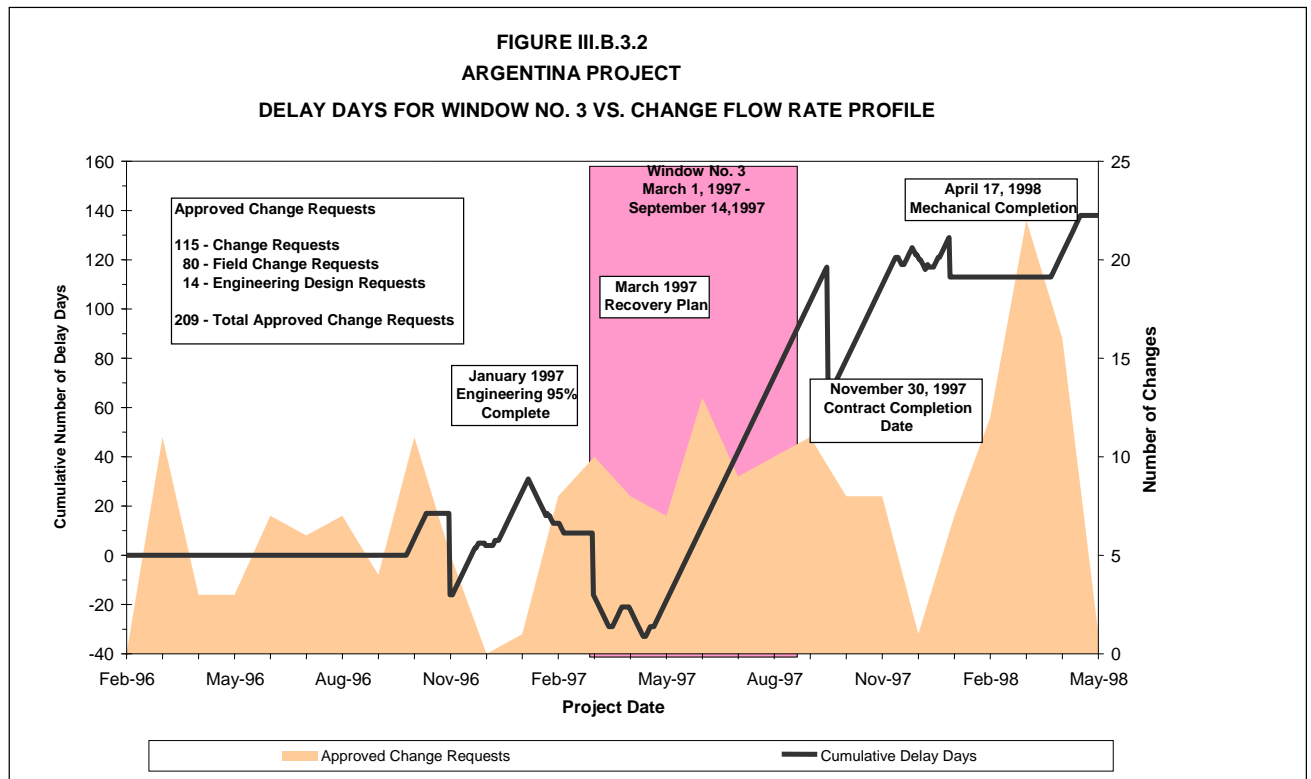
**TABLE III.B.3.3
ARGENTINA PROJECT
WINDOW NO. 3 CRITICAL ACTIVITIES**

Activity ID	Activity Description	Planned Start	Planned Finish	Actual Start	Actual Finish	Start Delay / (Gain)	Production Delay / (Gain)
A0600060	Accept - Substation 2 (6600)	Aug 04,1997	Aug 04,1997	Aug 28,1997	Aug 28,1997	0	0
A0580060	Accept - Substation 5 (380)	Aug 05,1997	Aug 05,1997	Aug 28,1997	Aug 28,1997	(1)	0
A0610070	Accept - Substation 1 (380) Distribution	Aug 06,1997	Aug 06,1997	Aug 28,1997	Aug 28,1997	(1)	0
A0560064	Accept - Substations 2/3 (380) Distribution	Aug 07,1997	Aug 07,1997	Aug 28,1997	Aug 28,1997	(1)	0
G0670094	Accept - Lighting Outdoors	Aug 08,1997	Aug 08,1997	Outside Window	Outside Window	17	0
C0790094	Accept - Grounding Tank Farm	Aug 10,1997	Aug 10,1997	Outside Window	Outside Window	(7)	0
00000576	S.S.Fittings - Delivery P-58 Rev3	Feb 25,1997	Jul 05,1997	Feb 25,1997	Aug 12,1997	0	38
E01240100	Piping Prefabrication	Jun 20,1997	Jul 19,1997	May 02,1997	Outside Window	0	19
E01270015	Absort.Beds Sn-K-33a/B - Fabr. & Deliv. Ba(P27)	Jul 10,1996	Apr 14,1997	Jul 10,1996	Feb 24,1997	-	(45)
E01270300	Absort.Beds - Sn-K-33a/B.Erection	Apr 29,1997	May 03,1997	Apr 08,1997	May 02,1997	24	20
E01270075	Absort.Beds Sn-K-33a/B - Instrument Installat	Jun 28,1997	Aug 24,1997	Outside Window	Outside Window	80	-
00005118	1599a Three Way Valves - Fabric&Deliv Bap(P120)	Feb 06,1997	Jul 16,1997	Feb 06,1997	Jul 15,1997	(1)	-
00005119	1599a Three Way Valves - Customs & Tz(P120)	Jul 17,1997	Jul 30,1997	Jul 20,1997	Aug 09,1997	-	6
H1160165	HTM Heater - Piping Erection	Jun 30,1997	Aug 13,1997	Not Dates		N/A	N/A

**TABLE III.B.3.3
ARGENTINA PROJECT
WINDOW NO. 3 CRITICAL ACTIVITIES**

Activity ID	Activity Description	Planned Start	Planned Finish	Actual Start	Actual Finish	Start Delay / (Gain)	Production Delay / (Gain)
H1160175	HTM Heater - Instruments Installation	Jul 21,1997	Sep 03,1997	Outside Window	Outside Window	46	-
G1540070	Softening Ys-Z-02 Fabr&Deliv Bap (P51)	Jun 28,1996	May 10,1997	Jun 28,1996	Jul 05,1997	-	51
G1540071	Softening Ys-Z-02 Customs&Tz (P51)	May 11,1997	May 24,1997	Jul 07,1997	Jul 21,1997	1	1
G1540130	Softening Equipment Erection	May 25,1997	Jun 07,1997	Jul 22,1997	Outside Window	-	41
00005800	Pipe Rack N°1 - Piping Erection	Apr 21,1997	May 04,1997	May 19,1997	Outside Window	26	105
B0540144	Steam Boiler - 3 ^o Piping Mto	Mar 01,1997	Mar 07,1997	Apr 01,1997	Apr 07,1997	28	-
B0540145	Steam Boiler Syst - Piping Mtls Delivery	Feb 17,1997	Jun 05,1997	Feb 17,1997	May 09,1997	(38)	(27)
B0540200	Boiler Syst - Piping Prefabrication	May 16,1997	Jun 05,1997	Jun 16,1997	Outside Window	59	71
G0970012	Saf. Shower-Yu-Z-02 Potable W.T. Fabr&Del B.A.(P)	Mar 05,1997	Jun 22,1997	Mar 01,1997	Jul 15,1997	(4)	22
G0970013	Saf. Shower-Yu-Z-02 Potable W.T. Customs&Site(P)	Jun 23,1997	Jul 02,1997	Jul 16,1997	Jul 21,1997	0	(4)
G0970040	Potable W.T. Plant - Yu-Z-02 Erection	Jul 03,1997	Jul 16,1997	Jul 28,1997	Outside Window	6	35
Total Net Delay Window No. 3: 132 Calendar Days							

As indicated earlier, the total net delay during the Window No. 3 period was 132 days (taking into account the concurrency of activities, since there can only be one day of gain or delay per calendar day). Figure III.B.3.2 is the Author's graphical illustration of Window 3.



The timing of approval for the changes was also critical. The Owner/Employer continued to approve and implement changes after the activities had been completed causing the Contractor to re-engineer and rebuild items. Again, this is one of the key lessons learned outlined in the San Roque project's "End of Project Report" that could have been used if the template had been complete. The Author then related the individual delays for each system to the changes thereto. The following Table III.B.3.4 summarized the Author's findings on behalf of contractor by relating the changes to the systems:

TABLE III.B.3.4 ARGENTINA PROJECT CHANGES AFFECTING WINDOW NO. 3 CRITICAL PATH SYSTEMS (BY GROUP)		
Area / System Group	Critical Path System	Change Number
Area A - Electrical Systems	A0560 – Substations 2/3 (380) Distribution	71, 89-1, 89-2, 94, 122, 127
	A0610 - Substation 1 (380) Distribution	71,89-1, 89-2, 94
Area B – Utilities Distribution	B0540 - Steam Boiler	2, 10, 37, 106, 118
	B0890 - Cooling Water Solid Stating	41
	B0950 - 7.0 Distribution	32, 86, 116
	B1890 - Cooling Tower & Distribution	10, 34, 116
Area C – Tank Farm and Truck	C0150 - Virgin E.G. Tank	10, 27, 74

**TABLE III.B.3.4
ARGENTINA PROJECT
CHANGES AFFECTING WINDOW NO. 3
CRITICAL PATH SYSTEMS (BY GROUP)**

Area / System Group	Critical Path System	Change Number
Unloading	C0790 - Grounding Tank Farm	41
Area D – Water Processing Phase 1	D0019 - Mix/Feed Tanks	10, 74, 79*, 85, 86, 116
	D0040 - Spray MD-C-30	10, 19, 57, 74, 79*, 84, 91, 117
	D2019 - Mix/Feed Tanks MW-C-52/53	10, 53, 74, 79*, 85**, 86, 91, 116
Area E – Water Processing Phase 2	E0086 - Civil / Architecture	85**, 96, 111, 112, 118, 134
	E0124 - Reactor SE-C-05	21, 60, 97, FCR 035
	E0127 - Absorption Beds SN-K-33 A/B	116, FCR 053
	E0128 - Regeneration System	10, 43, 79*, 86, 125, FCR 027
Area F – Water Conveying Systems	F0106 - Convey Systems 7, 8 & 13	89-1, 89-2
	F0135 - Convey Systems 10, 12 & 14	88, 89-1, 89-2
Area G – Miscellaneous Systems	G0640 - DCS C. Room, I/O Room & Remote I/O Panels	23, 84, 89-1, 89-2, 90, 92, 108, 127, 136
	G0690 - Lighting Yards	34, 41
	G0750 – U/G Industrial Water	10, 29, 74, 81
	G0970 - Safety Shower	10, 79*, 103, 108, 118
	G0980 - Industrial Water (A/G)	34, 79*, 81
	G1540 - Softening Water Plant	10, 38, 102, 118, 141
Area H – Water Processing Phase 3	H1160 - HTM Fired Heater MH-F-01	19, 73, 81, 99, 107, 116

The Author had demonstrated to the Owner/Employer on behalf of the contractor that the impact to time was caused by that the Owner/Employer's failure to live up to the bargain the parties had reached originally in the contract thru the failure to exercise a common Contract Administration process used by project management teams – both the data and the actual analyses that project management teams can prepare easily.

4. Project Cost Management

Project Cost Management concerns cost estimating, management and control of project costs. Sources of input information come from Project Scope Statement, the WBS, the WBS Dictionary and the Project Management Plan. The Owner/Employer must develop an

approximation of the costs of the resources required to complete project activities that civil works infrastructure construction project. The processes are initiated with preliminary cost estimates early in the project life cycle. Cost estimates must formally revised and updated when more accurate cost, activity durations and scope descriptions are available, to adjust for changes in risk and contingency, or to reflect changes in scope, resources, schedule and project constraints. Similarly a contractor needs to record the cost for the project it has committed the deliver. Additionally, the contractor has to continuously record the costs during project execution. Both the Owner/Employer and the contractor will use cost as a basis to create the base from which to measure the impact of change and to allow the giving of proper notice that “mutual mistrust’ envisions.

According to the PMBOK there are three major processes in developing the project cost that interact with each other and also between the other knowledge areas as well.³⁶

- (1) Cost Estimating
- (2) Cost Budgeting
- (3) Cost Control

Most Owners/Employers and contractors for civil works infrastructure construction projects have systems, procedures, and accounting processes that fulfill the needs. The project costs are then a resource that is applied to the project schedules or programmes in Project Time Management. Regular updating then makes the potential or actual impacts from change of any type observable. In addition, the contractor usually will record the bases for the costs that it estimated in the bid or submitted with the tender, including the specific resources that were planned.

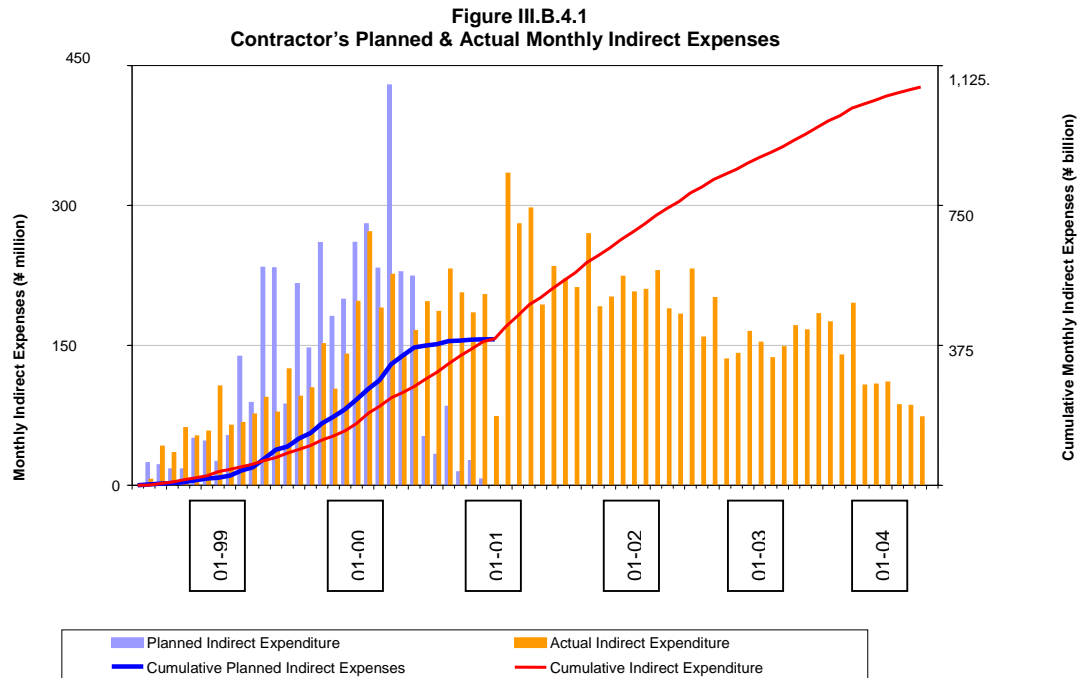
Using the civil works infrastructure construction project in Mexico described in Project Integration Management above,³⁷ the role of Contract Administration can be illustrated with regards to the Indirect Costs of project management and the Financing Cost increase. The Contractor had set a foundation for what would be expected in the global market, and as a result of the fundamental changes that the Contractor had incurred. The contractor, as part of its proposed bid, had to submit an Execution Plan that described its project management plan. The Execution Plan was included in the Indirect Costs estimated (quantity and duration) in the Contractor’s Unit Price portion of its bid. If the Owner/Employer admitted it caused a day of delay, the indirect percentage would have been revised. Unless the Indirect Costs percentage was adjusted for any Owner/Employer caused growth in indirect resources quantity or duration, the contractor would never be compensated such Owner/Employer caused cost impacts when the Unit Prices bid were used to pay the contractor for the impacts. The following list, for example, summarizes the primary findings of the Author developed in the detailed analyses relative to the proposed contractor Execution Plan and its interface with the Supervisor:

- The contractor had organized its project management team to perform its contractual scope of works. That organization was changed and disrupted with the Owner/Employer’s dismissal of its Supervisor in late October 2000. Established norms for project controls and approval procedures including the interface with the Supervisor were not continued with the Owner/Employer employees who replaced Supervisor. The Contractor’s indirect expenses increased in trying to adapt to the ‘new’ way of working with the Owner/Employer, e.g., language, administration cultures, changed requirements, and re-evaluation of already received approvals.
- The Owner/Employer’s Supervisor, despite its contract with the Owner/Employer indicating differently, had zero authority to approve and authorize changes, yet made or refused interpretations to address errors and omissions in the very engineering

that it had produced for the Owner/Employer to issue as bid documents. All Change Notices (CN's) required signature by the "Representative of Owner/Employer" and as such, the Supervisor simply became the messenger between the Contractor and the Owner/Employer, which voided the commercial role the Supervisor had been assigned by the Conditions of Contract. This lack of authority caused significant approval delays where any change had potential cost impacts.

The Owner/Employer required the contractor to submit and obtain the Owner/Employer's approval of revised Execution Plan and the new schedules, related WBS structure, and resource changes. These accepted changes increased the contractor's Indirect Costs through extension of project management resources (personnel, facilities, etc.) and the addition project management resources as the Owner/Employer's involvement in project execution became greater than was the industry practice for a fixed price EPC contract and as a result became more intrusive. These resource extensions and increases were then further exacerbated by the Owner/Employer changes from the Supervisor to itself. Nonetheless, the contractor only was allowed to use Unit Prices for changes that reflected the expectations in the defective bid documents. Additionally, the impacts from the Owner/Employer's breaches and failure were never priced at any rate as the Owner/Employer did not recognize causes and impacts.

The contractor used the regularly recorded project records to price these impacts. Despite the Owner/Employer's evaluation and acceptance of to-go changes in the Execution Plan, the Owner/Employer only allowed the contractor to use of the originally bid Unit Prices. Thus, the Owner/Employer forced use of Unit Prices that only had Indirect Costs based on the expectations presented by the bid documents. The contractor incurred significantly increased Indirect Costs from all these Owner/Employer-caused execution issues. The Author directed the contractor's project management team to summarize the actual detail from the Project Cost Management records it maintained, and the Author then compared each of the Project Execution Plans and the project management resources each contained to the Indirect Cost detail from the first Project Execution Plan that the contractor had submitted. The Author prepared the following Figure III.B.4.1 to emphasize and summarize the total impact:

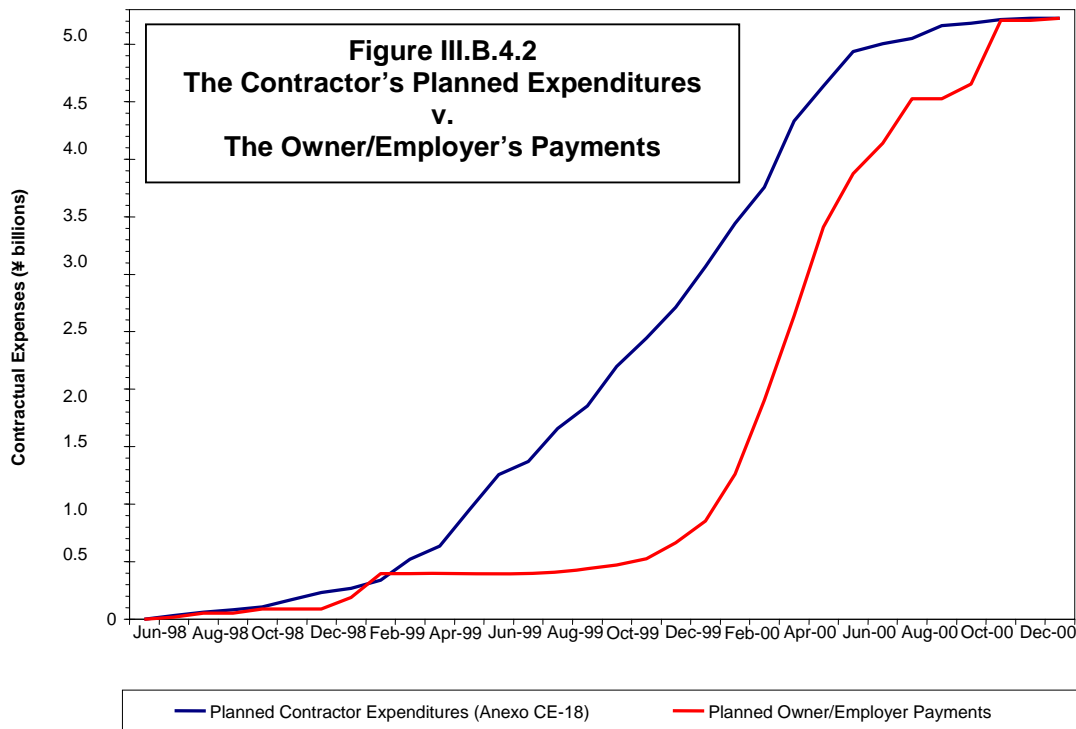


The Author then summarized the Indirect Costs that the contractor was seeking in Table III.B.4.1, which had been tied to the various Project Execution Plans the contractor had submitted (after the Author had removed those Indirect Costs for which the contractor was responsible for causing):

TABLE III.B.4.1 INDIRECT COST DAMAGES CAUSED BY THE OWNER/EMPLOYER	
Description	¥
Total Actual Indirect Costs	106,750,900,000
Less: Total Owner/Employer Payments	(45,366,945,000)
Less: Contractor Caused Indirect Costs	(5,054,862,000)
Total Contractor Indirect Cost Caused by the Owner/Employer	56,329,093,000

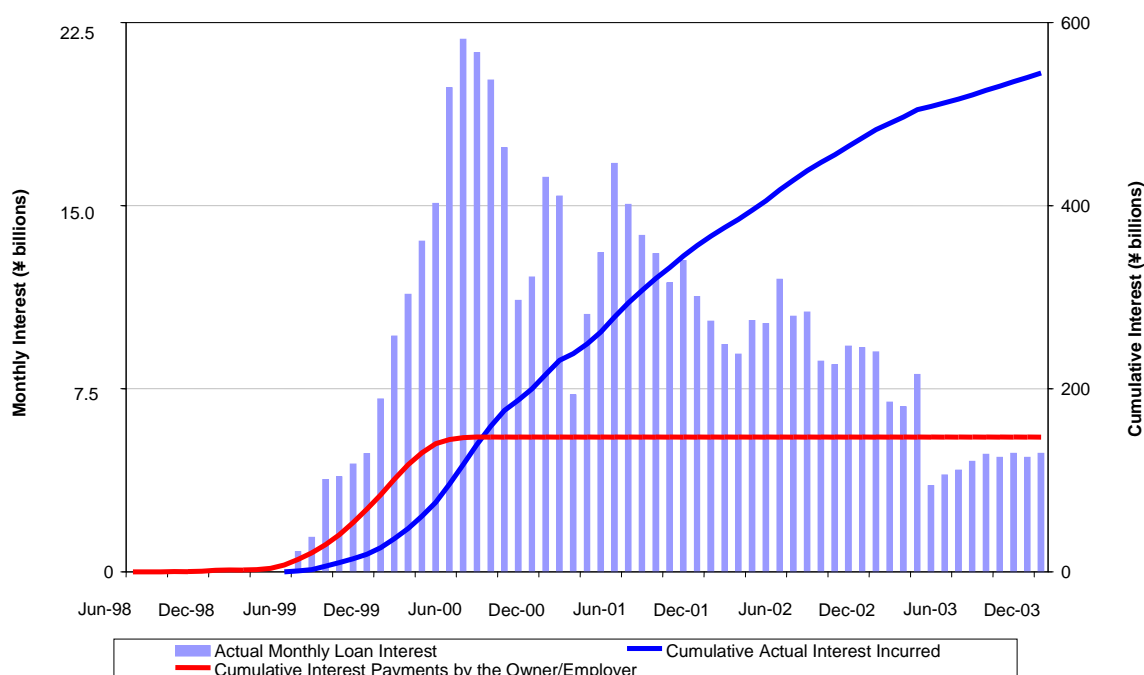
Similarly, the Author using the same Contract Administration records which the contractor had submitted to the Owner/Employer as required by the Conditions of Contract, further demonstrated to the Owner/Employer the amount Financing Cost the contractor was forced to incur as a result of the changed and extended execution it had experienced. The Contractor was a joint venture company that was formed to bid for and execute the project. The Owner/Employer's bid documents recognized that successful bidders would have to finance some of the costs it would incur before payment was earned, in contrast to World Bank financed projects which recognize an advance payment of up to 10% of the contract value. The Contractor was required to submit an expenditure schedule versus payment schedule as part of its bid that would support the financing level at a bid rate that was to be spread across all the Unit Price's. The cost and payment schedules provided the Owner/Employer with indication of its cash flow needs over the project as well. With each executed omnibus change, the Financing Cost schedules had to be updated for the expected to go work, even though the costs the Contractor incurred for the changes covered

therein could not be paid until the omnibus change was executed. The negotiation of omnibus changes took 6 to 12 months typically. Thus, even the projected periods of financing submitted to support the changes that were incorporated were never met from this lag. As with Indirect Costs, the use of a fixed financing cost percentage to be applied to direct costs in the Contract Unit Price's was based on the original bid document scope and execution period. The Author in Figure III.B.4.2 illustrated the variance between the contractor's planned cost and the Owner/Employer's actual payments that had to be covered by financing in the Contractor's proposal and bid.



The Contractor tied its payments to expected progress and its planned cost incurrence. This approach would minimize the amount of financing that the contractor would have to incur. Thus, the partners would not have to finance significant funds early in the Project execution. If the Project schedule was maintained, financing would be a small percentage of the costs that had to be recovered when payments were received. From the date of award, the Author found that the contractor's financing plan was frustrated by the Owner/Employer changes to the execution conditions, yet the contractor's project management team had shown what it had reasonably anticipated. The Author in Figure III.B.4.3 summarized the actual Financing Cost it incurred, excluding the costs impacts the Author has determined the contractor caused itself from the records the contractor maintained throughout the project.

Figure III.B.4.3
Actual Contractor Financing Costs for Capital Loans



The Financing Cost that the Author demonstrated what not anticipated by the contractor's project management team presented for the Contract Administration records maintained was summarized in Table III.B.4.2 as follows:

TABLE III.B.4.2 FINANCING COST DAMAGES CAUSED BY THE OWNER/EMPLOYER	
Description	Financing Costs ¥
Initial Operating Funds Loan Financing Cost	205,221,880,000
Operating Line Loan Financing Cost	348,989,490,000
Total Actual Financing Cost	554,211,370,000
Less: Owner/Employer Payments	(161,884,500,000)
Less: Financing Cost for the Contractor Caused Direct and Indirect Costs	(20,895,540,000)
Total Financing Cost Damages Caused By The Owner/Employer	371,431,330,000

The Owner/Employer's project management team would contest the amount of the Indirect Costs and the Financing Costs incurred in total, and particularly the amount that the contractor attributed to its own account. Even if the Author on behalf of contractor had

proven the basis for it's seeking the to achieve the level of the bargain first reached, the Owner/Employer's project management team in a culture of "mutual mistrust" would assume the Contractor was seeking more than it was entitled from the changed conditions.

5. Project Quality Management

Project Quality Management concerns the processes required to ensure that the project will satisfy the needs for which it was undertaken. PMBOK® states:

*"Project Quality Management processes include all the activities of the performing organization that determine quality policies, objectives, and responsibilities so that the project will satisfy the needs for which it was undertaken."*³⁸

There are three processes for Project Quality Management:

- (1) Quality Planning
- (2) Perform Quality Assurance
- (3) Perform Quality Control

Relevant regulations, codes and standards applicable are typically included in the Specifications and the Conditions of Contract. International Standards Organization (ISO) requires conformance to codes and standards all around the world and local codes may supplement the requirements. There are rigorous inspection requirements and recordation requirements that have been established in the global market for civil works infrastructure construction projects. Key is the documentation that the Owner/Employer establishes for the project quality requirements and the contractor needs to demonstrate the level of quality that it included in its bid; that it will meets such quality during execution and in the end result; and that it can be used to demonstrate variances.

The types of Contract Administration records that are maintained typically are designated in the standards that are incorporated in the specifications or referenced therein. Always there are specific record requirements that must be recorded and filed with appropriate government officials and/or are required by the Owner/Employer. The role of Contract Administration in these Project Management Process processes is to provide adequate planning and assure that the work is performed, inspected and tested in compliance with such designated standards and laws. In a civil works infrastructure project in Venezuela that the Author³⁹ evaluated, the Owner/Employer sought bids under a fixed price Engineer-Procure-Construct contract. During the project execution the contractor gave a notice for changed work when the Owner/Employer insisted that certain work be performed. The Owner/Employer countered that the work as planned by the contractor was of deficient quality and should therefore be re-performed to correct the deficiencies. The Author ultimately prevailed in the demonstration that the contractor's planning and execution did not meet the standards for the work required and that it did not maintain the records that were required.

The contractor submitted the engineering plan (Project Engineering Plan – PEP) that was required as part of its bid, but an updated the plan within the time specified in the Conditions of Contract was not provided. The Introduction to the PEP stated:

"The description of the 'Project Engineering Group', how it will function, the procedures it will follow, and the documents it will develop are described in this PEP. It will also serve as a reference document and valuable tool to

assist project engineering personnel in the systematic planning and completion of their responsibilities."

The Author demonstrated that the PEP was issued the week after the contractor had submitted the first required engineering submittal, the basic engineering, the transmittal for which certified that the engineering submittal met all the requirements of the Owner/Employer. The contractor's PEP noted that an accurate and complete project basic engineering was essential to establish control over the detailed engineering:

"The Project Engineering Group will execute/compare the detailed engineering of the complete project facilities from 'Basic Engineering' process design, preliminary studies and design specifications, and detailed engineering supplied by the Contractor from [a similar] project."

The similar project was the basis upon which the Owner/Employer had awarded the contract to the contractor. The purpose of the PEP was described as follows:

"The purpose of the...[Project Engineering Plan] is to assure that the execution of the engineering phase of this project is carried out in such a manner as to comply with:

- *The Project Technical Specifications*
- *[the Contractor's proposed design in the bid] Arrangement [defined in the PEP as the required performance requirements, codes, and standards] for Execution*
- *All Contractual Agreements*
- *Stated Schedules*
- *Administration Policies and Procedures developed to engineer, procure, manage, monitor and document all phases of the project."*

The contractor expressed in the PEP that its Detailed Engineering philosophy was

"...to perform quality detail engineering work on or ahead of schedule and within budget... a safe and reliable project will be the prime importance in the everyday events of the project engineering group."

Essential to this expressed contractor philosophy was a decreasing priority of parameters to be considered, with safety, operability, and maintainability in the top half of the priorities. The Author delineated issues of the contractor's adherence to this stated engineering philosophy in the response to the notice of changes the contractor had issued. The contractor's PEP had no detailed procedures for assuring engineering quality. "Checking" was required to be performed on all calculations, specifications, and all drawings, but detailed procedures on how to check were not provided. All that was required in the contractors PEP was:

- Regarding Calculations:

"Calculations shall not be considered valid until they have been checked by the discipline Lead Engineer (checker) or his designee...."
- Regarding Specifications:

"...The discipline Lead Engineer will be responsible for reviewing, checking and approving all specifications, with final approval by the Project and Paragon Project Engineering Managers."

- Regarding Drawings:

"All Drawings will be completely checked by the discipline engineers before being issued. The following checking procedure will be used for checking all drawings.

- The discipline checker reviews and checks the drawing for accuracy and correctness...- A final review and check is conducted by the discipline Lead Engineer...

- When all errors and/or omissions have been corrected to the satisfaction of the discipline Lead Engineer, the drawing is circulated to the other disciplines for a coordination check. Any comments resulting from this coordination check are reviewed and incorporated where applicable.

The coordination check procedure is repeated as necessary until all inter-discipline queries are resolved."

The Owner/Employer's project management team cited the standards that were referenced in the Conditions of Contract which had been provided in the specifications. The Author then presented that customary industry practice in preparing design documents, review and checking is typically done within a particular discipline, that is, piping drawings are checked for internal consistency and correctness. Thus, a pipe for a system must meet flow requirements amongst others, but also must be drafted as the same diameter on all drawings. A "Coordination Check" or interdisciplinary check is required to avoid interference, that is, to assure that drawings do not have multiple pieces of work from different disciplines in the same location. For example, a coordination check assuring that a physical location is not shown on a piping drawing as containing a pipe and then shown on a vent duct drawing with a duct in the same location then shown on a structural drawing with a steel column in the same location, etc. No detailed procedures were provided as to how checks, reviews, and coordination were to occur. If not specified, then typically some form of engineering quality assurance is established to make certain the checks, reviews, and coordination had been performed, but that was something that the contractor could not demonstrate.

The contractor also specified an engineering quality assurance strategy in the PEP:

"The project is on a 'FAST TRACT' [sic.] schedule, meaning that shortcuts may have to be taken to meet the very difficult schedule completion date. However, 'shortcuts', does not mean sacrificing engineering quality. Sacrificing engineering quality on the front end of the project would only cause problems during construction and after plant start-up. The quality of internal engineering is the responsibility of all professionals involved. Normal internal engineering checking and inter-discipline checking procedures are defined in [engineering documents and drawings]...The design of one discipline which may affect the design of other disciplines will be discussed and properly coordinated. Discipline design inconsistencies will be resolved under the Project Engineering Manager's direction and supervision, as required....As stated, the discipline engineering sections will check and review the basic design documents to ensure that all inputs necessary for completing

the project design are available, that they are accurate and consistent with project specifications and requirements, and they are in compliance with local regulations and standards. If further information or clarifications are required, the Project Engineering Manager will resolve the issues....Design verification will be done through regular internal design review meetings attended by engineering personnel. In addition, internal design audit will be conducted, under the direction of the Project Engineering Manager at the completion of major engineering milestones. Meeting notes of the design review meetings and audit findings will be published and transmitted for resolution and incorporation by the responsible engineering personnel."

Thus, the Contractor in the PEP placed responsibility with Engineering Manager, for ultimate assurance of engineering checking and interdisciplinary coordination. The PEP did not provide detail or procedures on how checks, reviews, coordination, or the Engineering Manager's verification would be performed. Concurrent with the late transmittal of the PEP, the Contractor issued to the Owner/Employer's project management team the project Quality Assurance Manual stated that:

"The goal of the QA/QC Program is to assure that design, procurement, shop fabrication, erection, inspection, testing and turn over activities are performed in accordance with the Owner/Employer's documented requirements, applicable codes, governmental regulations and proven good practices. The contents of this plan are intended to describe what is to be done to support achieving this goal, how it will be done and how it will be documented and reported to the Owner/Employer. QA/QC System for this project is based on a quality management approach to achieve quality and addresses the total range of E-P-C activities. The goal is to build quality into the way the Contractor's project management team defines, plans and executes each task in every phase of the project so that non-conformances can be minimized before they have an opportunity to impact cost or schedule. The specific objectives we seek to achieve on the Owner/Employer's project are as follows: to work jointly with Owner/Employer to plan and execute the work 'right the first time' so that unnecessary rework, delays and expense can be minimized."

The Contractor's Quality Assurance Manual covered engineering Quality Assurance/Quality Control (QA/QC), but it referred back to the incomplete PEP. The Contractor defined the purpose and procedures of the Engineering QA/QC Program primary objectives:

"...to be achieved in implementing the Project QA/QC Program during the planning and detailed engineering phases of the project are to design safe, operable facilities in conformance with Owner/Employer's performance requirements, the PEP, and other requirements, and to control the quality of the engineering process so as to minimize error and discrepancies. The Contractor's strategy for defining the details of how engineering tasks are to be conducted is established in the PEP. Engineering QA/QC Procedures describe how the deliverables (e.g., drawings, specifications, studies) produced by each engineering discipline are to be prepared, reviewed, checked and approved."

The Contractor detailed various planned quality management activities during engineering:

"QA/QC activities during engineering will be implemented in two stages.

The purpose of the first stage is to ensure that design and engineering tasks are performed by qualified personnel with a level of knowledge and experience appropriate to the complexity of the task....

The purpose of the second stage of the Engineering QA/QC process is to ensure that the quality objectives defined in the Project QA Plan and this plan have been satisfied. This is accomplished as follows:

- *Engineering deliverables are produced, checked, reviewed and approved by the Discipline Main Engineers, Discipline Department Heads and Engineering Staff in accordance with the procedures described in the QA Procedures and Engineering Practices applicable to this project."*

In the Contractors QA/QC Manual the Author found, the contractor tied the project's engineering quality assurance activities to those the contractor defined in the PEP. No detailed procedures on how activities, such as verification, reviews, checking, and coordination, were included in the QA/QC Manual or PEP. The Owner/Employer then detailed specific deficiencies in the engineering that the contractor has issued to the Owner/Employer and to subcontractors the contractor was using. These were the deficiencies that the subcontractors who had made fixed price bids on drawings and specifications that had clashes, and related problems were claiming as extras. Thus, under a culture of "mutual mistrust," the Owner/Employer's project management team had shown that the root cause of the problems was in the defining the assumptions on which the contractor had based its proposal and the contractor's failures with respect thereto.

To further illustrate the role of Contract Administration in a project's overall project management plan, the Author perform an analysis of the Owner/Employer project management team in a civil works infrastructure construction project in the Philippines in which the Owner/Employer terminated the Contractor after 19 months of a planned 48 months execution.⁴⁰ Using the lack of performance of the contractor in meeting the Project Quality Management requirement of PMI and the Contract, the Owner/Employer's project management team justified the Contractor's termination. The Contractor completely failed to meet the Contract requirements established in the Conditions of the Contracts, and international standards, regarding implementation of a Quality Assurance and Quality Control program for the project. As the PMI standards for project management establish, a key component of project planning is the QA/QC approach. Its timely implementation is essential to prevent poor workmanship and the impact of resultant repairs, corrections or replacements. QA/QC is an integral part of the management and construction process that ensure that the project will be a quality final product, built to specifications. An effective program promotes quality both within the organization and in the completed project. QA/QC is a program that must be implemented internally by the organization and must be ongoing to maintain quality in work practices and product in order to achieve the best possible results on the project. The QA/QC plan for this Project was required by the Conditions of Contract to be submitted for approval and implementation within 6 months of the Notice to Proceed.

Under the EPC Contract, the Contractor was to provide, implement, and administer a Quality Assurance/Quality Control program (QA/QC) for both design and construction of the work. The Conditions of Contract provided that the Contractor had to:

"Perform all inspections, expediting, quality surveillances, and other like service required for performance of the Work, including inspecting all materials and equipment that comprise the Project that are to be used in the performance of the Work."

and:

“Use effective quality assurance programs, acceptable to Owner/Employer in performing the Work. Within ninety (90) days after the Notice to Proceed Date, Contractor shall provide to Owner/Employer a Notice describing such programs to be used by Contractor in the performance of the Work. Owner shall have the obligation to promptly review and comment on such programs as described in Contractor’s Notice hereunder; provided, however, that Contractor shall remain solely responsible for performing the Work in accordance with this Contract. If Owner/Employer fails to comment within ten (10) Business Days after receipt of such Notice, Owner/Employer shall be deemed to have accepted such programs.”

The EPC Contract detailed the contractor’s QA/QC responsibilities:

“Contractor shall develop and implement a general QA program covering the Work and field quality control program and field procedures in order to ensure that the Work is performed in accordance with contract drawings, specifications and all other applicable code requirements as specified in the Contract documents. Such program shall be submitted to Owner/Employer for review and approval pursuant to the Conditions of Contract.

Contractor will verify that the in-progress and final inspections and tests are performed and documented as required.

Contractor will maintain accurate and legible records of the quality related activities readily available for review by Owner/Employer.

Contractor shall arrange and facilitate Owner/Employer’s inspections in Contractor’s and Vendor’s facilities and in the field in accordance with the Conditions of Contract.”

To complete the planning aspects, an experienced and competent international EPC contractor on a civil works infrastructure Construction project would also have readily available, off the shelf, a set of procedures and programs to guide the implementation of a project plan. As part of the Project, for example, the contractor was to provide, implement, and administer a Quality Assurance/Quality Control program for both design and construction consisting of, but not limited to, the following elements:

1. Develop a design QA/QC manual that will establish guidelines for the Engineering/design sub-contractor both for home office as well as site engineering work.
2. Develop a Construction QA/QC manual that will establish quality control documentation and inspection requirements.
3. Appoint a Quality Control organization which has independent authority outside of the project organization and which is staffed with a QA/QC Manager and support staffed.
4. Conduct QA/QC inspections prior to initiation of any work, during the course of work and at completion and issue deficiency reports as appropriate.
4. Establish and implement procedures for corrective action including “stop work” orders.

5. Provide the Owner/Employer periodic QA/QC reports.

The Author demonstrated from the project records that the Owner/Employer's project management team had maintained that the Contractor disregarded quality management from day-one, as evidenced by their disregard for submittal of a QA/QC program in a timely manner as required by the EPC contract. Prior to mobilization on site, the Owner/Employer's project management team was given specific notice of the QA program requirements. Four months later, the contractor had to be reminded it required an approved program because concrete and road work were being installed, and this work required QA/QC records. The contractor was notified after eleven months by the Owner/Employer was warned that its QA/QC practices must improve. The contractor, however, continued to fail to provide any form of QC on the work in progress. Quality in the work performed was compromised without a QA/QC program.

It was not until nearly a year had elapsed that the contractor finally submitted a QA/QC plan, but that plan did not meet the minimum standards that the contract required and the Owner/employer required re-submittal. The Owner/Employer required the contractor, as part of a Recovery Plan, to contact with an independent third-party to supply QA/QC engineers. The contractor took another two months to contract with a third party to undertake to its QA/QC program responsibilities. A final edition of the QA Program was submitted for use in construction of the project 15 months after NTP.

Lack of QC was evident from the start of the first work on site and road work. The main access road work was completed without any QC. Then the access roads to Adits were being constructed with noted quality problems with the sub-base, rip rap, water, slope stabilization, grades, culvert and drain sizes, and maintenance. The road construction was completed without engineering or quality control efforts. The result was wash out of culverts, wing walls and severe erosion. The condition and quality of the access roads affected progress of the TBM Adit (an access tunnel for the TBM) and the delivery of cement for the batch plant. It became evident that the contractor was not conducting QA/QC inspections nor maintaining any documentation, even after the receipt of the QA/QC program from the third party.

When the contractor began producing concrete for the batch plant it had erected on the site, the contractor was mixing concrete directly on the ground or in a backhoe bucket almost guaranteeing out of specification concrete. Additional quality problems were noticed in letters with the concrete operation by the Owner/Employer's project management team: coarse and fine aggregates were out of specification, dirty (unwashed) and poorly stockpiled. Despite numerous warnings, these conditions remained a constant problem. The contractor was not following the design mix proportions and went as far as not allowing their QC engineers at the batch plant to supervise the concrete quality procedures.

The Author demonstrated that the Owner/Employer's project management team was acutely aware that it had entered into a design-build/EPC contract and could not appear as interfering with the Contractor's means and methods. It continued to give notices of the Contractor's Project Quality Management failures during its execution. In spite of the requirements that all work be performed to strict QA/QC standards on the Project, both temporary and permanent, the Contractor never established a viable QA/QC program for any of the works up to the time it was terminated. The contractor's designated QC System Manager wrote over 14 months after the site mobilization:

"...since this is the first opportunity to prepare the Monthly QC Report, all QC matters from the beginning of the project to the end of [the first 14 months of

the project] will be contained to the Report. QC matters before are the submittal of drawings for approval.”

Quality management is a fundamental element of any project management approach. The EPC contract required compliance with requirements that are typical of international projects. The Contractor failed completely to meet its QA/QC requirements or to meet fundamental international project management standards. After five months of using the QA/QC procedures, the contractor was still not submitting the data to the Owner/Employer that the EPC contract required. The contractor was also beyond any hope of recovery on the schedule or programme and the Owner/Employer's project management team had documented the Contractor's failure to meet the Conditions of Contract which established the bargain the Owner/Employer had made. The contractor was terminated. The Author established that the Owner/Employer had been diligent since the inception of the project in performing Contract Administration, giving the Notices required under the Conditions of Contract, and allowing a reasonable time to correct deficiencies. The Owner/Employer had protected its bargain and the contractor had failed.

6. Project Human Resources Management

Project Human Resource Management concerns the processes required to make the most effective use of the people involved with the project. PMBOK states:

“Project Human Resource Management includes the processes that organize and manage the project team. The project team is composed of the people who have assigned roles and responsibilities for completing the project.”⁴¹

The four Project Human Resource Management processes include the following:

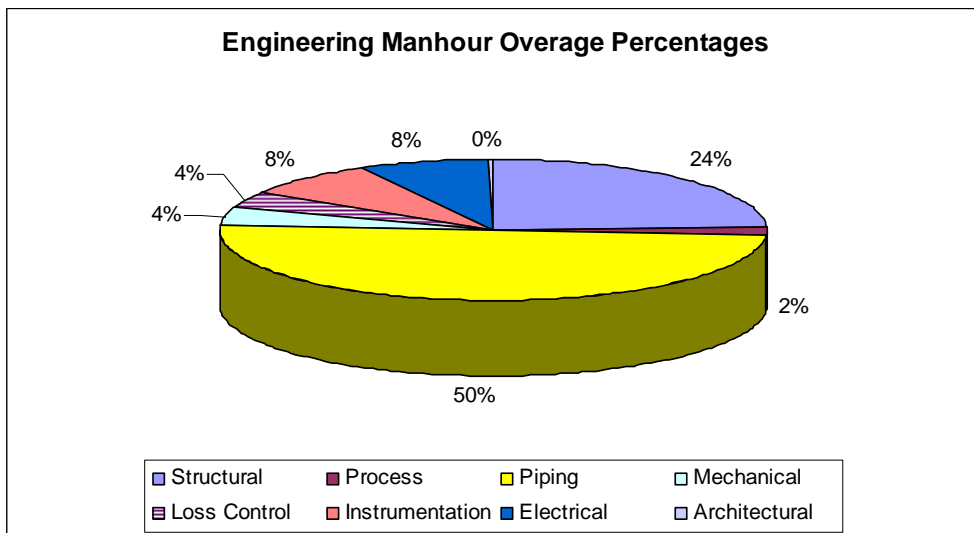
1. Human Resource Planning
2. Acquire Project Team
3. Develop Project Team
4. Manage Project Team

The Author similarly demonstrated the contractor on the civil works infrastructure construction project in Mexico (see Project Integration Management above) developed the unit prices for engineering that the Owner/Employer required in the bid. The Contractor submitted the categories and hours for each discipline in an Appendix to the Contract. Thus, the assumptions on which its bid was based were recorded. When it prepared a Work Breakdown Structure and loaded it on to the schedule that it submitted monthly to the Owner/Employer, the contractor's project management team was appropriately using Contract Administration to define its assumptions and updated/statused those assumptions monthly throughout the project execution. To demonstrate the impact on its detailed engineering, the Author summarized detailed analyses as follows when it was impacted by the OFE (the equipment that was to be provided by the Owner/Employer).

The Author produced Figure III.B.6.1 that showed the distribution of engineering man-hour overruns for all engineering over the entire Project. The piping overruns account for half of the total engineering overruns and structural engineering accounts for 24 percent. Process engineering shows a small 2 percent value which is deceptive because the process engineering drives all subsequent design and procurement activities.

Figure III.B.6.1

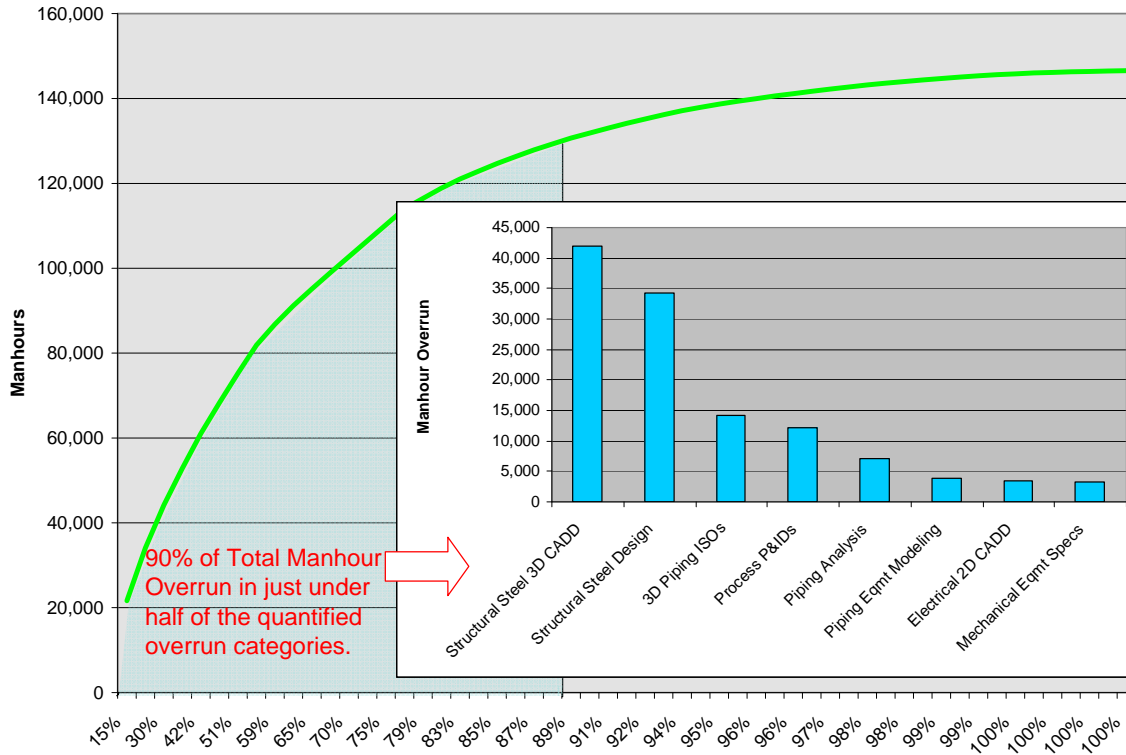
Percent Distribution of the Eight Engineering Categories that Comprise 90% of the Engineering Man-hour Overruns



Next the Author presented the “Cumulative Distribution and Primary Disciplines for 90 percent of Engineering Man-hour Overruns for the time period at issue.” The 90 percent value for all engineering manhours was selected to reduce the number of activities to analyze from the Working Schedule. Of the more than 1,200 activities identified as having either started late or completing in a longer time than planned, just 447 of those activities represent 90 percent of the man-hour overage for the time period.

Whereas piping accounts for the greatest man-hour overage for the Project as a whole, Structural Engineering and 3D CADD (computer aided design) proved the greatest overrun from April 17, 1999 to January 14, 2000 as illustrated by the Author in Figure III.B.6.2:

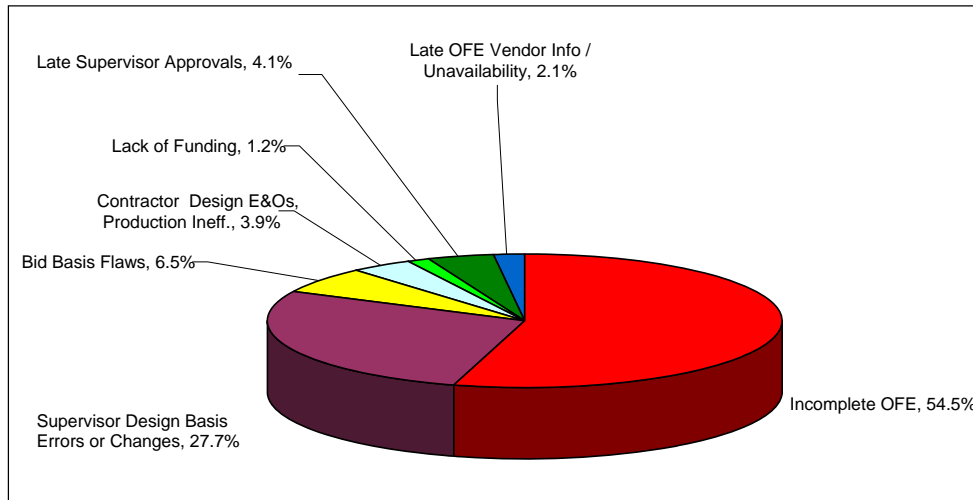
Figure III.B.6.2
Cumulative Distribution and Primary Disciplines
for 90% of Engineering Man-hour Overruns for the Project Period
April 17, 1999 to January 14, 2000



The contractor kept both the Owner/Employer and the third party Supervisor informed of the delays to engineering work and reasons for delays throughout the project execution. Minutes to the monthly review meetings, wherein all parties were represented, documented the issues that delayed engineering during this project period. Also, the project records demonstrated the contractor's willingness, and actual efforts to ameliorate the difficulties encountered, which difficulties were largely attributable to the Owner/Employer. Causation was demonstrated by the Author from those records regarding each piece of OFE and that the contractor reported to the Owner/Employer through Contract Administration efforts that reported monthly the delay/acceleration and the impact on the human resources that the contractor had bid through the WBS and the unit prices. Results of the Author's analysis are shown in following Figure III.B.6.3 and Figure III.B.6.4. The project records that were supplied monthly relative to the impacts caused by late OFE data and changes support the results the Author found.

Figure III.B.6.3

Causation Breakdown for Engineering Manhours in Project Period

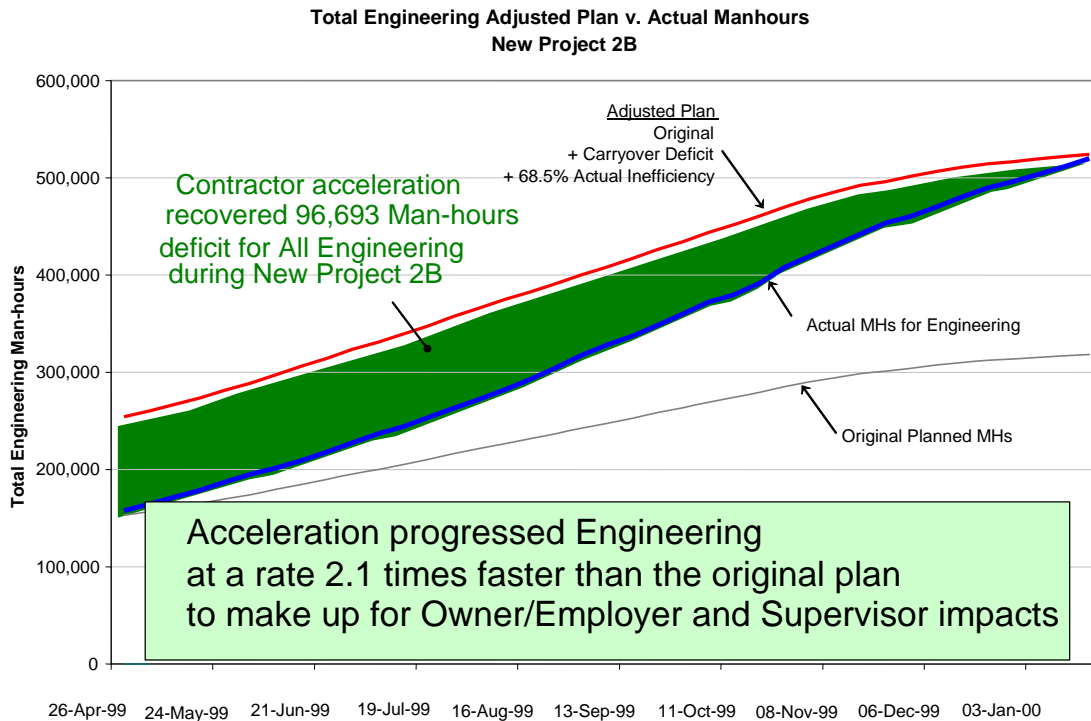


The Author demonstrated on behalf of the contractor to the Owner/Employer that incomplete OFE and lack of OFE vendor data combined comprised more than 55 percent of the man-hours overrun that it experienced in this period. Design errors and changes due to bid basis errors that were caused by the Supervisor and other Supervisor changes collectively accounted for about one-third of the impacted man-hours in the period. The Author's analysis also demonstrated that the contractor's own error & omissions and inefficiencies impacts as well – 3.9 percent of the engineering man-hours. Costs associated with these inefficiencies were deducted from the amount that the contractor claimed for the period or window being analyzed.

Despite the accountability for some of the engineering man-hours, the contractor's acceleration efforts during the project period brought engineering to about 85 percent completion versus 88 percent planned (or to 97-percent of plan). The Contractor had reported in the prior project period that engineering was only at 60-percent of plan. The Author demonstrated that the contractor had undertaken significant efforts to recover impacted man-hours imposed upon it by the Owner/Employer's and its Supervisor's errors of late OFE engineering data. The total engineering manhours expended in this project period accelerated as was shown by the Contractor to have increased by a factor of over two in comparison to the original plan.

Figure III.B.6.4

Actual Engineering Acceleration vs. Plan and Adjusted Plan



The overall gains realized were a logical byproduct of acceleration to each of the engineering disciplines. The contractor had shown that actual engineering man-hours had been expended occurred at a rate 6.5 times greater than planned using the WBS as it was loaded on to the contractor's schedules. A summary Table III.B.6.1 was then presented by the contractor that compared the original planned rate of progress versus the actual progress rate achieved for each of the engineering disciplines. As the Author had shown, the contractor accelerated every engineering discipline whether compared to the original planned manhours.

Table III.B.6.1 COMPARISON OF PLANNED VS. ACTUAL PROGRESS RATES FOR ENGINEERING*	
Engineering Discipline	Original Plan vs. Actual Progress Rate Achieved
Process	6.5
Structural	1.5
Piping	2.7
Instrumentation	2.3
Electrical	2.0
Mechanical	1.9
Loss Control	3.2
Architectural	3.4
Total Engineering	2.1

Notes:

* Values greater than 1 indicate the Contractor's acceleration

The contractor had applied the concepts of Contract Administration in all of its project management processes. The contractor had defined in a thorough manner the assumptions it had based its bid and proposed engineering man-hours. The Contractor's project management team was ever alert to the erosion of the basis of its bargain, and then report and kept the Owner/Employer informed. The Owner/Employer had the same data then as the contractor, and it used the data to show that the attribution of man-hours for the contractor's errors and omissions was reported at too low a level. Ultimately, through good Contract Administration the parties succeeded in keeping a bargain that reflected the changes through a process of "mutual mistrust."

7. Project Communications Management

According to the PMBOK:

*Project Communications Management is the Knowledge Area that employs the processes required to ensure timely and appropriate generation, collection, distribution, storage, retrieval, and ultimate disposition of project information."*⁴²

The Project Communications Management processes include the following:

- Communications Planning
- Information Distribution
- Performance Reporting
- Manage Stakeholders

The PMBOK requirement thus covers the timely reporting in information from one party to the other party that the Conditions of Contract require. Both the Owner/Employer and the Contractor must be familiar with the specific Conditions of Contract regarding the timing of notice. As noted above, a party can lose its bargain by giving notice in an untimely manner or an incomplete (unsupported) manner. Similarly, the failure to respond within the time the Conditions of Contract require or in an unsupported or incomplete manner may cost the party the benefits of its bargain. Additionally, the project management teams of both parties in exercising Contract Administration must record and distribute information sufficient for their respective project management personnel and the senior management personnel to make informed decisions. Thus, for example, regarding the civil works infrastructure construction project in Mexico discussed above, the contractor's project management team recorded in a detailed fashion the assumptions that under laid the bargain that it made with the contract, and shared information regarding items, such as, monthly scheduling performance (both delay and acceleration), the failures of the information provided by the Owner/Employer (or its third party Supervisor), the details of the impacts, etc. As a result, the Owner/Employer and its project management team were fully informed on a continuous basis, thus affording the Owner/Employer the opportunity to correct deficiencies and minimize the impacts.

Conversely, with regards to the civil works infrastructure construction project in the Philippines that the Author evaluated (see Project Quality Management above), the contractor totally failed in its Project Communication Management responsibilities and did not in any way meet the communication or documentation requirements. The extensive notices that the Owner/Employer sent to the contractor were not answered, were answered orally by personnel who were not recognized or authorized by the Conditions of Contract, answered orally and not followed by confirmation in writing, or exhibited no evidence of making any change as result of such notice. Although the PMBOK recognizes the existence on most projects of "informal lines of communication" and oral communications, the current

trend in the global market is to confirm in writing all oral communications in order to establish a documented written trail which records the action of the party. Today, the extensive use of emails as an acceptable form of communication is recognized. Email communications have an “almost life of their own,” as emails exist somewhere in the ethos of the web and are never really deleted. In some jurisdictions, however, there is still a need to formally transmit a written communication, although it appears to be a function tied to the law specified in the Contract. Ultimately, with respect to the Philippines civil works infrastructure construction project, the Author showed that the contractor’s project management team recognized its obligations as contained in the Conditions of Contract (both the proper project management personnel authorized to communicate and the timing responsibility) through its internal emails. The contractor’s internal emails further had established an intent to deceive the Owner/Employer by getting the Owner/Employer’s personnel “off their back” by telling them what “they wanted to hear.”

Within the global market, there is a belief that the informed Owner/Employer or the informed contractor is a party with whom the other party has entered into a partnership of “mutual mistrust,” but they should not be agonizing over facts, merely the consequences or impacts. Thus, the requirement of Contract Administration is for the project management team to produce for its party a communications manual that guides the party in the communications that it is required to meet the requirements of the Conditions of Contract regarding the timing, the personnel who receive communications, and how often or when they are required.

8. Project Risk Management

According to the PMBOK:

“Project Risk Management includes the processes concerned with conducting risk management planning, identification, analysis, responses, and monitoring and control on a project; most of these processes are updated throughout the project.”⁴³

The Project Risk Management Processes include the following:

1. Risk Management Planning
2. Risk Identification
3. Qualitative Risk Analysis
4. Quantitative Risk Analysis
5. Risk Response Planning
6. Risk Monitoring and Control

Every party to a civil works infrastructure construction project holds a particular and unique position relative to the risk elements for which it assumes responsibility during the execution of that project. The civil works infrastructure construction global market recognizes two types of risk management:

- Traditional insurance risk management, which is concerned with the management of the party’s insurance program (i.e. builders risk insurance, hazard insurance and liability insurance).
- Execution risk management, which is concerned with the management of specific events or conditions which may inhibit or prevent the achievement of

project cost, schedule and/or quality goals (i.e. design defects and construction delays).

The PMBOK is concerned primarily with the latter. Risk typically is defined as an element or factor arising during project execution which inhibits or negates the achievement of stated project cost, schedule or quality goals. Risk is both a potential condition and a specific element or event which may result in that condition. Project Risk Management is composed of systematic process by which risk elements or conditions may be identified, evaluated and avoided, mitigated or eliminated, in order to preserve the achievement of project cost, schedule, and quality goals. Project Risk Management is the common term for a systematic program by which a party to a construction project identifies, evaluates, and acts to avoid, mitigate or eliminate risk elements or factors which threaten the successful achievement of project cost, schedule, scope, quality, and goals.

The bases of Project Risk Management are measures of success or failure, extremes between which many permutations of partial success are most likely. Project management research has addressed metrics in many forums which generally focus on measurable functionality, scope, cost and timeliness.⁴⁴ In the practical reality of projects, the success is more likely perceived than measured by most stakeholders. Recent research suggests that:

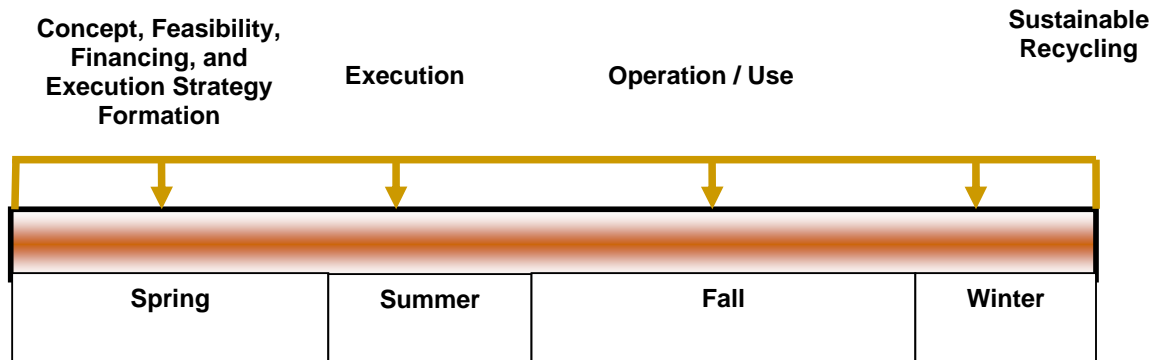
*"...each stakeholder assesses project success on the basis of evaluation dimensions that fit within his own agenda or within the interests of the group he represents....Perceptions may sometimes be incorrect representations of reality, but perceptions are the [stakeholders] sole possession and are the very basis upon which he makes his decisions."*⁴⁵

The typical stakeholder representative as a consequence develops metrics and measure success in terms that satisfy the stakeholder's project's goals.

Risk reduction and risk management is the key to improved project management and developing success metrics. Project and stakeholder success can be demonstrated through risk reduction and resultant impacts as risks emerge. Thus, risk management currently is heralded as a panacea for reduction in project execution problems and impacts. Proper use can go a long way towards achieving much of the risk reduction that is desired. Project Risk Management standard is the most recently developed knowledge area of PMBOK, but broadly based risk management tools over the life of a project are not widely understood and their application recognized by most project stakeholders. As a result, effective Project Risk Management on projects has evolved dramatically over the last two decades. Early techniques were heavily focused on theoretical statistical techniques, but the current focus is on practicality in application and has driven much of current Project Risk Management use and techniques being applied on civil works infrastructure construction projects globally.

Using a pipeline for an example, Project Risk Management provides the ability to identify risks, determine characteristics of risk emergence, measurement through control systems, and application of enhanced project management methods for improved achievement of project and stakeholder goals throughout the life of a pipeline project.⁴⁶ As shown in Figure III.B.8.1, the life of every civil works infrastructure construction project has what can be likened to seasons:

Figure III.B.8.1



THE RISK SEASONS OF A TYPICAL PROJECT'S LIFE

Risk management is essential to recognize and develop input to meet the different needs for the project and respective stakeholders success throughout the seasons of a project's life – a Project's Spring season (from the identification of a possible need that may become a Project to its financing/funding), a Project's Summer season (Project execution), a Project's Fall season (project use), and a Project's Winter season (sustainable recycling). As employed throughout a project's life, risk management requires focus and appropriate management techniques. Throughout a project's life there are organizations with a stake in the Project who's project management personnel or the equivalent are responsible for assuring goals are met and ever-present risks are managed. With project risk management processes becoming a growing part of successful project management processes, stakeholders must identify and use risk management tools that are applicable to the risks faced and assure effective return in managing those risks should the potential risks actually begin to affect the project.

Again using the pipeline example to illustrate civil works infrastructure construction projects in the global market,⁴⁷ ranging from water distribution to gas pipelines, provides insight into the type of Stakeholder risks that must be considered and addressed. Project records employed include risk assessments, risk profiles, risk management audits, project controls reports, and management reports. Generally, during the project's "Spring," risks are focused on assuring the proper balance between project specific risks (e.g., technology applicability) and context specific risks (e.g., cultural-social issues) to assure that the capital investment is not wasted. As the project delivery (design, procurement, construction, and commissioning) occurs in the project's "Summer," risks reflect typical engineering and construction implementation issues. Following commissioning, projects enter the long "Fall" of its use. Risks typically involve proper maintenance, improvement, and changing needs in light of evolving societal/demographic or operation/economic conditions. During its "Winter," the project increasingly faces the changing requirements on sustainability and recycling in an evermore environmentally sensitive world. Thus, Project Risk Management tools enable project management teams to identify, monitor and execute appropriate project management processes to meet the challenge of minimizing risk emergence impacts in a "season."

During the project's life, current global practice focuses Project Risk Management on both the project itself and the environment in which it is conceived, executed, operated and terminated. The key step of identifying risks that potentially may affect the pipeline project and its stakeholders come from many sources and change over time. Using socio-economic, commercial, and related trends in civil works infrastructure construction projects,

the Author has defined specific project factors and context specific factors enable necessary focusing on risk. Typical risk factors include:

Project Specific Factors:

- Delivery/Operation Risk. The ability to overcome the risk of delivering and operating the project as conceived. This risk factor involves those issues or concerns associated with actual engineering, procurement, construction execution and operation of the project, including non-traditional approaches such as a public owner's use of design-build contracts.
- Technology Risk. The ability to overcome the technological risks of the project. This risk factor involves those issues or concerns associated with the technologies involved in the execution methods and operational technology of the project.
- Financial Risk. The ability to overcome the financial risk of the project through to final completion and operation. This risk factor involves those issues or concerns associated with the financing of the project, including the execution period and operations or equity financing.
- Procurement-Contractual Risk. The ability to overcome the risks associated with the procurement of, or contracting for the execution and operation of the project. This risk factor involves those issues or concerns associated with the contractual and procurement approaches – systems - processes used for both project execution and operation.

Project Context Factors:

- Political Risk. The ability to overcome the political risk of the project, including; local, state and national political opposition, and code and regulatory impediments. This risk factor involves those issues or concerns associated with the local, regional and national political and regulatory situation confronting the project.
- Environmental Risk. The ability to overcome the environmental risks of the project. This risk factor involves those issues or concerns associated with the environmental problems, concerns and activities confronting the project during the project execution and the project operation.
- Social Risk. The ability to overcome the social risks of the project. This risk factor involves those issues or concerns associated with the social and cultural impacts of the project to the community and region within which it is to be located.
- Economic Risk. The ability to overcome the economic impact risks of the project. This risk factor involves those issues or concerns associated with the macro economic impact of the project to the community and region within which it is to be located.

All civil works infrastructure projects start as an idea; that is, a concept that will fill a specific need, within a specific time, and at a specific location. Thus, the primary party involvements are those of the owner-operators, financing sources, and users. Since there are essentially no limits or boundaries on concepts – if it can be imagined, someone can turn the concept

into a project. But, there are enormous risks involved in moving a project from concept through feasibility to financing. It is no longer enough to have a “good idea” upon which to seek funding or financing. In today’s global economic structure the “good idea” must be backed by analysis and examination of the multitude of risks involved in executing and assuring a useful life. As projects become increasingly complex and as competition for a share of the finite pool of global capital resources (public and private) to undertake projects increases, financing-funding sources must make well based decisions on which investments have the best chance of a significant return (economic or social). These decisions are tied to identifying potential risks and managing those risks.

However, not every concept should be or is transitioned into a project. Therefore, early in a project’s life, the stakeholders test the project’s assumed physical, technological and expense parameters versus the potential project’s need, feasibility and return on investment. A civil works infrastructure project concept at least must pass three tests to be practical:⁴⁸

1. Can the project be physically engineered and constructed?
2. Does the technology exist to engineer and construct the project to meet the purpose intended?
3. Does the expected benefit of the project justify the cost of engineering, constructing and operating the project?

If a concept fails any of the three tests, realistically it should not be built. Ancient to recent history is full of examples of projects which never should have been undertaken because the concepts failed to pass one or more of these three tests. Yet, there still are examples of projects being built in almost any location in the world which fail one or even all of the tests. Similarly, the tests must be applied to stakeholders, since the execution of those projects that fail one or more tests also have serious economic or social side affects, some intended and some unintended. Ultimately, risks from not balancing stakeholder goals can become “locked in” if the project is financed or funded to begin the “Summer” of its life, and risk impacts are assured.

Project Risk Management tools used in a civil works infrastructure construction projects include risk models and data that allow a rating of potential risks and provide input to shape project management processes as the project moves into its execution phase. Such Project Risk Management tools focus on providing developers (public and private) and financing-funding decision makers with the means for determining risks from the typical project and context specific conditions noted above. Additionally, in the competition for financing-funding from limited capital, modeling compares the civil works infrastructure projects to other potential projects and their capital use demand. For example, typical of current oil and gas pipeline risk issues being addressed includes:

- Reserves Risk (an Operations Risk Factor): Addresses the extent of reserves and contingency to be transported, and not only the anchor field, but also reserve risk associated with the prospects and discoveries in the area.
- Credit Risk (a Financial Risk Factor): Customer credit risk is a new risk issue stemming from the large inflow of small cap independents and the formation of many LLC’s (Limited Liability Corporations) without any real assets.
- Engineering Risk (a Technology Risk factor): The Exploration and Production requirements continuously are pushing the deepwater envelop. A large risk consideration is that the meteorological-ocean data (current and waves)

is empirical and is changing with new measurement information becoming available every year.

- Materials Risks (a Procurement Risk Factor): The huge costs of pipeline projects are driving the search for the cheapest material that meets specification which is to be fabricated in a location that has the least cost – often in different countries.
- Weather Risks (an Environmental Risk Factor): Loop currents and named storm risks are plaguing many off-shore projects, yet are increasingly uninsurable or not assignable.
- Insurance Risks (an Economic Risk Factor): The global reinsurance market currently has severe capital restrictions that are restricting access to project insurance.
- Customer Project Risks (a Political Risk Factor): Pipelines are a transportation system that relies on customer projects for its need and use. Political stability underpins many such projects and their market viability.
- People Risks (a Social Risk Factor): Changing social relationships and forced cultural changes of linear projects, like pipelines, are destabilizing local support and long term operability conditions.

Resulting risk model information typically is summarized graphically as in following Figure III.B.8.2 which has been hypothesized from an Analysis by the Author of a proposed pipeline project designated “Kobe.” It demonstrates the areas of risk to be managed and addressed. Financing-funding organizations can assess the risks and evaluate Project Management capabilities to address the risks and meet goals. With financing-funding the “planned” Project becomes a real Project to be executed and the Project moves into the “Summer” of its life.

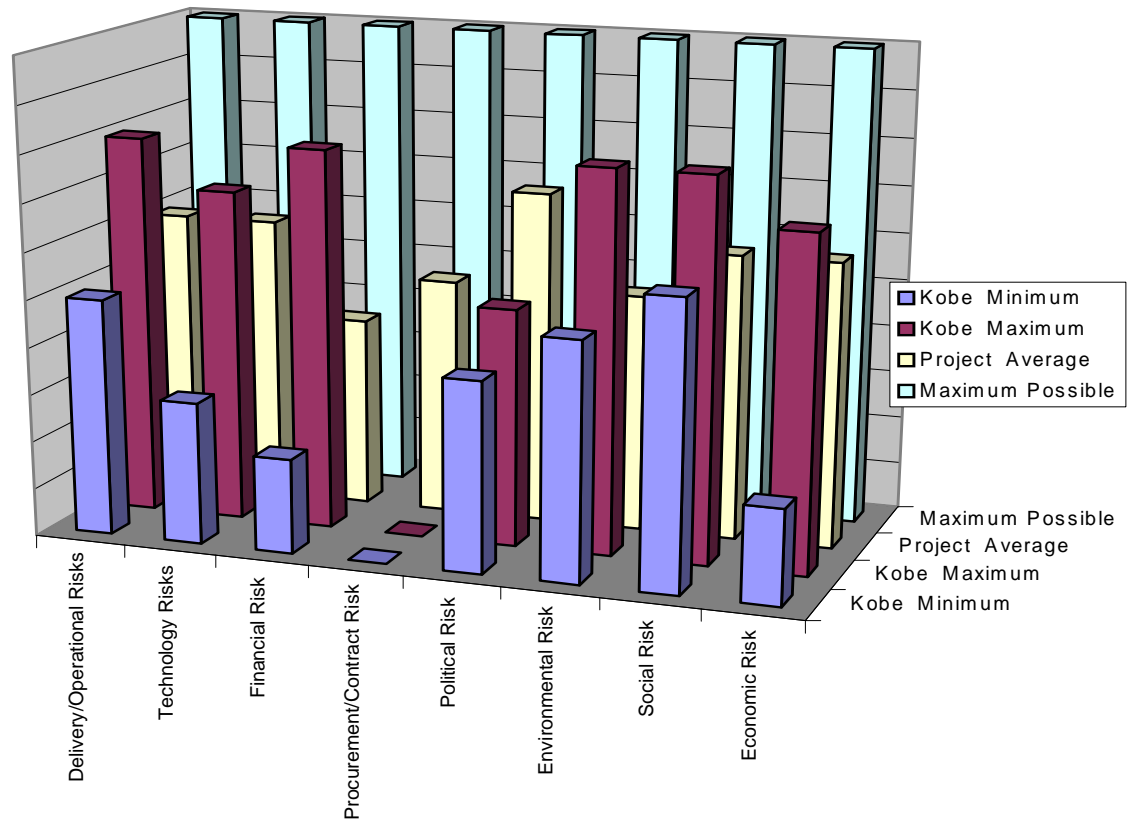
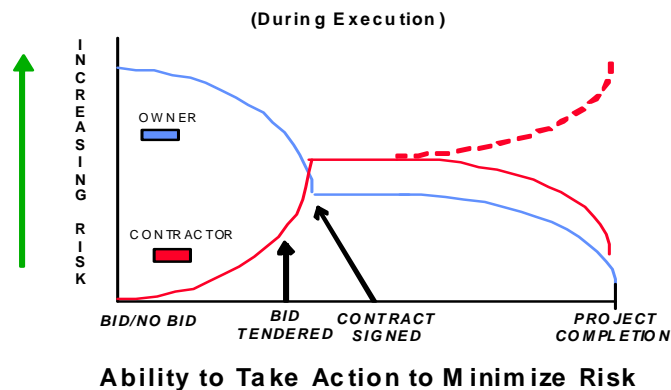


Figure III.B.8.2
PIPELINE PROJECT RISK ASSESSMENT RELATIONAL RATINGS GRAPH

For Owner/Employers and contractors that have entered into a contract for a civil works infrastructure construction project the risks are typically in not achieving the project scope, quality, functionality, cost and/or time that is the bargain that they made. Similarly, they both also must recognize how, what, when and where the risks of their not meeting project objectives means, and thus the benefits of the bargain that they respectively made. The amount of risk each party undertakes is different at different points in the project. The following Figure III.B.6.3 prepared by the Author illustrates for the Author's experience how risk flows throughout engineering and construction process plotted against the options the parties have available to influence or manage that risk. The deeper into the project each party goes, the fewer risk management options available. Wait too long and its only option is a claim or a dispute.

**Figure III.B.8.3
Project Risk Profile**



The role of Contract Administration in the Project Risk Management processes is one of “mutual mistrust,” that is, anticipating where the other party and/or the project will be at risk in achieving project success.⁴⁹ There is a definitive shift in the functional, management and control focus of risk management passing from the Owner/Employer to the contractor which occurs during the Bid Award phase of the project duration. The Project Formation stage of the typical project life cycle consists of the following activities:

- Concept – during this phase the Owner/Employer identifies the need for the civil works infrastructure project and establishes the initial outer limit parameters of the project in terms of function, location, and preliminary funding and timing targets.
- Feasibility – during this phase the Owner/Employer establishes the fundamental design and construction attributes of the concept of the infrastructure project and prepares an order of magnitude cost estimate and schedule for completion of the project based on those fundamental design and construction attributes.
- Financing – during this phase the Owner/Employer secures financing or dedicates funding for the project based upon the order of magnitude cost and schedule estimate, the comparative need for the project (evaluation and ranking of all capital projects identified to attain a priority ranking), the total capital funds available, the feasibility of completing the project as planned and the cost to benefit ratio expected as a result of placing the completed structure of facility into its intended service.
- Strategy Formation – during this phase the Owner/Owner finalizes the primary cost, schedule and quality goals for the project, selects the project delivery system, identifies the contractual and payment methods, drafts the contract document set, sets the basic design or performance specifications for the structure or facility, and establishes it's own project management and control processes, procedures and organization.
- Bid Award – during this phase the Owner/Employer develops and issues a Request for Proposal (RFP) or similar notice against which contractors will respond. During this phase the contractor will examine the RFP, develop a

project execution plan, estimate the cost to complete the full scope of work delineated, prepare the project schedule for completion of the scope of work, and undertake all of the other activities required within the RFP.

As can be seen in list, the Owner/Employer bears the sole responsibility for completing all of the Project Risk Management functions for the entire civil works infrastructure construction project until the Bid Award phase at which point the contractor begins to develop its own Project Risk Management plans in response the tender. Every project risk management action taken during the Project Execution stage is based upon and flow directly from the decisions made by the Owner/Employer and winning contractor during the Project Formation stage.

From the Owner/Employer's perspective, a civil works infrastructure construction project is successful when the Owner's cost, schedule, quality, scope, and functionality goals are met. The Owner/Employer is at the top of the project risk management structure. If the Owner/Employer's project management does not practice sound risk management, then it is almost a given that risks will be unidentified, misevaluated, unallocated, misallocated, and mismanaged during the execution of the construction project. How an Owner/Employer manages risk, and the Project Risk Management that it requires of the other parties that it brings into the construction project, will determine whether or not a project is successful. In the end, every risk element which is not actively managed and controlled has the potential to preclude the achievement of the Owner/Employer's goals for the project.⁵⁰

Until the point at which an Owner/Employer takes deliberate action to involve other parties in the execution of a civil works infrastructure construction project, all of the risk inherent in that project is the sole responsibility of the Owner/Employer. Once the Owner/Employer has decided to pay another party to assume specific elements of risk, it has a series of important decisions to make, such as which risks to allocate and which to keep; which project delivery method will provide the most suitable management of the inherent risk; which contractual provisions and payment methodologies are most compatible to the project delivery method and best suited for controlling the risk elements inherent in the infrastructure project. There are certain elements which are common to every sound Project Risk Management program:

- Project Risk Profile Development
- Project Risk Element Allocation
- Project Delivery System Selection
- Project Contract Form and Provisions

The core of every formal Project Risk Management program is a process by which all project risk elements are identified, evaluated and action plans prepared. A Project Risk Profile is an amalgamation of all the risk elements which are inherent in the civil works infrastructure construction project. Within that Project Risk Profile risk elements are identified, evaluated, and specific actions plans are established for addressing each of the risk elements contained within the profile. An Owner's Project Risk Profile should attempt to identify and evaluate every risk inherent within the project to be executed. Execution risks on any construction project flow from a variety of sources, which include:

- Construction Industry Environmental - certain risk elements exist simply because of the nature of the construction industry environment as a whole (i.e. construction is a physical undertaking and is thus exposed to natural

phenomena and conditions which can impact any element of the construction project).

- Facility or Structure Specific - certain risk elements are inherent in the type of infrastructure facility or structure to be constructed (i.e. a large water treatment facility vs. a high speed highway interchange).
- Legal Environment – certain risk elements are inherent to the legal jurisdiction within which the structure or facility is to be built (i.e. legislative funding limitations or restrictions on procurement methods).
- Decision Specific – certain risks are built into the project by the decisions or actions (or failures to act) of the Owner/Employer and Contractor during the civil works infrastructure construction project (for example, deciding to execute the project as fixed price EPC contract or employing a fast track schedule to completion).

Regardless of the source from which a particular risk element may flow, once the risk elements are in place within the body of the project they become inherent to that construction project. Regardless of which party to a project is ultimately responsible for the control, management or liability of a particular risk element, the risk element continues to exist as a threat to the successful execution of the project as a whole.

The Owner/Employer's position in managing risk on any civil works infrastructure construction project is concerned, it is important to remember that what it does not know can hurt it. An Owner/Employer has generally three options relative to those elements of risk which are inherent within an infrastructure construction project:

- Retain and manage risk elements.
- Allocate the responsibility and liability for managing risk elements to other parties to the project.
- Insure against the impact of risk elements.

A risk element must be allocated contractually or legally or insured against by the Owner/Employer. Consequently, an Owner/Employer cannot exercise its option to either insure or allocate those risk elements which it has failed to identify. And any risk element that an Owner/Employer fails to identify and then properly allocate remains, by default, the responsibility of the Owner/Employer during the execution of the project. Thus, however, the simple act of allocating various risk elements to other parties does not eliminate those risk elements as a factor within the body of the project. What an Owner/Employer is allocating to other parties is the responsibility for managing the risk element and liability for the impact to cost, schedule or quality created if that risk element does manifest during the execution of the project. If a risk element manifests itself during the execution of the project, the manifested risk will impact scope, cost, schedule and/or quality. While an Owner/Employer may have passed liability on to another party, the mere fact that cost, schedule, scope, and quality were impacted will have some effect on the Owner/Employer's own goals.

Each risk element poses a different level of threat to the attainment of project cost, schedule, scope, and quality goals. At a minimum a risk element evaluation should consider the likelihood of the risk element manifesting on the project and the impact to cost, schedule and/or quality should that risk impact the project. A risk element evaluation can be done on a simple matrix format which categorizes a risk as having a high, medium or low probability

and a high, medium or low impact on the project goals should it manifest. At the other end of the evaluation spectrum one can utilize sophisticated computer generated probability models, such as, a Monte Carlo simulation in order to actually model a risk element to attain detailed statistical analysis of probability over a range of scenarios. The evaluation method used is a matter of choice by the Owner/Employer with each method having definite advantages and disadvantages that an Owner/Employer should take into consideration as it develops its Project Risk Management program. Regardless of the method used, however, risk elements must be evaluated simply to ensure that an Owner/Employer has focused the right amount of attention on the right risk elements as it makes the thousands of decisions which go into the strategic planning of the civil works infrastructure construction project.

From that evaluation process an Owner/Employer identifies those risks which pose the most significant threat to the successful completion of the project and the full attainment of the project goals. Using the results of that evaluation an Owner/Employer can make informed decisions as to risk allocation among the project parties and establish the level of control or monitoring it should establish for each risk element during execution. Decisions as to whether to retain, allocate or insure a risk element depend upon the evaluation of an individual risk, the rule of thumb being that a risk should be assigned to the party in the best position to manage or control that risk. Thus:

- An Owner/Employer should retain those risk elements which it is in the best position to manage or control. For example: Owner/Employer's may retain the right to initiate and approve changes to the design of a civil works infrastructure construction project.
- An Owner/Employer should allocate those risk elements which another party to the project is in the best position to manage or control. For example: An Owner/Employer may allocate the responsibility to meet all applicable codes and regulatory requirements to the contractor.
- An Owner/Employer should consider insuring against the impact of the risk element should it manifest during execution of the project, if a risk element is beyond any party's ability to manage or control. For example: an Owner/Employer may secure insurance against the possibility of a typhoon destroying the structure or facility prior to the completion of construction.

Understanding the nature of the risk, the likelihood of a risk element occurring and the possible impact to cost, schedule, scope and quality, if the risk element occurs, are all factors that the Owner should consider during the Project Formation of the project. Decision's as to how to manage and control those risk elements which have been identified and evaluated are the some of most important that an Owner/Employer will make over the course of any civil works infrastructure construction project.

Only the Owner/Employer gets to choose which party to a civil works infrastructure construction project is allocated which risk element inherent within that infrastructure project and allocation of risk elements is one of the most important management decisions an Owner/Employer will make during the entire project life cycle. In the most recent past the theory was that an Owner should divest itself of as much risk as possible either through insurance or allocation of risk to other parties to the project. The theory was that the more risk allocated to others the less risk faced by the Owner/Employer. Unfortunately, the concept of total risk divestiture under any project delivery system was based on the mistaken assumption that once a risk element was allocated to others it (1) ceased to be a concern to the Owner/Employer and (2) had no impact on the Owner/Employer's cost, schedule, quality or quality goals. However, those assumptions have been proven false.

Therefore, the trend for civil works infrastructure construction projects is to allocate risk elements on the basis of identifying the party within the project structure which is best equipped and best positioned to manage that particular risk element. For example: the parties best equipped and best positioned to handle risks associated with meeting local, state and federal laws, regulations and codes are the contractors under a fixed price EPC contract. Therefore the responsibility and liability should be allocated as appropriate to the contractor under such a contracting approach. However, the party best equipped and positioned to manage and control changes to the project is the Owner/Employer. Therefore the responsibility and liability to manage and control change should be retained by the Owner/Employer.

Owner/Employers should take in account previous experience with similar civil works infrastructure construction projects when identifying various risks that it should consider. On a project the Author evaluated, for example, the Owner/Employer took previous experience into consideration when considering the risks to adequately handle in a follow on civil works infrastructure construction project in Australia.⁵¹ The Project was a major infrastructure improvement undertaken by an Owner/Employer (a concessionaire and a government agency) to transform a congested and inadequate road network with new tunnels, urban expressways, elevated roadways, bridges spanning major rivers, and state-of-the-art electronic traffic management systems. The primary goal was to reduce traffic within a major city and to reduce traffic congestion and travel time to and from the City's international airport. The Owner/Employer contracted with a Concessionaire under a Private Finance Initiative (PFI).⁵² The Concessionaire and the government agency together acted as the Owner/Employer under the fixed price EPC contract.

One element evaluated for the risk assessment was the Project construction schedule as prepared by the contractor, which was retained by the Concessionaire. The evaluation revealed that the Critical Path Method (CPM) schedule, which consisted of more than 10,000 activities, was being subjected to thousands of constraints. It was further learned that there was no contractual or optional relationship for the constraints. Specific areas of risk and potential impacts from the manually applied constraints to activities on the CPM schedule included:

- Potential risk of forcing activities on or off the critical path, which could, in turn, indicate project delay and responsibilities that might not reflect the actual critical path or the actual delay occurring to the project.
- Potential risk that project reporting based upon schedules with multiple non-contractual constraints could misrepresent the actual planned or forecasted progress dates, which in turn could result in the owner's inability to effectively monitor the Project.
- Potential inability to mitigate or eliminate the impacts of issues that might arise on the Project.
- Multiple non-contractual constraints not corresponding with International Scheduling Practices could raise unnecessary reviews or questions, which could further divert attention from the real issues that need to be addressed by the Project parties.

The Owner/Employer addresses lessons learned in the follow-on civil works infrastructure construction projects by: employing a Project Risk Management system to assure success, as Owner/Employer it would be able to quickly identify the constraints placed in the CPM

schedule, which then could serve as the starting point of commentary regarding the CPM schedule and changes that were necessary.

But the contractor has no Project Risk Management role in a civil works infrastructure construction project until the point at which the Owner/Employer issues the RFP requesting bids or tenders. Then the contractor must engage in Project Risk Management.⁵³ The first step that a prudent contractor should take will be exactly the same as that taken by the Owner/Employer: prepare a profile of the risk elements which have been allocated by the Owner/Employer to the contractor. From the contractor's perspective the risk elements include the discrete items delineated within the project scope of work (i.e. deliverables). The contractor must:

- Develop plans for executing the scope of work (deliverables), taking into account those risk elements which will pose a threat to the completion of those deliverables.
- Develop the schedule for completion of the scope of work taking into account those risk elements which will pose a threat to the completion of those deliverables as scheduled.
- Prepare a bid cost estimate for the completion of the scope of work taking into account those risk elements which will pose a threat to the completion of the these deliverables as estimated.

The contractor works under two significant disadvantages:

- It has a very limited time within which to prepare bid or tender which significantly restricts the depth to which it can conduct any analysis of the risk elements inherent within the project; and
- Its initial cost to prepare the bid or tender is, in itself, a significant risk to the contractor, as the contractor must invest money which it may never recover in an attempt to win a competitively bid project award.

Executing those steps noted above can be costly and time consuming, yet must be well done if the contractor is to have a chance to win the bid for a civil works infrastructure construction project. The contractor always walks a very fine and precarious line between over-investing and under-investing in the preparation of the bid and there is no simple formula that the contractor can apply that will tell it what the "right" level of investment might be. If the contractor invests too little and thus fails to correctly establish the risk profile for the project it runs the risk of winning a project only to find it has underestimated the cost and time it will take to successfully execute the scope of work. If the contractor invests too much in preparing the bid or tender it may accurately identify the risk elements but attempting to recover its "sunk cost" of bidding may result in submittal of a price which is non-competitive and thus lose the award of the project.

Once the decision has been made to bid or tender, a contractor has a definitive risk management role to play in the project, the results of which can potentially win or lose the award and just as importantly, lead to the success or failure of the Owner/Employer to achieve its cost, schedule, scope, and quality goals. The contractor must exercise a consistent approach and in exercising its probable Contract Administration role under the anticipation that it will win the bid. As a result, the contractor must rely on those documents issued by the Owner/Employer and its own civil works infrastructure construction project experience in order to prepare a definitive risk profile for the infrastructure project it is

bidding. The typical first step is a straight forward exercise: the contractor must abstract all of the risk elements allocated by the Owner/Employer to the contractor via the RFP document set (including the Conditions of Contract).

The second typical step, however, is somewhat more difficult in that the contractor must first identify those risk elements within that document set which appear to be missing. Second it must identify those risk elements which are presented with conflicting contractual provisions, for example, allocation of the schedule risk to the Contractor while the Owner/Employer retains of the approval of all schedule means, methods and activity sequencing. Third, it must identify those risk elements which from its own experience it will encounter during execution of the project, for instance, an Owner/Employer's desire to impose late changes in the project design.

Having identified all of the risk elements, the contractor must conduct its own evaluation of those risk elements in much the same manner and using much the same tools as the Owner/Employer had used during the earlier Project Formation stage. After that point, however, a contractor faces different decisions relative to how it will manage and control risk as the contractor does not have the option of cleanly allocating risk to another party that it might bring into the project. Although a contractor may pass through a particular performance risk to a subcontractor, if the risk element manifests and the project suffers an impact the Owner/Employer will not seek recovery from that subcontractor. The Owner/Employer will look no further than the contractor for recovery. From a practical standpoint, the contractor remains responsible to manage and control all of the risks which have been allocated to it by the Owner/Employer.

The contractor does have choices it may make concerning risk:

- If the total risk load is too high or there are a few significant risk elements which the contractor is unable to undertake, it can choose not to bid the project.
- If a risk element is likely to manifest during the execution of the project, the contractor can add money in the form of direct cost or contingency intended to cover the impact of the risk to the project. For example: it is not unusual for a contractor facing liquidated damages to assume a limited number of days of delay and add the cost of the expected liquidated damages for those delay days to their total bid or tender. The contractor can impose back-to-back (the terms of the subcontract mirror those of the contractors) the liability on subcontractors and vendors which, while it will not protect the contractor from the Owner/Employer, will enable the contractor to recover at least a portion of the impact cost generated by the risk element.
- A contractor can propose alternatives to the Owner/Employer which may reduce or remove a risk from the contractor in return for a lower price or shorter time to completion of the project. This alternative is not generally available in the global market.

Risk elements which an Owner/Employer has allocated to the contractor are a fact of life in the civil works infrastructure construction industry. In the end the contractor must price, schedule, control and manage risk if it is to be successful. Like the Owner/Employer, the critical first step is for the contractor to identify as much of the risk possible, evaluate that risk as accurately as possible, and then establish its alternatives for managing and controlling that risk.

For example, the following Table III.B.8.1 Pegasus Risk Identification Checklist™ (a firm which the Author founded and serves as the chief researcher) was compiled for a multi-national contractor for use in preparing bids on civil works infrastructure construction projects in the global market.⁵⁴

TABLE III.B.8.1

SAMPLE RISK IDENTIFICATION CHECKLIST™

Following is a list of typical areas that give rise to risk for the Contractor. This checklist is intended to assist in the identification of risks to be addressed in the project risk assessment and risk management plan. It is not a comprehensive list and identification, assessment and management of project specific risks must be carried out by qualified personnel.

1.0 NATURE OF THE RELATIONSHIP BETWEEN THE PARTIES

- i) Prior experience with Owner/Employer (the Contractor and any joint venture partner).*
- ii) Background check if new Owner/Employer.*
- iii) Prior experience with major partners and proposed relationship on this contract.*
- iv) Background check on new partners.*
- v) Credit checks findings (Owner/Employer and partners).*

2.0 OWNER/EMPLOYERS'S CRITERIA FOR AND DEFINITION OF SCOPE OF PROJECT.

- vi) Verify project financing is in place.*
- vii) Project phasing and schedule.*

3.0 LIST OF EPC DUTIES AND RESPONSIBILITIES.

- viii) Design*
- ix) Construction*
- x) Optional services including any operations or maintenance responsibilities.*
- xi) The Contractor's responsibilities in association with others (this will include information on the Contractor's share of any joint venture and a description of how risks are allocated within the joint venture). A Memorandum of Understanding (MOU) should be developed at this stage and submitted at least in draft form.*

4.0 LIST OF OWNER'S DUTIES AND RESPONSIBILITIES.

5.0 RESPONSIBILITY FOR OBTAINING VARIOUS PERMITS.

- xii) Environmental*
- xiii) Right of way acquisition.*

xiv) *Utilities.*

xv) *Construction site access.*

6.0 SUBCONTRACTING AND PURCHASE OF EQUIPMENT/MATERIALS.

xvi) *Small or disadvantaged business requirements/penalties.*

xvii) *Set aside or offset requirements.*

xviii) *Owner/Employer furnished equipment/materials.*

xix) *Consequences of Owner/Employer's rejection of subcontract or a subcontractor.*

7.0 SCHEDULING AND MILESTONE DATES.

xx) *Clear definition of interim and completion milestones.*

xxi) *Consequences of early/late completion (liquidated damages and/or early completion bonus).*

xxii) *Identify agreed to or anticipated caps.*

8.0 CHANGE ORDERS AND CLAIMS PROCEDURES AND ENTITLEMENT.

xxiii) *Force Majeure clause.*

xxiv) *Time limits for Owner/Employer decisions and approvals including any owner requested reviews.*

xxv) *Conditions for allowed change orders.*

xxvi) *Claim procedures, arbitration.*

xxvii) *Dispute resolution board.*

xxviii) *Law governing.*

xxix) *Appropriate unforeseen/changed conditions clause.*

9.0 CONSTRUCTION AND PERFORMANCE WARRANTIES.

xxx) *Limitations based on Owner/Employer-supplied information, equipment, resources (as applicable).*

xxxi) *Time limitations.*

xxxii) *Limitation to performance test (if applicable).*

xxxiii) *Warranty reserve included in price - it is not the Contractor's policy to provide a warranty.*

10.0 COMPENSATION

xxxiv) *Amount/formula for payment.*

- xxxv) *Mobilization payment.*
- xxxvi) *Granted by contract.*
- xxxvii) *Amount if stipulated.*
- xxxviii) *Arrangement within the project management team.*
- xxxix) *Progress payment procedures.*
- xl) *Substantial/final completion procedures and consequences.*

11.0 CLAUSES TO ENFORCE PAYMENT.

- xli) *Limitation and extent of right to audit to cost-plus/reimbursable items.*
- xl ii) *Interest and attorney's fee.*
- xl iii) *Escrow of disputed sums.*

12.0 LIMITATION OF LIABILITY.

- xl iv) *Limitation to fixed sum, percent of contract sum or formula.*
- xl v) *Limitation of liability to corporate entity.*
- xl vi) *No, or limited liability for consequential damages - this item requires early discussion.*
- xl vii) *Exclusivity of remedies clause.*
- xl viii) *Limitation of damages to required insurance limits and waiver of subrogation.*
- xl ix) *Reimbursement for Owner/Employer required design modifications.*
- l) *Limitation of Liquidated Damages.*
- li) *Damage attribution for Owner/Employer's delays.*

13.0 ENVIRONMENTAL

- lii) *Responsibility for hazardous waste.*
- liii) *Pre-existing (known).*
- liv) *Pre-existing (unknown or found during construction).*
- lv) *Compliance with other environmental regulations (list major governing regulations and party responsible).*

14.0 INDEMNITY PROVISION AND LIMITING OBLIGATION TO INSURABLE RISKS.

15.0 INSURANCE PROVISIONS.

- lvi) *Professional liability insurance.*

Ivii) Design/builder's insurance.

Iviii) Builder's risk insurance.

lix) Other insurance including any insurance associated with operation.

lx) Waiver of subrogation.

16.0 BONDS/LETTERS OF CREDIT.

lxi) Bid bond (amount, release date, provisions for call).

lxii) Completion bonds (amount, release date, provisions for call).

lxiii) Performance bonds (amount, release date, provisions for call).

lxiv) Payment bonds (amounts, release date, provision for call).

lxv) Letters of credit (amounts and purpose).

17.0 COSTS/COST SHARING.

lxvi) RFQ total costs and the Contractor portion (include copy of any cost sharing agreements).

lxvii) RFP total costs and Contractor portion (include copy of any cost-sharing agreements).

lxviii) Negotiation of total costs and Contractor portion (include copy of any cost-sharing agreements).

lxix) Mobilization costs.

lxx) Design cost.

lxxi) Construction cost.

lxxii) Warranty cost - it is not the Contractor's policy to provide a warranty.

lxxiii) Contingencies (describe).

lxxiv) Other costs not included above including cost of delays.

lxxv) Degree of participation of parties in cost proposal preparation.

lxxvi) Cost proposal type.

xii) Not-to-exceed price with shared savings.

xiii) Guaranteed maximum price including when finalized.

xiv) Fixed price (lump sum).

18.0 OPERATIONS AND/OR MAINTENANCE OF CONSTRUCTED FACILITIES.

lxxvii) Maintenance required of design/builder (explain).

lxxviii) Operations required of design/builder (explain).

19.0 OWNER/EMPLOYER RETAINAGE:

lxxix) Basis

lxxx) Amount (percent of payments or other)

lxxxi) Duration

lxxxii) When released

lxxxiii) Conditions of release

lxxxiv) Securities allowed as cash substitute

lxxxv) Type of securities

lxxxvi) Ownership of securities interest

20.0 CLEAR LIST OF INFORMATION:

lxxxvii) Any items for which Owner/Employer is responsible and on which the Contractor may rely.

lxxxviii) Of areas where the Contractor can provide substitutions and VE submittals.

21.0 STANDARD OF CARE FOR PROFESSIONAL SERVICES.

lxxxix) Professional services performed in accordance with standard of care.

xc) Responsibility for changes in codes or interpretations.

22.0 OWNERSHIP OF PLANS.

xcii) Limitations on use.

xciii) Hard copy, not electronic medium, as official copy.

xciv) Warranty/indemnity against copyright/patent infringement.

23.0 APPROPRIATE CREDIT AND PUBLICITY AND USE OF PROJECT FOR PROMOTIONAL PURPOSES.

24.0 DISPUTE RESOLUTION.

xcv) Step negotiations.

xcvi) Mediation.

xcvii) Arbitration.

25.0 TERMINATION PROVISIONS.

xcviii) By Owner/Employer during selection phase.

xcviii) *By the Contractor for cause.*

xcix) *By Owner/Employer for cause.*

c) *Premium for premature termination for Owner/Employer's convenience.*

ci) *Consequences of temporary suspension.*

26.0 LEGAL BOILERPLATE.

cii) *Governing law.*

ciii) *Integration clause.*

civ) *No waiver/severability clause.*

27.0 PROJECT CASH FLOW ANALYSIS.

cv) *Amounts and timing.*

cvi) *Linkage of payments to milestones.*

28.0 DESIGN

cvii) *Percent complete by Owner/Employer at RFP stage.*

cviii) *Owner/Employer's role/participation during D/B process.*

cix) *Joint venture partner (contractor) role/participation.*

cx) *Constructibility procedures by joint venture partners.*

29.0 CONSTRUCTION

cxii) *Owner/Employer's role/participation during construction.*

cxiii) *QC roles and responsibilities.*

cxiiii) *QA roles and responsibilities.*

cxv) *Material testing roles and responsibilities.*

cxvi) *Sources of labor, responsibility and associated labor risks.*

30.0 PROJECT COST FUNDING

cxvii) *Source of funds.*

cxviii) *Funding schedule if not fully funded.*

31.0 OTHER ITEMS

cxix) *Value engineering provisions/clauses/articles in RFP, if any.*

cxix) *JV operating committee/board of control structure.*

- cxx) *Organization chart showing key staff.*
- cxxi) *Attach copy of RFP.*
- cxxii) *Attach copy of Owner/Employer's organization chart.*
- cxxiii) *Attach copy of joint venture, or other similar agreement.*
- cxxiv) *Attach copy of Owner's contract for D/B.*
- cxxv) *List of other potential concerns.*

The Owner/Employer's or contractor's project risk management plan never controlled, avoided or mitigated a risk. A cost contingency cannot cover the total impact to a project, if the actions upon which the contingency amount was set are never taken by the contractor. And unless the Owner/Employer and contractor actually manage risk during the execution of the infrastructure project then all of the risk management efforts taken during the Project Formation will have been wasted. Managing risk during the Project Execution is one of the primary responsibilities for both the Owner/Employer and the contractor, since risk elements pose a threat to the successful completion of the infrastructure project.

To actively manage retained risk elements an Owner/Employer's risk management plan must be as complete and detailed as that which it would expect from any other project participant.⁵⁵ That plan should include predicting when each retained risk element is most likely to manifest during the project and establish a matrix of responses from which the Owner/Employer can choose an appropriate response to the manifestation of that risk element. Risk management action plans can be identified as either avoidance or mitigation based. Avoidance action plans are applied when the best way in which to control the risk element in question is to preclude the conditions which will result in the manifestation of the risk from every occurring. For example: if the Owner/Employer has retained the risk to obtain the required environmental permits by a certain date within the project schedule, its risk management plan should focus on the steps necessary to secure the permits at a specific date well in advance of the scheduled "need dates" established for those permits. Obtaining the permits as scheduled will avoid any ripple impact delay to the contractor's schedule which would flow from those permits being obtained later than planned.

Mitigation action plans are predicated on the assumption that a particular risk element will, at some time during the execution of the project, manifest and rather than attempting to avoid the risk the best response is to initiate actions which are directed toward reducing (or mitigating) the impacts of that risk element on the project. For example: Owner/Employers make changes in structures and facilities as they are designed and constructed. Rather than try to ban changes, an Owner/Employer would be better served by managing a change control process which limits the number of changes, streamlined the processing of changes and closely monitored the cost and schedule impact of each change on the project as a whole.

An Owner/Employer's management actions relative to the manifestation of a risk element should be based on specific actions taken in a timely manner so that impact to the total project will be minimal, otherwise it will be the Owner/Employer which suffers from its inability to manage and control the risk.⁵⁶ The risk profile of a civil works infrastructure construction project changes over time as a project is executed. Every decision made and event which occurs during a project has the potential to add, delete or modify the risk elements which comprise the risk profile. A part of every Owner/Employer's risk management plan should be to periodically audit the project risk profile to ensure that the any changes to that profile have been recognized and the risk profile has been modified to

accommodate those changes. Every contract has enforcement provisions in the Conditions of Contract which are specifically intended to be used by the Owner/Employer in the event that the contractor is not managing and controlling those risk elements for which it has bargained, as noted above. To monitor risk on a project the Owner/Employer must have cost, schedule, scope and quality control systems in place which enable it to track the activities and progress on the project.

During the Project Execution stage of a civil works infrastructure construction project the contractor's project management team in contrast, however, has three primary Project Risk Management functions, however all are critical to the ultimate success of the project and to maintain the benefits of the bargain:

- Management and Control of Allocated Risk.
- Updating of the Risk Profile and Risk Management Plans.
- Project Completion.

From the point in time when the civil works infrastructure construction project is awarded and the contract executed between the Owner/Employer and the contractor, Project Risk Management becomes a functional requirement of the project. The contractor has been paid to manage, control and bear the liability for that allocated risk and, in effect, now "owns" the allocated risk. The contractor has only two options open to it relative to that risk burden:

- Ignore the risk trusting to luck that the risk will not manifest.
- Actively manage the risk in order to control the manifestation or the impact of the risk.

A common misconception of contractor's is that the risk contingency established within a project budget and the schedule adjustments made to acknowledge possible risk impact are, in themselves, adequate risk management actions. That concept is false. The contingency amount was set primarily to fund those management actions that will be necessary to manage and control the risk element should it manifest, not to cover the liability of the risk element impact. Likewise, schedule adjustments were made to enable the contractor to overcome delays attributable to the manifestation of a risk element by giving it the flexibility to re-sequence activities or work around the risk impact, not to cover the liability of the risk element schedule impact. In short, contingency and schedule adjustments made during the bid phase were established as risk management tools, not as liability buffers.

During the Project Execution the contractor must have a proactive risk management program which flows from the risk profile and is based on monitoring risk to the same degree that it monitors physical progress on an infrastructure project. The contractor should prepare a "risk schedule" which places each of the major risk elements in relation to the overall execution schedule of the project. For instance, the most likely time to encounter equipment delivery problems is after issuance of the purchase order to the vendor and before expected delivery. That risk element therefore should be "scheduled" for close monitoring and management action during that period. The risk element should come off the "risk schedule" and risk profile when the risk opportunity has passed (for example, the equipment is delivered). The risk schedule technique keeps the contractor's project management team focus on the present and future risk elements and keeps the risk profile current to the progress point of the project. Note that a risk schedule is not akin to a critical path schedule and, in fact, many risk elements will never be on a projects critical path unless and until they manifest themselves on a project. In many instances risk elements should be closely

monitored and actions taken in an effort to assure that those risk elements never become part of the project critical path.

The contractor should also have in place risk monitoring systems specifically intended to track those conditions which may lead to the manifestation of a particular risk element. For example: if there are dates certain by which specific equipment specifications and designs must be finalized to support phased procurement and construction, progress on those specific designs should be isolated from the more general “design progress” curve and tracked on a more frequent basis. Focused frequent tracking will highlight any trend towards delay and enable the contractor to take avoidance or mitigation actions well in advance of the risk element having any actual impact on the execution of the project.⁵⁷

The Project Risk Management project control tools are designed to track cost or progress (or any other parameter) on a real time basis and immediately identify any variation from the planned execution curves. The Project Risk Management control tools are also focused on individual pieces of the scope of work (the individual risk element) and not a whole element (such as design) or total project progress. As risk elements are closed, the risk management control tools are constantly refocused on the current or upcoming risk elements. Early detection of a risk element manifestation allows the contractor to take appropriate avoidance or mitigation action, using project cost and schedule contingency to effectively control the risk element and limit its impact on the project as a whole. More so than any other project execution function, Project Risk Management is a forward looking function that depends upon the contractor to implement avoidance and mitigation actions in anticipation of a risk element manifestation. If a contractor waits to act on a risk element until the point at which that risk element has manifested itself, then all that can be done is to bear the liability for the impact created by that risk element. Risk elements may increase or decrease in importance or they may disappear off the risk profile completely depending on events and decisions made during the execution of the project. To be of any use, the contractor's project management team must constantly update the risk profile and the management plans in place to monitor, manage and control those risks must be adjusted to accommodate that changing risk profile.

Turning once again to pipeline projects for examples of civil works infrastructure construction projects, Owner/Employers and contractors face enormous risks in engineering and constructing the projects. Effective use of risk management tools enables project management to eliminate or minimize the impacts of risks as they emerge. As an example, from the engineer-constructor perspective, a risk identified during preparation of the bid or proposal, but forgotten during execution is essentially a disaster waiting to happen. It is not enough to identify the risks which exist in a contract or project. Using the pipelines example from above, the pipeline's execution must be monitored constantly to ascertain when those risks identified do emerge and then to assure the project management team is addressing the emerging risk reasonably and timely. Risk management tools are the key to minimizing the impacts of emerging risks, mitigation of potential claims and achieving maximum project success. Current pipeline project risk management programs address: identification of potential risks in a prioritized manner; development of protocols that define and monitor execution; monitoring systems that recognize risk emergence; applying the tools most applicable to managing a risk as it evolves; auditing performance periodically to assure effectiveness, etc. Such elements of risk management program are developed into the Risk Profile addressed above, and it is updated as needed.

Pipeline projects continue to face both traditional risks and newly evolving risk factors, including:

- Interface Risks (a Delivery Risk Factor): The risk of several different contractors working on different segments of a project is not being managed

in the design phase as more work must be executed on a fast track basis under design-build delivery methods.

- Underground Risks (a Technology Risk Factor): The unknowns underground will always be a source of risk that affects execution resources and methodologies.
- Joint Venture Risks (a Financial Risk Factor): The cost of many pipeline projects requires many stakeholders to be joint ventures to spread financial risk which also is forcing differing institutional approaches and cultures to clash and increasing, not diminishing financial risk sharing, although such risk issues are not fundamentally analyzed when JV's are established.
- Design-Build Risks (a Procurement/Contractual Risk Factor): Execution management practices that are not accustomed to design-build stakeholder expectations and industry practices are reducing design-build benefits and exacerbating impacts of risks as they emerge during pipeline execution, especially since many of the key "players" are over committed.
- Security Risks (a Political Risk Factor): Pipeline projects of all types are required in many unstable parts of the world, but the militant/terrorist threat and sophistication is well beyond that heretofore experienced.
- "Green" Risks (an Environmental Risk Factor): Pipeline projects experience increased environmental concerns in developed, developing, and under-developed countries with equal ferocity that impacts acceptable construction methodologies and resource use.
- Right of Way Risks (a Social Risk Factor): ROW issues are increasingly causing delay as pipeline routing through indigenous populations experiencing broader democratic approaches are asserting rights to extract social improvement with consequently larger cost to pipeline projects.
- Payment Risks (an Economic Risk Factor): In both developing and under-developed countries, water and wastewater pipelines are financed privately through concessions that require payment for the commodity transported, which requires both a risky impact on the economy and a culture shift from the perception of having to pay for what is considered a right.

Frequently, the risk management needs are organization wide for many Owners/Employers and contractors, not just project specific. Another significant tool that the Author developed and that is currently demonstrating results is a GAPP Analysis™ to ascertain current and needed risk management practices for improving the effectiveness of project management in the organization. The following Table III.B.8.2 is a typical summary work product from such a GAPP Analysis™. Table III.B.8.2 summarizes the analysis of project management processes that led to focusing on the risk management practices that needed attention within a contractor organization that includes execution of pipeline projects, for example. Project management processes were identified systematically for improvement that reduced impacts that were causing projects to not meet goals of this contractor. This GAPP Analysis™ was prepared for an international engineer-constructor with operations and business units globally. The GAPP Analysis™ defined its terms as follows⁵⁸:

- Process – identifies each different methodology used to accomplish the Work Process. An assessment is made as to whether the process meets Industry Best Practices (IBP).
- Practice – evaluates each step in the Method as it is applied that requires the exercise of judgment. If there are not adequate formal parameters on how judgment is exercised, there may be so much variation in the work process output that it makes the Risk Management system unreliable and uncontrollable.
- Uniform (U) – for each Method reviewed under the “Process” column, an assessment is made as to whether the Method is applied the same way each time – the same process steps are employed each time, the data is collected the same way each time, etc.
- Transparent (T) – for each Method reviewed, an assessment is made as to whether the application of the Method communicates what Method has been used for this work process and a clear record as to how the data is used in the Method.
- Accountable (A) – for each Method, an assessment is made as to whether the application of Method requires the same qualified people to make the decision and the management knows who they are.

The GAPP Analysis™ addressed whether the contractor in each Business Unit (BLR=Business Unit Level Review) employed International Best Practice (IBP) in addressing which processes met its Project Risk Management needs. (Note: Y=Yes; N=No)

Table III.B.8.2

**TYPICAL GAPP ANALYSIS™ SUMMARY TABLE
FOR A MULTI-DIVISION INTERNATIONAL CONTRACTOR
FOR CIVIL WORKS INFRASTRUCTURE CONSTRUCTION PROJECTS**

WORK PROCESS	Division 1				Division 2				Division 3				Division 4			
	IBP	U	T	A	IBP	U	T	A	IBP	U	T	A	IBP	U	T	A
Estimating Process	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	BLR	N	N	N
Estimating Practice	Y	Y	N	Y	Y	Y	N	Y	Y	Y	N	Y	BLR	N	N	N
Schedule for Proposal	Y	N	N	Y	N	N	N	Y	Y	N	N	Y	BLR	N	N	Y
Schedule in Execution	Y	Y	N	Y	N	Y	N	Y	Y	Y	N	Y	BLR	N	N	Y
Progress Reporting	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	BLR	N	N	Y
Project Cost Control	Y	Y	N	Y	Y	Y	N	Y	Y	Y	N	Y	BLR	N	N	Y
Contingency Estimating	Y	Y	N	Y	Y	N	N	Y	N	N	N	Y	BLR	N	N	N
Contingency Management	Y	Y	N	Y	N	N	N	N	N	Y	N	Y	BLR	N	N	N
Risk	N	Y	N	Y	N	N	N	N	N	N	N	Y	BLR	N	N	N

Management Proposal																	
Risk Management Execution	N	Y	N	Y	N	N	N	Y	N	N	N	Y	BLR	N	N	N	

The Owner/Employer's and the contractor's project management teams have the burden of Project Risk Management. In a "mutual mistrust" environment Project Risk Management uses all aspects of Contract Administration to protect the bargain each reached when they entered into the contract. Additionally, it is the greatest means of using Contract Administration for continuous improvement in every aspect of project management.

9. Procurement Management

Project Procurement Management concerns the processes required to acquire goods and services from outside the performing organization. PMBOK states:

*"Project Procurement Management includes the processes to purchase or acquire the products, services, or results needed from outside the project team to perform the work. ... Project Procurement management also includes the contract management and change control processes required to administer contracts or purchase orders issued by authorized team members."*⁵⁹

The Project Procurement Management processes include the following:

- 1) Plan Purchase and Acquisitions
- 2) Plan Contracting
- 3) Request Seller Responses
- 4) Select Sellers
- 5) Contract Administration of Products, Services, and Results
- 6) Contract Closure

From an Owner/Employer's perspective, every element of a contractor's works scope which is subcontracted away introduces an added layer of risk and complication to a project in which the Owner/Employer expected to have a single point of execution responsibility. Conversely, a contractor uses subcontractors/vendors to obtain a degree of familiarity that comes from a specialist who deals with the type of work. An Owner/Employer sees added layers of legal complications in the form of the subcontracts/purchase orders themselves. A contractor sees a spreading of the risk and the opportunity to assure scopes of work are defined that are not less or more than that for which it bargained. An Owner/Employer identifies added project execution risks, such as, the probability that elements of the total scope of work identified within contract will be overlooked or missed in the development of the individual subcontracts/purchase orders. The contractor looks to subcontractors/vendors to have a "mutual mistrust" philosophy as well, thus he is placed in role of the Owner/Employer relative to such subcontractor/vendor, and assures that it gets the benefit of the bargain that it received from the subcontract/purchase order. An Owner/Employer is concerned that the complex function of coordinating the thousands of activities necessary to successfully execute a project is made much more complex and difficult with the addition of each subcontractor. The contractor expects that the Contract Administration function is simplified with the subcontractors/vendors coordinating the hundreds of tasks that are necessary for the discrete scope of the works, and the contractor can coordinate at a higher

level. An Owner/Employer worries that the project cost and schedule will be impacted as a result of claims and contract disputes which may arise between the EPC contractor and its subcontractors. The contractor will look to the subcontractors/vendors for the “mutual mistrust” of both the contractor and the Owner/Employer. Most of all, an Owner/Employer fears that the contractor will be unable to exercise the control necessary to ensure that multiple subcontractors working under different contracting arrangements, with different scopes of work and sometimes competing needs and requirements can be managed in such a way as to achieve the Owner/Employer's cost, schedule and quality goals. The contractor protects its bargain with back-to-back contracts – that is, the Conditions of Contract will be identical to those the contractor has placed on itself by the Owner/Employer. Thus, to take the extreme case, to successfully execute a complex project like a civil works infrastructure construction project on the basis of subcontracting the majority of the construction of that project, a contractor must establish, staff, and implement a very comprehensive and coherent project management system.

For instance, with respect to the individual processes the contractor will typically have the following plans in place for the Plan Purchase and Acquisitions process which identifies which project needs can best be met by purchasing or acquiring products, services, or results outside the project organization. The process involves consideration of whether, how, what, how much and when to acquire: the Project Management Plan describes generally how the contractor would manage procurement during the execution of the project. Similarly the Plan establishes procedures and requirements soliciting bids and purchasing equipment, expediting and inspecting equipment. Each step is outlined in detail. It provides a “tentative” detailed procurement list, indicating preferred method of procurement for equipment items and categories of materials. A Procurement and Erection Specifications set the requirements for preparation of equipment specifications, revisions, and issuance under requisition to the purchasing group. Such a plan also provides standardized conditions of contract for equipment and materials purchases. Similarly, the Plan Contracting process would cover specifically the subcontracting needs. The Request Seller Responses process establishes the mechanisms for obtaining responses, such as bids, and proposals, from perspective sellers on how project requirements can be met. The Select Sellers process is used to establish the methods for receipt of bids or proposals, and applies evaluation criteria, to select one or more sellers who are both qualified and acceptable as a seller. Contract Administration of Products, Services, and Results ensures that both the contractor and the other party meet their contractual obligations and that their own legal rights are protected.

This general Contract Administration process ensures the seller's performance meets contractual requirements and that the buyer performs according to the terms of the contract. The contractor will maintain records such as the following:

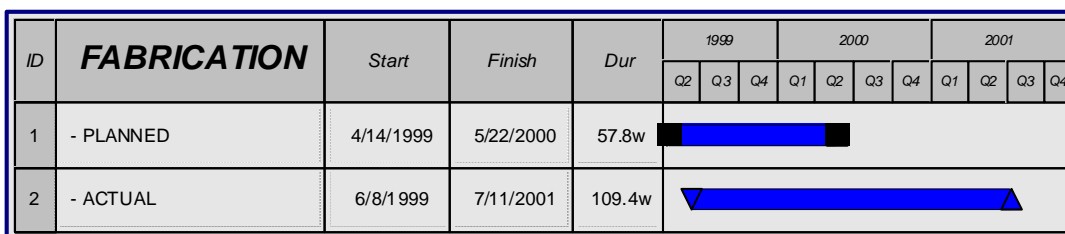
- a. Late or incomplete engineering documents to bid or work with;
- b. Engineering field changes and revisions;
- c. Subcontractor product quality;
- d. Incorrect or missing subcontractor submittals for schedule and activity sequencing;
- e. Bidding work before isometric and installation drawings were issued by engineering;
- f. Slow progress of construction;
- g. Low morale among craftspeople;
- h. Parts and equipment damaged or lost in the receiving and storage areas;
- i. Inability to start work due to activity overlapping with other subcontractors;

- j. Rework or correction of subcontractors' mistakes;
- k. Poor labor efficiency;
- l. Labor shortages.

The Contract Closure processes support the project completion process. It involves verification that all work and deliverables were acceptable. The Contract Closure process also involves administrative activities, such as, updating records to reflect final results and archiving such information for future use. Contract closure addresses each subcontract and purchase order applicable to the project.

The role of Contract Administration is illustrated by the Author's evaluation for the contractor's project management team regarding fabrication on the civil works infrastructure construction project in Mexico discussed in Project Integration Management above. The contractor planned its Procurement deliveries with vendors and subcontracted for Fabrication efforts both US and Mexican fabricators. The Owner/Employer's bid documents had a defined installation period that enabled the 909 calendar day project execution period to be achieved. Fabrication was initially delayed from the project schedule that reflected the Owner/Employer changes from Owner/Employer furnished equipment (OFE) that had forced a schedule change to accommodate the initial time impacts partially from the increased weights. The Owner/Employer correction of bid document deficiencies and changes did not stop with OFE delays and changes. As fabrication was executed, the continued Owner/Employer changes from increased quantities and weight and delayed were shown by the Contractor's project management team. The Owner/Employers OFE changes and delayed information forced out-of-sequence and delayed fabrication works, which was also noticed by the contractor's project management team. These Owner/Employer performance failures necessitated further rescheduling, including acceleration to meet the fabrication yard's commitments on other projects. Despite the contractor's and subcontractor acceleration efforts, fabrication too was additionally delayed by continuing Owner/Employer OFE problems. The Author summarized the resulting delay as illustrated the planned versus actual durations of the fabrication efforts shown in Figure III.B.9.1. The contractor had planned and subcontracted with the fabrication subcontractors based upon the Owner/Employer's information it reasonably relied when it had assembled its bid. That information was conveyed by the contractor in its schedule which specifically noted the fabrication yards time limitations. The contractor had submitted and the Owner/Employer had been put on notice. Further Project delay was avoided from the Owner/Employer causes through acceleration that the contractor's project management team discussed and presented monthly.

Figure III.B.9.1
Planned versus Actual Fabrication Effort Duration



Key to the genesis of significant Owner/Employer changes and impacts was the Owner/Employer's decision to not renew the third party Supervisors contract in the middle of

the actual fabrication efforts. The Owner/Employer took over the role of the Supervisor with personnel who had no “institutional” or “project” knowledge of the directions and technical decisions that the prior Supervisor had made. The Owner/Employer in its new role as the Supervisor reversed, changed, or expanded prior Supervisor decisions while refusing to acknowledge the significant impacts from the changes. Such untimely changes increased the significance of impacts from the changes and often forced re-sequencing of the work in fabrication, further exacerbating impacts, especially at the yard in the US. These impacts included forced rework and some workmanship problems. The fabrication issues were shown to have forced the contractor to continue to grow and expand its project management team to handle the unforeseen execution conditions and context. Despite all these causes of impact to the contractor, the Owner/Employer still would only allow the contractor Cost Impact estimates to be based on the Contract Unit Prices, which were shown by the Author to have been predicated on the Project execution conditions and contexts presented in the actually flawed bid documents. Additionally, the Supervisor (actually now the Owner/Employer) changed several important contract procedures, reporting, etc. that forced extended and expanded the contractor’s project management needs, thus increasing indirect costs. For example, after 2 ½ years of required submissions in English, the Supervisor forced all submissions to be in Spanish. Translators and their support had to be increased, and ultimately maintained for nearly 2 additional years.

As with the analysis of the project engineering, the detailed analyses and support for impacts were summarized by the Author as illustrated in the following Table III.B.9.1:

<p align="center">TABLE III.B.9.1 FABRICATION IMPACTS CAUSED BY OWNER/EMPLOYER X = Directly Related Factor y = Contributing Factor</p>					
Description	Increased Direct Resources	Increased Indirect Resources	Extended Indirect Resources	Increased Financing	Scope Changes
Special circumstances that were outside the control of the Contractor	X	X	X	X	y
Necessary corrections and modifications to assumptions relied upon by the Contractor that defined the scope of work	y	y	Y	y	y
Inconsistencies between contract documents and instructions given to the Contractor by the Supervisor	X	X	X	y	X
Discrepancies and divergence between contract documents	X	X	X	X	X
Errors and omissions in information included by the Owner/employer in the specified work	X	X	X	X	X
Errors in quantity or description, or omission in bills of quantity provided by the Owner/Employer	y	y	Y	y	y
Discrepancies in Owner/Employer specified requirements	X			X	X
Owner/Employer bid documents forced compliance with its requirements which were known	X	X		X	

TABLE III.B.9.1
FABRICATION IMPACTS CAUSED BY OWNER/EMPLOYER
X = Directly Related Factor y = Contributing Factor

Description	Increased Direct Resources	Increased Indirect Resources	Extended Indirect Resources	Increased Financing	Scope Changes
by Owner/Employer and/or demonstrated deficient, incomplete or inefficient					
Unreasonably inaccurate approximated quantities, particularly in steel tonnage estimates provided by the Owner/Employer	y			X	y
Divergence between contractually specified work and Supervisor's instructions	y	y	Y	y	y
Divergence between the Contractor's statement of compliance with specified work and Supervisor's instructions	X		Y	y	
Errors and inconsistencies in the contract documents	X	y	X	X	X
Ambiguities and discrepancies contained in drawings and documents	X	X	X	y	X
Discrepancies and divergence between the contract documents and descriptive schedules		y	Y		
PEP's requirement to use specific vendors and suppliers	X	X	X		
Failure of the Owner/Employer to carry out work in accordance with the active schedule	X	X	X	X	X
Extra work arising out of variations and changes mandated by the Owner/Employer	X	X	X	X	X
The Contractor's required execution of modified and additional work	X	X	X	X	X
Owner/Employer additions, omissions and substitutions of the work	X	X	X	X	X
Alterations to standards of materials and goods	X	X	X	X	X
Changes in position and dimensions of the fabricated units	X	X	X	X	X
Changes imposed upon the Contractor and its intended sequencing of works	X	y	X	X	X
Failure to provide OFE in accordance to contractual dates	X	X	X	X	X
Failure to ship OFE assembled as required by Contract	X	X	X	X	X
Failure to issue OFE in good working order	X	X	X	X	X

TABLE III.B.9.1
FABRICATION IMPACTS CAUSED BY OWNER/EMPLOYER
X = Directly Related Factor y = Contributing Factor

Description	Increased Direct Resources	Increased Indirect Resources	Extended Indirect Resources	Increased Financing	Scope Changes
Failure of the Owner/Employer and the Supervisor to reply to communication within specified time period	y		Y	y	

Through the use of the extensive Contract Administration records, the Author recorded assumptions upon which the contractor based and the extensive changes/support that the contractor gave the Owner/Employer continuously were used in an arbitration that was required in resolving disputes by the Conditions of Contract. The Owner/Employer simply would not accept the impacts claimed by the contractor when it had paid the impacts on changes that had occurred during the engineering period. The results summarized in the Table III.B.9.1 described the causation and the type of impact. The Author then demonstrated that the Owner/Employer's project management team then had to respond to the actual magnitude of the impacts.

C. Dispute Resolution and Contract Administration

Ultimately, those matters that can not be resolved in the global market on civil works infrastructure construction projects by negotiation enter into realm of a dispute between the parties. As has been shown, in a “mutual mistrust” project execution regime, the parties may not have a clear understanding of the assumptions and resulting consequences that underlie the agreement that both parties signed. Similarly, a party may either exceed or fail to perform what was required and upon which the bargain was based. The party claiming it was injured may then have a third party determine the compliance of the other party with the Conditions of Contract. This party is normally a neutral party, that is, has no relationship to either of the parties to the dispute. The party can apply to the courts of the country whose law governs the project, and the judge (and jury in some jurisdictions) will determine what the contract requires, the facts that are applicable to the issue, the entitlement or responsibility from such determination, and what impacts the party who was injured will receive. After all, the use of a judge is available. The global market parties, whether an Owner/Employer or a Contractor, however, does not see the use of courts as viable option on civil works infrastructure construction projects. A court is part of the government, and the government in most cases is the ultimate beneficiary of the civil works infrastructure project. Thus, the Conditions of Contract establish alternatives to the court. As long as the matter is not against the law, these are provisions which allow the parties to decide as a matter of contract how they will have disputes resolved. Thus, disputes can be resolved two ways:

- Adjudication which is the method of turning to the courts.
- Consensual which are established by contract.

The contractually established means normally fall into several types of “Alternative Disputes Resolution (ADR)” which fit into one of the following:

- Facilitated negotiation.
- Conciliation.
- Mediation.
- Arbitration.

The first three require the parties to finally agree and accept the decision that is suggested. Although arbitration can be “non-binding,” the trend in case of the global market for civil works infrastructure construction projects is for the arbitration to be binding on the parties to the dispute. This result is accomplished by the pre-agreement to be bound. In addition, most Conditions of Contract used in the global market provide that the processes be undertaken in a sequential fashion, that is, from the facilitated negotiation to the arbitration. The only consistent requirement is the neutrality of the third party.

Under all methods of dispute resolution involving civil works infrastructure construction projects in the global market, whether adjudication or ADR, the principle of “mutual mistrust” is used. The parties present their respective positions and versions of the facts. The facts must be supported. The role of Contract Administration, therefore, is important to the parties who will have to depend on their project management teams. The PMBOK requirements as global standards that are generally accepted and used thus are expected on civil works infrastructure construction projects. In fact, a party typically engages a specialist that reviews all the project records that the party maintained, and then compiles the “proof” that is presented in the ADR process. These specialists are in essence the compiler and interpreter

of the Contract Administration information, including the proofs of divergence from the benefits of the bargain; giving notice; providing support; and compliance with the project management standards. Thus, it is truly a fact, that Contract Administration is the back bone of project management and project management is the back bone of global civil works infrastructure construction projects.

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- ¹ Galloway, P. and K. Nielsen, "The Ubiquitous Requirement of "Performing to High International Standards," Proceedings of the 2nd Civil Engineering Conference in the Asian Region, Tokyo, Japan, 2001.
- ² Nielsen, K., "The Benefits and Challenges in the Globalization of Project Management Knowledge and Usage", Proceedings of Japan Society of Civil Engineers' First International Symposium on Construction and Project Management, Tokyo, Japan, October 2003.
- ³ See "Global Working Group: Standards: List of Existing Generic Standards for aspects of Project Management, January 2, 2000," available on the Australian Institute of Project Management web site, www.aipm.com.au.
- ⁴ See the Project Management Institute web site at www.pmi.org.
- ⁵ See the Project Management Institute web site: www.pmi.org. The available PMBOK languages are English, Japanese, German, Italian, and French.
- ⁶ Cooke-Davis, T., J. Schlichter, and C. Bredille, *Beyond the PMBOK Guide*, Proceedings of the Project Management Institute Annual Seminars and Symposium, Nashville, TN, USA, November 1-10, 2001, page 1.
- ⁷ The development of these metrics and methods and their status can be found at www.pmi.org web site under "OPM3" or Organizational Project Management Maturity Models", Project Management Institute, Washington, DC, 2003.
- ⁸ Project Management, Systems Approach to Planning, Scheduling and Controlling, Eighth Edition, Harold Kerzner, PhD., John Wiley & Sons, Inc., New York, NY, US, 2003.
- ⁹ Project Management Institute, A Guide to the Project Management Body of Knowledge, Section 1.3, 2004 Edition.
- ¹⁰ Project Management Institute, A Guide to the Project Management Body of Knowledge, Chapter 4, 2004 Edition.
- ¹¹ Project Management Institute, A Guide to the Project Management Body of Knowledge, Section 4.6, 2004 Edition.
- ¹² Project Management Institute, A Guide to the Project Management Body of Knowledge, Section 4.7, 2004 Edition.
- ¹³ Based on a project with which the author was involved on behalf of a multi-national engineer-constructor in Mexico.
- ¹⁴ Galloway, P. and K. Nielsen, "The Ubiquitous Requirement of "Performing to High International Standards," Proceedings of the 2nd Civil Engineering Conference in the Asian Region, Tokyo, Japan, 2001.
- ¹⁵ Based on a program of projects with which the author was involved on behalf of a multi-national engineer-constructor. The program included referenced projects in Spain, Argentina, and Holland.
- ¹⁶ Cushman, R. and J. Myers, Construction Law Handbook, Aspen Law & Business, US, 1999.
- ¹⁷ Chen, W., The Civil Engineering Handbook, CRC Press, US, 1995; J. Stewart Stein, Construction Glossary, John Wiley & Sons, Inc., US, 1993.
- ¹⁸ Construction Industry Institute, "Construction Changes and Change Orders: Their Magnitude and Impact", Hester, W., J. Kuprenas, T., University of California, US, Source Document 66, October 1991.
- ¹⁹ Ibbs, C. and W. Allen, "Quantitative Impacts of Project Change," Construction Industry Institute, Source Document 108, University of California, US, May 1995.
- ²⁰ The Construction Industry Institute, "Quantitative Effects of Project Change," Publication 43-2, The University of Texas at Austin, US, May 1995.
- ²¹ Hester, W., J. Kuprenas and T. Chang, "Construction Changes and Change Orders: Their Magnitude and Impact", Construction Industry Institute, University of California, Source, October 1991. In that study the CII concluded, in part, that owners and designers often make changes at the point at which detailed design is nearing completion. Also, see C. Ibbs and W. Allen, "Quantitative Impacts of Project Change", Construction Industry Institute, University of California, May 1995. That study reported on the impact of changes made during detailed design and construction and included tables which identified the spread of changes and noted in particular that "project growth" in the last quartile of construction could be accredited to project change.
- ²² Project Management Institute, A Guide to the Project Management Body of Knowledge, Chapter 6, 2004 Edition.
- ²³ Galloway, P. and K. Nielsen, "Schedule Delay Concurrency Issue Analysis & Proof", The International Construction Law Review, 7 ICLR 386, Part 4, London, UK, October 1990.

²⁴ See Pickavance, K., Delay and Disruption in Construction Contracts, Second Edition, UK, 2000; the third edition is scheduled to be released in November 2005, although the Author was asked to review the update in draft form. See also the 1999 Supplement to J. Wickwire, T. Driscoll, S. Hurlbut, Construction Scheduling: Preparation, Liability and Claims, US, 1991.

²⁵ Nielsen, K., "Is Ethics Dead in Project Controls Management?", was the main keynote address at the opening of Project Management Institute's College of Scheduling Annual Conference in Phoenix, AZ, US, May 23-26, 2005, which was peer-reviewed before its presentation, and requested for the PMI (PMICOS portion) web site, www.Pmi.org, expected to be published on the site by the end of August 2005.

²⁶ Project Management Institute, A Guide to the Project Management Body of Knowledge, Chapter 6, 2004 Edition.

²⁷ Project Management Institute, A Guide to the Project Management Body of Knowledge, Section 6.5, 2004 Edition.

²⁸ Based on a program of projects with which the author was involved on behalf of a multi-national engineer-constructor. The program included referenced projects in Spain, Argentina, and Holland.

²⁹ Project Management Institute, A Guide to the Project Management Body of Knowledge, 2000 Edition, US, page 65.

³⁰ Galloway, P. and K. Nielsen, "Schedule Delay Concurrency Issue Analysis & Proof", The International Construction Law Review, 7 ICLR 386, Part 4, London, UK, October 1990.

³¹ Galloway, P. and K. Nielsen, "Schedule Delay Concurrency Issue Analysis & Proof", The International Construction Law Review, 7 ICLR 386, Part 4, London, UK, October 1990.

³² Pickavance, K., Delay and Disruption in Construction Contracts, Second Edition, UK, 2000.

³³ Wickwire, J. Thomas J. Driscoll, Stephen B. Hurlbut, Construction Scheduling: Preparation, Liability and Claims, US, 1991.

³⁴ Galloway, P., and K. Nielsen, "International Construction Dispute Proofs", Nordnet '91 Transactions: The Practice and Science of Project Management, Trondheim, Norway, June 3-5, 1991.

³⁵ Primavera software is registered, trademarked and computerized project management software that is utilized to prepare CPM schedules.

³⁶ Project Management Institute, A Guide to the Project Management Body of Knowledge, Section 7, 2004 Edition.

³⁷ Based on a project with which the author was involved on behalf of a multi-national engineer-constructor in Mexico.

³⁸ Project Management Institute, A Guide to the Project Management Body of Knowledge, Chapter 8, 2004 Edition.

³⁹ Based on a project located in Venezuela with which the author was representing a government agency.

⁴⁰ Based on project with which the author was involved representing the Owner/Employer located in the Philippines.

⁴¹ Project Management Institute, A Guide to the Project Management Body of Knowledge, Chapter 9, 2004 Edition.

⁴² Project Management Institute, A Guide to the Project Management Body of Knowledge, Chapter 10, 2004 Edition.

⁴³ Project Management Institute, A Guide to the Project Management Body of Knowledge, Chapter 11, 2004 Edition.

⁴⁴ Pinto, J.K. and D.P. Slevin, "*Project Success: definitions and measurement techniques*," Project Management Journal, UK, 1988; M. Freeman and P. Beale, "*Measuring Project Success*," Project Management Journal, UK, 1992; A. Shenar, d. Dvir, "*Mapping the dimensions of project success*," Project Management Journal, UK, 1997.

⁴⁵ Diallo, A., and D. Thuillier, "*The success dimensions of international development projects: the perceptions of African project coordinators*," International Journal of Project Management, UK, 2004.

⁴⁶ Nielsen, K., "Risk Management: Lessons from Six Continents," accepted for publication the ASCE Journal of Engineering Management, no publication date, but expected to be the Fall of 2005.

⁴⁷ Based on the following pipeline civil works infrastructure construction projects with which the author as been involved in the last 25 years:

Table Pipeline Project Sample in which the Author Has Been Involved in the Global Market		
Project and Pipeline Use	Location	Type Client

Power Plant-Coolant/Discharge Water	Wisconsin, US	Contractor
Power Plant-Coolant/Discharge Water	New Hampshire, US	Owner-Operator
Power Plant-Coolant/Discharge Water (4 plants)	Connecticut, US	Owner-Operator
Power Plant-Coolant/Discharge Water	Ohio, US	Pipe Vendor
Power Plant-Coolant/Discharge Water (2 plants)	Florida, US	Owner-Operator
Power Plant-Coolant/Discharge Water	Texas, US	Owner-Operator
Power Plant-Coolant/Discharge Water	Malaysia	Engineer-Constructor
Power Plant-Coolant/Discharge Water	China	Engineer-Constructor
Power Plant/Host Process Steam	The Netherlands	Engineer-Constructor
Power Plant/Host Process Steam	Australia	Owner-Operator
Cooper Mine-Slurry	Utah, US	Engineer-Constructor
Cobalt/Nickel Mine-Slurry	Australia	Engineer-Constructor
Gas Pipeline (on-shore)	Bolivia	Contractor
Gas Pipeline (on-shore)	Peru	Owner-Operator
Gas Pipeline (on-shore/off-shore)	India	Contractor
Gas Pipeline (Off-shore)	Trinidad	Owner-Operator
Gas Pipeline (on-shore/off-shore)	Australia	Engineer-Constructor
Gas Pipeline (on-shore)	Canada/US	Engineer-Constructor
Gas Pipeline (off-shore)	Venezuela	Owner-Operator
Gas Pipeline (off-shore)	Venezuela	Engineer-Constructor
Gas Pipeline (off-shore)	Angola	Engineer-Constructor
Oil Pipeline (on-shore/off-shore)	Russia	Engineer-Constructor
Oil Pipeline (off-shore)	Mexico	Engineer-Constructor
Oil Pipeline (on-shore)	Mexico	Engineer-Constructor
Refined Petroleum Product (on-shore)	Kuwait	Contractor
Refined Petroleum Product (on-shore)	Turkey	Contractor
Outfall-Treated Wastewater (2 projects)	New York, US	Owner-Operator
Outfall-Treated Wastewater	California, US	Owner-Operator
Outfall-Treated Wastewater	Missouri, US	Engineer
Outfall-Treated Wastewater (2 projects)	New Jersey, US	Owner-Operator
Wastewater Collection	New York, US	Owner-Operator
Wastewater Collection	Wisconsin, US	Owner-Operator
Wastewater Collection	Connecticut, US	Owner-Operator
Wastewater Collection	Washington, US	Owner-Operator
Wastewater Collection	Manitoba, Canada	Owner-Operator
Water Pipeline	Panama	Contractor
Water Pipeline	Florida, US	Engineer
Water Pipeline	New Jersey, US	Regulator
Water Pipeline	California, US	Regulator
Water Pipeline	Virginia, US	Contractor
Water Pipeline	Pakistan	Engineer-Constructor

⁴⁸ Nielsen, K., "Risk Management Techniques – Evolving Project Management Tools For All Seasons", Track 1a, Infrastructure, Proceedings of the Third Civil Engineering Conference in the Asian Region (The 3rd CECAR), Seoul, Korea, 2004.

⁴⁹ Nielsen, K., "Trends and Evolving Risks in Design-Build, BOT and BOOT Projects", The International Construction Law Review, 14 ICLR 188, Part 2, London, UK, April 1997.

⁵⁰ Nielsen, K., "Structured Risk Identification and Allocation as a Component of Construction Program Management: A Process that Knows No Boundaries", Proceedings of ASCE Convention, Session - International Contracting Practices, Washington, DC, US, November 11, 1996.

⁵¹ Based on a project located in Australia with which the author was representing a government agency.

⁵² Nielsen, K., "Risk Allocation in Design-Build and BOT Projects", Proceedings of the Civil Engineering Conference in the Asia (CECAR-1), Asian Infrastructure, Sustainable Development and Project Management, Manila, Philippines, February 19-20, 1998

⁵³ Nielsen, K., "Execution Risk Management in Design-Build Infrastructure Projects", Proceedings of ASCE's Construction Institute Conference, Tysons Corner, VA, US, May 12-13, 2004.

⁵⁴ The Checklist was prepared by the author under a contract with a multi-national contractor for whom the author modified the trademarked checklist that was made specific to the types of civil works infrastructure construction projects the contractor typically bid.

⁵⁵ Galloway, P. and K. Nielsen, "Risk Management Analysis Techniques for Projects with Significant Environmental Issues", Proceedings of the ASCE-SAS Second Regional Conference, Beirut, Lebanon, November 16-18, 1995.

⁵⁶ Galloway, P. and K. Nielsen, "Anticipating Problems: Project Risk Assessment and Project Risk Management", H. Schaughnessy, ed., Collaboration Management, New Project and Partnering Techniques, John Wiley & Sons, London, UK, 1994; see also, P. Galloway and K. Nielsen, "Project Risk Management - Achieving Goals", Proceedings of the 11th INTERNET World Congress on Project Management, Florence, Italy, June 16-19, 1992.

⁵⁷ Nielsen, K., "Risk Identification and Allocation", Proceedings of the Global Construction Conference, London, UK, November 5-6, 2001.

⁵⁸ Based on an engagement of the author by a multinational contractor serving the global market for civil works infrastructure construction market.

⁵⁹ Project Management Institute, A Guide to the Project Management Body of Knowledge, Chapter 12, 2004 Edition.

IV. The Japanese Domestic Civil Works Infrastructure Construction Industry

A. Japan's Domestic Civil Works Infrastructure Construction Industry Prior to the Turn of the Century

Japan was faced with a problem just before the bubble economy was about to end in the early 1980's. The US economy faced severe economic problems of its own in the 1980's and the then US President, President Regan, "tightened the country's belt." He demanded that Japan allow US contractors access to the construction industry at the time when Japan needed to protect it. In 1986 the US demanded to participate in the Kansai International Airport Project in an attempt to cut the huge surplus that Japan enjoyed. Japan finally agreed to a bi-lateral treaty with the US in 1988 to open its construction market to US firms. This was called the Major Projects Agreement (MPA). It had two levels. The first level was negotiated in 1988 covered certain named projects.¹ The MPA was broadened in 1991 to include 34 named projects.²

In 1992 Japan signed the World Trade Organization's Agreement on Government Procurement (AGP) that was presumed to cover the whole of Japan's civil works infrastructure construction industry. The Agreement on Government Procurement sets forth rules for non-discrimination between foreign and domestic sources, and for their treatment to be the same as Japanese nationals. The AGP was subsequently reviewed on a number of occasions, and as a result of negotiations concurrent to those of the Uruguay Round, the AGP was amended to

1. Broaden the scope of government procurement (applying to regional governments, and to a broader range of government-related entities).
2. Apply the AGP to the procurement of services.
3. Introduce a complaint review system pertaining to procurement procedures.

The revised AGP was signed by 23 countries and went into effect in January 1996.³

The AGP was the world model for allowing global competition for public works construction. In September 1995 US Deputy Assistant Secretary of Commerce Searing traveled to local regions throughout Japan to meet with local government officials. Her objective was to encourage these officials to think more openly and to allow greater foreign participation on public works projects in their region. Knowing that local governments were obligated under the WTO to adopt open and competitive bidding procedures, she urged them to use the reform measures outlined in the 1994 Public Works Agreement as a model. In particular she emphasized the need to consider a foreign firm's international experience as well as to eliminate procurement practices and requirements that are unique to a certain region.⁴ In January 1996 Japan implemented the "Action Plan on Reform of the Bidding and Contracting Procedures for Public Works." These measures were signed in an exchange of letters between US Commerce Secretary Ronald H. Brown and Japan's Ambassador to the United States, Takakazu Kuriyama. The exchange represented progress toward the successful resolution of a longstanding problem between Japan and the US related to access by foreign companies to Japan's public works market. The Action Plan:

- Ensured that commissioning entities will take a foreign firm's international experience into consideration when determining a firm's qualifications.
- Introduced a comprehensive complaint mechanism which applies to all aspects of the procurement process.
- Committed the Government of Japan to develop measures to prevent anti-competitive practices.
- Expanded the universe of opportunities for foreign firms from 34 projects under the Major Projects Arrangements (MPA) to all public works projects above the WTO thresholds.
- Established a monitoring system on foreign participation in Japan's public works market.

The MPA effectively was replaced by the Action Plan, because the large size projects covered by the MPA were included by the coverage of the Action Plan, albeit to a wider potential group – all potential foreign competitors.

Japan fully implemented the measures outlined in the AGP on April 1, 1996. These measures covered construction-related procurements by central and quasi-governmental entities in Japan. It provided for open and competitive bidding procedures to be used when these entities conduct procurements for construction, design, and consulting work that are valued at or above the WTO government procurement thresholds. In the Action Plan, as revised, the prefecture governments and governments in Japan's largest cities were to adopt open and competitive bidding procedures.⁵

The Government also took steps to legislate the abolition of regional requirement through the Action Plan in January 1996. The Action Plan specified thresholds vary according to types of contract specified in the WTO AGP. They are based on Special Drawing Rights (SDR's), which are obtained by converting the applied standard values expressed as SDR's into the national currency. For example, the standard values for all types of voluntary measures determined by the Committee for Drawing Up and Promoting the Action Program, based on Notification No. 37 of the Ministry of Finance, as published in the official gazette (Kanpo) dated 25 January 2002, set the standard values for procurement contracts awarded between April 1, 2002 and March 31, 2004 as shown in Table IV.A.1

Table IV.A.1
Special Drawing Right (SDR) Equivalency to Japanese Yen

SDR 500	Equivalent to ¥70,000
SDR 100,000	Equivalent to ¥14 million
SDR 385,000	Equivalent to ¥54 million
SDR 800,000	Equivalent to ¥120 million
SDR 2 million	Equivalent to ¥280 million
SDR 5 million	Equivalent to ¥700 million

Thus, the Standard Values agreed in the AGP for various classifications at the SDR rates in Table IV.A.1 for period April 1, 2002, to March 31, 2004, for the Central Government, Local Public Bodies, and Government Related Organizations is shown in Table IV.A.2:

Table IV.A.2
Japan's AGP Commitments in Yen and SDR's

Classification	Central Government	Local Public Bodies	Government-related Organizations
Products	¥ 19 million (SDR 130,000)	¥ 29 million (SDR 200,000)	¥ 19 million (SDR 130,000)
Services	¥ 19 million (SDR 130,000)	¥ 29 million (SDR 200,000)	¥ 19 million (SDR 130,000)
Construction services	¥ 660 million (SDR 4.5 million)	¥ 2.22 billion (SDR 15 million)	¥ 2.22 billion (SDR 15 million)
Design consulting services	¥ 66 million (SDR 450,000)	¥ 220 million (SDR 1.5 million)	¥ 66 million (SDR 450,000)

The voluntary measures on government procurement determined by the Committee for Drawing Up and Promoting the Action Program were modified so that the standard values for products and services for the central government and government-related organizations was lowered from SDR 130,000 (19 million yen) to SDR 100,000 (14 million yen) consistent with the threshold in the Japan-Singapore Economic Agreement for a New Age Partnership. The threshold for the procurement of goods and services by the central government and public corporations was lowered to 100,000 SDR (¥ 14 mil.). Independent measures (WTO plus measures) were established for contracts exceeding 800,000 SDR's, which were not included in the AGP. The changes provided for the a procurement information plan on the SDR-level through notices provided prior to tenders (through seminars and the like), requests to potential suppliers to submit materials for market surveys, and requests to potential suppliers to submit comments on specification proposals.⁶

The criteria remained a difficult hurdle for foreign companies to handle. It was still onerous except for the very largest of foreign competitors. For example, in the past firms were required to maintain a place of business in a given region in order to qualify to bid on public works projects sponsored by the local government. Thus, as of January 1, 1996, the locality requirement was abolished and any qualified firm was able to participate in bidding on a local public works project. A construction firm still had to obtain a license and to register with the local government in a timely fashion. The registration process became easier. The firms no longer had to meet a very tight registration schedule that became available only once every two years. The January 1996 legislation allowed contractors, suppliers and consultants interested and qualified the right to register with the local government at any time. For example, the Ministry of Land, Infrastructure, and Transport's (MLIT) "Japanese Procurement Procedures for Public Works" states that an Open and Competitive Bidding procedure was employed for large scale civil works infrastructure projects. The WTO Agreement on Government Procurement applies to most of these works. Yet, for other public works, Designated Competitive Bidding procedure was widely employed.⁷ It subtly indicated that other than the largest projects, or the Action Plan and WTO plan projects, civil works infrastructure construction projects were handled under the Designated Competitive Bidding procedure. Also, a construction company was required to register on a list at each commissioning entity in order to participate in public works projects. Also, a single entity often had several regional bureaus or subordinate agencies that independently ordered civil works infrastructure construction works and separately had their own registration lists for contractors.

Registration was necessary not only to participate in bidding under the Open and Competitive Biding system, but also in the other bidding systems mentioned below.

Applications for registration were received at any time of the year, although the MLIT advises that several weeks for processing should be allowed. Each applicant firm was registered with the entity that would award the contract and was granted a license based on its score on the entities' evaluation. The ability of each firm was a function of the "Business Evaluation," which was a system for evaluating technical, financial, and other abilities of a construction company. A company that planned to participate in civil works infrastructure construction projects is required by the Construction Business Act to go through the Business Evaluation annually and is responsible for registering with every agency from which it will seek contracts. For example, if the Tokyo Metropolitan Governor issued the License, an application for the Business Evaluation had to be submitted to the Tokyo Metropolitan Governor. The Business Evaluation criteria include:

- Annual value of completed construction works by License classification.
- Net worth
- Number of staff.
- Business condition (financial statement analysis).
- Number of technical staff.
- Number of years in business.
- Record of labor compliance with welfare conditions.
- Record of safety performance.
- Number of qualified accounting clerks.

For a Japanese branch of a foreign firm or a majority-owned subsidiary of a foreign firm, the value of completed civil works infrastructure construction works overseas and the number of personnel resident outside Japan are treated identically with those in Japan by the Business Evaluation. Additionally, the size of technical staff and the number of years in business in foreign countries of an applicant will be counted, if the MLIT had certified their equivalence with those in Japan in advance. Moreover, an applicant could be evaluated jointly with closely related foreign group firms on a corporate-group basis upon request. Thus, a subsidiary of a foreign firm in Japan could be evaluated jointly with its parent firm. Nonetheless, the vast majority of civil works infrastructure construction projects still came under the "Designated Competitive Bidding" procedure.

There were a number of alternatives allowed, but not used as frequently as the Designated Competitive Bidding procedure. In Public Invitation Designated Competitive Bidding, the awarding government entity first decides to let the contract for a project, selects the licensed firms from which it will request the submission of technical documents, and then publishes an outline of the project and the qualifications of firms from which the entity requests the submission of technical documents. Firms that were interested in bidding or tendering on the project from the designated firms submitted their technical documents. The awarding government entity then examined the submitted documents and designated firms for participation in bidding or tendering. Reasons that a particular firm had not been selected for bidding or tendering were generally provided upon request. The MLIT ordinarily adopted this method for civil works infrastructure construction projects with a contract value of ¥ 200-730 million. For smaller yet civil works infrastructure construction projects in the range of ¥ 100-200 million, the Project Interest Registration Designated Competitive Bidding procedure is used. At the time of registration for the qualification to submit bids or tenders, the awarding government entity requests each construction company to indicate what types of construction projects it prefers to bid. When it comes time for the bidding or tendering, the awarding government entity considers the preferences of each company, and requests 10 or 20 registered companies to submit technical documents ("provisional selection"). After examining submitted documents, final nominees are selected to submit bids or tenders. For even smaller civil works infrastructure construction projects (less than ¥ 100 million), under Designated Competitive Bidding, an awarding government entity selects construction

companies that it wishes to invite to bid on the basis of the track record of each company's work and its score in the entity's construction company ranking system. Ordinarily, a selection committee at the awarding government entity was in charge of the selection.

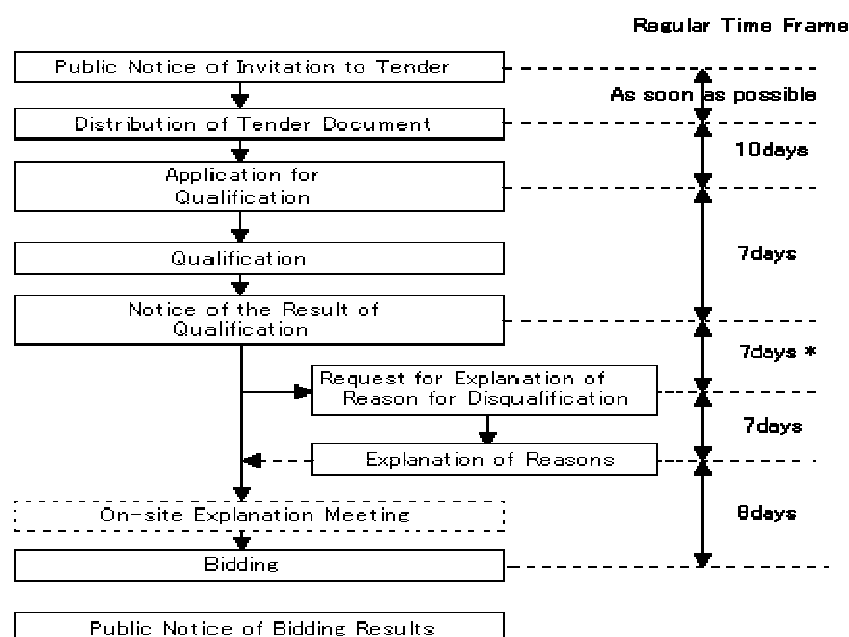
Although not common, the MLIT had experimented with other forms of bidding as tests:

- Under the Design-Build system different firms carry out the design and construction of civil works infrastructure projects in Japan. A small number of public entities were beginning to experiment with the design-build system.
- The Value Engineering (VE) system was introduced as a means of improving quality and reducing cost of a project. It is adopted at the tendering phase or at the post-contract phase. In VE in the post-contract phase, half of the cost savings achieved through the use of VE is often returned to the contractor. The MLIT and Local Housing Supply Corporations were beginning to use this system, and some local governments were test using it.
- Under the Technical Proposal Integrated Evaluation System, for a particular civil works infrastructure project, the awarding government entity calls upon bidders to submit technical proposals in addition to price bids or tenders. The awarding government entity then evaluates the bid or tender considering both the price and the technical proposal, reviewing factors such as quality, speed, design, and safety of execution.

The MLIT proudly reports that the time frames for foreign company registration and tendering/bidding complaints have been reduced. It reported that the system was used for the first time in FY 1998 to award a contract and now used by the MLIT is shown by the following diagram:

Figure IV.A.1

Open and Competitive Bidding Procedure (Standard Type)



For example, Table IV.A.3 compares various country's commitment levels on government procurement available to foreign contractors in comparison to Japan expressed in SDR's under the AGP (before the voluntary changes made by Japan):

Table IV.A.3
Sample Comparative Level of Procurement under the AGP

Classification	Japan	United States	Europe Union	Canada	Korea
<u>Central Government</u>					
Goods	130	130	130	130	130
Services	130	130	130	130	130
Construction Services	4,500	5,000	5,000	5,00	5,000
Design Consulting Serv.	450	400	130	130	130
<u>Local Public Bodies</u>	Prefectures, Designated Cities	37 States	Regional Self-Govern Bodies		Provinces, 5 Cities
Goods	200	355	200	355	200
Services	200	355	200	355	200
Construction Services	15,000	5,000	5,000	5,000	15,000
Design Consulting Serv.	355	355	200	355	200
<u>Government-Related Orgs</u>	70 Entities	7 Entities	Waterways, Transport Energy		23 Orgs
Goods	130	400	400	355	450
Services	130	400	400	355	
Construction Services	15,000	5,000	5,000	5,000	15,000
Design Consulting Serv.	450	400	400	355	450

The end result was that in the April 1, 1996 to April 1, 2006 period the civil works infrastructure construction market was to become fully open to foreign companies after a transition period set by the levels in the AGP.

What has happened? The US Department of Commerce described Japan at the beginning of 2003 as still the world's second largest market (after China). The US Trade Representative confirmed that Japan had the second largest global civil works infrastructure construction market in 2004 accounting for US\$ 190 billion.⁸ Japan it said:

*"continues to lead world construction activity, accounting for more than 33 percent of global spending [for construction], according to ENR (Engineering News Record) estimates... [however] construction spending in Japan is expected to continue to decline over the next few years, as Japan's economic slump continues."*⁹

Domestic construction had fallen from ¥81.4 trillion in 1990, of which civil works infrastructure construction accounted for 31.6%, by more than a third ¥53.8 trillion by 2003 and public works construction was ¥23 trillion or 42.8%. despite the decrease in expenditure.

But the US Department of Commerce also reported that

"competition best describes the current condition of Japan's public construction procurement market. This is due primarily to the shrinking number of large scale

public projects. As a result, cost reduction has become an important key to success. Japan has begun to study various technologies including project management, construction management and value engineering in order to explore new ways to increase the efficient use of public funds. These developments create opportunities for U.S. firms, which lead the world in these construction technologies. Japanese construction firms lag their counterparts in these areas...Apart from price, quality, and delivery time are also very important in the Japanese market...Additionally, construction scheduling is critical. It is estimated that U.S. construction firms succeeded in winning an average of at least \$200 - \$300 million in public contracts in Japan in 1999 and 2000. That translates to less than a 0.1% share for all public projects. When considering Action Plan projects, however, U.S. firms fared much better, capturing a 1% share. There are at least 100 foreign construction firms active in Japan [firms that hold licenses]. U.S. firms account for over half: 6 General Contractors. Not needing licenses are the 5 Architectural design firms, and 50 specialty design/consulting firms. Korean general contractors are the second largest contingent.”¹⁰

This record was dismal. The Government was forced in the face of a stagnating economy to commit to open up the domestic civil work infrastructure market to foreign construction companies. But the Government was still interested in protecting “its” construction industry, just as the ruling party had used civil works infrastructure construction for decades. Protecting the civil works infrastructure construction industry was of paramount importance. This protection was at the expense of the civil works infrastructure construction industry (the small and medium firms particularly), which it was not preparing for opening of the construction industry to foreign competition. What little had been done has not met with any significant success.

Japan continued to promote mega infrastructure projects as being open to foreign competition as the new century began. They claimed an estimated ¥30 trillion to be spent in Chubu region (2000 to 2005), the ¥640 billion Central Japan International Airport, the ¥3.2 trillion Second Tomei-Meishin Expressway (new 6-lane freeway connecting Tokyo-Nagoya-Kobe), and the un-priced maglev high-speed train linking Tokyo-Nagoya-Osaka.¹¹ But the focus was on procurement for materials/equipment, the providing of potential financing support, and not construction. Using the figure of one percent which had been achieved, the level of ¥3 trillion still would not be exceeded.

Government agencies also were arguing in 2000 that the historically high 5.5% to 6.5% of Gross Domestic Product (GDP) for civil works infrastructure construction be maintained as the country, it claimed, “Has a considerable appetite for Social Overhead Capital and still needs further improvements in its infrastructure.”¹² The “social overhead capital” was a euphemism for the ten construction stimulus packages noted above that the ruling party undertook between the years 1990 and 1999. The Government’s Ministry of Construction (the predecessor to the current Ministry of Land, Infrastructure and Transport) wanted more. Yet, this level of spending for civil works infrastructure, “social overhead capital,” could no longer be maintained. Even for existing infrastructure, the Government predicted that Maintenance and Renovation would exceed ¥20 trillion, and admitted “there will be little money to spare for new investment in public works” for a few years.¹³ Even the ten “stimulus packages” between 1990 and 1999 did not produce the results that were promoted as having as shown in Table IV.A.4:

Table IV.A.4
Announced versus Actual Levels of Japanese Stimulus Packages, 1993 to 1998

Japan's Fiscal Stimulus Packages, 1993 to 1998		
Date Announced	Announced Amount (¥ trillion)	Actual Stimulus Expenditure (¥ trillion)
April 1992	13.2	10.6
September 1993	6.3	5.1
February 1994	15.2	7.2
February 1995	1.6	1.6
April-May 1995	2.7	2.7
September 1995	14.0	7.9-9.0
December 1996	2.7	2.7
December 1997	15.9	2.9
April 1998	16.6	NA
November 1998	24.0	NA
Source: Asahi Nenkan (various issues) and Asahi Shimbun, November 17, 1998		

The most important component of these packages was civil works infrastructure construction. However, the actual increases in the late 1990's were rather moderate compared to the prominent and headline grabbing role of public works in the stimulus packages.

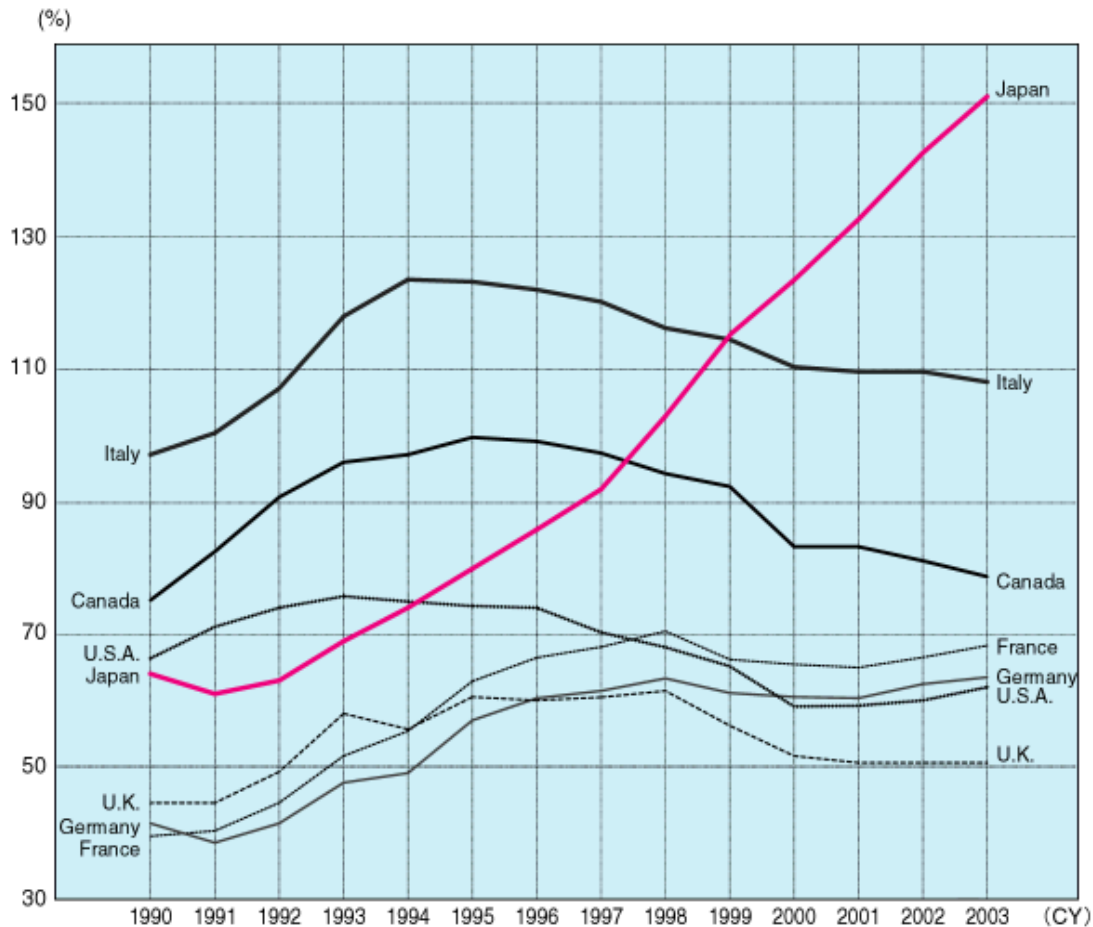
B. Japan's Domestic Civil Works Infrastructure Construction Industry 2000 - 2005

There are two reasons that actual civil works infrastructure construction fell short of the announced levels. First, the Government assigned roughly two thirds of the increases in public works spending to local governments without providing a commensurate increase in funding. The capacity of local governments to expand public investment was affected by their financial situation. The continued rise in public investment increasingly had been financed through local bond issues. The amount of outstanding local government bonds increased from 12 percent of Gross Domestic Product (GDP) in 1990 to 22 percent in 1997. Many local governments surpassed the legally allowed threshold of bonds outstanding and were put under bond issuance restrictions by the Government. Also, some of the public investment funds provided by the stimulus packages remained unused because of the poor implementation. Only 60% to 70% of the packages' public works had been translated into additional civil works infrastructure construction during the late 1990's.¹⁴ Yet, these the spending packages over the 1990's pushed up public debt in Japan to more than 140% of GDP – the highest ratio among industrialized nations.¹⁵ Many public corporations and local governments carrying out civil works infrastructure projects were essentially insolvent. Owing to a very weak domestic economy, which lowered tax revenues and raised government spending, Japan's fiscal balance has deteriorated dramatically. By 2000, Japan had the largest government debt-GDP ratio among the OECD member countries.¹⁶ The debt of Japan compared to other countries also establishes the Government inability to continue to finance civil works infrastructure construction. The Ministry of Finance reported recently on its web site:

*"Looking at the percentage of general government financial balances to GDP, many other developed countries have been working towards fiscal consolidation and have shown steady improvements. However, our country's fiscal deficit has greatly increased and exceeded that of other developed countries due to various measures aimed for economic recovery."*¹⁷

The precarious predicament that the protection of the civil works infrastructure construction industry is illustrated by the fact that compared to all developed countries, Japan is moving in the opposite direction when debt is taken as a percentage of GDP:

Figure IV.B.1
Ministry of Finance Reported Levels of Debt Expressed of a Percentage of GDP



Source: OECD Economic Outlook 72 (2002). Figures are calculated on SNA Base and for Japan and the US figures are calculated on general government financial balance excluding social security.

As can be seen in the figure, it is twice the levels of any other country that is moving upwards (France, Germany, and the US). The amount of potential government bailout is 15% of the 2000 GDP.¹⁸ The Government can no longer use civil works infrastructure construction as the vehicle to drive it through the economic slumps that continued to ravage Japan.

According to the Wall Street Journal, Japan has been in deflation for almost six years, and the Bank of Japan has said it will keep its policy framework until year-on-year changes in the core inflation show stable positive growth. Deflation has increased real interest rates and debt, leading to defaults that can weaken the financial system. It also has a negative impact on investment and wealth. The Ministry of Finance said outstanding debt held by the Japanese government hit a fresh high record of ¥751.107 trillion as of the end of December 2004, and that was up 2.8% from ¥730.985 trillion, the previous high. The government has slashed civil works infrastructure construction budgets and spending as is demonstrated in the following Table IV.B.1 and Figure IV.B.2 compiled from Research Institute of Construction and Economy data:

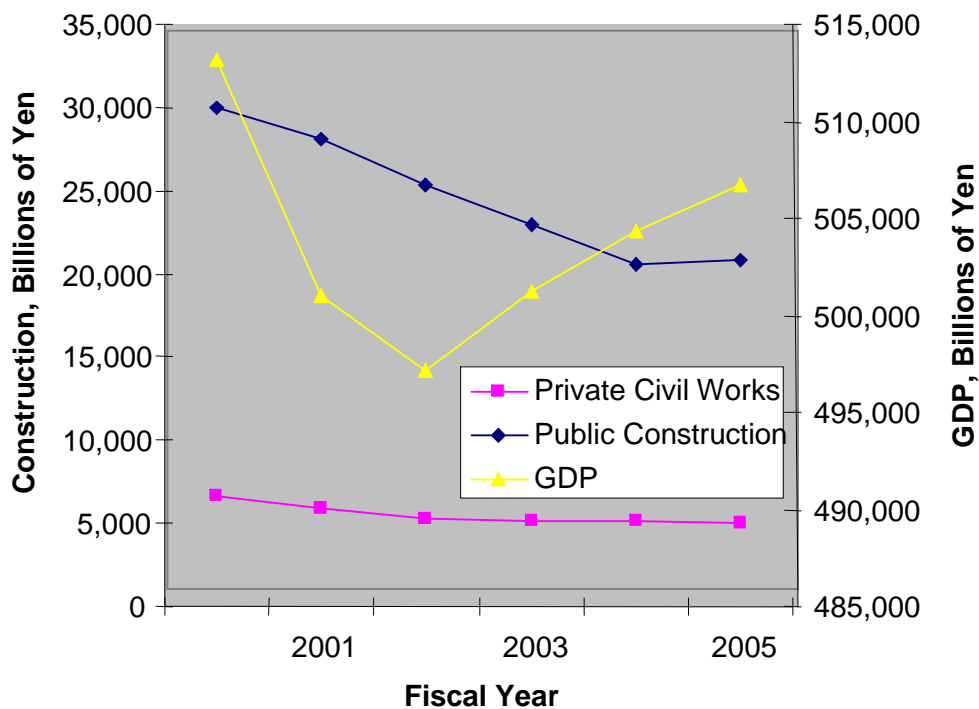
Table IV.B.1
JAPANESE PUBLIC AND PRIVATE CIVIL WORKS AND GDP

	Fiscal Year ¹⁹					
	2000	2001	2002	2003	2004	2005*
GDP (¥ trillion)	513,170	500,968	497,203	501,254	504,368	506,668
Rate of change from previous FY	1.0	-1.1%	-0.8%	1.9%	2.0%	1.4%
Public Construction (¥ trillion)	29,960	28,123	25,370	22,970	20,530	20,830
Rate of change from previous FY	-6.2%	-5.9%	-10.0%	-9.5%	-10.6%	1.5%
Percent of GDP	5.8%	5.6	5.1%	4.6%	4.1%	4.1%
Private Civil Works (¥ trillion)	6,616	5,903	5,280	5,190	5,140	4,980
Rate of change from previous FY	2.5%	-10.8%	-10.6%	-1.7%	-1.0%	-3.1%
Percent of GDP	1.3%	1.2%	1.1%	1.0%	1.0%	1.0%

* Forecasted in January 2005 by the Research Institute of Construction and Economy

Government spending on Public construction has fallen nearly 30% since FY 2000 and will continue to fall, but at a slightly slower rate and remain constant at this reduced level. Similarly, Private civil works infrastructure construction, albeit one-fifth the value of public civil works construction, has similarly fallen by 25% over the same time. But, it has been essentially flat as a percentage of GDP, 1%. The rate of the overall decline in civil works construction and private civil works is slowing to a value approximating ¥25 to ¥26 trillion, as is shown in Table IV.B.2 and Figure IV.B.1 which follows:

Figure IV.B.2
The Value of Domestic Construction Works and GDP-Japan



In the first quarter of 2005, the Mitsubishi Research Institute (MRI) reported that growth was only 25% of the levels that they predicted the previous quarter for 2005. MRI cited a “mood of adjustment” that was taking hold in 2005, but asserted the economy was unlikely to slip into deep recession – the net being GDP growth which was growing at the nominal GDP rate of 1.5%. This situation reflects the situation caused by the increasing (rather than decreasing) use of Fiscal Investment and Loan Program (FILP) funds to cover the losses from public corporations with prior spending on public works. The FILP in Japan collects funds through governmental financial institutions (most notably postal savings) and uses the funds to finance civil works infrastructure and other projects undertaken by government-affiliated corporations or to finance government loans to borrowers in targeted areas (targeted industries, small firms, mortgage borrowers, etc.). Many countries have government-sponsored loan programs. The Japanese program is distinguished by its size. At the end of fiscal 2000 (March 2001) the FILP involved ¥418 trillion, equal to some 82 percent of gross domestic product (GDP), and the program’s use of funds statement totaled more than the GDP. The postal savings system, the most important source of funds for the FILP, is the world’s largest financial institution. It held ¥250 trillion in deposits (35 percent of total household deposits) at the end of fiscal 2000.

The FILP may promote welfare and economic growth by financing projects that have such large externalities that private institutions would not undertake them. It also may be an impediment to welfare and growth by allowing the government to pursue wasteful projects. Historically the program has ignored market information, and its sheer size makes the cost of resource misallocation enormous. The FILP accounts are notoriously opaque. Thus, just before the restructuring that the Government has undertaken, the data shows that existing losses and expected transfers to cover future losses are enormous. These losses are implicit claims on the Government (and hence on taxpayers). FILP losses will impede economic

recovery, especially when taken with restructuring that the Government is being forced to undertake.²⁰

The outlook for public works construction (whether national or local government spending) is not good.²¹ Japan may take a long time to adjust precisely because it can afford to do so. Japan is a wealthy country with a large current accounts surplus and a large pool of domestic savings. Because of the efforts of trying to assuage the sectors of the economy, Japan has managed to avoid a major social or political crisis, but this has come at the cost of an economy that remains maladjusted and stagnant.²² The controlling party has “mortgaged” the future of both the country financial capability and that of the civil works infrastructure construction industry.

The MLIT in 2003 issued a white paper on fulfilling infrastructure needs of the future in light of the changing demographics.²³ The Government clearly cannot spend money on civil works infrastructure projects as “social capital overhead” to stimulate the economy. The MLIT completely was refocusing from a mere three years before. The focus was on the local prefectures and communities defining what they need in the future and then forming in essence, public/private partnerships to fund and execute the infrastructure needs. The message was clear: the national government will not and can not fund future projects and will no longer build what the Government determines are necessary (despite useful in keeping the ruling party in power). This position was a total departure from prior practice. Yet, this situation makes the implementation awkward, since the MLIT has been the repository of the engineering and management civil works infrastructure expertise for the country. It was now located in the MLIT, but it would no longer be source of funding that the party uses for its civil works infrastructure construction contracts. Conversely, the Prefectures and Local Governments do not have the contract administration skills necessary to oversee large civil works infrastructure projects.

Regarding the “roles of the public, community and private sectors,” the MLIT stated that recent “case studies suggest that community development initiatives are originated from:” voluntary groups, Non Profit Organizations (NPO’s), local government, and community development councils. To this end, the MLIT now defined its role as changing policies, etc., which are an impediment to achieving the goal, and supplying partnerships of the private sector and academia groups with information. As for human resource development, such as, in planning, engineering and construction management, the MLIT suggests that it will provide support to the prefectures and local governments by offering “professional advice.” Then MLIT suggests that business should give “priority to training their employees” and use external sources as human resources. As for the future role of the Government, they assigned two roles:

1. Ensuring a level playing field for local communities, businesses and municipalities to compete.
2. Developing physical and social infrastructure conducive to business.

They were encouraging cooperation and partnerships between municipalities and business/academia, for example. The Government, however, said it would provide major support for such efforts, if local initiatives are in line with its policies. These policies are focused for the foreseeable future also will not be realized because of an inability to provide the necessary funding, since FILP cannot guarantee funds anymore.

As 2003 began, the MLIT sought information on how it could supply the necessary personnel to meet the changes with which the Government was now faced, since it was no longer the main provider of civil works infrastructure projects. The MLIT said:²⁴

“The present situation of the Japan Construction Industry, which is facing a drastic reduction of construction investment, has resulted into a severe price competition among contractors. As a result, the number of low price bidding has been increasing at all levels of public offices especially cities, towns and villages. In addition, engineering officials who are in charge of supervising or inspection etc. in small towns and villages are tended to be insufficient. We really worry that the aforementioned facts may have resulted in decline of quality of public works. This is why we are particularly interested in the partnering of clients and advisers in public construction works in USA....We would like to learn the system more in detail in USA if it is possible. The followings are main points that we need to collect information in USA.

- 1. Scope of responsibility of a public office (especially for local municipalities) that places a contract for public construction works.*
- 2. The number of civil engineering officials who are in charge of public construction works for a public office of some particular jurisdictions.*
- 3. The role of civil engineering officials who are in charge of public construction works in a public office (especially for local municipalities).*
- 4. How consultants or third parties are engaged to help public office (especially for local municipalities) to carry out public construction works from its procurement through the completion. We want to know the legal status of those people and also the physical arrangement, i.e. location of their offices.*
- 5. Powers, roles, and liabilities of clients, consultants and contractors respectively in each case described in item 4.*
- 6. Contracting content (especially role sharing) between an advisers/consultants and a public office (especially a local municipalities).”*

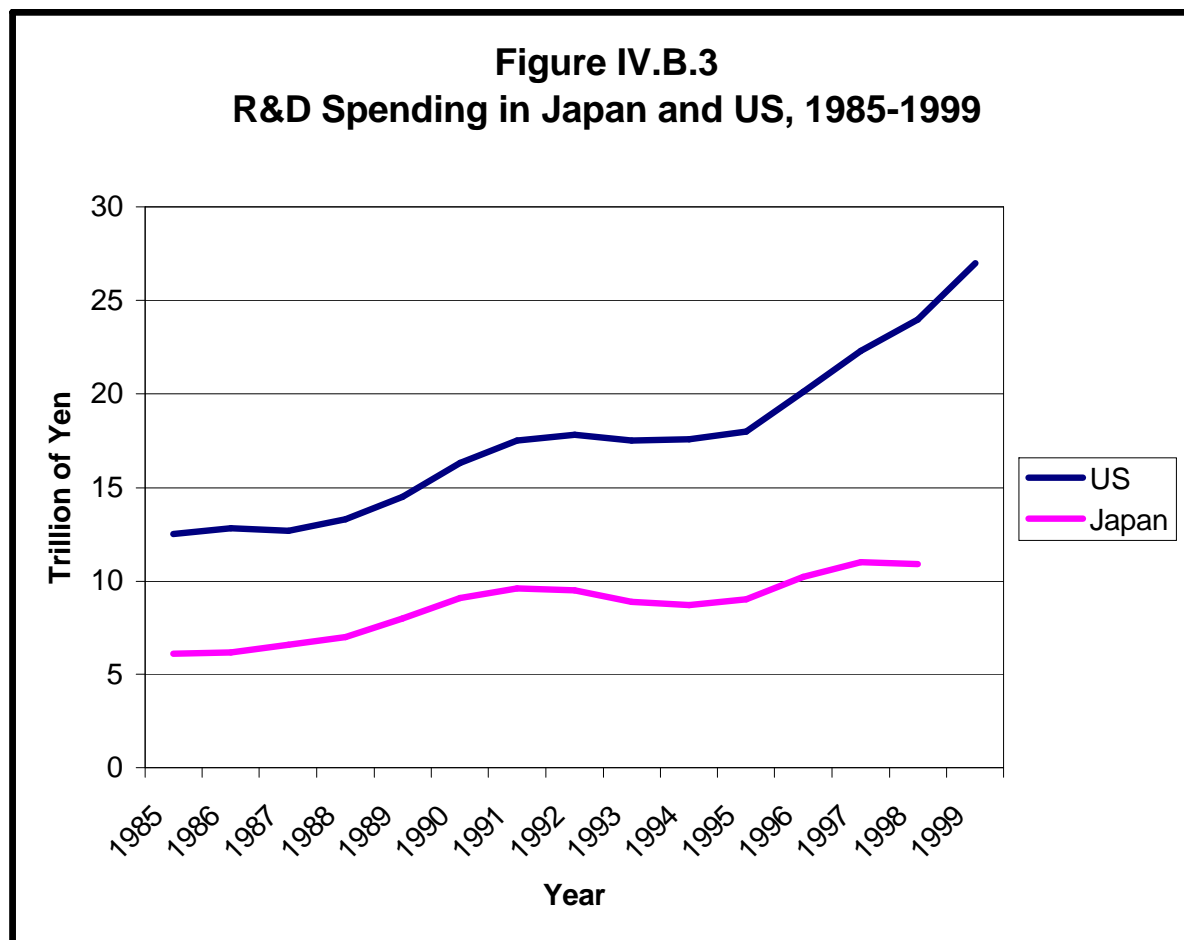
The information sought was because the Government had never contemplated that the Prefectures and Local Governments would ever have to deal with larger civil works infrastructure.

The export-driven industrial sector leads to a different scenario. A potent example of the new thinking from change is in area of industrial research & development (R&D) that led to so many innovations in the 1980's. The end of the “Bubble” economy led to a decrease in R&D spending and a decrease in traditional measures of R&D productivity, although Japan still spends a larger share of GDP than any other nation on R&D. As Japanese industry reached technology frontiers, Japanese business has had to reorient R&D efforts from the application and refinement of existing, relatively well-developed technology to the creation of more fundamental breakthroughs. The shortage of Ph.D.-level engineers and the relative weakness of Japanese academic science had inhibited the effectiveness of more technologically ambitious R&D in Japan. The Japanese similarly tried large centralized R&D labs with consequent lack of focus – something that the US abandoned in the 1980's. Similarly there has been an absence of a venture capital industry and the types of institutions that support start-ups.

These problems are being addressed now in various industries. Most notably has been the increase in forging of technological alliances with US firms, which has led to increased knowledge flows to Japanese firms. The increased knowledge flows have resulted in increased inventive productivity, but still this has not as been the case in the construction Industry. The one exception in export industries has been the Japanese electronics industry when compared to other manufacturing-export industries. The electronics industry has been much more aggressive in establishing technology alliances, despite seeing the same pattern of R&D expenditure decline as other manufacturing industries. Successful current R&D thinking is a five part strategy: (1) Greater reliance on R&D partnerships outside the traditional Keiretsu networks within Japan; (2) Greater reliance on foreign (especially US)

partnerships and acquisitions of high-tech firms; (3) Greater emphasis on cooperation with universities, domestic and foreign, coupled with a de-emphasis on centralized in-house R&D and a gradual downsizing of resources invested in central R&D facilities; and (5) increased interest and investment in corporate venturing programs. It is not the mere simple licensing of US technology which the Japanese has embraced wholeheartedly, it is the forging of technology alliances that allow the incorporation of ideas developed outside the firm into a firms own R&D efforts.

The current move towards partial outsourcing of R&D is a conscious imitation of a shift that was already underway in the US from the early 1990's.²⁵ The following Figure IV.B.3 illustrates the amount of private sector R&D spending in Japan and the US from 1985-1999:



Source: Gijutsu Yorun (2000)

When the number of patents applications generated by inventors in Japan, the EU and the US in their respective countries and world wide between 1987 and 1997 is measured, Japan filed twice as many in 1987 to 1989. Japan remained essentially flat during the next eight years, however, and, US and the EU each rose to more than three times the number of Japanese applications.²⁶ But, significant changes in the R&D arena are being undertaken as indicted. Similar changes in thinking have been occurring in the management arena. The documented success of a Westerner in turning around Nissan and the recent management change in leadership to a Westerner at Sony Corporation, the icon of the 1980's of Japanese innovation, portend the shift that is taking place in traditional Japanese industrial management. These are multinational organizations, and when their traditional methods no longer work in the global market, they are adapting rapidly. The uses of new ideas that are necessitated by a changing economy are forcing change. It is beyond the scope of this

thesis, but reform of Japanese engineering curriculum for the Japanese consulting engineers by P. Galloway is addressing the future role of Japanese consulting engineers in a global market.²⁷ Similarly, the approaches being taken by Dr. Gato Kano's of Kochi University of Technology with respect to Entrepreneurial Engineering²⁸ is a shift from tradition-bound Japanese thinking. Dr. Kano promotes thinking outside of the structured Japanese way through cross fertilization of engineering ideas and disciplines. The Japanese export-oriented industries are to make adjustments that allow them to compete in their domestic markets and also in the global market. The export-oriented industries are adjusting to the global market, and are doing so with reasonable success.

Such thinking, however, is not the case with the domestic civil works infrastructure construction industry. In 20 years the Government has introduced many policies relating to the construction industry. All were designed to keep the status quo with regards to foreign competition by evidencing change. The policies most recently included:

- February 1986: Construction Industry Vision for 21 Century
- March 1989: Promoting Program for Improvement of Construction Industry System
- April 1995: Construction Industry Policy Codes
- July 1999: Construction Industry Revival Program
- April 2002: Reorganization Plan for Construction Industry

These measures were oriented to further strengthening domestic civil works infrastructure construction industry by making more formidable in Japan, but not to preparing it foreign competition as the AGP required. For example, the 1995 Construction Industry Policy Codes ostensibly was intended to build into the industry the "quality" that Japanese contractors "were known for" and in the civil works infrastructure construction to rid the industry of perception as "dirty – *Kitanai*." The industry had been plagued with issues of quality, the exclusion of practices that reduce construction time and cost, bid rigging, and a system that obscures transparency.²⁹ Similarly, the MLIT has been promoting various actions, such as, utilizing Internet Technology (IT), aiming for reforms in public works processes. To realize transparency of bidding and contracts, the "Act for Promoting Proper Tendering and Contracting for Public Works" was established in order to make the processes of public works transparent. Preparation at using systems and work procedures was completed in 2001. This led to promoting the introduction and spreading of electronic bidding making full use IT. The basic principles for appropriateness in bidding and contracting thus began implementation the same year. Electronic Bidding has been applicable for civil works infrastructure construction projects ordered by the MLIT from FY 2003 onwards, as indicated earlier. Electronic bidding is to be applied to all civil works infrastructure construction projects, including local government agencies, by FY 2010.³⁰

In March 2004, the Japanese Cabinet adopted "The Three-Program for the Promotion of Regulatory Reform" comprising 762 regulatory reform measures to improve transparency.³¹ Still the construction industry is not represented in these governmental structural reforms. The Government is thus going through restructuring in other area of the economy as further means of adjusting to the new reality the country faces, yet the Government is still not making meaningful changes to the civil works infrastructure construction industry. The same ruling party that led the country into the economic problems also is leading the effort to restructure government in an attempt to streamline government processes. The once high flying and seemingly invincible construction industry, however, is left ill prepared to meet foreign competitors in either a reduced domestic market or compete in the global market. The civil works infrastructure construction industry still is suffering from practices that allowed the long-ruling party to manipulate elections, and its attempts during the 1990's to in a stimulate the economy through the civil works infrastructure construction projects. The ruling party had to keep foreign competitors out of the domestic civil works infrastructure

construction market to achieve the results it expected. The WTO pledge by Japan of allowing open competition to foreigners took a back seat. There has been little movement in the nine years since the AGP went into effect. Foreign firms have approximately 1% of the civil works infrastructure construction market. The Government did not make the required structural changes, instead it continued to incur huge debt for civil works infrastructure construction projects in an ill-fated attempt to stimulate economic recovery. The civil works infrastructure construction industry simply is not prepared for a truly open and competitive market by April 2006 operating under international rules. The Government has not issued changes to laws, procedures, rules and processes.

C. The Future Prospects of the Civil Works Infrastructure Construction Industry – 2006 Onwards

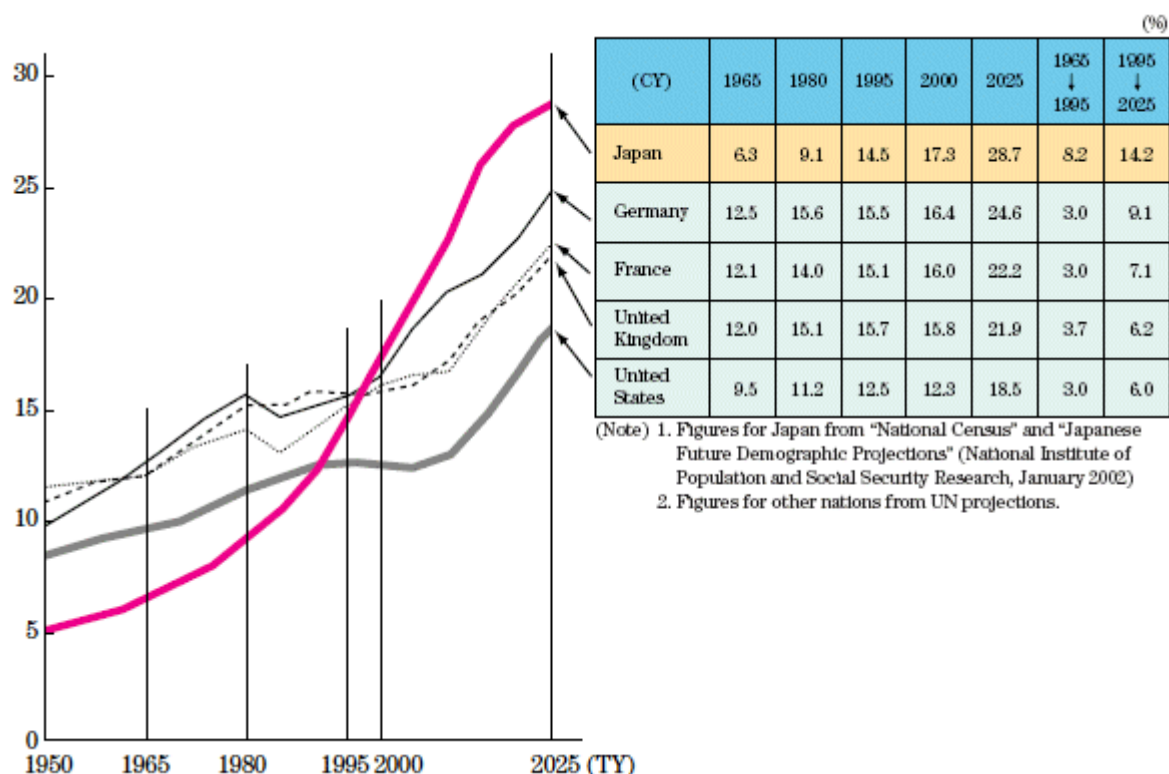
The means for enabling the industry to in effect prepare itself for domestic competition and train itself to go forth and similarly compete in the global market place needs to be established. The civil works infrastructure construction industry is a function of the contracting process that has enabled it to be “manipulated” for so long. Contracting for civil works infrastructure projects is under the Japanese Contract and Standard Conditions of Contract for Public Works. Yet, the protection that the construction industry has enjoyed for over fifty years is based on the same Contract and Standard Conditions of Contract for Public Works. The domestic civil works infrastructure construction industry is based on the Japanese legal principles that underlie contracting for such works in are embodied in the Construction Business Law, Chapter 3: Contract for Construction, Section 1: General Provisions, Article 18: Principle of Contract for Construction Work which states: “Parties executing a contract for construction work shall conclude a fair and equitable agreement in mutual good faith.” This principle of “mutual trust” was effectively used by the long ruling party (the Government) as the means of staying in power. Thus they had to exclude foreigners because they did not have the same legal contractual basis. The western world, which has provided construction with the standard conditions of contract, uses a contractual system that is founded on the principle of “mutual mistrust”. This approach is contrary to the manner in which most of the world’s civil works infrastructure projects are delivered. Further, the method of estimation and the qualifications for contractors meant that the contractors that bid on civil works infrastructure construction were pre-qualified, in a system that only they understood, and which made the Owner/Employer (the Government) the dominant contracting party. Thus, the Government had the players and the means of control to use civil works infrastructure construction to engage in “pump priming” to stay in power and to attempt to resuscitate the flagging economy without interference. It lost on both fronts as explained above. Finally, the ruling party began a series of reforms or a restructuring of the systems and laws of governance once it regained power. In the future, the Japanese Contract and Standard Conditions of Contract for Public Works must reflect the essence of the way the global market executes civil works infrastructure projects. If it is to survive, the Construction Business Law, and the Contract and Standard Conditions of Contract for Public Works will prepare the domestic industry to meet the inevitable opening of the domestic market to foreign competition, regardless of whether the Government, Prefectures, Local Government, or the private sector funds are used for future civil works infrastructure construction projects. A corollary benefit will be that the personnel and businesses will understand how to engage in civil works infrastructure construction in other markets – namely the global market.

To address what must change, one must look at the characteristics of the civil works infrastructure construction industry as it exists today. In March 2001 the Japanese Research Institute of Construction and Economy (RICE) predicted flat growth in public construction and private civil works by 2010 and 2020 for two cases. Under case 1 it was assumed that investment had a growth rate average per year of 0% over the period 2001 to 2010 and the period 2011 to 2020. Under case 2, it was assumed that investment had a growth rate average of negative 2% per year over the period 2001 to 2010 and of 0% per year for the period 2011 to 2020. The first five years (2001-2005) of the first period (2001 to 2010) exceeded a negative 2% per year. It was actually an average of a negative 7%! In constant 1995 yen, the value of civil works infrastructure construction and private civil works construction was projected at an average of ¥ 22.7 trillion in 2010, 2015 and 2020. This level is even reduced from the ¥ 25.8 that was expected for 2005. In February 2005 RICE again reiterated that the decrease in Government construction investment, other then disaster recovery, “is likely to continue,”³² Thus, the civil works infrastructure construction market for the next fifteen years will not grow. To analyze the possibilities, however, we must define the characteristics of the market today.

RICE in February 2005 also discussed the concept of investing in and using social infrastructure capital to provide a growing basis for the private sector to achieve productivity improvements. The Government had used the 1989 hypothesis that David Aschauer, a US Federal Reserve Bank of Chicago Senior Economist, published in his article entitled “Is Public Expenditure Productive?” as the justification for the ten stimulus packages it undertook in the 1990’s. The Government has found from semi-macroeconomic studies in the fifteen years since the article was published that the productivity effect differs by region, industry and type of infrastructure. RICE concluded that these findings will have “great implication for future efficient and focused social infrastructure improvement.” The research will affect the planning and the selection of the projects in which Government will invest. Nonetheless, the construction industry has a residual of expertise on the part of the Government and the contractors. It is “the execution of the social capital infrastructure projects.” While there will be a reduction in wholesale contracting by the Government, the Construction Industry as a whole has extraordinary expertise and experience for constructing civil works infrastructure projects and can offer that expertise to the global market.³³ The window of opportunity to utilize this expertise is slipping away. So why not use it to the advantage of the industry by using it to accomplish the Japanese Government’s international aid development goals, for example?

The domestic Japanese construction industry is currently facing an over supply of construction workers. The Government’s reduction in civil works infrastructure construction projects has been extreme, but the decline in available and experienced personnel has only been moderate. The socially mobile groups (the younger generations) have been the most affected. Thus, construction workers in all aspects of the industry from engineers to “muddy boots” laborers, whether employed by the Government in their role as the Owner/Employer or by the contractors and subcontractors have been affected. This trend has caused the number of workers who are aged 50 and above to constitute over 40% of all construction workers.³⁴ New workers are not being attracted to the civil works infrastructure construction industry because it is known to be a “3K” industry, that is, fatiguing, dirty and dangerous, and it is in decline. Many skilled workers are retiring which is creating a serious shortage of skilled workers. The “graying” of the construction work force is not only a function of the available work. The Japanese population is getting older as well, as shown in the following Figure IV.C.1 and Table IV.C.1 (% is the percentage of non-productive population – 65 years old):

Figure IV.C.1 and Table IV.C.1
The Ratio of People Older than 65 Years Old within the Total Population



The data suggests that Japan is growing older at nearly twice the rate as is the US. Japan is expected to experience the fastest aging of its population of any country. With a life expectancy reaching 88.1 years in 2050, Japan will have 42.4% of its population aged 60 and over, compared with 32.2% in Canada and 25.5% in the U.S.³⁵ In addition, the total population of Japan is declining rapidly as well, as is shown in the following Table IV.C.2:

Table IV.C.2
Projection of Japanese Population

Year	Population(thousands)			Population growth		Sex ratio (males per 100 females)	Population density (per 1 km ²)
	Total	Male	Female	Number (thousands)	Average annual rate of growth(%)		
2000 ¹⁾	126,926	62,111	64,815			95.8	340
2005	127,708	62,279	65,429	782	0.12	95.2	343
2010	127,473	61,932	65,541	-235	-0.04	94.5	342
2015	126,266	61,086	65,180	-1,207	-0.19	93.7	339
2020	124,107	59,766	64,341	-2,159	-0.34	92.9	333
2025	121,136	58,068	63,068	-2,970	-0.48	92.1	325
2030	117,580	56,121	61,459	-3,557	-0.59	91.3	315
2035	113,602	54,022	59,580	-3,977	-0.69	90.7	305
2040	109,338	51,851	57,487	-4,284	-0.76	90.2	293
2045	104,960	49,683	55,277	-4,378	-0.81	89.9	282
2050	100,593	47,526	53,068	-4,367	-0.85	89.6	270

Source: National Institute of Population and Social Security Research, Ministry of Health and Welfare, Population Projections for Japan, January 1997

In the next 40 years the total Japanese population will decrease by nearly 20%. In contrast, the US population is currently the only industrialized country whose population is

increasing.³⁶ Immigrants now account for 11% of US population, and the number of children in the school age (5 to 18 years old) is on the increase, setting the highest level ever in 2004.³⁷ More disturbing for Japan is the productive work force will see the proportion of women in the population continue to grow. Forty years from now in Japan, women will outnumber men by nearly 12%. Thus the construction industry, which is the most male dominated sector of the Japanese economy, will potentially be affected to a greater extent. RICE, in an about face, stated in February 2005 that two phenomenon will keep labor input from falling as fast as the productive population – a staggering total of 18% by 2020.³⁸ According to RICE, one quarter of the loss can be made up by:

*“...3.85 million women who are potential job seekers, [but who are] currently not employed and not applying for jobs, but who **are** willing to work. [emphasis in the original]...[In addition,] the population of senior citizens will increase by 10 million by 2020, ...many of whom will be healthy and willing to work. The decline in labor input can be curbed by employing more women and senior citizens.”*

This change is a radical because the labor force has had three fundamental aspects: life-time employment, predominantly male, and a small proportion of immigrants. There are three major reasons for the labor force's lack of diversity historically. The first two are based on the Japanese personnel management system and the legal framework that supports it: (1) the barriers to interim mobility for career employees, especially older men, and (2) the difficulty women face in developing meaningful careers after taking time off to raise children. The third impediment is the national reluctance to accept large numbers of immigrants into Japan. Japanese employment has historically had the following characteristics:

1. Unions are enterprise based and are 21% of the labor, but a higher percentage on civil works infrastructure construction projects
2. Job tenure for full time employees remains high, especially with the Government and the contractors in civil works infrastructure construction projects.
3. The interim mobility rates are not high. With the recent decline in funding for civil works infrastructure construction, it is not something that for which the Government and the contractors have trained employees (see discussion below).
4. The low rate of unemployment until recently, which has been replaced by high rate of unemployment in the Japanese context -- 5.4% in May 2002.
5. A close relationship between age and compensation is dominant theme in compensation.
6. Although the gender pay gap has narrowed for full time employees, the gap is still wide between female part-time workers and male full-time workers. Among the OECD countries, including Korea, only Japan is gender rather than occupation, age, or industry the most important determinant of wages.³⁹

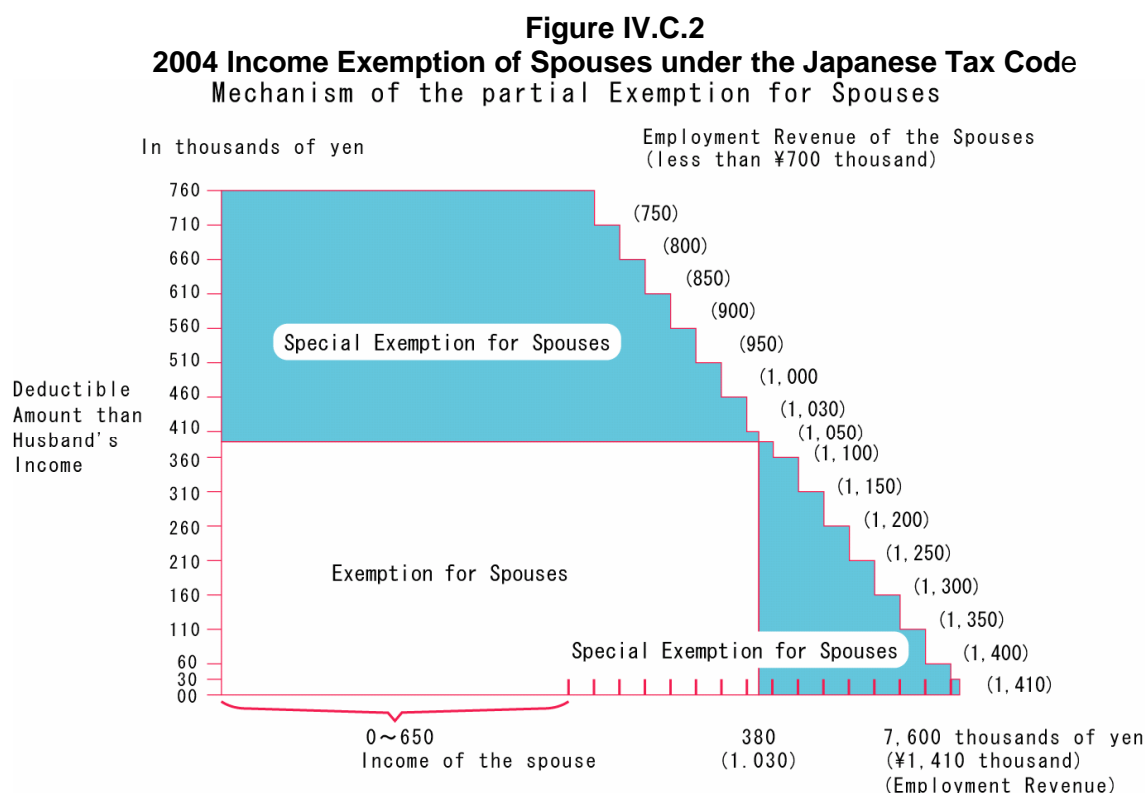
Nonetheless, permanent changes that have occurred in the last decade to the historical Japanese model portrayed above. The proportion of individuals who are part-time or contract workers is increasing. Managerial compensation is being tied to various measures of performance. But, despite the trend, the civil works infrastructure construction industry is experiencing two countervailing trends that must be addressed, if the RICE February 2005 assertion is to occur. The trend first must be reversed in young workers quitting or not seeking entry because of poor economic conditions and the “3K” image of the industry. The skills that exist in older workers are not transferable because of “training differences.” These trends, however, create a unique opportunity for the construction industry that can occur only with change.

The two sources of potential employee replacement require a substantial readjustment. A survey of Tokyo workers reasons for not wanting to change jobs is presented in the following Table IV.C.3. By far the dominant reason was age. It is symptomatic of older Japanese workers. When coupled with the second reason, the barriers to using the potential of retired persons are great. The training that the worker received as a young person entering a work force that embraced life time employment where he was “trained” in the approaches that were unique to his company.

Table IV.C.3 The Worker View of the Reasons Changing Jobs Is Difficult	
Reason Given	Percentage Giving Reason
I exceed the age limit of the job postings.	40.8
My work experience is not transferable to new companies.	23.4
My return to seniority will be lost and I will suffer a wage loss.	21.8
I do not know how to look for jobs.	19.1
I will lose personal contacts I established through my prior employment	14.1
I will suffer loss in my pension benefits.	13.5

Source: Recruit Works Institute, 2001.

Turning to females, female workers over 30 find it difficult to find attractive job opportunities. This is especially true for women re-entering the work force after child birth. For married women, barriers also include disincentives in the tax system and the dearth of meaningful work. The 2004 Japanese Tax Figure IV.C.2 shows the impact of a spouses tax exemption, when the spouses income even a limited amount.



Source: www.mof.go.jp/english/tax/taxes2004e_k.pdf

Given that the number of couples that are not having children, women are potentially a sound source of new talent for the construction industry. The percentage of females working

full time in Japan, however, is the lowest in industrialized nations. In the following Table IV.C.4, by subtracting the part-time participation from the total participation yields 19.8% of the female work force is employed full time. This is in contrast to the US where 52.6% of the female work force is employed full time:

Table IV.C.4		
Percentage Participation in the Work Force of Selected OECD Countries		
Country	Participation (% of females ages 15-64)	Part-time Participation
Japan	59.6	39.4
Sweden	76.4	21.4
US	70.8	18.2
United Kingdom	68.9	40.8
Germany	63.2	33.9
France	61.7	74.1
Italy	46.3	23.4

Thus, removing the tax disincentive for spouses will raise the number of women working full time. Using the OECD countries and especially the US as a benchmark, the estimate is that removal of these barriers would increase the productive labor supply in Japan by 13 to 18 percent and thus could raise the potential growth rate of the Japanese economy by roughly 1 percent a year over a ten year period.⁴⁰ In the following Table IV.C.5 results of a recent survey of the Japan Society of Engineers (JSCE) found the following breakdown of female members (regarding regular members, there are 30,761 of which only 520 are women or 2.5%) by the type of employer to be:

Table IV.C.5		
Percentage Female Versus Male Engineers by Construction Industry Employer		
Employer Category	Percentage of Women	Percentage of Men
Private Corporations	19	12
Consulting Engineers	30	24
Construction Companies	12	26
Public Corporations	3	3
Educational Institutions	15	11
Government	4	5
Self Employed	5	4
Other	12	15

Source: JSCE records; statistics presented at the JSCE Women Civil Engineers Round Table, Tokyo, June 2, 2004.

The only areas where the percentage of female was appreciably greater were consulting engineers, private corporations, and educational institutions. These findings are consistent with the notion that females have greater or at least equal capacity learn and have careers in technical areas. The total number of females at 2.5%, however, has to improve dramatically in order for women to be a significant factor in replacing the construction industry skills as suggested by the RICE study. Thus, the future will be bright for the civil works infrastructure construction market, provided that the part-time retired personnel and females are available to the civil works infrastructure construction industry. The two groups are ripe for training to meet a paradigm shift in the way the construction industry operates. This shift can be accomplished through revisions to the Construction Business Law, and Contract and Standard Conditions of Contract for Public Works.

The third impediment to a diverse work force is Japan's historic ban on immigration. This option does not appear to be one that the nation appears willing to accept at the moment.

Within the civil works infrastructure construction market there are reports of smaller projects being taken at low bidders because the contracts are by companies typically owned by multi-generation Japanese who are of Korean ancestry. Owners of such firms are not given Japanese citizenship despite living in Japan for three or more generations. These firms tend to use illegal Korean labor as a human resource. The practice is the only appreciable use of aliens in the construction industry, but it has been studied very little. The situation is typical of how industry has handled shortages of engineers that have occurred since beginning of the 1990's. For example, there is a critical demand in some fields, such as, software engineering, where the shortage of engineers with advanced degrees is so acute that there have been references to a "soft crisis" since the late 1980's in Japan. Even in the US, demand for software engineers dramatically outstripped supply in the 1990's – but US immigration law allowed the import of hundreds of thousands of foreign engineers to bridge the gap.⁴¹ Japan will always have shortages without addressing the immigration issue.

That leaves the issue of whether the Japanese civil works infrastructure construction industry is prepared to meet the challenges of opening the domestic market to foreign competition.

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V. The Appropriate Skills that the Japanese Civil Works Infrastructure Construction Industry Sets Will Need in the Future

A. The Japanese Civil Works Infrastructure Construction Market and Foreign Competition – Can the Industry Survive?

Can the Japanese domestic civil works infrastructure construction adapt sufficiently to allow foreign competition and also prepare itself for the global market? Authorities point out regularly that the uniqueness of the Japanese system for civil works infrastructure construction lies in the foundation of the Construction Business Law. The Japanese point to the samurai code (*Bushido* 武士道) and the samurai manual (*Hagakure* 葉隠) as underlying their ethics, and thus the uniqueness of the civil works infrastructure construction industry.¹ The samurai code teaches “never do unto others that which you would not have done to you.” As regards to the needs of contracting, disputes resolution, and project management, the Japanese are said to be merely following its dictates. Thus, these authorities find that the Japanese are embodying the concepts of “mutual trust” in all of the dealings. Meanwhile, since most of the global market has as a basis the underlying Western thinking, the concept is culturally alleged to be based on the Christian “Golden Rule,” which proclaims “do unto others as you would have them do unto you.” The difference is one of “not doing” for the Japanese, and one of “doing” in the global market. These concepts are only partially true. But, in the case of Japan the concept also explains why the ruling party was able to successfully use the civil works infrastructure construction industry for its own means for so long. Still, the Government is making changes in many sectors which have the same basis in Japanese culture. Yet, the Government is not treating the Japanese domestic civil works infrastructure construction industry equally.

To begin with, the Japanese Government (the Owner/Employer) and Japanese Civil works infrastructure contractors have been brought up to trust in a security that is represented by the domestic civil works infrastructure construction industry. It is ostensibly Japanese thinking: one controls individual desire with a view towards maintaining harmony between human beings and nature. It is a security which depends on others recognition of the nuances of their observance of the code. Thus, when foreigners are oblivious of all the properties that underlie the security, Japanese are at a loss, and they cast about to find similar meticulous properties according to which, for example, the others live. When they cannot find it, they are at a further loss to understand. The form of Contract and Standard Conditions of Contract used in the global market based on “mutual mistrust” is just such a situation. Japanese can understand the written word, and make the necessary assumptions consistent with their culture. But, for the Japanese domestic civil works infrastructure construction industry these factors are required and continually reinforced by the Construction Business Law, and the Contract and Standard Conditions of Contract for Public Works. This concept is one that unfortunately has been employed for over five decades in the current form, and has been manipulated by the ruling party to control civil works infrastructure construction. As a result, neither a “reformed” Japanese Owner/Employer nor the contractors are able to understand the basis of construction based on “mutual mistrust,” and it compromises their ability to understand the basics of Contract Administration. Neither party looks for the differences from what they assumed in either the tendering process or the bid. It is taken for granted that the Government will take care of them. This situation is consistent with the concept of dominance, that is, the parties are not equal, as reflected in the Japanese Standard Conditions of Contract for Public Works.

The concept of a dispute and its resolution in the domestic civil works infrastructure construction market is premised similarly. In legal systems in the global market, the relative

absence of recognition of an apology and subservience is related to formal legal processes which embody the adjudication of rights and liabilities by litigation or arbitration by independent third parties. The International Bar Association (IBA), the global professional association of lawyers who represent clients in the international arena, released in 2004 Guidelines on Conflicts of Interest in International Arbitration. It was prepared by a working group representing lawyers from the following countries: Canada, the UK, the US, France, Mexico, Belgium, Singapore, Australia, Switzerland, Sweden, Germany, New Zealand, South Africa, and the Netherlands – all traditional western countries. The guideline lists those situations that give rise to justifiable doubts as to an arbitrator's independence. The conclusion of the IBA is that the arbitrator is perceived to be biased "if facts or circumstances exist that from a reasonable third person's view of having knowledge of the facts or circumstances give rise to justifiable doubts as to the arbitrator's impartiality or independence."² The first three guidelines on the IBA's so called "Red List" which cannot be waived by parties, that is, facts the existence of which gives automatic doubt as to the arbitrator's independence, are as follows:

- “1. *There is an identity between a party and the arbitrator, or the arbitrator is a legal representative of an entity that is a party in the arbitration.*
2. *The arbitrator is a manager, director or member of the supervisory board, or has a similar controlling influence in one of the parties.*
3. *The arbitrator has a significant financial interest in one of the parties.*”³

Using these requirements, in the domestic civil works infrastructure construction market there is not even a mechanism of demonstrably unbiased Dispute Resolution. The foreign contractor in Japan will be forced to file a petition with a Board which is composed of the very people that it is asserting a claim against. This requirement is hardly consistent with transparency and accountability. The Construction Business Law, Chapter 3-2, prescribes the process to be followed for the “Settlement of Disputes Concerning Contracts for Construction Work.” The chapter specifies that a “Committee for Adjustment of Construction Work Disputes” and will be responsible for executing conciliation, arbitration and mediation for construction contracts. Construction Business Law, Article 25-16 (4), provides further that the arbitration proceedings of the Adjudication Committee will take place in accordance with the Arbitration Law to be supplemented by the Code of Civil Procedure, unless otherwise provided in the Construction Business Law. It further deems the members who are appointed to be public service personnel. The Construction Business Law, Article 25-16, requires the three members of a specific Adjudication Committee be appointed by the Chairman from the List of the Committee members to act as arbitrators. The situation does not create a perception of independence, but rather one of close affiliation with the Owner/Employers, which is the Government in the case of civil works infrastructure construction. This situation is acceptable where the dominant party, the Owner/Employer, determines unilaterally “what is a change” under the contract. But, if the contractor does not agree, it then has to submit a claim to a biased third party who will be perceived by foreign competitors as not being independent.

The system does not allow what foreign contractors expect, a neutral party having no relation to either of disputing parties. This situation is often explained by the relative absence of “apology” in the global market and is connected to the historic preoccupation with reducing all losses to economic terms that can be rectified in a money judgment. The ambiguities of an apology in cultures based on “mutual mistrust” are thought to be intimately tied to the uncertainties of human intention and their potential for manipulation. The belief is that an apology relies too heavily on inferring from an external act the presence of a state of mind – remorse or non-hostility – and therefore seems to be too subject to manipulation by deceitful people who say they are sorry and don't mean it. In cultures based on “mutual mistrust,” even when there is no conscious intention to deceive, the formal aspect of the act of apology inevitably tends to convert it into a conventional or stereotyped ceremony. By

contrast, in the “mutual trust” culture, the Japanese apologize by acknowledging their fault in contrast to a statement of explanation or justification of their behavior. Thus, in general, the Japanese seem to think it is better to apologize even when the other party is at fault. While non-Japanese may blame others even when they know that they are at least partially at fault. In the global market the expected norm is to deny wrong doing, to demand proof of fault, and seek affirmation from a neutral party. The Japanese express less concern for paying the damages and more on repairing the injured relationship between the parties. Sincerity therefore becomes less a function of the internal mental state and more a matter of performing the correct external acts that reaffirm submission to order. The presence of internal ambivalence is expected and accepted as non-threatening.⁴ Dispute resolution under the Construction Business Law is expected to be accomplished by understanding this need for maintaining long term relationships, that is with the Owner/Employer, and relying on the sense that the dominant party (the same Owner/Employer) is to be fair. The global market does not have such a culture, thus foreign contractors will not act in an acceptable manner under the Construction Business Law.

As regards project management development, the characteristics of personnel executing the works for the Japanese is based on collective group mentality and not making a decision unless it has been blessed by the group or at least reaching a decision that is not against the group consensus. This process is again consistent with the Construction Business Law and related laws as embodied, so we are told, by the cultural code. Traditional Japanese social norms emphasize harmonious interpersonal relationships and group solidarity. Interpersonal and group conflict can be found in many forms in Japan, but great emphasis is placed on the sacrifice of personal needs and individual self expression to avoid confrontation with the group. Within a group, maintenance of harmonious and smooth interpersonal relations and interdependence, that is, “mutual trust,” are of utmost importance. The more a group emphasizes in-group harmony and solidarity, the more intense that out of group enmity can be. Japanese are taught to accept such tensions and feelings of frustration as a natural consequence of social life, although they may not openly acknowledge the fact.⁵ There is no need to develop Contract Administration skills to make project management better able to cope with the process, as these skills are not desirable and are not necessary to provide project management for construction under the Construction Business Law, and the Contract and Standard Conditions of Contract for Public Works.

Thus, the Japanese civil works infrastructure construction Industry is not prepared and cannot survive in a market that is open to foreign competition, yet continues to operate and function as it has for so many years. The Government walks a thin line in committing the country to a period of structural change and dealing with the massive debt the country has accumulated. This change is being accomplished at the same time Japan is also dealing with demographic changes. The Government at the highest levels has committed Japan to change. While the changes must be made, the Government has left the domestic civil works infrastructure construction Industry in an unenviable position. It has to open the domestic market to foreign contractors that are accustomed to the global civil works infrastructure construction market.

In Japanese law, the most formal type of international agreements is a treaty. Article 73(3) of the Japanese constitution declares that the Cabinet is vested with the power to conclude treaties with foreign nations. However, the Cabinet must obtain a prior, or if circumstances demand, subsequent, approval of the National Diet when it concludes a treaty with a foreign nation. Some important international trade agreements have been approved by the National Diet and therefore are international treaties. Prominent examples include the GATT, the IMF Treaty, and the World Bank Treaty. The Protocol of Terms of Accession of Japan to the GATT was drafted and signed on June 7, 1995, and approved by the National Diet on July 29, 1995. A majority of the legal commentators in Japan maintain that a treaty should override a conflicting domestic law, especially where it is based on socio-economic policies.⁶

The GATT led to the WTO agreement and the enabling Agreement on Government Procurement, all are treaty obligations and are paramount law in Japan.

But, the Japanese Government's commitment to the WTO has not opened the domestic civil works infrastructure construction market, and the market can no longer be protected. The Government has made changes in the way it historically has "done business," but it has not come to "grips" with the characteristics of protection as illustrated in the preceding sections. The changes that have been made to date are essentially cosmetic, and have been interpreted in such a manner by the very people who have the most interest in the status quo. There are about 50 construction companies that historically have worked in the global market, but generally it has been for Japanese Owner/Employers or for Japanese international aid that does require the use of Japanese products, services or a major percentage thereof in return for the aid. Yet, the domestic industry is composed of thousands of companies that have no experience with a system of doing business that has global market attributes.

In assessing the market, what is required? Generally the WTO and the parties who operate in the global civil works infrastructure construction market want transparency in the process, a level playing field, and accountability. As discussed, transparency is elusive in an industry where there historically have been a limited number of Owner/Employers (the Government) who have decided what infrastructure it will fund, and then has a dominant contractual role. The Government has made merely cosmetic changes as discussed in the previous sections, but it will not be the same Government with whom the contractors have become accustomed to dealing. For example, although informal ways of carrying out government policies, such as, administrative guidance, are not necessarily unique to Japan, the degree of pervasiveness and the importance of administrative guidance in the Japanese governmental process is probably unique to Japan. In Japan, economic regulation must ultimately be based on legislation (such as, the AGP). However, agencies like the MLIT often choose not to use laws to accomplish their policy goals but to utilize the more informal process of persuasion when they wish to control the conduct of private enterprises. This informal process is called "administrative guidance." It is based on the concepts of "mutual trust" that is inherent in the Construction Business Law. Administrative Guidance is not legally binding. Often it is not in writing. Generally, it is used to impose a rule of conduct on the conduct of private enterprise. Administrative Guidance is attacked because there is a lack of transparency in the process through which it is executed. In the global market, enforcement procedures are usually provided for in the law, and everyone can see the process of enforcement. In Administrative Guidance there is no clearly defined procedure. Even if the Government and the private enterprise compromise on the Administrative Guidance it has received, it may affect the interests of outsiders and there is no standard procedure through which they may raise their objections.⁷ The recently enacted European Procurement Law is an example that allows stakeholders to raise their objections through a common, open procedure. In Japan the public is deprived of an opportunity of knowing what is under consideration by the Government and participating in the formulation of policy.⁸ Thus, "Administrative Guidance" has dominated governmental control of Japanese economic life, especially in the case of the Japanese Construction Industry. Since the Government in the future is planning to only have a limited role civil works infrastructure construction, there is no role for the use of Administrative Guidance.

The cosmetic changes made effects primarily MLIT (the Government) and major city civil works infrastructure construction. The current laws do not make Prefectures and local government compliant with even the cosmetic changes until 2010. The central Government has moved away from providing funding and away from providing complete control of civil works infrastructure construction projects, a process that provided little stakeholder involvement. Instead the Government will assist in "removing restraints" faced by Prefectures, local governments, and NPO's regarding civil works infrastructure construction.

The recipients (local governments, and NPO's) have little training or experience, and the Government simply has offered little to assist in their capacity building.

Therefore under the Construction Business Law, etc., a philosophy of "mutual trust" still underlies the civil works infrastructure construction industry. The Prefectures, local governments, and NPO's do not have personnel either trained or capable of handling significant civil works infrastructure construction projects. On the other hand, the contractors have to work under the only basis with which they are familiar. It is a situation that is fraught with potential problems, like the potential for the very problems of "*dango* 談合" that the Government has attempted to clean up, but the efforts have primarily been at the Central Government level.⁹ As was discussed earlier, for instance, the World Bank and its affiliates assume there is corruption or bribery in financing and execution of projects. The World Bank is trying to assure transparency by vigilance and training. Internationally, anticorruption instruments, such as, the OECD's Anti-Bribery Convention and the U.N. Convention Against Bribery, have demonstrated the international community's determination to fight fraud and corruption at all levels. The international funding sources are preparing Owner/Employers to have the capacity to assure there are recognizable means to transparency. Thus, as Owner/Employers, the Prefectures, local governments and NPO's are not prepared to serve in a role open to foreign competitors. There are those that have attempted to raise warnings for years, but scant attention has been paid to their prognostications until recently.¹⁰ The domestic civil works infrastructure construction industry must receive the same attention that other sectors of the economy that promote international trade receive.

One needs only to ask "what will happen if foreign contractors are allowed to really compete in the Japanese domestic market?" Foreign firms are accustomed to "mutual mistrust." Under such a philosophical approach, they will take into account all the assumptions that it reasonably made on the contract documents as the Owner/Employer seeks bids or tenders. Since the Construction Law, and the Contract and Japanese Standard Conditions of Contract for Civil Works only requires a price, and not the schedule or programme, the foreign contractor will have all the basic Contract Administration information, as illustrated in preceding sections should the Owner/Employer change the slightest scope or quality requirement, or demand something that was not reasonable inferable from the original scope and quality. The foreign contractor will not rely on a benevolence of the Owner/Employer. In the first instance, the foreign contractor will expect to have its bid accepted, if it reasonably reflected what the Owner/Employer wanted and it was a responsible bidder. It will not be satisfied with re-bidding with the exact project (scope, quality, time) until the Owner/Employer is satisfied with the bid number. During execution, if the Owner/Employer delays the contractor's performance, using the material it recorded against its assumptions and plan, the contractor will file for an extension of time. The Owner/Employer will not have experienced personnel or the means to determine if the contractor is right, wrong, or has overstated the impact. The schedule or programme and a Bill of Quantities are not a part of the contract. The Contract and Standard Conditions of Contract for Public Works (1995 Edition), General Conditions, Article 3, states that: "*the Bill of Quantities and the Work Program [which has to be submitted and approved by the Owner] shall not be binding on the Owner or the Contractor.*" The Owner/Employer will not even have the latest update to provide information of a schedule or programme. For instance, the logic, sequences, and durations (which is a function of the resources one applies), require a level skill in order to calculate impacts to the specific activities. It is a skill that is not required if you are simply scheduling works to achieve or adhere to the completion date for the civil works infrastructure construction project. The foreign contractor will take the position it is entitled to the impacts to the affected activities, even if it was responsible for later concurrent or project delay. But, the Owner/Employer will not accept the latter, and will make a unilateral determination. If it is not accepted, the process will not be transparent. The Owner/Employer personnel are accountable for its actions and the impacts that occurred. With neither the

Owner/Employers nor the contractors prepared, the result is the prospect of a large sector of the economy that is potentially lost to foreign contractors, a crisis in the making.

Other countries are keenly aware of the necessity of meeting the dictates of a global market. The Government of the Hong Kong Special Administrative Region, for example, has considered their Standard Form of Conditions of Contract for compliance with what is considered the prevailing best practice in international construction. This 25 year effort has been ongoing through the precedent government agency, the Works Bureau, with the most recent effort concluded in early 2001 after the return of Hong Kong to China at the end of 1999.¹¹ The report addresses the “allocation and [project] management of risk in the procurement of [civil infrastructure] works projects...based on international best practice” in regards to the Conditions of Contract. In the global market, the ultimate goal of risk allocation by means of the Conditions of Contract is to promote project execution regarding time of execution and budget without sacrificing scope and quality. The report concluded risks are assigned to the party best able to handle them. The Conditions of Contract have a default philosophy that when unusual risks occur during project execution they are best borne by the party who gains long-term benefit of the project, the Owner/Employer. For civil works infrastructure construction projects, there is a need, especially where government entities are involved, to protect the public’s financial stake, but in a transparent and accountable manner. Therefore both parties, Owner/Employer and contractor, must be adept in accepting the challenges that proper risk management places on them, that is, a “mutual mistrust” philosophy coupled with proper contractual allocation. A study in the United States has shown that 5% of civil works infrastructure construction projects cost may be saved by using the most appropriate Conditions of Contract allocating risk in a “mutual mistrust” environment. But, the savings assume that adequate project management exercising Contract Administration throughout the phases of the project execution in a “mutual mistrust” environment.¹² Thus, foreign contractors will expect a “hard nosed” and “above board” contracting environment.

Irrespective, foreign construction firms entering the domestic Japanese civil works infrastructure construction market will have significant expectations above and beyond just the Owners/Employers. Japanese civil works infrastructure construction has a unique feature: the materials, equipment and transportation logistics required to execute the projects is readily available. General contractors have subcontractors and equipment /material suppliers with whom they have had a long history or a relationship. General contractors can get most equipment and materials it requires for civil works infrastructure construction projects within a short period of time. The members of a “*keiretsu*”, or organized relationship, will share in the financial results of a project on which they work together, whether negative or positive. The parties to these long standing relationships (at least for the key team members) do not work for other general contractors. Thus, the general contractor provides the management, construction engineering, and the resources to support the protect team.

Foreign contractors do not have such relationships. The foreign contractor relies on the same “mutual mistrust” on its relationships with subcontractors and equipment/material suppliers. Subcontractors are monitored in the same fashion for compliance with the requirements. If a subcontractor believes that it is being required to perform or supply something that was not planned, the subcontractor must practice contract administration to the same extent as if it was the contractor, and treat the general contractor as if it was the Owner/Employer. Thus, the level of project management with contract administration skill is expected and is commensurate with the scope of work inherent subcontracts and equipment/material purchase orders. In most global markets these tiers of subcontracts and equipment/suppliers are intensely competitive. In the global market these tiers do not have a paternalistic general contractor to protect them, and to whom they will look to supply work for

them. In the global market these tiers of subcontractors and equipment/material suppliers are exceptionally competitive.

The large Japanese contractors made one significant attempt to enter the global market after the collapse of the “bubble economy,” with nearly disastrous results. Damages during execution were astronomical losses with which the companies have had to struggle for years.¹³ To begin with, to successfully succeed in an atmosphere of “mutual mistrust” requires project management personnel trained in Project Management and especially a culture of Contract Management. At the end of 1994, Kunishima and Shoji published a book on project management that compared the practices inherent in Japan with those found in the US and Germany.¹⁴ It began with the observation that there is little difference in the manner in which construction technology is used to complete construction projects in the three nations. They suggested that the manner in which the projects were accomplished was quite different. This difference was identified as the management techniques that were employed. The authors attributed the difference to values based on uniquely Asian values for Japan, while those values for the US and Germany were based on western traditions. The undeclared aim of the book was to justify and promote the adoption of the Japanese project management approach. The book followed an early 1990 report by the JSCE President, Kiyoshi Horikawa, in the Volume 29 of the JSCE Journal entitled “JSCE Activities in the International Era.” Dr. Horikawa said:

“...international competitiveness is now a serious concern for Japanese enterprises in order to compete fairly with others inside and outside Japan. It is needless to say that the construction system in Japan has evolved to the present style through a long history of custom and tradition in order to accomplish the highly qualified construction of various civil engineering structures. However, the present ways and systems in Japan seem to be a different from those of other countries, particularly in Europe and the U.S.A. That is why Japanese contractors have experienced bitter difficulties caused by the cultural differences between Japan and client countries. Since we have to open various markets including the construction market in the near future, we should adjust ourselves to these new circumstances. Even in such circumstance we should maintain a dauntless attitude, and we should stay pliable in order to adjust ourselves to different views. In order to reach our ideal circumstances, all of the people have to be well grounded in culture and to respect each other. We should thoroughly investigate the way of thinking and the mode of carrying out work in other countries, and then clearly distinguish the differences among us. Based on the above investigations, we should increasingly devote our effort to let the counterparts in negotiation understand our thinking.”

Since that time the Japanese civil works infrastructure construction market has severely contracted and will not grow again to its former size. Dr. Horikawa, however, was continuing the process of describing the Japanese approach to project management. It was a process of describing through the use of culture, customs, etc., which it was hoped would effectively have the Japanese system adopted in Asian markets, as that was the area that held the most promise for the future of civil works infrastructure construction (the period just before the late 1990s melt down of the Asian economies) and justify essentially the status quo in the ongoing negotiations over opening the Japanese domestic civil works infrastructure construction market to foreign competition.

To illustrate that North American and European project management is more comparable today than it was even then, the following Table V.A.1 is an updated form of the one that Kunishima and Shoji used in 1994. The data on which it was based originally was a compilation of Japanese project management practices that had been compiled by the Japan Society of Civil Engineers’ (JSCE) Construction Management Committee. The Committee had been formed formally in 1985 and it had been collecting data since that time.

The 2005 update is based on interviews by the Author of executives from companies who set the standard for global practice or are Japanese contractors involved in the global market, as well as, the domestic market for civil works infrastructure construction.¹⁵

Table V.A.1
Cultural Differences in Europe, the US, and Japan that Impact Project Management

Cultural Trait	Germany (1990)	Europe (2005)	US (1990)	US (2005)	Japan
Objectives for business entity	Continuity and social values	Continuity, social values, and profitability	Profitability	Continuity, social values, and profitability	Permanent existence
Basic business principles	Fair competition	Fair competition	Fair competition	Fair competition	Impartial (fair) sharing
Characteristic Features	Reliability	Reliability	Self-assertion	Self-assertion	Harmony
Business style	Client first policy	Client first policy	Short-term competitive relationships with long term focus	Short-term competitive relationships with long term focus	Long-term credible relationships
Working condition	Individual	Individual often within a team	Individual often within a team	Individual often within a team	Teamwork
Employment form	Improvement of position by changing jobs	Improvement of position by changing jobs	Improvement of position by changing jobs	Improvement of position by changing jobs	Mostly lifetime employment
Employment attitude	Employing individual	Employing individual's skills	Employing the individual's skills	Employing the individual's skills	Employing individual
Principles of behavior	Participate, create, and work skills	Participate, create, and work skills	Participate in education and manifestation of skill	Participate in education and manifestation of skill	Attend, learn, and labor
Wage system	Ability, achievement, and rank	Ability, achievement, and rank	Ability and achievement	Ability and achievement	Seniority and achievement
Measure of business achievement	Short-range profit	Short-range profit	Short-range profit	Short-range profit	Contracts awarded and long-range profits
Changes to business entity	Slow	Moderately Rapid	Rapid	Rapid	Slow
Decision-making process	Discussions between superiors and subordinates	Moving from top-down to flat team	Moving from top-down to flat team	Moving from top-down to flat team	Bottom-up and mutual-agreement
Working environment	Individual Offices	Individual offices and spaces	Individual offices and spaces	Individual offices and spaces	Large, shared offices
Loyalty to organization	Medium	Medium to Little	Little	Little	Great
Competition with organization	Avoid	Increasing	Broad	Broad	Avoid

Table V.A.1 Cultural Differences in Europe, the US, and Japan that Impact Project Management					
Cultural Trait	Germany (1990)	Europe (2005)	US (1990)	US (2005)	Japan
Relations between colleagues	Friendship	Individual with movement to task teams	Individual with movement to task teams	Individual in association with task teams	Sense of commonness
Perception of work	Responsibility	Responsibility	Responsibility	Responsibility	Lifetime Employment with a movement to forcing early retirement
Decision criteria tendency	Results-oriented	Results-oriented with recent process orientation	Ideas, philosophy, and processes	Ideas, philosophy, And processes	Results-oriented
Human resources	Long-range assets	Long-range assets	Floating assets	Floating assets	Fixed assets
Reward	Big	Big	Big	Big	Small (bonuses, promotions, and salary)
Punishment	Relocation or dismissal	Relocation or dismissal	Dismissal	Dismissal	Relocation
In-house education	Permanent	Moving toward self-education, PMI or other certification	Considered little, self-enlightenment promoted	Continuing self-education, PMI certification	Systematic and seriously taken
Salary difference	Medium	Medium	Big	Big	Small

The Author found that Europe and the US have become even closer in regards to the cultural traits that underlie project management. From the interviews the also Author found in the last 15 years that 4 of the 24 cultural traits Europe and the US now have a common cultural trait (yellow shading in Table V.A.1). In a further 6 of 24 cultural traits, Europe and the US were moving towards commonality (blue shading in Table V.A.1). In 9 of the 24 cultural traits, Europe and the US had identical cultural traits or had similar cultural traits (light gray shading in Table V.A.10. In the same 15 years, the Japanese had pursued a process of making cosmetic changes and explaining why their culture, and thus project management, is different. But, as Dr. Horikawa said, even those Japanese companies that have led the way in the global market “*have experienced bitter difficulties caused by the cultural differences between Japan and client countries.*” The Japanese domestic civil works infrastructure market cannot with stand foreign competition and neither can the Japanese governmental units that will be the future Owner/Employers nor the Japanese contractors. They both have to learn global style Contract Administration and allow the development of soundly based project management to create the ability to compete. Merely asserting that the style of contracting is in essence different based on code provides little in terms of capacity building to handle civil works infrastructure construction projects. The Japanese must adapt the Construction Business Law, and the Contract and Standard Conditions of Contract for Public Works so that the domestic industry gains experience while it still has superb construction technology.

B. Japanese Project Management in an Environment in which There Is Foreign Competition

In the domestic civil works infrastructure construction market, the Japanese contractors have had no foreign competition, as been discussed above. As for the global market, the size of the Japanese participation has not been significant relative to the overall size of the global market for civil works infrastructure construction. Following WWII, Japan began construction in the global market in 1954 as part of its war reparations. Works began in the late 1950's on a commercial level. In the late 1970's it was primarily in the Middle East (Oil & Gas Projects and Expressways). Investment reached ¥1 trillion in FY 1983. The effects of Japan's "bubble" economy affected domestic and global investment. Overseas investment and consequently the global construction share fell sharply with the collapse of the "bubble" economy. For the next two decades investment focused first on Europe and the US in hotels, office buildings and resorts. As the Asian market grew to exceed Europe and the US, the Asian market focused on private buildings for Japanese clients and civil works infrastructure project development primarily funded by the Japan's ODA loans, which required the use of Japanese contractors. In the early 1990's, Asia took hold as the OCAJI's primary Japanese overseas market. It rose again to over ¥1.6 trillion in FY 1996, and then declined again rapidly as Asia underwent its economic crisis (nearly 20% in the following year). Today, Asia still represents two thirds of Japanese orders for construction orders, albeit a declining total volume.¹⁶

In 1984 a survey was conducted by the Normura Research Institute regarding activities of member companies of the Overseas Construction Association of Japan, Inc. (OCAJI).¹⁷ The survey was conducted just as the volume of foreign work reached the ¥ 1 trillion level. The survey addressed the relative strengths or weaknesses perceived by the Japanese contractor membership in project management in comparison to foreign counterparts in the Europe and the US. The OCAJI membership was the 50 or so largest and most sophisticated Japanese contractors that worked outside of Japan. The survey found that these Japanese contractors felt that they were more advanced in the areas meeting the cost, schedule and quality of civil works infrastructure construction projects, the result of serving the "demanding" Government client. Of particular relevance, the OCAJI membership perceived they were less advanced in negotiation, determination of payment conditions, protection against country risks, adapting to the culture or local conditions, logistics, and project management overall.

A book written by F. Hasegawa while at the Massachusetts Institute of Technology concluded relative to Project Management training for civil works infrastructure construction projects, that personnel had been trained by the Government as an Owner/Employer and by the contractors themselves, and that training had to be specific to the individual contractor.¹⁸ There was not a basis of developing a standard for project management, since the contractors as a whole served essentially one client, the Government, and the contractors had a specific way of dealing with project cost, schedule and quality that met the demands of the client, the Government. Therefore, the Government had no experience with alternative methods of project delivery for civil works infrastructure construction projects, and contractors had no perspective relative to the demands of other Owner/Employers. These necessary skills are needed to compete effectively in the global market. Furthermore, there was no need in the domestic market to develop contract administration skills which a project management team needs in the global market.

In 1993, the lack of skills necessary in global market oriented project management was again emphasized by K. Takayanagi in an article in the International Construction Law Review.¹⁹ The project management function has been traditionally assumed as part of the overall scope by the Government. The Government and the contractors operating in the domestic civil engineering infrastructure construction market have project management

expertise well suited to the Construction Business Law and the Standard Conditions of Contract for Public Works. As a result, “there never has been encountered any serious problems in terms of quality, completion time and cost.” The contractors are left with the need for execution expertise and they are well suited to secure the requirements of quality, completion time and cost. The results achieved reflect the requirement of “Japanese construction laws...that any [civil works infrastructure construction] project works are not allowed to commence until the design of such work as a whole is completed and approved by the relevant Government authorities.” Thus, the benefits of innovative contracting methods and cost savings are not available for the domestic civil works infrastructure construction market.

Japanese project management thus is focused differently than best practice in the global market. It has always been, as is demonstrated above. Contract execution is focused on Project Cost Management because the process to the Japanese is to manage the project to achieve within a time period a target cost with the quality set forth in the specifications in conformity with a contract made pursuant to the Construction Business Law. But Project Cost Management as a predictive tool has limited application for a competitive domestic market or the global market. The only real variable in the Japanese project management is total cost and total execution time. When you are near the project completion you apply for an “omnibus” change order to cover the extra cost. Therefore, the commonly believed adage that Japanese contractors always bring their civil works infrastructure construction projects in for a cost, time and quality that are acceptable the Owner/Employer – the Government.²⁰ But, if you are always measuring against the total, you will not “pick up” variances at a discrete level until after the cost has been incurred and reflected in the cost accounting maintained. This approach, which is quite detailed in Japanese construction companies, is the primary software development by most contractors. As a consequence, they do not have skills oriented to project scheduling and the loading of resources on to discrete activities. In fact, most contractors, and even the most sophisticated Japanese contractors, use Microsoft Project because it is easy to understand and meets the requirements of the Contract and Standard Conditions of Contract for Public Works despite its inherent limitations.²¹ The sophisticated contractors have Primavera, which is the most widely used scheduling or programming software system used in the global market, but they do not use its capability to the fullest because “it is too complicated.”

For foreign contractors who operate in the global market, the variance in any assumption is a potential for recovery, because it goes to the basis of bargain. It is the “life blood” of European and US contractors. The concept is to adequately record the assumptions as developed with respect to all aspects of the project, and then to regularly record and monitor them as part of a vigorous Contract Administration regimen as shown above. Using powerful tools, such as, Primavera, to record resources and costs in a relational data base attached to individual activities, foreign contractors have recorded the data relative to assumptions in a bid and then regularly update the data with “as incurred” data.²² They use Project Risk Management at the same time and in addition to monitor a civil works infrastructure construction project the likely areas before the variance even occurs.²³ Thus, foreign contractors (and Owner/Employers) fashion Contract Administration in a manner that is quantitative-based on the most current civil works infrastructure construction project information for evidence of variance at discrete levels at its earliest stages of incurring. They do not wait until the impact becomes a final. To do so would violate a primary concept of “mutual mistrust,” the giving of notice so the other party can attempt to deal with the problem that is causing the variance.

S. Kusayanagi wrote in 2004 in one of the latest treatises on Japanese project management that,²⁴

“in European and American countries, contract administration is regarded as one of the most important factors of the [project] management techniques, and in the educational program of the construction engineering, contracts are taught in the special courses. When compared with construction engineers of the foreign countries, our Japanese engineers are far behind the levels, as seen in the actual performance of international construction projects, in the scope of the recognition of the importance of contractual matters and related knowledge...[With experience only with “mutual trust” construction contracting,] contract administration is not recognized as one of the construction techniques, and the chances of learning them are given to Japanese construction engineers neither in the schools nor in the [Japanese civil works infrastructure construction] companies...In the near future, the realistic handling of contract administration, such as, strict compliance with the construction contracts, definitions of the rights and obligations under contracts, will be needed in domestic construction projects. In the field of settlement of contract-related issues, the qualitative analysis in pursuing ‘existing rights’ and the quantitative analysis clarifying the ‘magnitude of rights’ will both be required. In the Japanese construction industries, such a tendency is strongly prevailing about those who own knowledge of laws and contracts only perform contract administration and is not to be done by construction engineers as this merely shows the qualitative side of contract administration...Contract administration for [civil works infrastructure] construction projects need indispensable analysis functions from the qualitative side and from quantitative side. Construction administration then can only become practical....”

Kusayanagi then emphasized that the determination of entitlement is the qualitative side and the determination of the magnitude of the impacts that resulted is the quantitative side of Contract Administration. To continue to use tools that do not provide or allow the necessary recording of assumptions and the ongoing data to carry out Contract Administration is relied upon by the civil works infrastructure construction industry simply is based on the fact that it is not required by the Construction Business Law, and the Contract and Standard Conditions of Contract for Public Works. Not teaching the basic rudiments of Contract Administration is because of the same reason. Therefore, there is no incentive for developing project management skills and they will remain the same unless what is required is changed.

Thus, changing the Construction Business Law to allow a contract that is not an aberration under the Japanese Civil Law is the first step. As has been developed earlier, it permits the current contract that is based on a method that is unique to the civil works construction infrastructure construction industry and allowed the ruling party to manipulate a whole sector of the economy. By integrating “mutual mistrust” and an equality of parties rather than allowing a dominant and protective party, the industry will be forced to face conditions that are akin to the global market. Such a change would be in line with the steady reforms that Japan is making in the substantial revisions that it enacted in the Commercial Code in 2002 and subsequent codes since then. This result also requires Standard Conditions of Contract suited to the Contract, and especially so for “Public Works.” Then the universities will begin the courses to “re-orient” and teach the Contract Administration skills necessary. In the meantime the civil works infrastructure construction industry must have a viable transition plan.

Before addressing suggestions on modifying the Construction Business Law, and the Contract and Standard Conditions of Contract for Public Works, the question must be asked: how can Japan acquire the Project Management skills that represent global best practice the short term? Without incentive, neither the prefectures, local government entities, and NPO’s who will play a significant role in future civil works infrastructure construction projects as the Owner/Employers nor can the contractors who will contract with them can develop the project management skills. The “adjustment” period mandated with Action Plan has been squandered away and has not prepared the civil works Infrastructure construction industry

for 2006, because only cosmetic changes have been undertaken by the Government to change the system. The downsizing of the domestic market does nothing but create a desperate market that really does not want foreign competition. The EU faced similar issues and problems of imposing uniform procurement regulations, namely The European Regulations concerning Public Procurement, have been issued for nearly 35 years. The regulations were generally modeled after the French Public Procurement Code. The EU regulations that were issued became the subject to the second phase of directives for their implementation after two decades, the period for the initial transition. For example, it extended the application to private bodies who received concessions for civil works infrastructure construction as the awarding authorities.²⁵ After a further 15 years the EU effectively superceded the separate national systems, which then forced transparency and competition. But, Japan cannot wait 35 years for there to be transparency and competition to be achieved. Japan committed to the WTO to do so by 2006.

Other Japanese industries that have fueled the economy have done well in export markets. As these industries have expanded they have had to learn. They had to become accustomed to and work with forms of contract found in the global market. These industries initially lacked expertise that historically there had never been a need to understand. These industries then experienced the demands of a legal/contracting system that required expertise to survive. The expertise development was aimed at the applying the industries technology in broader markets and engaging the required expertise in the short term transition period. Frequently the Government made changes in the regulatory regime that applied to a sector on the economy, such as, the recent changes in the energy industry.²⁶

The Japanese civil works infrastructure construction contractors could seek merger partners. Japanese construction technology for the most part is cutting edge in the use and application of materials and equipment to solving civil works infrastructure construction projects issues (e.g., the Seiko Bridge with regards to self-conforming concrete, etc.). Although innovation has concentrated on the materials and equipment to achieve the possibility of being awarded civil works infrastructure construction projects, the contractors can merge with or acquire foreign firms focused on project management and Contract Administration. But as an industry, and by even Japanese standards, the civil works infrastructure industry has a low level of dividend payments because of the need to hold cash (a holdover from the revitalization and growth period prior to the 1980's) which have historically invested the funds in low-productivity investments. In other market systems one would expect this to be corrected by takeovers, which until recently was very rare in Japan – because of archaic laws.²⁷ The merger process could be facilitated by further reforms to the Commercial Code than were passed in 2002. But there are still problems despite the Revised Special Measures Law for Industrial Revitalization which made exceptions to the Commercial Code to allow Mergers and Acquisitions using modern merger techniques, which hampers Direct Foreign Investment in Japanese contractors and which also prevents them from acquiring necessary technology (the reverse by keeping Japanese from acquiring foreign firms and repatriating the technology).²⁸ The US Trade Representative in 2005 urged the Japanese Diet to pass legislation in 2005 “to permit certain modern merger techniques, including triangular mergers, cash mergers, and short form (squeeze-out) mergers, as part of its commercial law revision.”²⁹ These laws provide potential avenues for a transition plan for the civil works infrastructure construction contractors not previously available to them. Similarly, these same contractors could form partnerships, provided that the Joint Venture provisions of the Civil Law are changed as China has done recently (see discussion below).

The Japanese civil works infrastructure construction contractors and future Owner/Employers could go out and hire project management specialists (foreign consultants) with the requisite contract administration background. This avenue is a practical solution in a transitional context provided that they can obtain such expertise economically. In the case of Owner/Employers the time is ripe for using alternative methods for civil works

infrastructure Construction. For example, the US is rapidly expanding its use of Design-Build, Engineer-Procure-Construct contracts for civil works infrastructure construction projects. The Design-Build Institute of America even has written a model code for the equivalent of local governments.³⁰

Many of the large public or joint public-private infrastructure projects financed with prior Fiscal Investment and Loan Program (FLIP) funds generate less revenue than budgeted, which implies significant contingent liabilities of the government.³¹ Therefore, Japan is experimenting with Public Private Partnerships (PPP) or Private Finance Initiative (PFI) alternatives to providing the funding for civil works infrastructure construction projects.³² Under this concept the government entity would need econometric expertise, and the project management expertise would be required by the entity executing the project, which would most likely include such a project management specialist. Since Japanese central and local governments have been facing financial difficulties under the continuing economic conditions, it is difficult for them to carry out civil works infrastructure construction projects. The Japanese have used the United Kingdom's PFI model as a new civil works infrastructure construction development model to provide public services while reducing public expenditure. PFI incorporates mechanisms to minimize the final project cost charged to taxpayers/users to secure long term and stable public service provision by private companies, and secure accountability. Most of the legal issues involved in applying PFI in Japan have been temporarily addressed by effectively making "private" such "public works" projects by means of enactment of the Project Finance Initiative Act (*Minkan Shikin-to no Katsuyo niyoru Kokyo Shisetsuto nikansuru Horitsu*), Law No. 117, (1999). Although PFI is touted as an effective scheme for improving the efficiency of civil works infrastructure development projects, it is impossible and inappropriate to apply PFI to all of them. On the other hand, to carry out future infrastructure development projects in an aging society with a falling birthrate, the mechanisms and concepts of PFI could be broadly introduced into the civil works infrastructure construction industry. At present, PFI is being used for the construction of a limited number of new civil works infrastructure construction projects, notably new power plant projects and a waste water treatment plant. The largest single impediment to the use of alternative methodologies, however, is the Construction Business Law, and the Contract and Standard Conditions of Contract for Public Works.

The global market has adopted PPP and PFI concepts widely. The value of Australia Public Private Partnership market, for example, is approximately Aus\$ 20 billion.³³ One of the most successful PPP or PFI has been the "Partnership Victoria" program in the State of Victoria, Australia, which was launched in June 2000. This concept was successfully built upon the prior governments PPP efforts. As an example, the government has built a toll way (completed and in operation), and is building the Multi-use Building/Melbourne Central Rail Station, and the Regional Rapid Rail System upgrade.³⁴ This program has met several intended goals: value for money, transparency, and competition.

The current set of guidance materials is available to all stakeholders, thus assuring one key element: all stakeholders know how the process works, and stakeholders are a part of the process. Partnership Victoria states:³⁵

"the public and private sectors have roles to play in building world-class infrastructure or Victoria...[by] by uniting the public and private sectors to deliver improved services to the community...through innovative solutions, value for money and better services...[The policy focus is completely on services for which the construction of supporting infrastructure, and thus project management and contract administration, is merely a part. Thus, Partnership Victoria] "focuses on the whole-of-life costing of infrastructure and related ancillary services, and a full consideration of the benefits of risk allocation to the private party....The private sector can often deliver public infrastructure services more cost-effectively than government can...There is no

presumption that the private sector is invariably more efficient in building and operating public assets. Equally, there may be no obvious benefit in holding or keeping assets in public ownership if the private sector is better placed to build or update them, and services to the community are improved or delivered at a lower cost. The key issue is which form of project delivery provides the best value for money in meeting government services objectives.”

The retention of what Victoria considers core services is identified on a case by case basis guided by the concept that there are certain core public services for which it has clear responsibility to service recipients and the community. Transparency is assured by the method of evaluating bids. It is based on the use of a “Public Sector Comparator (PSC)” that is known to all stakeholders (the process is known, not the evaluation, before contracting). The PSC provides a financial benchmark for assessing the value of money of private sector bids and includes the value of risk allocation to the private party that occurs under a Partnership Victoria approach. Projects are assessed against a public interest test comprising probity, transparency and other criteria to protect the interests of the community and to ensure that no group is unreasonably disadvantaged by, or denied access to, the proposed civil works infrastructure construction project and/or services as a result of the way the services are to be delivered.

The Partnership Victoria program considers the main business of government is to procure the services which depend on or are otherwise associated with civil works infrastructure construction, which is had been the traditional idea of government’s procurement from the private sector. To assure the public interest and transparency are considered, Partnership Victoria assesses projects against public interest criteria relating to effectiveness, accountability and transparency, equity, public access, consumer rights, security, privacy and rights of representation and appeal at the planning stages by affected individuals and community. Partnership Victoria considers the following when judging value for money:

- Risk transfer (relieving government of cost of asset-based risks; significant transfer of risk to the private sector).
- Whole-of Life Costing (one party responsibility for the upfront cost of design and construction; on going service delivery; operational, maintenance and refurbishment costs).
- Innovation (innovative solutions for how services requirements are delivered).
- Asset Utilization (developing revenue opportunities for use of an asset by third parties which reduce their cost to government).
- Scale (projects: greater than AU\$ 10 million).
- Duration (service requirements of up to 30 years).
- Service Focus (clearly definable and measurable output specifications suitable for payment for services on a delivered basis).
- Complexity (sufficient complexity and/or other characteristics which invite innovative solutions).
- Market Capability and Appetite (existence of genuine business opportunity and sufficient private sector parties to assure an effective and competitive bidding process).

The value for money principle under Partnership Victoria dictates that government takes back some risks which it can manage at a cheaper cost than it would have to pay the private party to hold the risk. For example, a government can handle the risk that it will change the delivery specification during the period. Thus, for pricing and management reasons, optimal risk allocation dictates that the particular risks are allocated in line with capacity to control and manage at least cost, whether the government or the bidder.

Allocation of common risks in a Partnership Victoria Project is handled as suggested below, which relies on the concept of “mutual mistrust” consistent with the proper risk allocation that was found in the recent Hong Kong study on the Standard Conditions of Contract discussed above:³⁶

“Site Risk is assigned to the private sector (land contamination, acquisition, and indigenous issues), but the government may take back or share risks associated with

- Existing government sites (e.g., existing defects, environmental liabilities, etc.)
- Planning and Environmental approvals when in excess of a contractual amount.
- Process expenses as agreed on a case-specific basis.

Design, Construction and Commissioning Risk is assigned to the private sector, except for government changes or interferences in the process.

Sponsor and Financial Risk is borne by the government, but mitigation of that risk is laid out in the contract (e.g., share in interest rate changes, requiring the bid to have firm funding, requiring the government to share in a windfall if interest rates are significantly better than bid by the defining certain parameters, not taking the lowest bid based on quality of the financing, etc.).

Operating Risk is always allocated to the private sector except that the government will bear the costs of government intervention (such as, change in specification) or interference.

Market Risk comprises demand and price risk. The extent of demand risk borne by the private sector depends on the value for money question and whether the government is only service customer. Demand risk to extent possible is assigned to the private sector. Price risk is the private sectors, but it can be hedged by setting some measure to periodically adjust the price, such as, a benchmark econometric measure.

Network and Interface Risk includes the risk that a complementary on which the project or service depends will be removed or changed, thus altering the demand for the service or the quality of government inputs changes beyond certain parameters. To achieve optimal government flexibility to the community the network risk is only assigned to the government where a change discriminates against the project. The interface risk occurs when government action frustrate the standard of delivery of the service that is the core of the project. These cases are handled by the government and the private sector each bearing the risk that their service has on each other.

Industrial Relations Risk is held by the private sector.

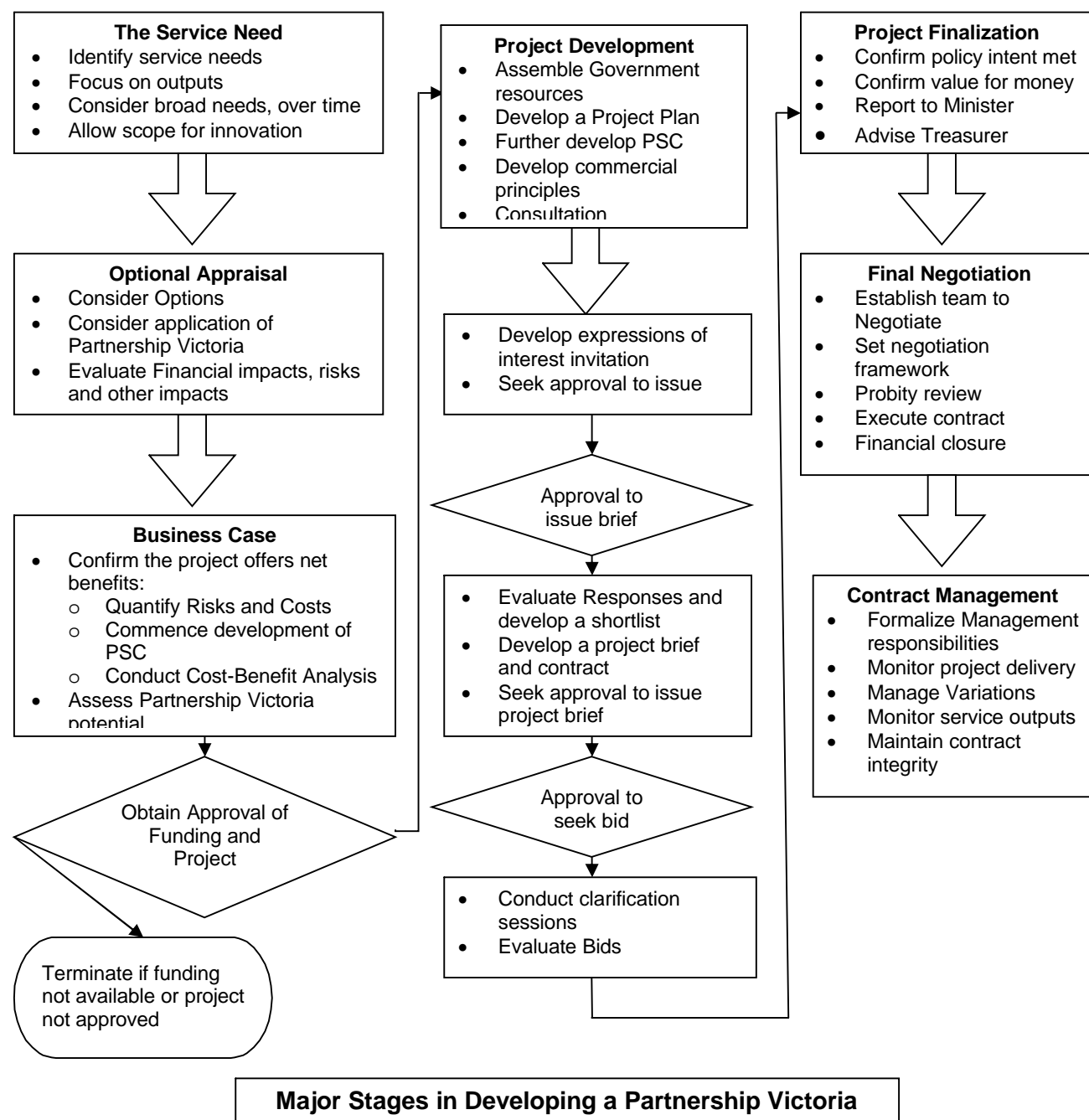
Legislative and Governmental Risk is taken by the government for acts that interfere with the private sector ability to perform, and change in law risk is taken by the government, but as the Victoria is a state in Australia, the risk of National law change is assigned to the private sector (the can insure against it).

Force Majeure Risk which is commercially insurable is assigned to the private sector and uninsurable Force Majeure risks are shared provided that there is value for money and varying levels of risk assumption are explored.

Asset Ownership Risk is risk is assigned to the private sector, unless it is technology dependent, when the risk is shared.

The process is set forth in Figure V.B.1 in which the Author summarizes the decision process:

Figure V.B.1
The Partnership Victoria Development and Decision Process



Therefore, there are reasonable transition options available to the domestic civil works infrastructure construction industry to gain the requisite project management and contract administration knowledge to assure their survival while changes in the Construction Business Law and to enable the Contract and Standard Conditions of Contract for Public Works to be adjusted. The resulting transition will not be easy, but the suggestions allow the industry to change and survive in a domestic competitive market that meets the objectives of Japan commitment to WTO.

C. The Project Management and Contract Administration Skills that Could Be Developed Will Enable the Japanese Civil Works Infrastructure Construction Industry to Be a Formidable Global Market Competitor

How can the Japanese construction industry acquire the skill sets that it will need to succeed in the global market where it has been unable to do so consistently in the past? Japanese firms also must look off shore, as other industries have done, because the Government does not have the capacity to continue to build civil works infrastructure construction projects. With private participation, like PFI projects as a transition period option, for example, the civil works infrastructure industry will be prepared to broadly compete with other international parties in the global market. Japan's overseas civil works infrastructure construction, despite its still relatively small percentage of the combined domestic and global markets it serves, offers some intriguing possibilities. The Government could "sell" its expertise in constructing social capital through civil works infrastructure construction projects before it is lost.³⁷ Japan has been the largest and a very visible donor regarding the ongoing 2005 Tsunami reconstruction of civil works infrastructure in the affected countries surrounding the Indian Ocean. Such reconstruction works are a good example of the combined talents of the Japanese Government and the civil works construction contractors with these emergency works, especially since Japan possesses a civil works infrastructure construction industry that arguably uses the finest of construction technology.

Most global Japanese civil works infrastructure construction, however, is funded by JBIC ODA or is related to sectors in which Japanese business is involved. But is it enough to just rely on JBIC to provide civil works infrastructure construction industry with projects? Total development and recurrent expenses for infrastructure will amount to as much as 5.5 % of GNP of the world's developing countries from 2005 to 2010.³⁸ ODA financing, though, only amounts to 10% of this amount, and that is a drop in the bucket.³⁹ As previously noted, JBIC in the 2005 revisions to its Handbook for Procurement under JBIC ODA Loans has declared that the revisions "will contribute to a transparent and stable operation of the system, facilitate procurement procedures, and enhance capacity building in borrower countries." In the recommendations on the Standard Conditions of Contract that are to be used for civil works infrastructure projects, JBIC built in the principles of "mutual mistrust" by requiring the use of the FIDIC Standard Conditions of Contract. As pointed out, the reasons proffered for this use was "to facilitate perusal by bidders and review by JBIC." Thus, recipient countries and global contractors will either know or have to learn about these principles. By far the majority of the Japanese civil works infrastructure construction industry does not have sufficient experience. JBIC even goes so far as to state that the full FIDIC Table of Contents is to be used as "is," and then exceptions reflected in a separate section. Obviously, the answer to the question is no, Japan cannot just rely on ODA financing. Japan must broaden its capability to perform such civil works infrastructure construction, as the level of domestic work may never return to previous levels.

As "mutual mistrust" experience is gained, the Japanese can become formidable competitors as they have in other industries. As summarized by the Author in Table V.C.1, according to the World Bank from 2005-2010 alone, countries classified as "developing" will require US\$233 billion (¥23.3 trillion) for civil works infrastructure annually, and annual operation and maintenance will require a further US\$232 billion (¥23.2 trillion).

Table V.C.1
Developing Country Global Market for Civil Works Infrastructure Construction
In the 2005 to 2010 Period

Region ⁴⁰	New Infrastructure		Maintenance & Operations		New Infrastructure & Maintenance	
	US\$ Bil. (¥ Tril.)	% Total	US\$ Bil. (¥ Tril.)	% Total	US\$ Bil. (¥ Tril.)	% Total
East Asia / Pacific	99.906 (9.991)	27.1	78.986 (7.899)	16.5	178.892 (17.889)	21.1
South Asia	28.068 (2.807)	7.5	35.033 (3.503)	7.3	63.101 (6.310)	7.4
Europe & Central Asia	39.069 (3.907)	10.6	58.849 (5.885)	12.3	97.918 (9.792)	11.5
Sub-total	167.043 (16.404)	45.3	172.868 (17.289)	36.0	339.911 (33.991)	40.0
Developing World Total	233.139 (23.314)	63.2	231.654 (23.165)	48.3	464.789 (46.479)	54.8
World Total	369.095 (36.910)	100.0	479.624 (47.962)	100.0	848.719 (84.872)	100.0

* 1 US\$ = 100 ¥

In the last 20 years, Japan has concentrated primarily on Asia, but there is a broadly based global market. As Table V.C.1 illustrates, East Asia, South Asia and Central Asia have 40% of the combined market, over ¥ 34 trillion during the five year 2005 to 2010 alone. Over the prior 20 year period, 1985 to 2005, there was a shift in terms of geographical focus by Japanese contractors who do work overseas, however, initially concentrating on South Asia and gradually shifting to East Asia as the Chinese market has arisen to be the largest market in the world. Recently, limited numbers of Japanese civil works infrastructure construction contractors have been active in the Eastern European and Central Asian geographic areas. The 20-year shift has reflected the economic fortunes of Asian regions, especially over the last 10 years. So, why concentrate on East Asia? The US now imports more from China than from Japan, while Japan imports more from China than from the US. The expansion of trading relationships within the East Asia region will lay the foundation for regional economic integration in the future. China's admission to WTO points to a growing role for China as a demand absorber in the future. First, expanding foreign investment will lead to the formation of divisions of labor between China and East Asian neighbors (much like has been in progress for the US for decades). Second, rising income levels will lead to increased demand for imported goods. Third, the need for civil works infrastructure development is expanding (as shown by the compilation of World Bank statistics in Table V.C.1), especially in the area of non renewable resources. For Japan, the relationship with China is basically one of "complementation," and the challenge will be to raise the level of Japanese industry involvement while strengthening its interdependence with China.⁴¹

The future, however, will be dependent on capacity building in the Asian developing world, which is a particular focus of JBIC. Asia is geographically close to Japan, specifically East Asia, followed by South Asia, and then Central Asia. Capacity building will be dependent on the Japanese civil works infrastructure construction industry's ability to demonstrate broadly based experience with the global market, both as Owner/Employers and contractors. The Government can help in this arena by negotiating Free Trade Agreements (FTA's). If Japan delays FTA negotiations and is consequently left in a trading wilderness as FTA's are formed instead of among Asian economies or Asian economies and the US, Japanese will find themselves at a disadvantage – a decline in exports, development of production facilities overseas, and a deteriorating investment climate.⁴² Capacity building on the part of the

target countries for civil works infrastructure construction coupled with the capacity building in “mutual mistrust” environment on the part of the Japanese civil works infrastructure construction industry will enable sustained growth for Japan. Sustained benefits can be developed by continuing to build experience with PPP (PFI) alternatives, which Japan currently is well placed in which to serve a role.

To emphasize the potential of the East Asian market, for example, the US Department of Commerce in late 2003 advised US competitors in the global market on the benefits of China as a market.⁴³

“...China construction activity of all types of 'manufacturing, industrial, residential, commercial, and infrastructure, both public and private' will remain strong, in part due to China's anticipated economic growth stemming from its December 2001 entry into the World Trade Organization. U.S. firms seeking work in China face stiff competition from Chinese competitors. For these firms, establishing partnerships in China may represent the quickest way to enter the Chinese market. However, full implementation of China's architectural, engineering, and construction commitments 'key conditions for China's WTO accession' has now made it possible for U.S. firms to open foreign majority-owned joint venture subsidiaries and special-purpose wholly foreign-owned construction firms [still not available to Japanese contractor's in Japan], with wholly foreign-owned local design firms permitted by December 2006. China's implementation of international rule-of-law principles [“mutual mistrust” principles] under the WTO should help to ease U.S. industry concerns about local adherence to contract terms and being paid for services rendered.”

Civil works infrastructure construction investment remains a key element of China's economic growth strategy. Growth in overall civil works infrastructure construction investment continues at double-digit levels, in an effort by China's central government to keep national economic growth rates above 7 percent annually, despite pressure to cool off the rate of growth in the economy.

The US Commerce Department again reported:

“Perhaps the best known of China's pending infrastructure projects is the \$23 billion worth of sports, retail, housing, transportation, energy construction, and environmental remediation project spending between now and 2008 in preparation for the Beijing Summer Olympics. Meanwhile, Shanghai anticipates spending \$3 billion to build venues for Expo 2010, with additional billions to be spent on transportation and other expo-related infrastructure projects. Subway construction is now under way in Shanghai, Guangzhou, Tianjin, and seven other cities; 8,500 miles of railroad is to be added by 2005; and numerous nationally and locally funded dam, energy, pipeline, and highway projects are underway across China... Additionally, power, petrochemical, and environmental projects offer prospects for U.S. engineering and construction firms experienced in these sectors... However, U.S. architects, engineers, and contractors face significant obstacles in their efforts to obtain work in China. Financing remains a key issue, even on civil works infrastructure projects. While Chinese officials have said they would prefer 15 to 20 percent of public infrastructure to be financed by foreign sources, this represents moving foreign direct investment away from export-oriented private sector industrial construction—with relatively easy return on capital available—to projects with uncertain return on revenue and long payback periods. U.S. firms face stiff competition from...the substantial pool of national and local contractors in China. For U.S. firms, profitable participation in Chinese projects will depend on careful attention paid to the role the firm will play in local partner-ships, the stability of

*potential return on investment, and the type of competitive advantage the U.S. firm will enjoy over its competitors in the Chinese market....*⁴⁴

The global market can be of real benefit to Japan and to the Japanese civil works infrastructure industry, if it too is competitive. Creating project management and contract administration skills to effectively compete in the global market is an attractive outlet for Japan.

D. Chinese Law as an Example of an Asian Country that Has Adopted the Principles of “Mutual Mistrust” Relative to Civil Works Infrastructure Construction

As discussed, the Japanese apparently pursued a theory of having their ideas on project management and the lack of need for contract administration accepted equally by the global market, especially East Asia. Japan thinking apparently assumed: “East Asia has a common cultural heritage with the Japanese.” Thus, the Japanese thinking apparently continued: the Japanese civil works infrastructure construction industry could work in the global market using a form of project management that was used in its own domestic market, because East Asia, and notably China, contract law was fashioned on similar ideas of Confucianism. Unfortunately, that concept has not proved viable, particularly as Chinese Law has developed in the last 10 to 15 years. Similarly, where lending is by international institutions, including to China, the use of a Contracts and associated Standard Conditions of Contract for civil works infrastructure construction must be based on the principles of “mutual mistrust.” This requirement has led to the need for project management skills that employ contract administration even in the “Asian” market.

To understand the development of Chinese construction law, as with Japan, you cannot separate culture from law. But, Chinese history, and particularly the last half century, is quite different than that of Japan, despite both having had a ruling party that dominated power for most of the time. The understanding of modern Chinese law thus can only be understood through an appreciation of the social, cultural, political, and historical aspects of Chinese legal traditions. China’s current legal system reflects a vast number of legal traditions over the millennia.⁴⁵ As with Japan, the deeply-rooted philosophies and culture of classical China, such as, Confucianism, must be studied. In addition, there are the legal traditions of Daoism and Legalism. China’s legal system is also influenced by external forces such as the extraterritorial privileges exerted under the treaty system between China and the Western powers which, in effect, forced China to adopt Western legal principles that stem from civil code countries of Europe (Germany and France) and from the common law countries (US and United Kingdom). The influence of treaties was much greater than Japan, because of the US relied heavily on the anthropological writings of Ruth Benedict, especially The Chrysanthemum and the Sword, as discussed above, in fashioning Japanese law following the surrender of Japan in 1945.⁴⁶ In 1949, when the Communist Party took control of China, Chinese law was based on the political philosophies of Marxism-Leninism and Mao Zedong, and the Soviet legal system. Since 1980, China has adopted a laws and enacted regulations governing commerce, foreign investment, and Securities regulations, from international sources. As China reforms its economy, it is using the legal standards of its trading partners to hasten its development efforts, to build the confidence of foreign investors, and to accommodate the entrepreneurial capitalism. This latter influence is primarily an influence from the US, however, which is its largest trading partner.

Confucian codes of conduct are clearly defined patterns of obedience have become inextricably intertwined in Chinese society and culture just as in Japan. Confucian teachings hold that an individual should be guided by “*li*,” that is, virtue or propriety, rather than by “*fa*,” the law.⁴⁷ Confucianism is an ethical system that seeks to teach the proper way for all people to behave in society. The focus is more on the interests and harmony of the family, clan, or community rather than the rights of a single person. Confucius taught that most of the ills of society happened because people forgot their stations in life and rulers failed to practice virtue. The rationale of Confucianism is that society is organized in a hierarchy of superior-inferior relationships. If every person performed his or her role, stability and social order would be sustained. Confucius emphasized complete obedience and loyalty of the inferior to the superior and, at the same time, the benevolence of the superior to the inferior. Thus, it is the same philosophical base that Ruth Benedict described relative to the Japanese.

Confucianism influenced every aspect of Chinese life, including its governmental systems, politics, and the law. Confucianism developed during a time of moral chaos, in which common values were widely rejected, crime was rampant, rule by war lords was the norm, and government was corrupt and distrusted by the people. Before Confucius, China was a feudal society on the verge of collapse due to increased population and ongoing war. During the Han Dynasty (206 BCE—220 CE), Confucianism was employed as an ideological reference point to allow the Han emperors to run China with a reasonable degree of efficiency. Since that time, and up to the end of the Qing Dynasty in 1911, Confucius's teachings were a mainstay of curriculum for government officials. A familiarity with Confucian canons was the principal requirement for civil service examinations, the bureaucrats kept the empire intact for two thousand years. It is the basis for Chinese culture, but since 1980, the Confucian values seem to have been receding, as China has moved to entrepreneurial capitalism.

Daoism (Taoism), is a second school of thought developed by philosophers Lao Zi (5th century BCE) and Zhuang Zi (4th century BCE). Daoism maintains that a person follow the Dao, the way, without interference of desires. Daoism advocates inaction, political passivity, and spontaneity without human interference. Daoism opposes institutions and organizations, moral laws, and governments as human artifices that obstruct the Dao. Daoism taught the art of living and surviving by conforming to the natural way of things. Daoism further advocates that the best way to govern the world is not to govern it. Daoism encourages avoiding public duty in order to search for a vision of the transcendental world of the spirit. Daoism viewed a proper government would be one that would not wage war would not be complex, would not interfere in people's lives, would not emphasize luxury, ritual, and wealth, and, if practical, would be inactive. The inactivity envisioned would be a government that is merely a guide and not one that governs. Daoism believed that the order and harmony in nature were far more stable, unified, and enduring than either the power of the state or the civilized institutions structured by humans. Although Daoism may be different from Confucianism, it is not contradictory.

The third major school of thought that significantly influenced the modern Chinese legal system is Legalism, "*fajia*." Legalism is based on the teachings of Shang Yang (d. 338 BCE), the advisor to Shi Huang Di, the First Emperor of China. Shi Huang Di was regarded as abusive and a tyrant by Confucians, although he succeeded in unifying the nation and put an end to control by war lords. Legalism advocates rewards and punishments by which to keep all people in order. Legalism held that man is evil and selfish, and thus required a draconian set of laws that would make the continent easier to control and to avoid social disruption. Legalism advocated dismantling feudal privileges, strict accountability for actions, and the standardization of individual duties in a manner whereby everyone is bound equally to the same standard. Legalism emphasized that the standards do not favor the nobles over the common people.

Confucianism, Daoism, and Legalism each played a role in developing the legal system of China. Buddhism also had an impact on Chinese society, but did not play a significant role in development of the Chinese legal system. In addition to the purely internal philosophies, the development of China's contemporary legal system was strongly influenced by a number of external legal philosophies. Demands placed on China to reform its legal system as a condition to abolish extraterritorial judicial privileges, and the political philosophy of Marxist-Leninist thought that took hold in China after years of war, foreign interference, and abject poverty are the more relevant events.

For centuries, China flourished in isolation from the rest of the world. Codification of the law in ancient China, which was primarily penal in nature, was undertaken during the Qin (221—206 BCE), Tang (618—907 CE), Song (960-1279 CE), Ming (1368-1644 CE), and Qing

(1644-1912 CE) dynasties. During these two millennia, jurisdiction over purely commercial disputes was settled through either mediation or arbitration because of distrust of legal institutions, where the decision making was arbitrary.

During the Qing Dynasty (1644—1912), the Western world approached the Manchu rulers for strategic purposes and to open trade. China initially was ambivalent toward the foreigners and believed that it had no need for relations with Europe and the United States. As traders set up posts in China's coastal areas, the Manchu rulers allowed the foreigners to govern their own affairs, but then they gradually asserted jurisdiction. After the Opium War, the Western powers, Great Britain, Germany, France, and the United States, imposed upon China a number of unilateral treaties granting land and trading concessions in various parts of China. The result dismembered China and parceled her off into spheres of influence. These treaties established a system of extraterritorial privileges under which foreign subjects were exempt from local jurisdiction, and, instead, were subject to their own national authorities for conduct while physically present in China. Extraterritorial privileges included an exemption from jurisdiction of local courts; freedom from arrest by local officials; and the right to a criminal or civil trial by consular or national courts. Prior to the establishment of extraterritorial privileges, China asserted jurisdiction over foreigners and subjected them to local Chinese law. Extraterritorial jurisdiction in China was secured by nineteen countries including in chronological order: Russia, United Kingdom, US, France, Sweden, Norway, Germany, Denmark, The Netherlands, Spain, Belgium, Italy, Austria-Hungary, Peru, Brazil, Portugal, Japan, Mexico, and Switzerland. The US, for example, secured its extraterritorial privilege in its treaty with China, concluded on July 3, 1844. The China Treaty of 1844⁴⁸ provides that "citizens of the United States who may commit any crime in China shall be subject to be tried and punished only by the consul, or other public functionary of the United States, thereto authorized, according to the laws of the United States" [and that] "all questions in regard to rights, whether of property or person, arising between citizens of the United States in China, shall be subject to the jurisdiction of and regulated by the authorities of their own Government." The Western powers imposed the system of extraterritoriality based upon the perceived imperfections in the Chinese legal system. In response to treaty authorization, foreign governments established a multiplicity of courts located physically in their territory in China. For example, the US established in China the US Court for China, thus a dispute against with an American company by a Chinese company was required to be made before the U.S. consular court having jurisdiction.

After the practice existed for over 60 years, and on the demand of the Chinese government, the US and UK promised to abolish the extraterritorial system on the condition that China establish a legal system consistent with international norms. Article 15 of the commercial treaty between the United States and China of 1903 provided as follows:

"The Government of China having expressed a strong desire to reform its judicial system and to bring it into accord with that of Western nations, the United States agrees to give every assistance to such reform and will also be prepared to relinquish extra-territorial rights when satisfied that the state of the Chinese laws, the arrangements for their administration, and other considerations warrant it in so doing."

In response, the Chinese government took steps to reform its legal system, including the establishment of an independent judiciary and codification of its laws. Despite undertaking numerous reforms in the first two decades of the 20th century, the foreign powers failed to relinquish their extraterritorial privileges. China, despite years of civil war and protracted discussions with the foreign powers to abolish the extraterritorial system, continued to reform its legal system. In January of 1943, however, the Western powers formally abandoned the system of extraterritoriality. China was thereafter allowed to subject foreigners to Chinese laws and court system.

In 1949, the Chinese Communist Party (CCP) abolished all laws and the legal system set up by the Republic. In February 1949, the CCP forcefully removed the Guomindang government, including its judiciary and the entire body of laws. The CCP issued a directive abolishing the Guomindang's six codes, all modeled after European legal codes, including the Constitution, Commercial Law, Civil Law, Civil Code of Procedure, and Criminal Code. In September of 1949, the CCP issued the Common Program of the Chinese People's Consultative Conference, which became the temporary basic law of China until 1954.⁴⁹ The CCP then pursued a program based upon the concept of historical determinism, which provides that the party is the primary means of transforming China from a feudalistic society into a Communist utopian society. In order to perfect its unique historical role, the CCP pursued a policy of class struggle that involved the destruction of "class enemies." The hope of utopia appealed to the people after years of war had resulted in impoverishment. The collective responsibility system of the Communists had its roots in Confucian thought. The theory of loyalty under was redirected into loyalty to the CCP and the State. The Confucian ideal of virtue under Maoist thought was simply the unequivocal support and practice of the CCP's current political program. The "virtuous" person in Maoist China was a person who followed the party line. Further, both Maoism and Confucianism eschewed written law entirely in favor of general principles and left it up to the "experts"—cadres in the former and the mandarins in case of the latter—to apply the principles to specific cases, and oftentimes with punitive results. The recognition of general principles, as opposed to the rule of law, is why China, in stark contrast to Japan, had virtually no written law until the 1980.

Soviet legal scholars taught students in China, and Chinese students studied in the Soviet Union. China developed a legal framework that includes the first PRC Constitution in 1954 and a set of organic laws designed to administer the court and prosecutorial systems. Soviet laws and principles were readily adopted as models until a shift in politics led to the Soviet Union falling out favor with Beijing in 1957. In May of 1957, Mao Zedong encouraged the "blooming of a hundred flowers and the contending of a hundred schools of thought." Mao called on intellectuals of China to speak out against the abuses in the CCP. After a period of five weeks, the program was terminated and resulted in an "anti-rightist" campaign against those that spoke out. The legal profession and the judicial system were affected. Ideological repression was followed by a purge of the government and the CCP. The anti-rightist movement was followed by an abandonment of the Ministry of Justice (MOJ) in 1959 along with China organizational structure for the legal profession.

From 1958 to 1965, the country focused its attention on developing policy to rapidly transform the country into a world power. During this time period, Mao launched the Great Leap Forward movement, which was intended to heighten economic productivity and self-reliance in China through collectivization of people's communes and decentralization of industrial production. Today the Great Leap Forward is regarded as a failure since the government overstated the production and agricultural results, which led to widespread famine. The Great Leap Forward set the stage for the next round of revolutionary excesses, those of the Cultural Revolution from 1966 to 1976. Development of the law and legal institutions took on secondary importance to Mao's goal of mass mobilization to achieve self-reliance. During the Cultural Revolution, the few open law schools were closed and the law faculties were sent to labor camps. The law libraries and books were destroyed by the Red Guard. The legal profession disappeared overnight and almost no laws were enacted and no law books published during the Cultural Revolution. Civil disputes were resolved by local mediators, and criminal matters were handled in the political arena by the Ministry of Public Security, party committee structure, or the state courts that remained open.

The Cultural Revolution ended in 1976 with the death of Mao and the arrest of the "Gang of Four." After ten years of lawlessness during the Cultural Revolution, the Chinese government took steps to slowly open China to the rest of the world. In 1978, the

government instituted the Four Modernizations, a program designed to develop and modernize China's agriculture, industry, national defense, and science and technology. Incumbent in this bold plan was the building of a modern legal system as a key element to ensure the institutionalization of economic reform, and to gain the confidence of the global community. The Chinese government emphasized that the excesses of the Cultural Revolution occurred as a result of certain officials taking advantage of China's incomplete legal system to seize power. To guard China from returning to a similar situation, the National Party Congress (NPC) stressed the need to develop a legal system that ensures the stability and continuity of the laws; guarantees the equality of all the people before the laws and to deny anyone the privilege of being above the law; and that the law may be revised only through legal procedures and not at the personal whim of a particular leader. In the interim, the United States officially recognized the People's Republic of China on January 1, 1979, and several months later the two governments established formal diplomatic relations with the opening of respective embassies. In 1972, the United States and the PRC opened trade with the signing of the Shanghai Communiqué. Since that time, the US and China have executed a number of bilateral agreements and that has led to the 25 years of reforms, including recently, construction laws.

The economic liberalization policies of the 1980s gave rise to consumer expectations by the late 1990's of personal ambition, initiative and wealth. The Chinese government, in response, has used the enactment of laws to shape entrepreneurial values and to preserve the CCP existence and legitimacy. At the same time, the Chinese government has been, and continues to be, under pressure from its trading partners to strengthen its laws, improve the enforcement of its laws, allow for greater transparency, and give access to its citizens in order to facilitate market access and stability, and more recently to attract foreign investment. Inherent in this change is the development of its construction law.

To begin with, the Contract Law⁵⁰ defines a construction project contract as an agreement whereby a contractor performs certain tasks involving the construction, installation, demolition or refurbishment of a work of improvement. The Contract Law requires that a construction project contract must be in written. The Contract Law provides that a contract for the construction of a work of improvement shall contain the following provisions:

1. Scope of Work
2. Construction schedule and time for performance
3. Quality and specifications of works
4. Contract price and budgeting
5. Schedule for delivery of technical information
6. Materials and equipment to be used
7. Inspection and acceptance procedures for the work of improvement
8. Warranty Period

The Contract Law further provides that activity relating to the tender and evaluation of bids for construction projects must be conducted publicly and fairly. Projects for State agencies must follow procedures established by the government and the approved documents for the specific project, including feasibility studies, land-use plans, and investment plans approved by the national, provincial, and local governments. The contractor may enter into subcontract arrangements with the approval of the principal, but is liable for the acts and omissions of any subcontractor. An Owner/Employer has the right to enter into contracts with several contractors at the same time, and may retain a project supervisor to oversee the work of the various contractors. The Owner/Employer has the right to inspect the work progress so long as the inspection does not interfere with the rights of the contractor. The contractor has an express obligation to notify the Owner/Employer of its progress so that the Owner/Employer has time to inspect its work. After the completion of the construction work, the Owner/Employer must inspect the work to assure the work is in accordance with the

construction drawings and specifications, the acceptance inspection regulations, and quality inspections standards promulgated by the government. If the construction is acceptable, then the Owner/Employer must accept the construction project and pay the contractor the balance of the price as agreed. The contractor is liable to the Owner/Employer, if the works fail to meet the terms of the contract or the construction standards set by the government. If the quality of the construction work does not comply with the agreed standard due to any reason on the part of the contractor, the Owner/Employer may demand that the contractor cure the defects within a reasonable time period. If the contractor fails to cure the defects within the prescribed time, the contractor is liable for damages for breach of the contract. The contractor is also liable for any property damage or personal injuries sustained as a result of the contractor's failure to abide by the terms of the contract or to maintain workplace health and safety standards. The Owner/Employer is liable to the contractor for any damages resulting from interference, delay, a failure to supply materials, access to work sites and technical information, or other reason on the part of the principal. If the Owner/Employer changes the specifications or the contract terms, provides inaccurate data, or fails to provide necessary working conditions to assist the contractor in completing the works, the Owner/Employer is liable for damages to the contractor. In short, the Owner/Employer and contractors have all the responsibilities and liabilities that are expected in the global market.

The Construction law of the People's Republic of China (1997) was adopted by the National Peoples Congress (NPC) to improve the supervision and administration of construction activities, to promote the construction industry, and to ensure that construction projects are undertaken in a safe manner.⁵¹ The Construction Law outlines the qualifications for contractors, construction project building permits, construction contracts, tender process, construction project supervision, construction work safety management, construction project quality control, and legal liability. Some major municipalities also have similar laws, like the Rules of the Shanghai Municipality on the Construction Market (1997 and amended in 1999) which covers the qualifications for persons engaged in building activities, general contractor and subcontract activities, role of supervisory agencies, project contracts and building cost calculations, project quality and safety, and penalties and legal liability.⁵² The Construction Law applies to all parties engaged in construction activities in China, including the construction of various types of structures and their auxiliary facilities, as well as the installation activities involving related wiring circuits, piping, and equipment. There is no separate contract status established under the Construction Law. The contract must be consistent with the Contract Law.

The government also is promoting a greater participation in China's construction and engineering services market by foreign companies. China also has special laws regulating foreign contractors involved with road construction,⁵³ and the electric power industry.⁵⁴ The Telecom Regulations, for instance, provide that the construction of public telecommunication networks, special telecommunication networks, and radio and television transmission networks are required to comply with government planning policies and be approved prior to the commencement of construction. Under the Telecom Regulations, any party involved in constructing roads, bridges, tunnels, railroads, and other large civil works infrastructure projects is required to consult with the local telecommunication authorities before commencing construction, and to avoid any disruption of existing telecom cables, lines, or facilities.⁵⁵

Regarding foreign contractor participation, in September 2004, the Ministry of Construction released a draft revised version of the Construction Law for public comment which "fine tuned" the law with several issues in the global market.⁵⁶ Even the process of stakeholders commenting is a process that is consistent with WTO requirements of transparency. At the end of 2002, China adopted regulations that apply to foreign enterprises involved in construction, engineering, or construction design in China.⁵⁷ Foreign investors may also

establish a Foreign Invested Enterprise (FIE) construction company through reinvestment by an existing FIE or by purchasing an equity stake in another construction company. Under the FIE Construction Regulations, foreign investors that are approved for work in China may engage in multiple projects simultaneously and are not limited to a single contract or project. After an enterprise is established, the company is required to apply for a construction enterprise qualification certificate from the Ministry of Construction or branch office, and is required to abide by the laws and construction standards adopted by China.⁵⁸

The FIE Construction Implementing Regulations provides that “construction activities” are defined to include:

“...new construction, expansion and reconstruction activities in the fields of civil engineering, construction engineering, lines, pipelines and equipment installation, and refurbishment.”

Thus, the regulations cover the civil works infrastructure construction industry. The Construction Law and enabling regulations specifically incorporate Standards Conditions of Contract from the global market. The approval procedures under the FIE Construction Regulations require that a foreign contractor obtain approval from the Ministry of Commerce, and then obtain approval from the Ministry of Construction.⁵⁹ Thus, any FIE construction company can have 75% foreign ownership and can engage in any civil works infrastructure construction project.

By the end of 2006, foreign investors will be allowed to set up Wholly Foreign Owned Enterprises (WFOE) that are engaged in construction and engineering services. As a result, foreign construction or construction design companies can establish wholly foreign-owned enterprises, equity joint venture, or contractual joint venture enterprises. Although WFOE construction companies can be established, they will be limited initially to the following types of civil works infrastructure construction projects:

1. A project funded by foreign investment, with foreign donations or with foreign investment and foreign donations.
2. Projects funded by international financial institutions that are, pursuant to the loan terms, granted through international invitations of bids.
3. Sino-foreign joint construction projects in which the foreign investment accounts for 50 percent or more of the total.
4. Sino-foreign joint construction projects approved by the government in which the foreign investment accounts for less than 50 percent of the total and due to technical difficulties cannot be implemented solely by Chinese or FIE construction enterprises.
5. Chinese-invested construction projects approved by the government that due to technical difficulties cannot be implemented solely by a Chinese or FIE construction enterprises, but may require joint construction by Chinese, FIE and foreign construction enterprises.

Civil works infrastructure construction is allowed to be undertaken by majority owned foreign construction companies, and wholly foreign owned construction companies on a more limited basis. This situation is in stark contrast to what is allowed in Japan. And, the contract and the Contract and Standard Conditions of Contract that has been used are consistent with the global market, and the principles of “mutual mistrust.” As has been indicated, civil works infrastructure construction investment remains a key element of China's economic growth strategy, and China has adopted a new legal regime which is consistent with “mutual mistrust” as used in rest of the global market.

Consistent with the new legal regime, a dramatic increase in the number of disputes between foreign and Chinese parties has resulted from increased in foreign investment and trade in China. The development and maintenance of a predictable dispute resolution system was a critical element for foreign parties in their decisions to invest in China. Thus, the global market has demanded, and, China has responded with a means of resolving disputes that meets these requirements. Although, the Chinese traditionally prefer to resolve disputes in a non-confrontational manner, and, if possible, without the involvement of a third party, the Contract Law, Construction Law, and enabling procedures are being revised to account for the perspective of global stakeholders. Consultation is simply direct negotiation between the disputing parties or their representatives. Consultation is expressly encouraged under Chinese law, and, specifically with respect by the Contract Law, Sino-Foreign Co-operative Joint Venture Law, and Sino-Foreign Equity Joint Venture Law. This movement toward dispute resolution began with the 1979 Trade Agreement between the US and China, which highlighted the importance of consultation and mediation:⁶⁰

"The Contracting Parties encourage the prompt and equitable settlement of any disputes arising from or in relation to contracts between their respective firms, companies and corporations, and trading organizations, through friendly consultations, conciliation or other mutual acceptable means."

But, it is usually the last step prior to initiating a more forceful means of resolving a dispute. The Trade Agreement further provides with respect to subsequent Arbitration:

"If such disputes cannot be settled promptly by [consultation], the parties to the dispute may have recourse to arbitration for settlement in accordance with provisions specified in their contract or other agreements to submit to arbitration. Such arbitration may be conducted by an arbitration institution in the People's Republic of China, the United States of America, or a third country. The arbitration rules of procedure of the relevant arbitration institution are applicable, and the arbitration rules of the United Nations Commission on International Trade Law recommended by the United Nations, or other international arbitration rules, may also be used where acceptable to the parties to the dispute and to the arbitration institution."

Thus, the Chinese have used global market dispute resolution for 25 years, and have required the use of perceived impartiality on the part of the arbitrators. More recently, the current Arbitration Rules of the China International Economic and Trade Arbitration Commission (CIETAC) were adopted in 1995, amended in 1998 by the China International Chamber of Commerce, and further amended by CIETAC in 2000.⁶¹ CIETAC is responsible for the sole commission for resolution of foreign-related commercial disputes. The revised 2000 CIETAC Rules of Arbitration expand the scope of CIETAC's jurisdiction over domestic business and commercial disputes, including disputes between FIE's. Under The Arbitration Law the government restructured its domestic arbitration system, thus making CIETAC independent of any administrative organization. CIETAC's approved list of arbitrators includes a large number of foreign individuals, including legal professionals from the US, Hong Kong, Australia, Canada, and various European countries. Although CIETAC's list of arbitrators includes highly qualified and eminent Chinese jurists, lawyers, and professors, foreign contractors prefer to appoint an arbitrator of neutral nationality to ensure that the tribunal will be impartial. Of the approximately 300 approved CIETAC arbitrators, one-third is foreigners or residents of the Hong Kong Special Administrative Region. Under the CIETAC Rules, all approved arbitrators must have professional knowledge and practical experience in such fields as law, economics, trade, and science and technology. Chinese is the official language of CIETAC, but parties may select the official language of the proceeding in their arbitration agreement or at the commencement of the proceedings.

CIETAC may hear cases involving international and foreign-related disputes between the following categories of parties and matters:

1. Disputes characterized as foreign-related or international in nature.
2. Disputes related to the Hong Kong Special Administrative Region, the Macao Special Administrative Region, and Taiwan.
3. Disputes between foreign-invested enterprises or between a foreign investment enterprise and a Chinese legal person, physical person, and/or economic organization.
4. Disputes arising from project financing, invitations to tender and bidding submissions, project construction, or other activities conducted by a Chinese legal person, Chinese individual, and other economic organization that utilizes capital, technology, or services from foreign countries, international organizations, or from the Hong Kong SAR, the Macao SAR, and the Taiwan region.
5. Disputes that may be taken in accordance with special provisions of, or upon special authorization from, the laws or administrative regulations of the People's Republic of China.

In 2000 CIETAC revised its rules to include “domestic disputes” referred by agreement, which includes any commercial dispute, including disputes between FIE’s, provided the parties have contractually agreed to arbitrate the dispute before CIETAC. Thus, the CIETAC Arbitration Rules provide for independent third parties, including disputes involving civil works infrastructure construction projects.

Under the CIETAC Rules, with respect to all foreign-related contracts, the parties may choose the law governing the interpretation and enforcement of their agreement.⁶² Therefore, while the law applicable to a contract for the formation of a joint venture is Chinese law, where that joint venture enters into commercial contracts with other entities, the parties are free to select the laws of another jurisdiction to govern their contract. The tribunal may also apply the provisions of relevant international conventions to which China has acceded, or, where applicable, accepted international practices or customs.

Thus, for civil works infrastructure construction projects, project management and contract administration are based on global practice, and that practice is based on “mutual mistrust.”

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- ¹² Smith, R., "Allocation of Risk – The Case for Manageability," 13 International Construction Law Review 549, London, UK, 1996.
- ¹³ The author experienced these losses first hand. He was engaged by several Japanese firms with respect to global projects (civil works infrastructure construction projects, and to a lesser degree other types of projects).
- ¹⁴ Kunishima, M and M. Shoji, The Principles of Construction Management, Sankaido, Tokyo, Japan, 1994.
- ¹⁵ Modified from original table form M. Kunishima and M. Shoji, The Principles of Construction Management, Sankaido, Tokyo, Japan, 1994 (English version, 1996) page 24. It was first presented by the K. Nielsen as "Trends and Evolving Risks in Design-Build, BOT and BOOT Projects", given at the ASCE/ICE Triennial Conference, Session IV: Pitfalls in International Engineering and Construction: What to Watch For, Philadelphia, PA, US, October 17-20, 1996. It was subsequently published in the modified form by the K. Nielsen in "Trends and Evolving Risks in Design-Build, BOT and BOOT Projects", The International Construction Law Review, Volume 14, Part 2, April 1997. It has since been the subject of additional input from interviews conducted in late 2004 and early 2005 with executives of contractors from Europe (ABB, Kvaerner, Foster Wheeler Italy, Foster Wheeler Spain, Foster Wheeler UK, Foster Wheeler France, Walter, Zublin, Snamprogetti, Alstrom, Federici, Syseca, Siemens and Ansaldo), the US (Bechtel, Fluor, Foster Wheeler, Shaw, Wilbros, Dresser Rand, Halliburton, Kellogg Brown & Root, Chicago Bridge & Iron, The Washington Group, Black & Veatch, Mortensen and Zurn Industries); and Japan (Nippon Steel, Toyo, Chiyoda, Taisei, Kawasaki Steel, Shimizu, Kajima, Toyoda, Fuji and Obayashi).
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²¹ Based on the interviews by the author of Japanese contractors for the 2005 update on project management culture and included the following Japanese contractors: Nippon Steel, Toyo, Chiyoda, Taisei, Kawasaki Steel, Shimizu, Kajima, Toyoda, Fuji and Obayashi.

²² Nielsen, K., "Is Ethics Dead in Project Controls Management?," Keynote Paper delivered at the Project Management Institute College of Scheduling Second Annual Conference, Scottsdale, AZ, US, 2005, www.pmicos.org.

²³ Nielsen, K., "*Risk Management Techniques – Evolving Project Management Tools For All Seasons*", Track 1a, Infrastructure, *Proceedings of the Third Civil Engineering Conference in the Asian Region (The 3rd CECAR)*, Seoul, Korea, 2004.

²⁴ Kusayanagi, S., *Technique and Practice of International Construction Project Management*, Seminar on Practical Application of Construction Technology Fiscal Year 2004, for the Japan International Cooperation Agency, the Ministry Land, Infrastructure, and Transport, and Japan Construction Training Center, 2004.

²⁵ Frilet, M., and A. Baelen, "Public Works Procurement in Europe," 12 *ICLR* 123, January 1995.

²⁶ US Trade Representative, *2005 National Trade Estimate Report on Foreign Trade Barriers*, Washington, DC, US, 2005.

²⁷ Ando, D. Christelis, and T. Miyagaw, "Inefficiency of Corporate Investment and Distortion of Savings Behavior in Japan," *Structural Impediments to Growth in Japan*, edited by M. Blomstrom, et al, National Bureau of Economic Research, Chicago, Illinois, USA, 2003, page 155.

²⁸ *Third Report to the Leaders of the US-Japan regulatory Reform and Competition Policy Initiative*, June 8, 2004, page 39.

²⁹ US Trade Representative, *2005 National Trade Estimate Report on Foreign Trade Barriers*, Washington, DC, US, 2005.

³⁰ See the Design-Build Institute of America's "Draft Model Ordinance," www.dbia.org.

³¹ Doi, Takero, and Takeo Hoshi. "Paying for the FLIP," *Structural Impediments to Growth in Japan*, edited by Magnus Blomstrom, et al, National Bureau of Economic Research, Chicago, Illinois, USA, 2003, page 37.

³² Hasegawa, A., "PFI as a New Infrastructure Development Scheme," *Journal of the Mitsubishi Research Institute*, No. 37, October 2001.

³³ Media Release, From the Treasurers of Victoria and New South Wales, November 5, 2004.

³⁴ K. Nielsen has been retained by the Victoria Government with respect to Project Management issues on all three of the projects mentioned continuously since 1997.

³⁵ Secretary of the Department of Treasury and Finance, *Partnership Victoria Overview*, *Partnership Victoria Practitioner's Guide*, *Partnership Victoria Public Sector Comparator Technical Note*, and *Partnership Victoria Risk Allocation and Contractual Issues*, Victoria Department of Treasury and Finance, Victoria, Australia, 2001.

³⁶ Secretary of the Department of Treasury and Finance, *Partnership Victoria Overview*, *Partnership Victoria Practitioner's Guide*, *Partnership Victoria Public Sector Comparator Technical Note*, and *Partnership Victoria Risk Allocation and Contractual Issues*, Victoria Department of Treasury and Finance, Victoria, Australia, 2001.

³⁷ Yoshida, T., "Japan's Experience in Infrastructure Development and Development Cooperation," *JBIC Review No. 3*, Tokyo, Japan, 2000.

³⁸ Fay, M., and T. Yepes, "Investing in Infrastructure: What is Needed from 2000 to 2010?," World Bank Policy Research Paper 3102, 2003.

³⁹ Japan International Cooperation Agency, "A New Dimension of Infrastructure," March 2004, page 18.

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- ⁵³ Highway Law of the People's Republic of China (1997), China Laws for Foreign Business, Commerce Clearing House (CCH), Business Regulation. ¶ 19-628.
- ⁵⁴ Electric Power Law of the Peoples Republic of China (1995), China Laws for Foreign Businesses, Commerce Clearing House (CCH), Business Regulation ¶ 19-604.
- ⁵⁵ China Telecom Regulations, articles 45, 46, 48, 49, 50, 51.
- ⁵⁶ See www.cin.gov.cn.
- ⁵⁷ Administration of Foreign-Invested Construction Enterprises Provisions (2002), Ministry of Construction and the Ministry of Foreign Trade and Economic Cooperation, known as the "FIE Construction Regulations"; Relevant Administration of Qualifications in the Administration of Foreign-Invested Construction Enterprises Provisions Implementing Procedures (2003), the Ministry of Construction, the "PIE Construction Implementing Regulations."
- ⁵⁸ Administration of the Quality of Construction Works Regulations (2000). Ministry of Construction.
- ⁵⁹ Under the FIE Construction Regulations, arts. 6-14, a foreign contractor must submit application to MOFCOM that includes a feasibility study, articles of association, bank creditworthiness and proof of corporate existence, financial statements, and documents concerning PIE personnel. Under the FIE Construction Regulations, art. 10, a foreign contractor must submit to the Ministry of Construction include FIE construction enterprise qualification application, approval certificate from the Ministry of Commerce, and various financial documents.
- ⁶⁰ 1979 Trade Agreement between the United States and China, Article 8.
- ⁶¹ Laws for Foreign Business (CCH), Business Regulation, ¶ 10-480.
- ⁶² The Chinese Civil Law, art. 145.

VI. Recommendations for Establishing a “New Japanese Standard Conditions of Contract for Civil Works”

The FIDIC Contracts and the associated Standard Conditions of Contract are recognized throughout the world as a reference document for the construction of civil works infrastructure projects. In recent decades the FIDIC contract documents have become a de facto international standard that is known by stakeholders in the global market for civil works infrastructure construction. Therefore, in the global market, the expectation is that “everyone” is familiar with the FIDIC contract documents. It is from the FIDIC contract documents that modifications are suggested and emphasized, so that changes that are being made are obvious. As previously indicated, the FIDIC contract documents are based on a philosophy of “mutual mistrust.” Therefore, the Author has used the FIDIC contract documents to illustrate and contrast the changes that will avoid as crisis in the Japanese civil works infrastructure construction industry and to develop and foster project management and contract administration skills sets.

One commentator compared the Japanese Standard Conditions of Contract for Public Works with the requirements of the Institution Civil Engineers (ICE) standard contract used in the United Kingdom in 1992.¹ With respect to international construction contracts, the following was noted regarding Japanese contractors operating in the global market with the 1987 FIDIC version of the Red Book, which was an adaptation of the ICE contract and conditions of contract:

“Over the past three decades, Japanese contractors have acquired a lot of experience in undertaking international construction projects under the FIDIC Conditions [of Contract], but they are still lacking sophistication in functional knowledge of the full ramifications of the FIDIC Conditions, and therefore experience difficulties in negotiation of, and in dealing with problems of performance in, contracts based on those Conditions [of Contract]. The consequence of this situation is often additional incurred costs or delay or both, leading to a bad financial result for the Japanese contractors. This does not necessarily mean that Japanese contractors lack negotiation skills or management capability in general; rather it means that they have applied (and many are still applying) the methods and practices of Japanese domestic construction contracting to the performance of international contracts... And one might think those Japanese forms to be commercially practical...a detailed examination...show[s] that these forms definitely are lacking, not only in precision in their conditions and the procedural requirements necessary for the proper performance of construction contracts, but also a mechanism for dealing with the situation in which no agreement is reached by negotiation between the parties, especially in respect of extension of time and adjustment to the contract price... Commercial [mutual trust] depends upon economics, therefore, economic power fills in the vague details in Japanese construction contracts...The Japanese standard forms of construction contract together with the bidding system and subcontracting system will not work well in the future performance of a contract in a truly competitive market, which is demanded, not only by outside pressure, i.e. the involvement of foreign nationalities, but also by the economic situation of the Japanese domestic market, i.e. persisting recession.”

As has been indicated above, the management skills of project management that is derived from contract administration that is necessary in executing projects based on a culture or philosophy of “mutual mistrust” is the specific management ability that the domestic civil works infrastructure construction industry lacks.

Japanese contractors have tried developing contracts that address "mutual mistrust" in the conditions of contract. The Engineering Advancement Association of Japan (ENAA) in 1986 published a standard contract and conditions of contract for process plant execution where the Owner/Employer has a process license from the contractor – the ENAA Form of International Contract for Process Plants. In 1992, ENAA revised the standard contract documents and issued a new second edition, and added an alternative for process plants where the Owner/Employer does not procure a process license from the contractor. In 1996, ENAA issued a standard contract and conditions of Contract for power plants – the ENAA Form of International Contract for Power Plant Construction. The ENAA forms were intended for execution of Lump Sum Turnkey industrial plants. The ENAA forms are primarily used by Japanese contractors offering private construction of these industrial plants in the global market. Although the ENAA forms have garnered reference by international commentators, they are used less often by other global contractors in executing these types of projects in the private sector. The projects on which the ENAA forms are used are not normally considered civil works infrastructure construction, unless there is a significant process requirement or a significant equipment component. Curiously, the timing of the ENAA forms development was coincident with the Japanese attempt to have a philosophy of "mutual trust" accepted as an option in the global market. The Japanese apparently felt a result would be the promotion of a form of project management that did not place a high degree of importance on contract administration. The Japanese apparently believed the adoption of the ENAA forms would make the requirements of the commitments made to the WTO more palatable. Then, Japan did not have to reform the civil works infrastructure construction industry and enable it to compete domestically with contractors that were familiar with the "mutual mistrust" environment of the global market. The plan has not worked. The ENAA forms, however, do demonstrate some areas of what may be acceptable to the Japanese. The ENAA Forms are a useful guide in some instances for civil works infrastructure construction.

In 1999 FIDIC began issuing revised contract forms, or the so-called FIDIC "Rainbow Series" of contracts. The "Rainbow Series" cover a number of different delivery or execution methods. The key contracts involving civil works infrastructure construction projects, however, are:

- The traditional "Red" book form which is the "Conditions of Contract for Building and Engineering Works Designed by the Employer, 1999." The World Bank requires the use of the prior 1987 fourth edition (1996 Reprint) of the form known as the "Conditions of Contract for Works of Civil Engineering Construction." Although the World Bank has not adopted the new 1999 edition, there is indication that the changes to the 1987 Edition that the World Bank's Standard Bidding Procedures require be used for global civil works infrastructure construction are similar to what FIDIC has published with the 1999 edition.
- The "Silver" Book which encompasses the "Conditions of Contract for EPC Turkey Projects, 2nd Edition, 2003," covers Engineer, Procure, Construct, Design-Build (or Turnkey) type contracts. This form of contract covers Lump Sum Turnkey (LSTK) contracts where the contractor tenders on a design concept to perform detailed engineering and construction for civil works infrastructure construction projects. It is being promoted for use on BOT [Build-Own-Transfer] or PPP [Public Private Partnerships] civil works infrastructure construction projects. This form of contract that would cover the newly evolving method in Japan of executing civil works infrastructure construction projects by way of PFI [Private Finance Initiative] schemes.

These are the forms of Contract and the Conditions of Contract that the stakeholders civil works infrastructure construction global market are using, and the project management personnel are today honing their contract administration skills. Below are addressed a number of areas similarity with "mutual mistrust" as exemplified by the FIDIC Conditions of

Contract and areas where they differ dramatically with “mutual trust,” as exemplified by the Construction Business Law, the Contract and Standard Conditions of Contract for Public Works. The laws could be changed to either allow adoption of the FIDIC Red and Silver Books, or they can be used to modify the Japanese Construction Business Law and the Standard Conditions of Contract for Public Works. In the following discussion, the Standard Conditions of Contract for Public Works is the latest edition, promulgated on May 23, 1995.

The reason to use standard forms was exemplified by one commentator who said in regard to standard contract forms used for construction:²

“The construction lawyer who wished to do a good job for his client first should assemble as many of the standard forms as he can, organize them by contract type, and analyze them. Next he must make a tentative recommendation for the particular transaction for which he has been asked to draft a contract. Prior to making this recommendation, the lawyer should consider whether the owner is best served by a customized contract or by a standard contract. A customized contract should be used in the owner wished to take more interventional role, if the architect or engineer is not to perform in the way that design professionals usually perform, and if the contract is to be one with a tight fixed price. Also, if the owner does not prefer arbitration, as built into the standard contracts, a customized contract is more expensive to prepare and requires greater skill. If an attorney does not have the skill and cannot justify the time needed to develop or procure a customized, he should suggest a standard contract. If no standard contract fits his client’s needs, he should recommend that the client retain an attorney with the skill to draft a good customized contract.”

The recommendations below are based on great experience as to what the global market requires and expects, but as recommendations, they should be merely a starting point. Adherence to such recommendations will avoid the crisis that is facing the Japanese civil works infrastructure construction industry through the creation of a New Japanese Standard.

A. Change is Necessary in the Construction Business Law

The level of similarities and dissimilarities between the FIDIC Conditions of Contract and the Standard Conditions of Contract for Public Works is about equal. But, a major difference in the Conditions of Contract is the number of conditions that refer to issues being subject to “mutual consultation” or “mutual negotiation” (*kyogi* 協議). Thus, what has been referred to as the “mutual trust” orientation of the Construction Business Law. The requirement of “mutual consultation” in the Standard Conditions of Contract of Public Works often is criticized as being contrary to global practice in civil works infrastructure construction execution and it is a slightly less of a requirement in the 1995 edition.³

Nonetheless it is still a hold over allowed by the Construction Business Law. The Owner/Employer is given a dominant economic position, and “mutual consultation” elevated to a almost revered position that is held against foreign competitors because they “don’t culturally understand.” The Construction Business Law actually alters the Civil Code requirements for a “Contract for Works,” and substitutes a contract form not recognized by the Civil Law. Thus, much of the genesis is the contract form that the Construction Business Law creates is as a result of allowing a form of contract that is an aberration. Further, the Construction Business Law has substituted contractual requirements in regards to payment terms, liability, warranty, risk of loss, etc., that have allowed civil works infrastructure construction to be manipulated in the past. The result has been the industry as it is found today. The civil works infrastructure construction industry faces an uncertain and troublesome future unless there are changes to allow competition in line with Japanese WTO commitments and to prepare for a consequent transition.

1. Form of Contract

First and foremost, the dominant position of Owner/Employers (the Government) must be eliminated from construction contracts. Thus, the allowed contract for civil works infrastructure construction must recognize the equality of contracting parties, and not perpetuate the concept of contracting between a benevolent master (the Government) and its servants (the contractors). This one change to the Construction Business Law will make the practice of “mutual consultation” less necessary. FIDIC in prior editions of the Conditions of Contract required parties as part of the Dispute Resolution process to initially negotiate their differences in good faith, but the good faith was from a philosophy of “mutual mistrust.” Thus, if the Government felt that “mutual consultation” was still desirable, they could equate the practice to negotiation in good faith as a first practicable step, but not make it overwhelmingly the “only step.” The issue of equality of the parties only will become a reality in the civil works infrastructure construction industry through the procedures, such as, those that create the concept of “mutual mistrust.”

For, as a commentator concluded over a decade ago:⁴

“The Japanese standard forms of construction contract together with the bidding system and subcontracting system will not work well in the future performance of a contract in a truly competitive market...”

Japan does not have a tradition of the Engineer typical on projects in the global market, that is, the Engineer is not from an independent firm. In Japan pursuant the Construction Business Law, the Engineer’s role is fulfilled in construction contracts by the Owner/Employer’s project manager supervising the contractor’s performance of the work in accordance with the construction contract, and, if such contract is not being complied with, to have the contractor rectify it. The Standard Conditions of Contract for Public Works, article 9(1), provides that when the Owner/Employer appoints the “project manager,” the

Owner/Employer shall inform the contractor of such project manager's name. Under the Construction Business Law and the Public Accounting Act,⁵ the project manager nominated by the Owner/Employer (the Government), whether from the procuring agency's contracting staff for a civil works infrastructure construction project or a hired construction consultant, assures the contractor's performance of the contract obligations.⁶ The contractor is required pursuant to the Construction Business Law to nominate a "Chief Engineer" and a "Managing (Supervising) Engineer" of suitable qualifications and inform the Owner/Employer.⁷ The Construction Business Law has detailed requirements that the assigned Engineers must possess to assure that the Owner/Employer has secured the required "Construction Technology." The contractor's assigned Engineers are required by the Construction Business Law to meet the requirements of education and experience, and to have the proper certifications. Japanese engineers for civil works infrastructure construction have been trained well. Their competence is assured by thorough testing that is required under the Construction Business Law. Thus, Engineers who are assigned by contractors engaged in civil works infrastructure construction are trained, tested, approved, certified, and experienced in the Standard Conditions of Contract for Public Works. Therefore, Japanese Engineers thoroughly understand the requirements of a contract that assures the dominance of the Owner/Employer that the Construction Business Law imposes. But, the Japanese Engineer on civil works infrastructure construction must develop project management skills that are consistent with the best practices in the global market, and that requires contract administration that they will use with a contract that recognizes "mutual mistrust."

The Government can use the WTO agreements to accomplish reforms required in a sensible and logical fashion by changing the Construction Business Law. If they do not, the contract and the methods that flow from the Construction Business Law in Japan will be forced upon it by foreign competitors who use global practices.

2. The Bidding System

The bidding system is not transparent as discussed earlier. The bidding systems does not meet what parties who operate the global market expect. One method for changing the bidding or tendering procedures could be the use of guidance that is suggested by the UNICITRAL (United Nations Commission on International Trade Law) Model Law on Procurement of Goods, Construction and Services as regards the bidding or tendering processes. Although the law has been enacted by a few countries, legal commentators are in general agreement that the law is generally consistent with the WTO's Agreement on Government Procurement (AGP) that is driving the Japanese Government's need to allow foreign competition in the domestic construction market, and particularly civil works infrastructure construction.⁸ The Model Law is based on concepts of "mutual mistrust" and reflects best practices from the global market. The Model Law suggests the following regarding:

a. Qualification of Suppliers and Applications for Qualification

To ascertain the qualifications of suppliers or contractors, the Model Law sets out broad criteria. The AGP only limits pre-qualification criteria by reference to the need not to discriminate. The Model Law requires public notification in named newspapers and for tenders in international newspapers. The invitation to bid or tender and invitation to pre-qualify must contain certain information including the nature and quantity of goods and the location of the construction, the timetable for supply and construction, the criteria and procedures to be used for evaluating qualifications, and a declaration that suppliers or contractors may participate regardless of nationality or, where there is some restriction, what that restriction may be. The notice must also make it clear where the documents can be obtained, the price range, the currency, language and place and deadline for submission of

tenders. The charges for any documents must be no more than cost and any documents must clearly set out all the requirements relating to the procurement. These requirements are quite detailed and refer to all information likely to be required of a tender, including the names of officers who can be contacted in order to provide information and “who are authorized to communicate directly ... with contractors . . . without the intervention of an intermediary” The documents must also set out the various rights which bidders have under the Model Law, including the right to seek review of an unlawful act or decision. The qualification criteria adopted by Japan for foreign companies, although cosmetic in nature, meets these criteria. These criteria should be adopted for all parties, foreign and domestic.

b. Non-discrimination

The Model Law would require that criteria for evaluation be published and that any evaluation be made in accordance with those criteria. The Model Law expressly prohibits discrimination on the basis of nationality or on criteria which are “not objectively justifiable”. The AGP is consistent, but the breadth of practice is questioned by some commentators.

c. Pre-qualification

The rules for pre-qualification proposed in the Model Law require the procuring entity to provide considerable detail about the manner and place of submission. The procedures that have been established domestically in Japan are consistent with both the Model Law and the AGP.

d. Nationality of Suppliers

The Model Law specifically permits suppliers or contractors to participate in procurement proceedings without regard to nationality. However, an exception is permitted where the procuring entity decides on grounds specified in the procurement regulations, or according to other provisions of law, to limit participation in procurement proceedings on the basis of nationality. The AGP makes some form of discrimination possible unless parties are nationals of countries that have signed the AGP. In Japan, bi-lateral trade agreements accomplish the same result, but have effectively been used to limit access to domestic markets.

e. Form and Language of Communications and Documentation

The Model Law forbids rules which are discriminatory and propose (as an option) that notices be published in a language understood in global market. This is consistent with the spirit of the AGP. This language is typically English, and Japan in the last two years has been consistent with this requirement. But, it is only projects that fall within the purview of the AGP. The Japanese market must become competitive, so opening the civil works infrastructure construction market more broadly will accomplish the goals outlined above much sooner.

f. Procurement Records

The Model Law requires careful record keeping with respect to all procurement proceedings. This requirement is consistent with the AGP, but only with respect to those projects which fall under its purview. In the interests of transparency, all decisions on civil works infrastructure construction (unless there is a security or related reason that is known to all bidders) should be documented and appropriately available for public scrutiny.

g. Reasons for Rejections of Bids or Tenders

The Model Law permits the procuring entity to reject all tenders for no reason, but the AGP only permits rejection of all bidders or tenders, if such is in the public interest. In this area the Government has used the right to reject all tenders for no apparent reason as a means of effectively employing the Designated Competitive Bidding on civil works infrastructure construction and to obtain a bid for the price that the Government has determined the project is worth. Rejection of bids or tenders and the defining the allowed reasons therefore must be spelled out in the procedures and be consistent with a revised Construction Business Law. The reasons must be limited, recorded in the procurement records, and open for public scrutiny, thus lending transparency to the process.

h. Public notices and anti-corruption provisions

The Model Law requires public notice of procurement contract awards, which is consistent with the AGP. The Model Law also requires procuring entities to reject tenders where there are offers of inducements by suppliers or contractors. The MILT procedures on corruption discussed earlier, for example, need to be broadened to cover all Owner/Employers, including those under PPP or PFI regimes, and strengthened regarding the offering of inducements in the domestic civil works infrastructure construction market.

i. Methods of Procurement

The majority of domestic civil works infrastructure construction is subject to the rules for Designated Competitive Bidding, under which many of the abuses described earlier have occurred. Thus, Designated Competitive Bidding should be forbidden except where there are specifically described situations, such as, emergency construction, etc. The Model Law permits restricted tendering in two broad sets of circumstances. The first allowed exception is economy and efficiency where the goods, construction or services are available by reason of their highly complex or specialized nature only from a limited number of suppliers or contractors. Thus, the Designated Competitive Bidding should be limited carefully to such circumstances. The second is that the time and cost required to examine and evaluate a large number of tenders would be disproportionate to the value of time goods, construction or services to be procured, which should accommodate procurement for small civil works infrastructure construction, especially by local townships.

j. Submission of tenders

The Model Law recognizes that procuring entities may need to change the date for submission of tenders and permits them to do so where one or more suppliers or contractors may not be able to submit bids or tenders by the deadline owing to circumstances beyond their control. Under the Model Law is a blanket prohibition on the opening of bids or tenders received after the deadline. This latter provision is contrary to the provisions of the AGP which permit late receipt where this is not prejudicial to the process and where the lateness is outside the control of the bidder. The domestic procedures that govern civil works infrastructure construction are generally adequate, provided that the use of Designated Competitive Bidding is restricted.

k. Opening and Evaluation of Bids or Tenders

The Model Law addresses procedures in some detail. Bids or tenders must be opened at the time specified and all bidders are permitted to be present at the opening. The details of each tender that are requested in the solicitation must be announced at the opening. Once the bid or tender is open the procuring entity may seek clarifications of the tenders in order to assist in the examination evaluation and comparison of them, but no change in a matter of substance in the bid or tender may be sought, offered or permitted. A bid or tender is not regarded as responsive if it does not conform to all the requirements set out in the bid or

tender solicitation documents unless the non-conformity is minor and does not materially alter or depart from the requirements. A bid or tender which is not responsive may not be accepted. These procedures are consistent with the AGP. The broadening of these requirements for the domestic civil infrastructure construction market will require a change in the requirements of the form of contract allowed through changes in the Construction Business Law.

I. Review and Appeal

The Model Law allows review where a supplier or contractor claims to have suffered or is likely to suffer loss or injury due to a breach by the procuring entity. Complaints must be made first to the head of the procuring entity and must be submitted within a defined period of time. The head of the procuring entity is not required to consider a complaint after procurement contract has entered into force. If the complaint is not resolved by agreement the head of the procuring entity is required within 30 days to issue a written decision indicating his reasons and any corrective measures. If he does not issue a decision or the complainant is dissatisfied further remedies will be available. The Construction Business Law provides for such an administrative review body. But, it is subject to the types of transparency conflicts that were criticized above. The administrative review body should have a detailed brief, possibly limited to review of such bidding disputes, and not engage in any type of conciliation or mediation. Then the administrative review body is not subject to abuse, or the perception of abuse. All suppliers or contractors participating in the procurement proceedings are entitled to notice of the complaint and any such supplier or contractor has a right to participate in the review proceedings. Copies of decisions by the head of the procuring entity or the administrative body must be made available to other bidders and eventually to the public. Therefore, the use of Administrative Guidance must not be used for the domestic civil works infrastructure construction market.

3. Subcontracting

In Japan there are over 550 million licensed construction contractors and 99% of them are small and medium-sized firms consisting of unincorporated individual firms and incorporated firms with capital less than ¥100 Million. The issue of subcontracting becomes bound up with the licensing laws for contractors engaging in civil works infrastructure construction. There is a typical hierarchy of subcontractors. Almost all of the licensed contractors are labor only, with the contractor generally providing or renting necessary equipment.⁹ The work is generally negotiated by the contractor with these labor-only subcontractors, after the contractor has tendered its bid and the Owner/Employer awarded the contract to it. The subcontract agreements are simple, often oral, and provide that the subcontractor undertake a specific part of the works with the general contractor responsible in all respects to the Owner/Employer. In the case of civil works infrastructure construction, the contractor is expected to control cost, quality, safety and the date of completion. Because of the Japanese tradition of "tiered" subcontractors, the contractor's importance to these dependent labor subcontractors is very large, and thus the Construction Business Law extensively prescribes responsibilities of contractor and subcontractors with respect payment to subcontractors.¹⁰ Similar to the global market, the contractor can choose what portion of the works it will subcontract, but the contractor is forbidden from subcontracting all of the works to one or more subcontractors.¹¹

Nonetheless, the global practice of subcontracting by way of bidding before tender, having written subcontracts, etc. will come with foreign competition. The key element is to have written agreements with specialist subcontractors. While FIDIC does not provide much guidance, it follows that the Conditions of Subcontract should be “back-to-back” with the provisions of the 1999 FIDIC Red Book. In other words, the policy of the subcontract Conditions of Subcontract should be, wherever practicable:¹²

- a. For the contractor to have, in relation to the subcontract works, the rights and obligations (except as to price) of the Owner/Employer.
- b. For the subcontractor to have, in relation to the subcontractor works, the rights (except as to price) and obligations of the contractor.

Thus, to the extent the Construction Business Law makes a contractor responsible to the Owner/Employer, the Construction Business Law should require a subcontractor to be responsible to the contractor for its defined scope in the same manner as the contractor is to the Owner/Employer (except for price). Furthermore, under the 1999 FIDIC books the contractor is to inform the Owner/Employer (or the Engineer) within a prescribed time (normally 28 days of the subcontractor commencing work) of its intent to subcontract an identifiable scope, the particulars regarding such contractor, and the start date of such subcontractor. A comparable provision in the Construction Business Law should require all subcontractors to be used on civil works infrastructure construction projects to be identified, the scope of the works subcontracted to the specific subcontractor, and information that is required of foreign contractors. The issue of project management with contract administration between the contractors and subcontractors must be handled commensurate with such the change in the contracting philosophy of the Construction Business Law. At the very least, the subcontractors will of necessity have to adapt to remain competitive in the domestic market, because the role of “Big Brother” to the contractor will not be viable for civil works infrastructure construction.

Specialty subcontractors from the global market who have the skill, equipment, expertise, and the labor will seek out market opportunities as the domestic market for civil works infrastructure construction is opened to meet Japan’s WTO commitments. The issue of the licensing of contractors and subcontractors is beyond the scope of these recommendations, but the need to address project management and contract administration skill competency is equally as important to subcontractors.

The 1999 FIDIC Red Book does provide for the use of nominated subcontractors, which is not recognized by the Construction Business Law. The practice is not endorsed by FIDIC, and the origins are asserted by ENAA to be the development of the nomination system in use in Europe and the United Kingdom. The traditional problems of the system “*are those arising where a nominated subcontractor has stopped work because of its insolvency, or has repudiated the subcontract before completing the work, or is dismissed by the Contractor for incompetence.*”¹³ Clause 5 of the 1999 FIDIC Red Book defines a nominated subcontractor as one:

- a. “*who is stated in the contract as being a nominated subcontractor, or*
- b. *when the Engineer, under clause 13 [Variations and Adjustments] instructs the contractor to employ as a subcontractor.*”

The contractor is under no obligation to use the nominated subcontractor, if he raises reasonable objection by notifying the Owner/Employer or the Engineer. The grounds to object are not specified, but the 1999 FIDIC Red Book gives a number of acceptable grounds: competence, lack of resources, lack of financial strength, etc. Also, the contractor is not required to accept the subcontract, if it is not “back to back” or does not indemnify the contractor for non-performance. There are specific payment provisions that are comparable to those regarding subcontractors in the Construction Business Law. In the 1999 FIDIC Silver Book a subcontractor may only be nominated by the Owner/Employer for Variations.

The ENAA Model Forms which predated the 1999 FIDIC Books did address the matter of nominated subcontractors. ENAA requires in the Model Forms’ provisions regarding nominated subcontractors:

- a. A nominated subcontractor must be named by the Owner/Employer before entering into the contract, and the terms (including pricing) of the subcontract must be specified in the contract documents.
- b. The “provisional sum” and “prime cost” concepts are not employed
- c. Unless subcontract terms have been agreed before signing the prime contract, the contractor is entitled to refuse the subcontract with the nominated subcontractor. The contractor can also refuse to enter the requested subcontract if the nominated subcontractor declines to undertake the contractor’s obligations and liabilities (back to back contract terms) that the contractor has with the Owner/Employer; or if in the contractor’s opinion the nominated subcontractor is not competent and reliable.
- d. In the event of the contractor’s refusal of the original nominated subcontractor, the Owner/Employer must name another nominated subcontractor, enter into a direct contract with the nominated subcontractor or require the contractor to proceed to subcontract the nominated subcontractor despite the contractor’s refusal. The third choice, however, entitles the contractor to amend its contract with the Owner/Employer, and if amendments are not agreed within 30 days of the contractor’s proposal of such amendments, then the third choice expires and the Owner/Employer must either accept one of the first two options or abandon the nomination process.

The net effect of these nominated subcontracting provisions is to give the contractor effective control over the process. If a nominated subcontractor is agreed to by the contractor, then the subcontract is fixed prior to signing the contract with the owner. The true effect of the ENAA Model Forms nomination provisions is to shift most of the risk of satisfactory performance by the nominated subcontractor to the Owner/Employer. One commentator at the time suggested that:

“The net effect of these nomination provisions is to give the contractor effective control over the nomination process, and if a nominee is agreed, then to fix the subcontract relationship (including price and subcontract conditions) prior to signing the contract with the owner.”¹⁴

This same position is taken by the European International Contractors (EIC) as regards the 1999 FIDIC Books. The EIC wants provisions similar to that of the ENAA, if nominated subcontractors are allowed.¹⁵ The practice of nominated subcontractors is not a practice

that is accepted universally in the global market. Japan should not change the Construction Business Law to allow its usage.

4. Dispute Resolution

The 1999 FIDIC Red Book defines the process for dispute resolution, which provides in Clause 20¹⁶ and through the various sub-clauses there under, provides for a multi-step process that is conceptually the same as provided in the Construction Business Law. The FIDIC concept and that of the Construction Business Law, however, are decidedly different. In the FIDIC Red Book the traditional “two-tier” approach has been maintained for Dispute Resolution as was contained in the 1987 FIDIC Red Book, 4th edition, except that the role of the Engineer as a decider of disputes in the first instance has been replaced by a Dispute Adjudication Board (DAB). The 1999 FIDIC Red Book procedure for settlement of disputes by a DAB may be broken down into six steps:

- a. The DAB procedure applies where there is a dispute between the Contractor and the Owner/Employer. The dispute must arise from a claim that has been decided and rejected by the Engineer. The Contractor is thus still pursuing the claim because the contractor does not agree with the Engineer's decision. For example, the Contractor claims that the Owner/Employer delayed the Contractor because the Owner/Employer changed the conditions upon which the tender or bid was based, and having given timely notice, the contractor is claiming reimbursement of its additional costs, profit, and time extension. If the Engineer rejected this claim on the basis the scope defining documents had shown the intent to include the scope, and the Contractor disagreed, a dispute that could be referred to the DAB under Clause 20.
- b. The Contractor refers such dispute to the DAB in writing for its decision under Sub-clause 20.5.
- c. The DAB, which act as a panel of experts and not as arbitrators, must give a written decision of its decision to the parties within 84 days.
- d. If either party is dissatisfied with the DAB's decision, then either the Owner/Employer or contractor must notify the other of its dissatisfaction within 28 days or the decision becomes “final and binding”.
- e. Where a party has been given a notice of dissatisfaction within the 28 days, both the Owner/Employer and the contractor have 56 days to attempt amicable settlement.
- f. Where the DAB's decision neither becomes final and binding nor amicably settled, the dispute is finally settled by arbitration. There is a key difference between FIDIC and the Construction Business Law. The members of the DAB are final determiners of the “facts,” what is meant practically by the provisions of the contract requirements, what factually occurred, etc.

There is no perception of prejudice of any of the DAB members. And transparency is maintained because all of their decisions must be in writing. Arbitrations under the 1999 FIDIC Books tend to become relatively narrow, because no dispute may go to arbitration unless it has been through the six steps. Accordingly, if the arbitrators embark on any other matters, without the parties' consent, they will be exceeding their jurisdiction and any award

may be set aside, refused recognition and enforcement by a competent court. On civil works infrastructure construction projects there are typically a large number of disputes. In each case, each dispute must have passed through the six-steps. As regards counterclaims, for example, it assumes that the Contractor has complied with the six steps and commenced arbitration. If the Owner/Employer wants to introduce counterclaims in the same arbitration, the Owner/Employer must follow this same procedure with respect to its counterclaims, unless it demonstrates that the counterclaim was effectively included in a dispute which had already been referred to the DAB for decision.

The purpose of the pre-arbitral DAB procedure is for both parties and, subsequently, any arbitration panel to have the benefit of a decision of the DAB on every dispute. A decision of the DAB may increase the chance of a settlement and avoid the need to arbitrate the dispute. That purpose is subverted if a party is relieved from complying with Clause 20 in respect of any dispute merely because the other party has done so with respect to another dispute. The test of whether a counterclaim raised by the Owner/Employer must be submitted to the DAB for decision should be whether the Contractor had previously requested the DAB to decide a dispute which necessarily would have resulted in a decision on that counterclaim. If the Contractor had made such a request, then the Owner/Employer will be able to raise the counterclaim in the arbitration without having to make an independent referral of the matter to the DAB under Clause 20. On the other hand, if the Contractor had not done so, and the issue raised by the counterclaim had not been encompassed in an earlier dispute, then the Owner/Employer submits that issue to the DAB for decision before submitting it as a counterclaim in the arbitration. It can take 168 days from the time of referral of a dispute to the DAB under Clause 20 before a party can begin arbitration (84 days for the DAB to make a decision, plus 28 days for the giving of a notice of dissatisfaction, plus 56 days for amicable settlement).

The FIDIC Red Book has always provided that the Engineer may be called as a witness and give evidence before the arbitrators. In the prior editions of the FIDIC Red Book the Engineer's decisions were often the Employer's first line of defense to the Contractor's claims. Clause 20 in the 1999 FIDIC Red Book does not state expressly that the members of the DAB may be called as witnesses in the arbitration, because the primary role of the DAB is to decide disputes which are submitted to them and, unlike the Engineer, they would not normally have first-hand knowledge of the execution of the works. The earlier editions of the Red Book, which had provided that disputes had to be decided by the Engineer, had expressly provided that neither party was limited in any arbitration to the evidence or arguments put before the Engineer. Accordingly, the current provision is to the same effect now that a DAB is in place. The principle is that in arbitration, either party is entirely free to present new arguments or evidence in relation to disputes and is in no way limited by what it may have said previously. In arbitration, the parties will normally be represented by lawyers, which may not have been the case when submissions were made to the DAB. Accordingly, legal arguments or evidence which had not been presented to the DAB may be presented for the first time at the arbitration. At the same time, the jurisdiction of the arbitrators is limited to the disputes which have been previously referred to the DAB and been processed through the six-steps. Any decision of a DAB is admissible in arbitration. As a DAB will consist of construction professionals or lawyers who are independent of the parties and who have been chosen with their consent, its decisions are likely to be fairer than those of the Engineer under prior FIDIC Red Books.

The contractor may not suspend or slow down work on the grounds that it has brought to arbitration and the Owner/Employer may not withhold payment from the contractor on such grounds either. As a practical matter, it may be very difficult for either the Owner/Employer or the contractor to simultaneously execute the works and engage in arbitration. Arbitration demands attention from management and staff. For this reason, both parties tend to wait until after completion of the works before beginning arbitration. But, they still will have to meet the notification timing and six steps timing requirements.

The DAB is similar in nature to the Dispute Resolution Board (DRB) which originated in the United States in the late 1970's. Generally, three independent and qualified individuals meet regularly on site during project execution and make recommendations in relation to any disputes as these arise. Through the 1990's the use of DRB's were specified for large civil works infrastructure construction projects in the global market, and DRBs enjoyed considerable success in resolving and avoiding major disputes without the need to seek recourse to arbitration or litigation with the consequent expenses.¹⁷ The problem with a DRB was that their decisions were not binding, despite the fact that their decision could be used by either party in any subsequent arbitration. Dissatisfied parties could just ignore the DRB's decision and their decisions became just another tier of the decision making in the dispute resolving process that was not binding and enforceable. As the 1999 FIDIC Red Book has been used increasingly on civil works infrastructure construction in the global market, the DAB is replacing the prior voluntary use of DRB's.¹⁸ The FIDIC Contracts Guide (FIDIC Guide),¹⁹ covering the 1999 FIDIC Books, notes in regards to the 1999 FIDIC Red Book that it is preferable that the DAB visit site on a regular basis, even if there is, at that time, no dispute. Under this approach the members of the DAB would be in a relatively informed position to assist and prevent major disputes arising. The perception and the belief of the parties of the independence of the DAB is thus crucial to its success.

The overall requirements may appear to be burdensome. Through sound project management that uses contract administration both parties are expected to engage in protecting their own interests – the bargain that each reached. Thus, the dispute resolution under the 1999 FIDIC Red Book embodies a philosophy of “mutual mistrust” that forces both parties to develop project management practices and contract administration processes that reflect global best practices.

In contrast to a DAB or a DRB, the current practice in Japan relative to disputes, the parties to a contract, except those subject to the Construction Business Law may elect one of the following methods of resolving disputes:

- Mediation/conciliation by an independent third party appointed by the contracting parties' agreement, which conclusion does not bind the disputing parties unless accepted by both of them, but such accepted conclusion is not enforceable like a court judgment.
- Civil conciliation at the Court under the “Civil Conciliation Act,”²⁰ whereby the court conciliator's proposed settlement, if accepted by the disputing parties, becomes final, binding and enforceable.
- Arbitration under the Arbitration Law, revised in 2003,²¹ and the Code of Civil Procedure which provides that an arbitral award becomes final and binding, and is enforceable.
- Litigation under the Code of Civil Procedure, which provides that all final judgments are binding and enforceable.

- Amicable Settlement or compromise outside of the Court which is settlement that reflects the practice wherein the parties reach a new agreement, which is becomes binding, but not enforceable, per se, under the original agreement.

The latter is the only dispute resolution method that does not involve an independent, third party to make judgments. Generally, this is consistent with global practice. With respect to civil works infrastructure construction industry, however, contracts are governed by the Construction Business Law, and the Owner/Employer is the Government. In virtually all cases of civil works infrastructure construction, the Adjudication Committee as established by the Construction Business Law engages in dispute resolution. The Construction Business Act stipulates three methods of construction dispute resolution. Mediation is defined as a system whereby a member of the Adjudication Committee appointed by its Chairman gives the relevant parties an opportunity to amicably settle construction disputes by means of negotiation.²² Conciliation is defined as a system whereby construction disputes are mediated by three members of the Adjudication Committee appointed by its Chairman to settle the disputes. The Adjudication Committee may prepare a conciliation plan and recommend the same to the disputing parties for acceptance.²³ In such conciliation process, if the Adjudication Committee deems it necessary, a hearing will be held.²⁴ Yet, the Adjudication Committee is composed of the same personnel who are called upon to undertake the final step, arbitration.

The Construction Business Law, Article 25-16 (4), provides that the arbitration proceedings of the Adjudication Committee take place in accordance with the Arbitration Law, supplemented by the Code of Civil Procedure, unless otherwise provided in the Construction Business Law. The dispute resolution process is dependent on the “mutual trust” that flows from the unique contract that is required by the Construction Business Law. In reality the vast majority of cases any disputes are settled by conciliation undertaken by the Adjudication Committee under the Standard Conditions of Contract for Public Works, if and when the contractors use such provisions. As noted above, in reality civil works infrastructure construction projects, the Owner/Employer (the Government) settles most disputes unilaterally in a non-open forum by means that are not written and are contrary to the methods that are used in the global market. There has been no reported case for such mediation/conciliation or arbitration by the Adjudication Committees under the Construction Business Law. With the necessary change to the Construction Business Law recommended, the methods of dispute resolution should be changed to mirror what the global market requires, and generally is in line with the rest of the laws.

Even the ENAA Forms provide in Clauses 6.1 and 6.2 for a two tiered process similar the prior editions of the FIDIC Red Book. First, a decision must be made by the “Expert” who is named in the agreement, may be appointed by the parties’ agreeing, or appointed under the International Chamber of Commerce’s (ICC) Rules for Expert Determination. Under the ICC Rules, the Expert determination is a mandatory step prior to the second step.

Although no binding effect is given to such Expert decision, even during a provisional period until the arbitration award is rendered pursuant to the second step. The second step, should a party or both parties be dissatisfied with the Expert’s decision, is binding arbitration in accordance with the ICC Arbitration Rules. The ENAA Forms, however, were written before the FIDIC rainbow series. Nonetheless, it demonstrates recognition of the importance of using independent third parties for dispute resolution when the market has parties that are accustomed to the global market.²⁵

The changes that the 1999 FIDIC Books make to the dispute resolution process are nearly identical to those that the World Bank requires be made the FIDIC Red Book, 4th edition, in its SBDW (Standard Bidding Document for Works) Procedures, and specifically in the associated Conditions of Particular Application (COPA). But unlike the World Bank which requires borrowers (Owner/Employers) to consider whether the provisions should be

included in the contract documents, the provisions in the 1999 FIDIC Books apply by default in the contract documents unless altered or removed through the Particular Conditions of Contract.²⁶ The major similarities between clause 67 (Dispute Resolution) in the required World Bank revisions to the FIDIC Red Book, 4th edition, and clause 20 in the 1999 FIDIC Red Book are that:

- The DAB procedure applies to all disputes under the contract.
- Where there are to be three members of the DAB (which is compulsory under clause 67 of the COPA), one member is selected by the contractor, one by the employer and these two members select the third member (who acts as chair).
- Either party may submit the DAB's decision to arbitration if dissatisfied.
- The DAB is established at the start of a civil works infrastructure construction project and therefore available at short notice throughout the project execution to rule on matters.
- If neither party gives notice of dissatisfaction with set timeframes (56 days under the COPA, 28 days under the 1999 FIDIC Red Book), the DAB's decision is "*final and binding*" upon both parties. However, 1999 FIDIC Red Book requires both parties to promptly give effect to the decision "*unless and until it shall be revised in an amicable settlement or an arbitral award*", the SBDW provides that the DAB's recommendation becomes final and binding on the Owner/Employer and contractor, if no notice of intention to commence arbitration has been given.

With respect to PPP or PFI contracts for civil works infrastructure construction projects, the DAB is identical in concept, but it is an optional step in the 1999 FIDIC Silver Book and the 1999 FIDIC Yellow book. The World Bank is considering adopting the 1999 FIDIC Silver Book for PPP or PFI type projects.²⁷ Its use is relevant where financiers are involved and require certainty of outcomes. The World Bank is considering reservations expressed by the European International Contractors association²⁸ and the ORGALIME federation.²⁹ Nonetheless, the composition of the DAB is crucial, and as the FIDIC Guide asserts, the success of the dispute resolution procedure depends on the parties' confidence in the individuals who will serve on the DAB. However, in the 1999 FIDIC Silver Book suggests that the DAB is only appointed after a party gives its notice of intention to refer a dispute to the DAB and the DAB will expire after it gives its decision on the dispute.³⁰ Thus, contractors of civil works infrastructure construction in the global market usually seek to amend the 1999 FIDIC Silver Book so that a DAB is set up at the outset for the duration of the project, despite the extra cost this may cause. The contractors assert the DAB appointment only after the dispute has occurred seems completely to detract from the DAB's original purpose. As regards the use in Japan of the PPP or PFI execution method, the Construction Business Law changes should incorporate the contract forms used and not rely on the totally separate Project Finance Initiative Act, Law No. 117, enacted in 1999 to create an exception to the Construction Business Law.

5. The Role of the Engineer

Typically in the global market there is an Engineer employed by the Owner/Employer for the design civil works infrastructure projects and to also act as the Owner/Employer's agent during the execution of civil works infrastructure construction. As regards the Engineer's role

in civil works infrastructure construction, in the prior FIDIC Red Book, 4th edition, the Engineer was required to act as the Owner/Employer's agent during execution of the contract for the works. The Engineer was also adjudicator of the disputes between the Owner/Employer and the contractor. The Engineer's decision was binding on the parties unless a party sought arbitration, then the Engineer's decision prevailed until a final and binding decision is awarded by the arbitration panel. When the Engineer acted for the Owner/Employer, it was obligated to act impartially. In the 1999 FIDIC Red Book such impartiality is not required of the Engineer. The 1999 FIDIC Red Book actually assumes de facto that the Engineer is a biased agent. The Engineer's decision is still required, but where the Engineer is required to obtain the approval of the Employer before issuing an instruction, the requirement must be stated in the Particular Conditions of Contract, thus acknowledging the presumed bias.³¹ In the absence of such acknowledgement, where the Engineer issues an instruction without first obtaining the Owner/Employer's approval, the Owner/Employer is still deemed to have given its approval, except as to the changing the contract.³² The Contractor thus is relieved of a need to establish any limitations on the Engineer's powers.

The Owner/Employer must insert affirmatively, however, language that the Engineer will render opinions "fairly" and pursuant to the contract, in lieu of "impartially," in situations such as the where the World Bank requires use of its SBDW (Standard Bidding Documents for Works). Even so, this is still implicit recognition of the Engineer's bias.³³ As one commentator said of the requirement:

*"The FIDIC engineer is not a perfect role, and the people who fill the role are not always perfect people, but the system has a success rate which far exceeds its failure rate—and when we are faced with failure, we always have our friends the lawyers to fall back on."*³⁴

The ENAA Forms, however, do not define a role for an Engineer. The Owner/Employer names a representative to act on the Owner/Employer's behalf, but in that role the representative receives all notices, instructions, information and other communications to be given by the contractor to the employer.³⁵ The 1999 FIDIC Silver Book uses the format of an Owner/Employer's representative in lieu of an Engineer as well. The Owner/Employer ultimately assumes the obligation of making a decision, but he first is required to consult with the contractor. If the contractor is dissatisfied with the decision, the six steps leading to a DAB decision outlined above become operative, except that the DAB is constituted for that dispute, unless the parties agree otherwise.

The common element in the global market is that decisions are ultimately made by a perceived independent third party, if the parties do not agree. There is not such a party for civil works infrastructure construction projects in Japan, as indicated earlier. The Owner/Employer of civil works infrastructure projects in Japan has been the Government. In 1959, the Ministry of Construction (today the Ministry of Land, Infrastructure and Transport) issued a Circular entitled "Methods of Contracting for the Design of Civil Engineering Works," which issued instructions regarding the both design consulting and construction consulting. The circular established the principle of separation of civil works infrastructure design from its construction execution.³⁶ The Government has historically planned and designed civil works infrastructure projects and fulfills the agent's role during their construction. The Government was responsible for the design adequacy of civil works infrastructure construction projects, and the contractor provided engineers who execute the projects accordingly. The Construction Business Law, indicated above, must be changed regarding civil works infrastructure construction projects. Such a change will have the corollary benefits of fostering a Japanese consulting engineering industry similar to what is found in the global market place, provided that Japanese engineers are trained in contract administration and a full scope of project management, such as, discussed earlier.

A further role is required where a PPP or PFI approach is used. There must be an independent party to which the Owner/Employer, the Concessionaire, Engineer, and the Contractor can have requirements and their fulfillment judged. The 1999 FIDIC Silver Book does not address this issue because of its lack of an Engineer that the 1999 FIDIC Red Book recognizes. For example, in the case of the Partnership Victoria process used in Melbourne, Australia, discussed above, PPP concession agreements contain a mechanism under which the government entity and the concession company appoint an independent technical adviser (with names, such as, independent verifier, independent certifier, etc.) to monitor the project on behalf of the government, and to carry out valuation and certification roles (including for extensions of time, variations, and the like).³⁷ The decisions of these independent technical advisers are agreed to be final and binding with limited dispute rights by any party. Therefore, the contract requires the Owner/Employer, the concessionaire and the engineer/contractor to agree to adhere to the decisions of the independent technical advisers. This actually is more than the role of a DAB under the FIDIC Books, in that there independent role only comes into play when the parties have a dispute. Here, the independent technical advisor determines all parties' compliance generally with the "benefits of the bargain" and any impact by a party's claimed infringement of that bargain.

If Japan is to allow its civil works infrastructure construction industry to adapt to a market with foreign competitors, the Construction Business Law must address the issue of the role of an Engineer that is consistent with a global market contract. Currently, Japan is generally inconsistent in concept and dissimilar with in that the role of the engineer and the contracting philosophy. Since the Government is no longer able to afford the luxury of funding approximately 99% of civil works infrastructure projects as in the past, the ultimate responsibility and obligations for design and superintendence of civil works infrastructure construction must be made compatible with practices in the global market. The Standard Form of Contract and Standard Conditions of Contract for Civil Engineering Services for Public Works, also issued by the MILT 1995, must be addressed in a manner that is consistent with the recommended changes to the Construction Business Law, the Contract and Standard Conditions of Contract for Public Works that flow from the Law.

B. Change is Necessary in the Standards Conditions of Contract for Public Works

The Standard Conditions of Contract for Public Works must be changed to allow for the absorption of the concepts of the global market into the domestic civil works infrastructure construction market as it is opened to foreign competition pursuant to the WTO. But what is the real meaning of globalization for the domestic civil works infrastructure industry? As discussed earlier, globalization for the domestic civil works infrastructure industry means to accept “mutual mistrust” as the basic philosophy of project execution. From such changes the resulting system demands will mean that engineers will have to change and be trained in the procedures of executing civil works infrastructure construction industry with project management and contract administration that meets global standards. Through contract administration, the terms to which every stakeholder in the industry are established when they are defining the “bargain” for which they bid or tender, and then are the “rules” by which execution is judged, evaluated, and monitored. In order for the industry to gain experience to enable it to compete domestically with parties from the global market, and to successfully become a major competitive factor in the global market. To be practical and effective Japan must either adopt a form similar to the FIDIC forms for civil works infrastructure construction, or adopt clauses that are comparable. While Japan could adopt FIDIC, there is a much that is comparable in the current Standard Conditions of Contract for Public Works provided that the form of Contract used for civil works infrastructure construction is changed as recommended. Thus, the discussion that follows is with respect to several major provisions of such Standard Conditions of Contract in concept. Other clauses will be acceptable by changing the manner in which some clauses are interpreted in light of a revised or new Construction Business Law. The suggested changes must of necessity be viewed with the suggested changes to the Construction Business Law which the Standard Conditions of Contract for Public Works is the means of implementing the change that will foster both development of project management and contract administration skills. The domestic Conditions of Contract for Public Works must reflect what the parties will need to record, maintain, and monitor, because it will train both Owner/Employer and contractor personnel to adequately compete with foreign competition and function in the global market. Therefore, the recommendation is to meet the 1999 FIDIC Books terms of concept. As regards specific wording of the requirements, it is not necessary to use the exact FIDIC language, but wording should not deviate extensively, because that will again make Japan's civil works infrastructure construction industry unfamiliar with the global market.

1. Contract Price and Payment

Inherent in the 1999 FIDIC Books is the concept that details of the tendered or bid price are provided to the Owner/Employer, as requested, and incorporated into the contract on civil works infrastructure construction projects.³⁸ The provisions are somewhat different for each of the 1999 FIDIC Books, but in general reflect this philosophy. This requirement includes providing detail relative to the Quantity Survey (or Bills of Material) and any Provisional Sums that the contractor must include in the arriving at the lump sum it is tendering or bidding. In the case of the Quantity Surveys required under the 1999 FIDIC Red Book, if the final measurement of a specific quantity is between 90% and 110% of that specified, then the Owner/Employer will pay the tendered unit price times the actual quantity. If the quantity falls outside this range, and the parties cannot agree, then the dispute resolution procedure is followed to determine actual quantities and the pricing.³⁹ This situation is good example of the importance of the contract administration that is required the part of both parties. The project management teams of both the Owner/Employer and the contractor are required to monitor the conditions under which the one party specified what was desired and the other offered in its tender or bid. The party that documents and gives timely notice will be in the

best position to establish what is different than what it had assumed and the basis of the assumptions, the reasonableness of the assumptions, and the required performance. All the project management teams are then expected to monitor whether the work was included or not included within the intent of the items that are the subject of the difference.

The contrast of what is required by the 1999 FIDIC Books and what is required in a tender under by the Japanese Standard Conditions of Contract for Public Works is stark. See, for example, the prior discussion on bidding procedures. Under FIDIC, the global market for civil works infrastructure construction projects expects to produce careful recordation of assumptions, monitoring, and proof.

Assuming that PPP or PFI approaches to funding civil works infrastructure construction projects, the 1999 FIDIC Silver Book, for example, highlights the careful recordation of what was assumed in tendering for a civil works infrastructure construction project. The contract price is defined as:

"...the agreed amount stated in the Contract Agreement for the design, execution and completion of the Works and the remedying of any defects, and includes adjustments (if any) in accordance with the Contract...The Contractor shall be deemed to have satisfied himself as to the correctness and sufficiency of the Contract Price...Unless otherwise stated in the Contract, the Contract Price covers all the Contractor's obligations under the Contract (including those under Provisional Sums, if any) and all things necessary for the proper design, execution and completion of the 'Works and the remedying of any defects.'"⁴⁰

The Contractor is deemed to have satisfied itself as to the correctness and sufficiency of its tendered or bid price. The 1999 FIDIC Silver Book still contains numerous exceptions, however, to its obligations that allow the contractor to request an increase in the contract price. For example, circumstances that go the assumptions that were made in the lump sum tender or bid include.⁴¹

- a. Costs to the contractor caused by the Owner/Employer's failure to give the contractor access to or possession of the site within the time stated in the Particular Conditions.
- b. Unforeseeable work accommodations to Owner/Employer's personnel or public authorities causing the contractor to incur additional cost.
- c. Costs caused by the Owner/Employer's instructions to the contractor regarding archaeological remains discovered on the site.
- d. Changes in the host country's technical standards and regulations for which the contractor's compliance causes additional costs.
- e. Additional costs caused by the Owner/Employer's instructions to vary the location or details of any tests or to perform additional tests.
- f. Additional costs caused by the contractor's compliance with the Owner/Employer's instruction to suspend work to the extent the suspension was not due to the contractor's fault.
- g. Additional costs caused by the Owner/Employer's interference with the tests on completion.

- h. Additional costs of tests required after the correction of any defect or damage to the works to the extent the defect or damage was not attributable to the contractor.
- i. Additional costs incurred by the contractor when instructed by the Owner/Employer to search for a defect in the works not attributable to the contractor.
- j. Additional costs to the contractor caused by any unreasonable delay by the Owner/Employer to the tests after completion.
- k. Additional costs as a result of any unreasonable delay by the Owner/Employer in permitting access to the works or plant by the contractor, either to investigate the causes of a failure to pass a test after completion or to carry out any adjustments or modifications.
- l. Additional costs caused by a change in the laws of the host country.
- m. Price adjustments for increases or decreases in the cost of labor, goods and other inputs to the works, if so provided in the Particular Conditions.
- n. Financing charges for delayed payments.
- o. Additional costs resulting from the contractor's suspension of work for the Owner/Employer's failure to provide evidence of its ability to pay or non-payment.
- p. Costs of termination by the Owner/Employer for its convenience, that is, without fault.
- q. Cost to the contractor of rectifying any loss or damage due to an Owner/Employer's risk event.
- r. Payment by the contractor of insurance premiums for which the Owner/Employer is responsible and the amount of any insurance payment that would have been received upon the occurrence of an insurable event absent Owner/Employer failure to maintain insurance.
- s. Costs resulting from the occurrence of a Force Majeure event (see the discussion below).
- t. Costs incurred in connection with termination of the contract after a Force Majeure event.
- u. Costs incurred in connection with termination of the contract due to the occurrence of an event making it impossible or unlawful for either party to be released from further performance.
- v. Variations (see discussion below).

Each of these items has various assumptions of what the Owner/Employer or the contractor must define in establishing the bargain that each expects. The contractor thus will seek payment that results from an alleged change with which the Owner/Employer will agree or disagree. In general, the risk of an increase in construction costs will be borne by the

contractor on the theory that the contractor is best placed to control this risk by virtue of having considered all available information that would affect its tender and having provided an appropriate contract price in consideration of all labor and materials necessary for the design and execution of the works. Consequently, the contractor will generally be unable to seek a price increase in the event of changes in the cost of labor or materials unless the assumptions that it reasonably assumed and recorded were different in each of the above situations.

Correspondingly, in the 1999 FIDIC Silver Book the contractor is exposed to the Owner/Employer where the conditions of execution that it assumes were different. For example, the contractor may incur additional financial liability beyond the contract price in the following circumstances:

- a. Changes in applicable country standards which might reduce the cost to the contractor and be subject to a claim for price reduction by the Owner/Employer.
- b. Additional costs incurred by the Owner/Employer from the rejection and retesting of part of the works.
- c. Additional costs incurred by the Owner/Employer for performing remedial work for which the contractor is responsible.
- d. Additional costs incurred by the Owner/Employer relating to any revised programme or schedule necessary to ensure an appropriate rate of progress in the completion of the works.
- e. Liquidated damages payable by the contractor to the Owner/Employer for each day after the time for completion until the issuance of the Taking-over certificate.
- f. Additional costs paid by the Owner/Employer for carrying out the tests on completion upon the contractor's failure to do so within the time allotted.
- g. A reduction in contract price due to failure of the works to pass test or performance tests on completion (see discussion below).
- h. Cost incurred by the Owner/Employer of remedying any defects (see discussion below).
- i. Decrease of cost resulting from a change in the laws of the host country.
- j. Adjustment of contract price for a decrease in the cost of labor, goods or other inputs to the works, if provided in the Particular Conditions.
- k. Retention money held by the Owner/Employer for work not in accordance with the contract or other failure of the contractor to perform.
- l. Costs incurred by the employer related to any termination for the contractor for fault.
- m. Cost of any loss or damage to the works for which the contractor is responsible.

- n. Payment by the Owner/Employer of insurance premiums for which the contractor is responsible and the amount of any insurance payment that would have been received upon the occurrence of an insurable event absent the contractor's failure to maintain insurance.

Likewise, the Owner/Employer will generally be unable to seek recovery of costs from the contractor, for example, unless it can establish a causal connection to a failure of the contractor, and the costs incurred were reasonable. These examples require the recordation and monitoring. Currently, the Owner/Employer (the Government) is not requiring such information be maintained, or even providing the means for doing so, through the Construction Business Law and the Standard Conditions of Contract for Public Works.

All of the 1999 FIDIC Books have provisions with respect to advance payment and monthly progress payments by the Owner/Employer to the contractor. The 1999 FIDIC Red Book and the 1999 FIDIC Silver Book differ regarding terms of monthly invoices. The 1999 FIDIC Red Book requires submission to the Engineer first and the Engineer passes it on to the Owner/Employer. Under the 1999 FIDIC Silver Book monthly invoices go directly to the Owner/Employer.

In Japan regarding the domestic civil works infrastructure construction industry, little significance is placed on written records, as discussed earlier. Rather, the domestic Japanese civil works infrastructure construction market is founded on dependent relationships; contractor with the Owner/Employer, contractor with subcontractors, etc.⁴² The Owner/Employer (the Government) for civil works infrastructure construction makes an advance payment and installment payments to enable a contractor to procure materials, hire labor and establish an operating fund.⁴³ While it is common for contractors to be paid each month for the performance of the previous month, the problems with such a system and the differences from the global market were presented earlier. With the change in the contract allowed by the Construction Business Law, a change in what the contract requires is necessary as suggested earlier with respect to contract price and the breakdown that may be required. The real difference between Japan and the global market is with respect to Variations. With respect to payment, there is little difference from what the global market expects.

2. Variations

Almost every construction contract for civil works infrastructure construction used globally has a variation clause which allows the employer to order variations at his convenience. The 1999 FIDIC Books, clause 13, Variations and Adjustments, allows the Owner/Employer to order a variation at any time before the works is taken over by the Owner/Employer and is reasonably consistent with the design of the works. The contractor may offer "value engineering" changes, if acceptable, to the Owner/Employer. Also, the ENAA Forms, clause 39, provides similarly conditions. In case of extra work on Japanese civil works infrastructure construction projects, the Standard Conditions of Contract for Public Works reflects a contract that establishes the dominant position of the Owner/Employer (the Government) and the practices that it engenders. The contractor is reimbursed after it has executed such extra work, because of a "work first and pay later" philosophy that the Government has demanded and continues to enforce. The contractor is thus placed in a relatively unfavorable cash-flow position. The Standard Conditions of Contract for Public Works require Bills of Quantities to be submitted and approved in situations "when...a large number of uncertain factors, etc." exist, but they are not "binding" on the either party.⁴⁴ Furthermore, the Japanese Standard Conditions of Contract for Public Works, what is required is monitoring the after-the-fact cost consequences and then making an appeal the Owner/Employer who makes a unilateral determination in the case of disagreement.⁴⁵ This unilateral practice is

unique to the Japan and not accepted in the global market. The practice only can be sustained because of the contract conditions allowed by the Construction Business Law. With the recommended change in the contract suggested earlier, minor adjustment in the unchanged provisions of the Standard Conditions of Contract for Public Works would be necessary with respect to when and how changes are handled, whether instigated by Owner/Employer or the contractor, such as, the manner in which a change is submitted and evaluated. Either the approach reflected in the 1999 FIDIC Books or the approach of the ENAA Forms would be acceptable as they are virtually identical.

Variations by their nature affect the scope, quality, time of performance, or cost, or a combination of any of them. Global best practices in project management and contract administration, as illustrated earlier, are driven by assuring a party achieves the benefits of the bargain that it entered into but for the variations, changes, or other interferences that the other party caused. The Standard Conditions of Contract for Public Works therefore must specify the timing parameter for notices and resulting actions on the part of the Owner/Employer, the contractor, and the Engineer (assuming that Japan establishes its engineers in a role similar to the global market). Therefore, Japan must pay careful attention to all the timing requirements required, which should be reflective of those found in the global market.

When a PPP or PFI approach is used, there are additional considerations that are recommended be incorporated in the Standard Conditions of Contract for Public Works. The 1999 FIDIC Silver Book addresses most risks and requirements of the contract for a civil works infrastructure project. The Owner/Employer, however, does continue to bear some risks under terms of the 1999 FIDIC Silver Book which may not satisfy the lenders.⁴⁶ The lenders may wish to see additional financing for cost overruns, for example. The financing of the Owner/Employer must take into consideration potential cost overruns from Variations. This result can be done either through increasing the amount of financing by an amount to account for a reasonable contingency (e.g. 5%—10%) or by providing for a stand-by line of credit, with or without a cap, generally from the sponsors of the civil works infrastructure project if it is different than the Owner/Employer. This stand-by credit can also be provided by the contractor (in the form of an additional completion guarantee), although this will generally not occur unless the contractor is also one of the civil works infrastructure construction sponsors.

The Conditions of Contract should also deal with the situation where lenders may also want to implement step-in/step-out rights, which allow the lenders to step into the contract and take the place of the Owner/Employer under certain circumstances. Such Conditions of Contract give the lenders the right to step in to the contractor's obligations under the contract, but do not require them to do so. The lenders will also be allowed to step out of the contract where they have stepped in, but no longer want to maintain the obligations they have assumed. The Conditions of Contract typically provide that the lenders will give a notice, after which the contractor's termination rights are suspended. The lenders will then appoint an additional party that is bound to satisfy the project company's obligations under the contract until completion. The contractor will then be bound to this additional party for the period of its presence as the step-in entity.

3. Time of Performance and Project Delay

In the global market, as discussed earlier, the Owner/Employer's (or the Engineer's) project management personnel and the contractor's project management personnel are expected to utilize the schedule or programme submitted by the contractor. Thus, the 1999 FIDIC Books all require essentially the same data. In the global market, project management teams for both parties to civil works infrastructure construction projects employ the management of time to record the assumptions that define the bargain. In then monitoring the schedule or

programme regularly, variances from plan can be identified, alternative means for achieving what constituted the bargain can be planned, forced divergences caused by the other party can be measured, and required notices can be given. The 1999 FIDIC Books require the parties' project management teams to use the schedule or programme proactively. There are specific requirements to monitor progress, measure performance, etc.⁴⁷ For instance, the 1999 FIDIC Books requires the parties to accomplish activities such as:

- a. The Owner/Employer (or its Engineer) evaluating the contractor's schedule or programme submitted to assure that it meets all the contract requirements, including the Owner/Employer's (or its Engineer's deliverables or reviews), and that the contractor has a plan that accomplishes project. Thus, for example, the 1999 FIDIC Red Book requires various tests that must be undertaken.
- b. The contractor submitting a schedule that corrects the deficiencies that the Owner/Employer (or its Engineer) found in the contractors schedule or programme.
- c. The contractor submitting a schedule or programme that details all expected deliverables or reviews required of the Owner/Employer.
- d. The submittal by the contractor on a periodically as set forth the Particular Conditions of Contract schedule or programme status, indicating, for example, such events or circumstances that may or are delaying the works.
- e. The Owner/Employer (or its Engineer) reviewing the submitted periodic schedule data to assure the progress is meeting plan, etc.
- f. The contractor submits when required current and future events or circumstances which may impact progress according to the approved plan.

Then, the 1999 FIDIC Books allow the parties to seek time extensions to the project completion date, if they are warranted. Generally, the 1999 FIDIC Red Book generally allows extensions to the civil works infrastructure construction project time for causes, such as:

- a. Variations, for example, where quantities required in execution, or the quality, etc. are changed.
- b. Delay by the Owner/Employer or the Engineer under the following clauses:
 - 1.9.1 Delayed Drawings or Instructions
 - 2.1 Right of Access to the Site
 - 4.7 Setting Out
 - 4.12 Unforeseeable Physical Conditions
 - 4.24 Fossils
 - 7.4 Testing
 - 8.9 Consequences of Suspension
 - 10.2 Taking Over Parts of the Works
 - 10.3 Interference with Tests on Completion
 - 11.8 Search for a Contractor to Remedy Defect (Not Responsibility of the Contractor)
 - 12.3 Evaluations Related to Measurement and Rates
 - 12.4 Omissions
 - 13.2 Value Engineering
 - 13.7 Changes in Legislation

16.1 Suspension of Work]
17.4 Consequences of Employer's Risks

- c. Productivity issues, etc.
- d. Acceleration order by the Owner/Employer (or its Engineer), provided the contractor was not the cause.
- e. Force Majeure events (see the discussion below)

But, the requirements are significant and to meet them is difficult if the contract administration is has not been used through out the execution of the civil works infrastructure construction project, as the examples earlier attest. Where the Owner/Employer or the Engineer order acceleration, for example, because the contractor is not making the progress, the Owner/Employer's or the Engineer's contract administration will have to prove that contractor was the cause of the delay, not itself. Where a party believes it is entitled to an extension of time or the must maintain the time for completion, the other party can recover cost impacts, but the proofs are extensive. Also as indicated earlier, the result is that project management personnel from both the Owner/Employer and the contractor become exceedingly skilled in the contract administration that is necessary in the global market for civil works infrastructure construction projects.

The ENAA Model Forms do not require as extensive a scheduling or programming requirement as the 1999 FIDIC Books. The ENAA Model Forms, however, address typical problems found with industrial plant construction projects that may be found also with certain types of civil works infrastructure construction projects, namely performance, and partial taking over. ENAA suggests, for instance, various ways in which the partial taking over or completion is to be accomplished.⁴⁸

In contrast, under the Construction Business Law and the Standard Conditions of Contract for Public Works, *"the Japanese are not used to increases in budget, they're not used to extensions of schedules or programmes, and they're not used to people saying what they mean."*⁴⁹ Once a Japanese contractor has committed itself to the completion date for a civil works infrastructure construction project, the Owner/Employer expects the contractor to achieve it. If for any reason those committed objectives seem threatened the contractor is unlikely to raise this with the client. The Owner/Employer expects that contractor's problems in completing the project are to be resolved by the contractor. Under the contract of dominance provided by the Construction Business Law, if the contractor's problems are caused by the Owner/Employer (the Government), it is to be resolved by an agreement reached with respect thereto, but it is resolved because the Government makes a unilateral decision thereto. The Standard Conditions of Contract for Public Works require a schedule or programme to be submitted, but it is not binding on either party. Owner/Employer and contractor personnel thus have no need to engage the contract administration or project management practices related to a schedule or programme as a result. The contractors are focused only on the completion in a timely manner, and must incur the costs first.

The Standard Conditions of Contract for Public Works do have provisions for Liquidated Damages payable to the Owner/Employer for failure of a contractor to meet the completion date, as do the 1999 FIDIC Books. The differences concern the level on the limitation on the amount Liquidated Damages that can be charged. The ENAA has a controversial provision that combines all liabilities with a provision that limits them to 50% of the contract amount. Limitation will be discussed under Defect Liability below. Thus, no changes are recommended.

Under the 1999 FIDIC Silver Book the contractor bears the risk of delays in completion. This allocation of risk is based on the principle that the contractor will best be able to regulate the timing of the construction work to satisfy its schedule or programme and meet the contract completion date. In essence, this principle is followed for civil works infrastructure construction in Japan. The Standard Conditions of Contract for Public Works require little adjustment once the form of contract for civil works infrastructure construction to be financed or executed pursuant to PPP or PFI methods is harmonized with that used in the global market. Additional requirements, however, may be required by lenders who provide financing.⁵⁰ Thus, for example, the contractor's commitment to completion date for a civil works infrastructure construction project is essential to the lenders. Late completion can cause loss of production, loss of market share, damages in relation to other related agreements, and can result in additional finance charges. The 1999 FIDIC Silver Book generally satisfies the lenders' requirement, but the contractor on the civil works infrastructure construction project is entitled to an extension of time for delay caused by:

- The Owner/Employer's failure to give the contractor access to or possession of the site within the time stated in the Particular Conditions.
- The Owner/Employer's instructions to the contractor regarding archaeological remains discovered on the site.
- Changes in the host country's technical standards and regulations which cause the contractor's delay.
- The Owner/Employer's instructions to vary the location or details of any tests or to perform additional tests.
- Unforeseeable delays or disruptions by the public authorities of the host country.
- The contractor's compliance with an Owner/Employer's instruction to suspend work to the extent the suspension was not due to the contractor's fault.
- The Owner/Employer's interference with the tests on completion.
- A change in the laws of the host country.
- The contractor's suspension of work for the Owner/Employer's failure to provide evidence of its ability to pay or for non-payment.
- The occurrence of an employer's risk set out in the Particular Conditions of Contract.
- The occurrence of a Force Majeure event.

The Owner/Employer's project management personnel and the contractor's project management personnel still have a large proof burden that only the use of detailed contract administration can provide. So, while the principle is comparable, the adoption by Japan of the recommended changes is still appropriate to foster project management skills that come from such contract administration.

Also, under PPP and PFI approaches, the concession agreement typically obliges the Concessionaire to meet completion dates the concession agreements with specified with limited extension of time entitlements. Thus, the concessionaire, as the Owner/Employer, may have less limited commitments in the contract for the civil works infrastructure project

construction. In back-to-back agreements, contractor will only be entitled to an extension of time, if the Owner/Employer as the concessionaire is granted an extension of time under the concession agreement. Where a breach is solely caused by the Owner/Employer and as the concession company is not entitled to an extension of time under the concession agreement, the Owner/Employer and the contractor will need to agree on alternative forms of compensation. The changes in the Construction Business Law recommended should accommodate such an eventuality, allowing additional money to cover acceleration costs, and relief from liquidated damages in lieu of an extension of time (as the concession company will not be able to extend the completion deadlines under the construction contract beyond the completion deadlines under the concession agreement). The contract administration required is certainly much more extensive than the Japanese civil works infrastructure construction industry has had to learn and practice domestically.

Regarding Force Majeure, the concept essentially is recognized by all laws, whether in the global market or Japan.⁵¹ The 1999 FIDIC Books provide Force Majeure in terms of Owner/Employer risks, which provide that:⁵²

- a. The contractor is required to take full responsibility for the care of the civil works infrastructure construction project, regardless of the extent of completion, including materials and plant from the contract start until completion. It also defines "Goods," which includes the contractor's equipment, whether on or off the civil works infrastructure construction site; and "Contractor's Documents," which includes computer software and documents of a technical nature supplied by the contractor.
- b. If any loss or damage happens to the to such project works, materials and plant, other than due to Owner/Employer's Risk (as defined), the contractor must "rectify" this loss or damage at the contractor's cost.
- c. Owner/Employer's Risks are generally events or circumstances over which neither party will have any control, for example, war, hostilities, etc., or events or circumstances caused by the Owner/Employer, directly or indirectly.

The 1999 FIDIC Red Book includes specific Owner/Employer Force Majeure risks that are limited. The ENAA Model forms take a more extreme position, defining essentially anything that is beyond the control of the contractor as Owner/Employer Risks. The law in Japan is not easily construed, but generally it is consistent with FIDIC. The Standard Conditions of Contract for Public Works defines Force Majeure Risks provides the following definition of "disasters":

"...wind storms, heavy rains, floods, tidal waves, earthquakes, landslides, cave=ins, fire, riots and disturbances, and any other natural and artificial phenomena, for which neither of the parties is responsible."

Compensation is likewise different, but such differences are primarily tied to the definition of Force Majeure. The 1999 FIDIC Books provide that if the civil works infrastructure construction project suffers loss or damage and/or delay due to an Owner/Employer's Risk, the contractor must rectify the loss or damage to the extent required by the Owner/Employer or its Engineer. Relative to such rectification, and the Contractor suffers delay and/or incurs additional cost, the contractor is entitled to an extension of time and to the cost of rectification. Thus, the respective project management teams must prove what the scope requiring rectification was part or not respectively of its assumed bases of its bargain, that such scope was destroyed or damaged by the event, and the delay and/or cost was reasonable. Regarding the 1999 FIDIC Silver Book, issues of Employers Risk are more limited, because the contractor is responsible for engineering, procurement and construction.

There still may be issues between the Owner/Employer in its role as the concessionaire under the PPP of PFI concession agreement and its role under the construction contract. Both delay and compensation under the Standard Conditions of Contract for Public Works would become a source of dispute, unless the Construction Business Law is changed. Because there is nothing submitted that is binding on either of the parties, and the Owner/Employer (the Government) unilaterally decides extent of delay and/or cost if the contractor does not agree. Thus, unless the Standard Conditions of Contract for Public Works seems to match global market practice, it will not prepare the domestic civil works infrastructure construction industry as it is currently constituted without adopting global market Conditions of Contract.

4. Defect Liability and Limitations of Liability

The 1999 FIDIC Books all make the contractors liable for defects in the civil works infrastructure construction project. The type of defect has some relevance and it is subject to the legal requirements identified as the substantive law governing the contract. Thus, there may be issues, such as, whether and the extent to which patent defects or latent defects (those were not found by tests, etc.), are present and have to be corrected or rectified. Clause 17.6 limits the contractor's liability, but the amount of such liability is subject the following:

- a. Exclusion of the Contractor's and Owner/Employer's liability for loss of use of the civil works infrastructure construction project, loss of profit, loss of any contract, indirect or consequential damage, etc. which is incurred by the other party as a result of the defect.
- b. Inclusion in the limitation of liability Liquidated Damages for delay and for failure to the performance guarantees.
- c. Setting a monetary limit on the Contractor's total liability.

The monetary limit is not specified, however, and the default limit is the total contract amount. With respect to such limit, The FIDIC Contracts Guide, 1st Edition, 2000, suggests that the appropriate limit varies depending, among other things, on the nature and importance of the civil works infrastructure construction project, the risks involved and the extent of the contractor's obligations. Thus, the limit may be set anywhere between nothing and the contract value. The 1999 FIDIC books require the Owner/Employer to afford a contractor the opportunity to remedy or rectify the defect, but limit the time frame for such to 24 months from the commencement of the warranty period (following completion). The 1999 FIDIC Books also require that the parties consider a broad range of insurance, either required of the Owner/Employer or the contractor.⁵³ In practice, the extent of these insurance policies can provide the civil works infrastructure construction project and the parties that protect their respective financial interests in the event of the items that are subject to the monetary limit.

The ENAA Model Forms, in 1992, actually first brought the issue of limits on the liability of contractor's in the global market to the attention of commentators.⁵⁴ The World Bank in 1993 was concerned about the ENAA Contracts limiting the total liability to 50%, and including in the coverage of the limitation Liquidated Damages for delay and performance guarantee failures, defects liability, and patent (for the particular process) liability.⁵⁵ The 1999 FIDIC Books reflect the situation that now is followed in the global market. Other provisions of the ENAA Model Forms are quite consistent with the global market.

The Standard Conditions of Contract for Public Works reflects the requirements of the Civil Law in this instance, rather than the Construction Business Law, regarding defects liability.⁵⁶ The Civil Law imposes a strict liability on contractors, but that liability is limited by time. Thus, the concepts are in practice consistent with the global market, but imposes a potentially a larger definition of defect on contractors and different timing. The issue regarding civil works infrastructure construction projects is practice, and especially so under the circumstances of a sharply decreased volume of civil works infrastructure construction. With the Government historically essentially being the sole party contracting for civil works infrastructure construction, and given the non-equal status under the Construction Business Law, contractors had to rely on the Government for work. The practice has been to remedy or rectify and defects in civil works infrastructure projects. Using the ENAA Model Forms as an indication of what Japanese contractors find acceptable in locations elsewhere in global market, the “practice” in the domestic civil works infrastructure construction market will have to meet global practice in a globally competitive market. Inherent in this change is a concept of providing insurance. As long as the extent (scope) of the defect liability is limited to an amount that is certain, and the time limitations maintained, the Standard Conditions of Contract for Public Works, would not have to be changed except with respect to a limit. The amount certain should be limited to the contract amount at the least. With the reform that is currently underway in the domestic insurance industry, products will become available.⁵⁷

By way of assuring best global practices in project management consistent with contract administration, the process with respect to defect liability is one of training. The domestic industry for civil works construction must have parties that have personnel who will protect the bargain reached under the contract, but also the assets of the entities they represent. The processes regarding defect liability envisaged must ensure that the process is fair and reasonable.

Under PPP and PFI approaches, the 1999 FIDIC Silver Book does reflect global defect practice as far as it goes. The 1999 FIDIC Silver Book, however, does not reflect any special provisions in the concession agreement with respect to Owner/Employer’s defect liability exposure. Concession agreements typically limit the concessionaire’s right to claiming revenue loss from the acts of the Government. For example, most concession agreements have a “fitness for purpose” warranty clause, and under the 1999 FIDIC Silver Book makes the contractor responsible for the design of the work and for the accuracy of the Owner/Employer’s requirements, including design criteria and calculations.⁵⁸ The Owner/Employer is not responsible for any error, inaccuracy or omission in setting out exactly what it is buying and the civil works infrastructure project could serve. Most concession companies, however, under the concession agreement are usually obliged to provide a fitness for purpose warranty to the government entity for performance of the civil works infrastructure projects. While the contractor is responsible for the “initial” state of the civil works infrastructure project that it designed and constructed, the facility must be appropriately maintained, and where necessary, upgraded to ensure that it continues to be fit for its intended purpose throughout the length of the concession period. If the contractor is not responsible for the maintenance and any capital upgrades, it will not give a “blanket” fitness for purpose warranty of lengthy or unspecified duration. The Owner/Employer’s requirements and the projected usage, for example, are a common source of dispute, and claims of defects, and defense by contractors to such claims. As indicated earlier, the contractor may of necessity need the assurance that back-to-back agreements are appropriately required. The changes in the Construction Business Law recommended should accommodate should meet this need.

C. Risk Management as a Perspective

Although discussion has focused on recommended revisions to the Construction Business Law and the associated Contract and Standard Conditions of Contract for Public Works, the fundamental issues that will force change, and then force change in the methods of doing business, is the manner in which the parties perceive their risk. The Japanese domestic civil works infrastructure construction industry has a distorted view of what is required to successfully do business. The best project management practices of the domestic industry now focus only on the manner in which they have to satisfy an Owner/Employer that unilaterally sets what it perceives what is needed; what civil works infrastructure project will fulfill the need; at what the project cost, schedule, and quality; and then dictates the outcome of any disputes. Contractors have developed contract administration skills that allow it to excel in this environment.⁵⁹ Change what is required and the means of successfully meeting what is required will change.

The recommendations are suggestions to consider in revising the Construction Business Law, and the Contract and Standard Conditions of Contract for Public Works. Great attention must be paid the concepts of Project Risk Management discussed and illustrated above. Risk will be new or much different in the future to the parties to the domestic civil works infrastructure construction industry. Risk is both a potential condition and a specific element or event which may result in that condition that will affect scope, schedule, quality, and cost. Thus, as described earlier, the management of such risk is by way of systematic processes by which risk elements or conditions may be identified, evaluated and avoided, mitigated or eliminated, in order to preserve the achievement of a civil works infrastructure construction project's cost, schedule, and quality goals. Thus, the primary goal of the domestic civil works infrastructure construction industry, both the Owner/Employers and the contractors, must be the achievement of project management and contract administration skills that provide them with the ability to identify risks, determine characteristics of risk emergence, measurement through control systems, and application of enhanced project management methods for improved achievement of project and stakeholder goals.⁶⁰ Through project risk management processes becoming a growing part of successful project management processes, stakeholders must identify and use risk management tools that are applicable to the risks faced and assure effective return in managing those risks should the potential risks actually begin to affect the project. Without risk there will little incentive to change.

Also, plans for privately financed civil works infrastructure construction projects are a fact of life in the global market, and now include tests projects in the domestic civil works infrastructure construction market. Like Japan, host governments must provide modern infrastructure, but they cannot afford the initial cost of providing it. The development of PPP of PFI schemes has the potential to become the "norm" in the future, including in Japan's domestic civil works infrastructure market. As Japan experiments with this methodology in providing civil works infrastructure, they should use the opportunity to introduce the domestic civil works infrastructure construction industry to change that will allow it to develop suitable project management and contract administration skills that will enable it to become a formidable competition in any market.

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VII. CONCLUSION

In the global economy of today, a measure of a country's economic success is its willingness to subject its domestic industries to the vigor of foreign competition. To do so says to all stakeholders that its industries are able to compete on an equal footing with the rest of the developed world. In fact, that is what Japan did in 1996 by committing to the World Trade Organization that among other things its domestic civil works infrastructure construction market would be open to foreign competition. This willingness was the result of having a highly skilled civil works infrastructure construction industry that had developed a world class reputation for technical excellence and quality in its implementation. The engineering and construction techniques Japan developed in constructing its civil works infrastructure are admired throughout the global market. This result reflected the strong hand of Government and the uniqueness of Japanese culture. It also had allowed Japan to rapidly develop in less than half a century, so that by the late 1980's it was a leading economy in the world.

This result also followed a development pattern that has been repeated throughout modern history, albeit in approximately one half the time of the United States, for example. This pattern was assured by the government taking a strong hand in the development of infrastructure that then allows the rest of industry to thrive and develop. For countries that move forward from an economic category of "under developed" to an economic category of "developing," the government must take necessary steps to protect its capability to build capacity in its civil works infrastructure construction industry. Thus, Japan used the Construction Business Law which was based on the societal and cultural concept of "mutual trust" to develop and protect the industry that it needed. Once established, Japan then developed an industry that uniquely met requirements and practices that the use of the "mutual trust" necessitated. Competitors from "developed" countries they could not compete under such unique requirements and practices, because such foreign competition simply could not understand them.

When a country continues the historical development pattern, it moves from an economic category of "developing" to an economic category of "developed. When it has done so, a country no longer has to protect its civil works infrastructure construction industry. Japan thus made a commitment to the WTO when its economy had reached the "developed" category status. Japan thought that the civil works infrastructure construction industry could adapt and be prepared to compete with the world in its domestic market. Japan has enacted minor changes in the ten years that Japan envisioned that a transition period would be required. It did not contemplate, however, that such an "open" market would require a much different way of project management and contract administration skills. As a result, the Government (the MILT) undertook various action plans in the past ten years aimed at restructuring the domestic civil works infrastructure construction industry. These laws addressed various issues of quality, project transparency, but kept intact basic framework with which it had protected the civil works infrastructure construction industries. The Government did not address the key management competencies that are necessary to be global players. The results are quite different in actuality then what was expected. The Government actions are not resulting in change and capacity building for either Owner/Employers (the Government) or contractors. Specifically, the lack in understanding and vision of what such management competencies encompass has not prepared the civil works infrastructure construction industry to compete with global competitors either in the domestic or global markets.

In studies reported herein, the author chose to address the question of why the Japanese have not succeeded in the development of needed levels of management competency or establish the counter measures necessary to prepare the industry – specifically the creation "contract administration" skills necessary to perform project/construction

management. Contract administration is the key function that is required of engineers to succeed in project/construction management and succeed in the global market. The author studied the social backgrounds of the Japanese market and the global market, the laws that underlie civil works infrastructure construction, and the standard conditions of contract that effectuate such laws. The author then developed how the global market's principle of "mutual mistrust" requires parties to develop these management competencies and the Japanese market's principle of "mutual trust" does not. This approach has never been used to address how the civil works infrastructure construction industry should be restructured in Japan.

The author found the following as result these studies:

- Japan has developed formidable international competitors in many industries, and has done so in industries that it has opened to foreign competitors domestically as well as in the global market.
- Japan as a result has developed management skills that enable its personnel to compete in their domestic markets for such industries.
- Japan has not developed into formidable international competitors in the civil works infrastructure construction industry, either in the domestic market or the global market.
- The Japanese Government and civil works infrastructure construction contractors have not developed contract administration skills and thus the project/construction management skills required of competitors in the global market for civil works infrastructure construction.
- The global market for civil works infrastructure construction is based on the presumed equality of the parties and the stakeholders are expected to operate with a principal of "mutual mistrust."
- Under the principle of "mutual mistrust" both parties to a civil works infrastructure construction contract proceed under the assumption that the other is trying to obtain a better position than that for which it bargained, and no one is better placed than itself to protect the benefits of such bargain.
- The principal of "mutual mistrust" is established by the contract and conditions of contract used throughout the global market for civil works infrastructure construction.
- Although Japanese laws appear to be an amalgamation of Civil Codes with a bit of Common Law thrown in, Japan interprets its laws and their apparent conflicts based upon the principle of "mutual trust."
- "Mutual trust" is unique to the Japanese and stems in part from their belief in the dominance and benevolence at the same time of their leaders or superiors.
- The Japanese are capable of integrate new and different concepts into the governance of their daily lives and thus change their way of thinking, especially as regards management as shown in many industries over the last two decades, but the Japanese have not done so in the civil works infrastructure construction industry.

- The domestic civil works infrastructure industry is based on the Construction Business Law and the form of contract that it establishes which is an atypical form not recognized by its Civil Law.
- Under the Construction Business Law, the Owner/Employer (the Government) is given a dominant position and the stakeholders are expected to operate within a principal of “mutual trust” and the Owner/Employers dominance and benevolence.
- The civil works infrastructure construction industry can grow and benefit from the development of project management skills that are based on competency in contract administration.
- These competencies in turn will create efficiencies and larger returns from operations that the Japanese civil works infrastructure construction industry does not and cannot produce when they operate under the principle of “mutual trust.”
- The domestic civil works infrastructure construction industry is increasingly criticized by the public for a lack of transparency and accountability as it continues using the protections required when Japan still was a “developing” country.
- Transparency and accountability are a condition of continued participation in the World Trade Organization, and other Japanese industries have found such transparency and accountability essential as they have transitioned to remain major stakeholders in global markets.
- The Japanese civil works infrastructure construction industry does not just face a crisis, but it is in a crisis that can be remedied and be turned around through the adaptation the way in which it does business.
- Since the country can no longer afford to protect the domestic civil works infrastructure industry, the industry will become in the future just a minor sector of the economy, less important to Japan, and will be absorbed by other industries, except for the smallest of stakeholders.
- A New Japanese Standard Conditions of Contract for Public Works must be developed by incorporating practices that are consistent with the principle of “mutual mistrust,” and that cannot happen successfully until it changes the requirement that the civil works infrastructure construction be performed pursuant to a contract is based upon a principle of “mutual trust,” a current condition of the Construction Business Law.
- The author has written a New Construction Business Law and New Japanese Standard Conditions of Contract for Public Works that is presented in Appendix A.

Summary Of Dissertation Entitled:

“Avoiding a Crisis in the Construction Industry: Guidelines for Internationalizing the Japanese Standard Conditions of Contract for Civil Works” by Kris R. Nielsen, Ph.D.

In Japanese society, the law historically has a limited function. It becomes one small part of the mechanisms for social control. For example, where there are conflicts and/or disputes, societal resort to formal law and institutions is not usually the first course of action of the Japanese. Today, however, there is an astonishing amount of change afoot, and a considerable amount of uncertainty regarding the future. The Japanese Government and companies generally have become major players in global markets. The Japanese managers of companies go forth and strive to become masters of the cultures in which they compete. The Japanese people have become world travelers. They are regularly exposed to different ideas and cultures. Communications, the great equalizing influence of the new century, has led to a blending of cultures at an increasing and irreversible rate. Now that Japan is facing economic problems, a questioning and re-evaluation of the practices that it has cherished has commenced in a manner and depth that it never occurred before.

The author extensively studied the characteristics of the Japanese domestic market and the global market for civil works infrastructure construction. The contract and conditions of contract which govern the execution of civil works infrastructure construction projects in each market generally are thought to be a reflection of the industry practices. These practices in turn drive and shape the skill sets engineers must learn and practice daily in order to fulfill the requirements demanded in such execution successfully.

Japanese civil works infrastructure is arguably the most extensive per capita in the world. It is civil works infrastructure that reflects the highest of technological and engineering competency. The construction contracting for civil works infrastructure projects is governed by the Construction Business Law. Under that Law, the Government contracts with contractors using the Contract and the Standard Conditions of Contract for Public Works. These contract documents are said to reflect the philosophy of the Japanese legal system, and the contracting approaches that it embraces. In order to understand and evaluate the Japanese civil works infrastructure construction market, the author studied the Japanese social, cultural and historical developments that have shaped the legal bases therefore and to understand what makes Japan and the Japanese market unique.

The legal foundation of Japan is based on Civil Codes of France and Germany, and the Common Law of the US (and to a lesser degree the United Kingdom). Europe, Australia, the Americas, Africa, and the rest of Asia generally have one or the other of these same legal foundations. Yet, civil works infrastructure contractors from these seemingly disparate legal traditions can compete against each other and function acceptably in the global market for civil works infrastructure construction projects. Japan's contractors, however, cannot compete in such a global market because the domestic market has a basic difference. Japan has created a form of industry practice that is based on the Construction Business Law that creates an exception to the basic forms of contract that are allowed under its Civil Code. The Construction Business Law recognizes the dominance of the Owner/Employer—the Government for essentially all of the civil works infrastructure construction market. The Construction Business Law requires the use of a written contract that incorporates the principle that: *“parties executing a contract for construction work shall conclude a fair and equitable agreement in mutual good faith”*—a concept of “mutual trust” in the fairness of the dominant Government as Owner/Employer. The Construction Business Law gives the Government the authority to determine the outcome disputes unilaterally, but in practice the Owner/Employer frowns upon disputes in the civil works infrastructure construction industry. The Construction Business Law requires the contractors to engage in the subterfuge of

pointing out changes and then awaiting the unilateral determination of Owner/Employer as to the value and time consequences of such changes. This principle has allowed the Government to manipulate the industry to its own ends, and in return it has protected the industry from foreign competition. Faced with the need to rebuild the Japanese economy recently, the Government now has embarked on a program of legal restructuring in most sectors of the economy to better prepare Japan to better meet the situation and conditions that it now faces. It is doing so through changes in the laws that govern economic sectors, except for the civil works infrastructure construction that is subject to the Construction Business Law from which almost all of the current issues originate.

The Japanese Contract and Standard Conditions of Contract for Public Works are based on and reflect the Construction Business Law. The Contract and Standard Conditions of Contract for Public Works have been used for over fifty years. The basic provisions have been altered only eight times, but the revisions have been relatively minor and reflect minor revisions. The efforts that the Government has made in the last decade to comply with the commitments under the World Trade Organization's Agreement on Government Procurement have been cosmetic, and the Government has not changed the Construction Business Law. The current Contract and Standard Conditions of Contract for Public Works are used to protect the domestic civil works infrastructure construction industry from foreign competition still. The Government and the domestic civil works infrastructure construction industry are "casting about" and bemoaning their future and that of the industry. The Government and the civil works infrastructure construction industry are attempting to use a varied composite of ideas that are used in various European and US infrastructure construction markets, but it is achieving little success. To define the problem, some of the issues that are characteristic of Japanese civil works infrastructure construction, which are at odds with the rest of the world, were explored. Japan's response to the challenges and changes that began twenty years ago was first one of retreat and denial. Then it was of pragmatic utilization of new rules and circumstances to continue policies of promotion and protection. Today it is one of accepting global standards and policies in general, but it is not doing so in the civil works infrastructure construction industry. The manner in which the domestic civil works infrastructure construction industry can change will be dependent on revisions Construction Business Law, and the Contract and the Standard Conditions of Contract for Public Works to reflect global standards and policies. Such change will avoid a crisis and can lead to results which will provide the domestic construction infrastructure construction industry with a future it so desperately needs.

Given this legal foundation, the Construction Business Law and the promotion activities of the Government that it accommodates, are out of sync with the rest of the Civil Code. Today, the public questions the "transparency" of the civil works infrastructure construction process because of decades of ruling party abuse. As has been stated by the authorities, the dominant and patronizing Owner/Employer for civil works infrastructure allowed by the Construction Business Law assumes: "The Employer is always clean, fair, and right....[The Government] is far from being involved with collusion affairs of contractors." The Construction Business Law requires the Owners/Employers (the Government) and the contractors to deal in a cooperative manner, that is, because it is believed that the Owner/Employer (the Government) has "to make a fair and right selection, because [the Owner/Employer (the Government)] is bound by the logical restriction of actions or laws and regulations which always force the most suitable obligations and answers." This contracting approach is supposedly a furtherance of the concept of "giri" that Ruth Benedict portrayed in her classic anthropological text, The Chrysanthemum and the Sword, used to fashion Japanese law following the surrender of Japan in 1945. In practice it has resulted in the abuses that are a part of the history and practice of the Japanese civil works infrastructure construction industry for the past fifty years.

In practice, hiding behind the concepts of dominance and a patronizing superior, the contractors do not submit claims based on allegations that the Owner/Employer (the Government) is demanding something for which the contractor has not bargained. Instead the letters or petitions appeal to the pride and the defined role of authority to do what is “right.” Typically the petitions are couched in terms of suggested or offered changes to what the Owner/Employer (the Government) originally intended or desired. In essence, claims in the domestic civil infrastructure construction market are “design changes”. The reason why contractors use a “design change” is to convey to the Owner/Employer (the Government) that it changed the original design unilaterally and it needs to give the contractor the additional cost (and a time extension, if necessary). Thus, there are not claim documents submitted. The Owner/Employer (the Government) then calculates the value of time and cost for such acceptable changes according to its own unilateral figures and notifies the contractors accordingly. Thus all matters are settled on or before the final payment is made when the contractor formally “delivers” the executed project. The contractors are “forced to accept” this payment given the “design changes” that resulted from the contractor’s “proposed changes.” Despite the Construction Business Law, and the Contract and Standard Conditions of Contract for Public Works providing that the Government and contractor will “mutually agree,” most cases of civil works infrastructure construction actually are one-sided and settled by “the intentions” of the Government, and the contractors are seldom invited to participate in an official negotiation processes. Everyone usually is “satisfied” with the result, especially, since the Owner/Employer (the Government) is the source of 99% of civil works infrastructure construction.

The author found that a unique contracting status bestowed by Construction Business Law allowed the Government to use the Contract and Standard Conditions of Contract for Public Works to fashion a civil works infrastructure construction industry that has developed characteristics that are different from the global market. The Japanese Contract and the Standard Conditions of Contract for Public Works, however, has not enabled the construction industry to develop either:

- An extensive understanding of construction execution for civil works infrastructure in the global market place.
- The project management skill sets (for example, contract administration to support a viable disputes resolution process) necessary to fully integrate the Japanese civil works infrastructures construction industry into the global market construction works.
- A domestic market that meets the criteria for entry to the World Trade Organization (WTO).

The result has been the development of an “insulated” domestic construction industry for civil works infrastructure that Japan can sustain no longer. The current status of the domestic civil works infrastructure construction industry is one of crisis. The crisis is the result of the Construction Business Law, the Contract and the Standard Conditions of Contract for Public Works and the realities of Japan today that do not meet:

- The intent of the legal changes that the Government is enacting.
- The demand of the electorate for the transparency in the process of awarding and executing civil works infrastructure construction projects.

- The commitment that the Japanese civil works infrastructure construction market will become a part of the global civil works infrastructure construction market.

Most countries have socio-economic systems that embody some form of Western legal philosophy. These systems have been adopted or forced on countries all over the world. Most of the revolution that has globalized commerce in the last two centuries is based on Western legal principles. When the global community or individual countries have funded or financed civil works infrastructure projects, contracts and conditions of contract are similarly based on principles that underlie Civil Law and Common Law. One can immerse himself or herself in the idiosyncrasies in the study of comparative law between the laws of one country that is based on the Civil Law and of another country that is based on the Common Law. There is certainly a role for those who do so. But to work in the global market and engage in commerce does not require an understanding of such idiosyncrasies. In most countries of the world, civil works infrastructure construction is governed by the contracts and conditions of contract which are based on Civil Law and Common law. Although there are differences in the manner that Civil Law and Common Law jurisdictions reflect the legal principles, there really are few differences that are meaningful, and contracts based on one or the other are recognized and administered the same. Thus, these principles have shaped the manner in which Owner/Employers and contractors expect the other to act. A body of practice and expectations has developed for civil works infrastructure construction, and has evolved into "industry standards."

There are a number of principles that underlie contracts and conditions of contract for civil works infrastructure construction. A fundamental one is that the parties to a contract are recognized as equal. One party is not more dominant than another. It underlies all contracts, particularly contracts for construction. Even where one of the contracting parties is a government, the contractor is recognized as being equal. Unlike the Japanese Construction Business Law, the one party is not superior to the other. One party is not to "dominate, and also be patronizing" at the same time.

The fundamental basis of contracts in global market is a concept of "mutual mistrust." What is meant by "mutual mistrust" is the Owner/Employer believes that the contractor inherently will try and execute and deliver some less than that for which is obligated; that is, the contractor will provide less scope or quality and/or take longer. The contractor believes that Owner/Employer will demand more than the contractor has agreed to execute and deliver; that is, the owner wants more scope or quality and/or delivery in less time. The Owner/Employer and contractor are expected to "protect" the benefit of their "bargain," as there is not "anyone who will do so for it." The allegedly injured party has an obligation to the offending party to give reasonable notices of its failure or the presumed failure to "live up to the bargain." The noticed party can agree, negotiate a solution, or dispute the assertion. Because the Owner/Employer and the contractor may have different interpretations of what each committed in the consummation of their bargain, there is a presumption that the allegedly injured party may go to courts to recover the benefit of its bargain. When a party does so, it is entitled to the bargain to which it agreed, nothing more or nothing less. The civil works infrastructure construction industry, however, has substituted for "resort to the courts" various alternative means of resolving such disputes, whether that is negotiation, determination, mediation (conciliation) and/or arbitration. Also, there is often means in the contract and conditions of contract of guaranteeing the other party is capable of living up to its bargain, such as, performance and payment guarantees.

The legal principle of "mutual mistrust" is thus inherent in the global market, essential to international commerce, and fundamental to civil works infrastructure construction. In addition the principles of "transparency" enable abuses in the global civil infrastructure

construction market to be minimized by adherence to codes of conduct and the empowerment of stakeholder to challenge the processes that are used. The required use of Standards Conditions of Contract that are based on legal principles of “mutual mistrust” in turn require users to become familiar with the processes and skill sets which enable parties to function under terms that are familiar. It forces parties, whether owner/employers or contractor, to behave in an expected manner. Where there are variances from that bargain reached, parties must learn to measure change and how to present a case for resolution. “Conditions of Contract” thus force the parties to be always alert to what the other party is doing with respect to its obligations and commitments. A party must protect its bargain at all times or it suffers the consequences. Vigilance is mandatory. The timing and associated actions are mutual and equal. The Owner/Employer and the Contractor is each assumed to be knowledgeable and capable to protect its interests. The “Conditions of Contract” thus create an actual execution context of “mutual mistrust.” The financing and execution of civil works infrastructure globally is undertaken through the use of various types of contracts and standard conditions of contract that are understood and accepted by stakeholders that operate in the global market. For example, the most widely used forms of contract and conditions of contract for executing civil works infrastructure globally is the suite of contracts that is promulgated by Fédération Internationale des Ingénieurs-Conseils (FIDIC), and it incorporates the philosophy of “mutual mistrust.”

The author identified the skill sets that are required in the global market. The author found that when the “Conditions of Contract” are standardized, then both parties are aware of the “mutual mistrust” obligations from experience with the forms. Both parties can train personnel in the means of monitoring, controlling, and executing its performance to assure it receives the benefits of the bargain made. Also, the same is true in monitoring and notifying the other party of its failure to live up to the bargain, whether inconsequential or significant. The question then becomes: “given the requirements of ‘mutual mistrust,’ what are the proper skill sets for personnel in either the employ of the Owner/Employer or a Contractor to possess?” In order for a party to monitor its bargain, the party must record the definitions and/or assumptions that its bargain represents in the contract that was consummated. The contract documents and/or the “source” documents that were “rolled up” must establish what it intended. The standards are recognized internationally by the parties that are active in the global market, so that there is a metric against which performance is measured. The Contractor equally must have standards. They exist in the global market, are recognized internationally and are a basis for measurement or a “metric.”

Once the bases of the bargain are recorded, then the process of executing the project begins. The systems of monitoring for conformance or change from that which either party defined or assumed must then be used during project execution to monitor the other parties performance. This monitoring becomes a metric for measuring the deviations from the project in a timely manner that is the essence of “mutual mistrust.” It also becomes the means for providing timely notice that is built into most civil work infrastructure project Conditions of Contract. Collectively, these two steps of preparing a base and monitoring are known as Contract Administration and they are the backbone of project management. Every project involves dynamic tension between parties. Each party enters the project with a preconceived set of assumptions, demands and expectations as to its own role in the project. Each party also enters a project with a preconceived idea of the roles that others will play in that project. These internal and external expectations tend to be somewhat competitive in nature. These competing demands and expectations must be kept in balance, if the project is to fulfill the expectations of any of the parties involved.

Contract Administration is fundamental to successfully operating under the principle of “mutual mistrust” which is required in the global market. For example, standardization must

follow a uniformity of a body of knowledge that can be employed in accomplishing suitable education and practical training, and most importantly project execution. The benefits of standardization are continued development of Contract Administration and project management knowledge, education, training and execution based thereon. There is, however, another tangible result is achieved. Parties of diverse cultural and commercial backgrounds develop common understandings and common execution-performance expectations. Both understandings and expectations lead to anticipatable management approaches, communication, and efforts. Ultimately, improved project management leads to reduced risk of execution problems and disputes. Management and commercial decision making becomes reasonably prudent and vastly improved. The result: Projects are successful and parties meet their goals.

For contractors who operate in the global market, the variance in any assumption is a potential for recovery, because it goes to the basis of bargain. It is the “life blood” of European and US contractors. The concept is to adequately record the assumptions as developed with respect to all aspects of the project, and then to regularly record and monitor them as part of a vigorous Contract Administration regimen. They use Project Risk Management at the same time and in addition to monitor a civil works infrastructure construction project the likely areas before the variance even occurs. Thus, foreign contractors (and Owner/Employers) fashion Contract Administration in a manner that is quantitative-based on the most current civil works infrastructure construction project information for evidence of variance at discrete levels at its earliest stages of incurring. They do not wait until the impact becomes a final. To do so would violate a primary concept of “mutual mistrust,” the giving of notice so the other party can attempt to deal with the problem that is causing the variance.

The process of protecting the benefits of a bargain begins with the project management personnel using the tools and the data to record and develop the assumptions for execution and for management of the project. Contract Administration under a culture of “mutual mistrust” is a process of continuously evaluating and trending of “how the project is doing” when measured against the plan. When the project is found to be trending or deviating from plan, the project management team must identify the potential causes and the party responsible. For example, if the Owner/Employer’s project management team through its Contract Administration efforts finds the cause and responsible party to be the Owner/Employer, then it is up to the project management team to identify and implement actions to minimize the impacts, that is, manage the result. It is the function of Contract Administration to spot the trend or the issue as early as possible. If the application of Contract Administration leads the Owner/Employer project management team to conclude the Contractor is causing and is responsible for the potential impacts, proper notice as required by the Conditions of Contract, must be timely given to the Contractor. Further, the Owner/Employer’s project management staff must prepare analyses that demonstrate the non-compliance with the Owner/Employer’s requirements – the benefits of its bargain. The converse is equally true of the Contractor’s project management team. Therefore, a primary responsibility in the global market for civil works infrastructure construction projects is Contract Administration throughout the project duration. The author specifically, identified and illustrated the project attributes that define project scope and quality, time of performance, and cost of performance, and project risk management as the primary elements of contract administration.

The author then evaluated the Japanese civil works infrastructure construction industry’s need to learn and use the project management skills under the current Construction Business Law, the Contract and the Standard Conditions of Contract for Public Works. The

Japanese civil works infrastructure construction industry does not have to record and share their respective assumptions as to the bases from which it defined the very foundation of the tender it requires or the tender that it is making. Only in the area of quality does Japan have standards that the rest of the global market recognizes. The area of cost of performance is well developed on the part of Japanese contractors, but to a specific contractor's requirements. The areas of planning and time projection, productivity measures, and scope definition are not demanded by the market, thus are not well understood or used. There is no incentive for the stakeholders to demand, to monitor or to analyze and project specific items of variance from the assumptions that underlies the bargain that either party thought it made. The author thus found the Japanese civil works infrastructure construction industry severely limited in the areas of scope management, time management and risk management. Additionally, the author also found the subcontracting (vendors and subcontractors) process (the organized groups under primarily a single general contractor) and the process of independent third party dispute adjudication to be out of sync with the global market.

The author also analyzed a comparable Asian market. China has elements of social and cultural development that are alleged to be similar to those of Japan. Yet, the Chinese have enacted recently laws that will allow it to develop the skill sets that stakeholders employ in the global market for civil works infrastructure construction and allow foreign competition in their domestic market. The author found that in order to understand the development of Chinese construction law, as with Japan, you cannot separate culture from law. But, Chinese history, and particularly the last half century, is quite different than that of Japan, despite both having had a ruling party that dominated power for most of the time. The understanding of modern Chinese law thus can only be understood through an appreciation of the social, cultural, political, and historical aspects of Chinese legal traditions. China's current legal system reflects a vast number of legal traditions over the millennia. As with Japan, the deeply-rooted philosophies and culture of classical China, such as, Confucianism, must be studied. In addition, there are the legal traditions of Daoism and Legalism. China's legal system is also influenced by external forces such as the extraterritorial privileges exerted under the treaty system between China and the Western powers which, in effect, forced China to adopt Western legal principles that stem from civil code countries of Europe (Germany and France) and from the common law countries (US and United Kingdom). The influence of treaties was much greater than Japan, because of the US relied heavily on the anthropological writings of Ruth Benedict, especially The Chrysanthemum and the Sword, as discussed above, in fashioning Japanese law following the surrender of Japan in 1945. In 1949, when the Communist Party took control of China, Chinese law was based on the political philosophies of Marxism-Leninism and Mao Zedong, and the Soviet legal system. Since 1980, China has adopted laws and enacted regulations governing commerce, foreign investment, and Securities regulations, from international sources. As China reforms its economy, it is using the legal standards of its trading partners to hasten its development efforts, to build the confidence of foreign investors, and to accommodate the entrepreneurial market capitalism. This latter influence is primarily an influence from the US, however, which is its largest trading partner. Thus, China's construction law incorporates a philosophy of "mutual mistrust."

The author demonstrated the changes to the processes the Government has made in nine years since opening the domestic civil works infrastructure market to foreign competition have been cosmetic in nature. The changes have not led to development of effective counter measures and have not led to development of a culture of contract administration that will enable the industry to succeed. The author demonstrated that the industry will be changed in a haphazard manner without such changes and explored the possibility of surviving a further period of transition beyond 2006. For example, Japanese firms might look off shore, as other industries have done, because the Government does not have the capacity to continue to build civil works infrastructure construction projects. With private participation, like PFI projects as a transition period option, for example, the civil works infrastructure industry will

be prepared to broadly compete with other international parties in the global market. Japan's overseas civil works infrastructure construction, despite its still relatively small percentage of the combined domestic and global markets it serves, offers some intriguing possibilities. The Government could "sell" its expertise in constructing social capital through civil works infrastructure construction projects before it is lost. Japan has been the largest and a very visible donor regarding the ongoing 2005 Tsunami reconstruction of civil works infrastructure in the affected countries surrounding the Indian Ocean. As "mutual mistrust" experience is gained, the Japanese can become formidable competitors as they have in other industries.

The FIDIC Contracts and the associated Standard Conditions of Contract are recognized throughout the world as a reference document for the construction of civil works infrastructure projects. In recent decades the FIDIC contract documents have become a de facto international standard that is known by stakeholders in the global market for civil works infrastructure construction. Therefore, in the global market, the expectation is that "everyone" is familiar with the FIDIC contract documents. It is from the FIDIC contract documents that modifications are suggested and emphasized, so that changes that are being made are obvious. As previously indicated, the FIDIC contract documents are based on a philosophy of "mutual mistrust." Therefore, the Author used the FIDIC contract documents to illustrate and contrast the changes that will avoid as crisis in the Japanese civil works infrastructure construction industry and to develop and foster project management and contract administration skills sets.

Ultimately, the author found that in the global economy of today, a measure of a country's economic success is its willingness to subject its domestic industries to the vigor of foreign competition. To do so says to all stakeholders that its industries are able to compete on an equal footing with the rest of the developed world. In fact, that is what Japan did in 1996 by committing to the World Trade Organization that among other things its domestic civil works infrastructure construction market would be open to foreign competition. This willingness was the result of having a highly skilled civil works infrastructure construction industry that had developed a world class reputation for technical excellence and quality in its implementation. The engineering and construction techniques Japan developed in constructing its civil works infrastructure are admired throughout the global market. This result reflected the strong hand of Government and the uniqueness of Japanese culture. It also had allowed Japan to rapidly develop in less than half a century, so that by the late 1980's it was a leading economy in the world.

This result also followed a development pattern that has been repeated throughout modern history, albeit in approximately one half the time of the United States, for example. This pattern was assured by the government taking a strong hand in the development of infrastructure that then allows the rest of industry to thrive and develop. For countries that move forward from an economic category of "under developed" to an economic category of "developing," the government must take necessary steps to protect its capability to build capacity in its civil works infrastructure construction industry. Thus, Japan used the Construction Business Law which was based on the societal and cultural concept of "mutual trust" to develop and protect the industry that it needed. Once established, Japan then developed an industry that uniquely met requirements and practices that the use of the "mutual trust" necessitated. Competitors from "developed" countries they could not compete under such unique requirements and practices, because such foreign competition simply could not understand them.

When a country continues the historical development pattern, it moves from an economic category of "developing" to an economic category of "developed. When it has done so, a country no longer has to protect its civil works infrastructure construction industry. Japan thus made a commitment to the WTO when its economy had reached the "developed"

category status. Japan thought that the civil works infrastructure construction industry could adapt and be prepared to compete with the world in its domestic market. Japan has enacted minor changes in the ten years that Japan envisioned that a transition period would be required. It did not contemplate, however, that such an “open” market would require a much different way of project management and contract administration skills. As a result, the Government (the MILT) undertook various action plans in the past ten years aimed at restructuring the domestic civil works infrastructure construction industry. These laws addressed various issues of quality, project transparency, but kept intact basic framework with which it had protected the civil works infrastructure construction industries. The Government did not address the key management competencies that are necessary to be global players. The results are quite different in actuality than what was expected. The Government actions are not resulting in change and capacity building for either Owner/Employers (the Government) or contractors. Specifically, the lack in understanding and vision of what such management competencies encompass has not prepared the civil works infrastructure construction industry to compete with global competitors either in the domestic or global markets.

The author chose to address the question of why the Japanese have not succeeded in the development of needed levels of management competency or establish the counter measures necessary to prepare the industry – specifically the creation of “contract administration” skills necessary to perform project/construction management. Contract administration is the key function that is required of engineers to succeed in project/construction management and succeed in the global market. The author studied the social backgrounds of the Japanese market and the global market, the laws that underlie civil works infrastructure construction, and the standard conditions of contract that effectuate such laws. The author then developed how the global market’s principle of “mutual mistrust” requires parties to develop these management competencies and the Japanese market’s principle of “mutual trust” does not. This approach has never been used to address how the civil works infrastructure construction industry should be restructured in Japan.

Thus with respect to the Construction Business Law, and the Contract and Standard Conditions of Contract for Public Works, the author created a New Conditions of Contract for Civil Works that incorporated his findings including:

- First and foremost, the dominant position of Owner/Employers (the Government) must be eliminated from construction contracts. Thus, the allowed contract for civil works infrastructure construction must recognize the equality of contracting parties, and not perpetuate the concept of contracting between a benevolent master (the Government) and its servants (the contractors). This one change to the Construction Business Law will make the practice of “mutual consultation” less necessary. The issue of equality of the parties only will become a reality in the civil works infrastructure construction industry through the procedures, such as, those that create the concept of “mutual mistrust.”
- Japan does not have a tradition of the Engineer typical on projects in the global market, that is, the Engineer is not from an independent firm. In Japan pursuant the Construction Business Law, the Engineer’s role is fulfilled in construction contracts by the Owner/Employer’s project manager supervising the contractor’s performance of the work in accordance with the construction contract, and, if such contract is not being complied with, to have the contractor rectify it. The contractor’s assigned Engineers are required by the Construction Business Law to meet the requirements of education and experience, and to have the proper certifications. Although Japanese engineers for civil works infrastructure construction have been trained well,

Engineers who are assigned by contractors engaged in civil works infrastructure construction are trained, tested, approved, certified, and experienced in the Standard Conditions of Contract for Public Works. Therefore, Japanese Engineers thoroughly understand the requirements of a contract that assures the dominance of the Owner/Employer that the Construction Business Law imposes. But, the Japanese Engineer on civil works infrastructure construction must develop project management skills that are consistent with the best practices in the global market, and that requires contract administration that they will use with a contract that recognizes “mutual mistrust.” Thus, project execution can become a three-party system instead of the two-party system that it is today.

- The introduction of a Competitive Bidding system. The bidding system is not transparent as discussed earlier. The bidding system does not meet what parties who operate the global market expect. The majority of domestic civil works infrastructure construction is subject to the rules for Designated Competitive Bidding, under which many of the abuses described earlier have occurred. Thus, Designated Competitive Bidding should be forbidden except where there are specifically described situations, such as, emergency construction, etc.
- Thus, to the extent the Construction Business Law makes a contractor responsible to the Owner/Employer, the Construction Business Law has to be changed to require subcontractors to be responsible to the contractor for its defined scope in the same manner as the contractor is to the Owner/Employer (except for price). Contract terms have to be “back to back.”
- With the necessary change to the Construction Business Law recommended, the methods of dispute resolution must be changed to mirror what the global market requires, and generally is in line with the rest of the laws.
- Minor wording and interpretive changes necessary to allow interpretation of the Construction Business Law and the coincident Conditions of Contract to enable a workable system.

The author concluded, the Standard Conditions of Contract for Public Works must be changed to allow for the absorption of the concepts of the global market into the domestic civil works infrastructure construction market as it is opened to foreign competition pursuant to the WTO. But what is the real meaning of globalization for the domestic civil works infrastructure industry? Globalization for the domestic civil works infrastructure industry means to accept “mutual mistrust” as the basic philosophy of project execution. From such changes the resulting system demands will mean that engineers will have to change and be trained in the procedures of executing civil works infrastructure construction industry with project management and contract administration that meets global standards. Through contract administration the “bargain” is established, and become the “rules” by which execution is judged, evaluated, and monitored. In order for the industry to gain experience to enable it to compete domestically with parties from the global market, and to successfully become a major competitive factor in the global market. Although Japan is culturally and socially unique with a set of business practices that have worked for over half a century, the resulting will enable Japan to avoid the crisis that is facing the domestic civil works infrastructure construction industry.

APPENDIX

SUGGESTED CHANGES TO THE JAPANESE STANDARD CONDITIONS OF CONTRACT FOR PUBLIC WORKS

TO CREATE A

NEW STANDARD CONDITIONS OF CONTRACT

Consistent with the suggested revisions to the Standard Conditions of Contract for Public Works that are contained in the body of this dissertation, the Author presents a suggested New Standard Conditions of Contract. These Conditions of Contract anticipate as a predicate that the Constructions Business Law will be modified or interpreted to allow the use of a contract that is based on principles of “mutual mistrust.” The current Contract Agreement form, for example, still must be a “fair contract,” but both parties actually must be recognized as being “equal,” both in words (as the actual contract currently says) and in actual practice. As such, the New Standard Conditions of Contract will not need extensive revision but rather interpretation consistent with the suggestions previously made. Furthermore, most civil works infrastructure construction, whether funded by the government or through some form of Public Private Partnership (PPP)/Private Finance Initiative (PFI), will require essentially a complete design or a standard means of defining the scope to enable the works to be bid uniformly.

The translation from Japanese to English of the current Standard Conditions of Contract for Public Works is unofficial, but there is not an official English version. The New Standard Conditions of Contract have used this translation, and have supplemented it with the suggested revisions that may be distinguished by the italics print. Also there are notes with respect to various matters that are offered to users of the New Standard Conditions of Contract. Thus, I have used English as the language of the New Standard Conditions of Contract as this is the language used with such forms throughout much of the global market.

In addition, consistent with standard conditions of contract in use throughout the world, the New Standard Conditions of Contract reflects the use of “General Conditions” supplemented by “Particular Conditions of Contract,” wherein the user supplements or changes the “general conditions” to accommodate the particular needs of the construction project.

The New Standard Conditions of Contract shall not be used for contracts less than ¥ 10 million, but the spirit reflected therein should be considered, as is appropriate.

NEW STANDARD CONDITIONS OF CONTRACT

PART A – GENERAL CONDITIONS

ARTICLE 1 - GENERAL PROVISIONS

1.1 Based *collectively* on the *Contact Documents*, namely the Contract Agreement, the *New Standard Conditions of Contract Part A – General Conditions and Part B – Particular Conditions* (hereinafter referred to as “Contract Form”), the Owner/Employer and the Contractor shall, in accordance with the Drawings and Specifications (hereinafter, this means the attached drawings, specifications, *incorporated by reference documents*, regulations, *letter of acceptance*, the tender documents, bills of quantities, time schedules, and other documents that the Owner and its Engineer or contractor are required to submit prior to the commencement of the project or during execution of the project), execute this contract in strict observance of the laws and regulations of Japan.

1.2 The Contractor shall complete *and deliver to the Owner* the construction works stipulated in the *Contract Documents* (herein after referred to as “Works”) within the Construction Period stipulated in the Contract Agreement; and the Owner shall pay the amount specified as the Contract Price to the Contractor.

1.3 The Contractor shall select and determine methods of temporary work, methods of work, and all other means and methods necessary to complete the Work Objects (hereinafter referred to as “Work Methods”) *as the Contractor submitted in the Tender Documents or submitted during the project execution and accepted by the Owner or its Engineer* at the risk of the Contractor, except as otherwise explicitly specified in the *Contract Documents*.

Note: The Owner and/or the Engineers acceptance of the Work Methods is merely for information and monitoring and does not constitute or limit the risk of the Contractor. The Contractor may change the Works Methods provided that it is first submitted to the Owner or the Engineer as specified in the Contract Documents.

1.4 Any information concerning the Contract obtained by the Owner, the Engineer or the Contractor or by any person employed by the Owner, the Engineer or the Contractor in connection with the Contract is confidential and shall not be used or disclosed by the Owner, the Engineer or the Contractor or by any such person *except as provided by law*. None of the parties shall be forced to divulge to the other information that is not a requirement of the *Contract Documents*.

Note: This clause requires interpretation and public access to the extent that they are given access by the law, but contemplates that Administrative Guidance, for instance, is a practice that is abolished and forbidden by the Construction Business Law. Public access to information is a key transparency issue for compliance with the WTO.

1.5 All *communications* specified in the *Contract Documents* shall be submitted in writing and communicated officially as provided in the *New Standard Conditions of Contract Part B – Particular Conditions*.

1.6 The language to which the parties are subject concerning all *communications shall be the English language*, but execution of this contract can be the Japanese language *provided that any the named individuals in the Contract Documents have sufficient fluency in English to administer the contract*.

Note: The use of English is essential for contract administration and the key personnel of each party, since English is the language that is recognized in the global market, For contracts under ¥ 10,000,000 unless otherwise stated in the New Standard Conditions of Contract Part B – Particular Conditions.

- 1.7 The currency applicable to this Contract is Japanese yen *unless otherwise stated in the New Standard Conditions of Contract Part B – Particular Conditions.*

Note: Any portion of the contract that is allowed to be in a different currency should be sufficiently defined in the New Standard Conditions of Contract Part B – Particular Conditions.

- 1.8 Except for those items otherwise explicitly specified in the *New Standard Conditions of Contract Part B – Particular Conditions*, the units of measurement applicable to this Contract between the parties are the units of measurement stipulated by the Measurement Act (Law No. 51, 1992).

- 1.9 *Except for those items otherwise explicitly specified in the New Standard Conditions of Contract Part B – Particular Conditions* the method of counting time periods applicable to *the Contract Documents* is the method stipulated in the Civil Code (Law No. 89, 1896) and in the Commercial Code (Law No. 48, 1899).

- 1.10 This Contract shall be governed by the laws and regulations of Japan.

- 1.11 The competent court of the Government of Japan shall have exclusive jurisdiction over any and all litigation concerning this Contract *provided that all matters are first subject to the provisions of Article 52.*

- 1.12 When the Contractor is a joint venture, the Owner shall execute all action under this Contract vis-à-vis the representative of the joint venture; and all action executed by the Owner in accordance with this Contract vis-à-vis the representative of the joint venture shall be deemed as action vis-à-vis all the constituent members of the joint venture; moreover, the Contractor shall execute all action under this Contract vis-à-vis the Owner via the representative of the joint venture.

- 1.13 *The order of the precedence of the Contract Documents shall be: The Contract Agreement, the Letter of Acceptance, the Tender Documents, Regulations, the New Standard Conditions of Contract Part B – Particular Conditions, The New Standard Conditions of Contract Part A – General Conditions, the Specifications, the Drawings, Bills of Quantities, Time Schedules, and other documents that the Owner and its Engineer or contractor are required to submit prior to the commencement of the project or during execution of the project.*

- 1.14 *The Owner owns the documents prepared for the Works, whether issued by the Engineer or it, and represented by the Contract Documents as issued for the tender, as modified during execution, and including all notices, communications, submittals, whether generated by either party, and the contractor shall maintain two copies of all such documents have the right to use such documents to execute the Works.*

- 1.15 *The Contractor shall create or cause to be created the documents it is required to prepare by the Contract Documents and shall maintain such documents in the place designated in the Specification at all times until the Works are completed and/or submit the documents as indicated in the Specifications and shall give the Owner*

and the Engineer unrestricted access to the records maintained in accordance with both Article 1.14 and this Article.

- 1.16 *The Contractor shall indicate in any Time Schedules to be submitted by it pursuant to the Specifications, all information or instructions that is required by the Contract Documents to be provided by the Owner and/or the Engineer or it requires to complete the Works and when, which shall be reasonable, if not specified; shall give the Owner and Engineer timely notice of the potential time and/or cost impacts and the Owner may be liable for such cost and/or time impacts pursuant to Article 21 that result from delay in such information or instructions; and the Owner shall be liable for such costs or delay; provided that the Contractor is not the cause for such needed information or instruction.*
- 1.17 *Either party shall notify the other and the Engineer of any omission or error in the Contract Documents as soon as it became aware or reasonably could have become aware of such omission or error, and may result in a Variation and/or Time Extension request pursuant to Articles 19 and 21 respectively.*

Article 2 - COORDINATION OF OTHER WORKS

- 2.1 *The Owner shall, if the Owner deems necessary, have the Engineer or a third party coordinate the execution of the Works to be implemented by the Contractor under this Contract with the execution of other, closely related works as identified in the New Standard Conditions of Contract Part B – Particular Conditions and executed by a third party, or as determined during the execution of the Works upon notice by the Owner to the Contractor. In this case, the Contractor shall abide by all coordinating arrangements made by the Owner, or its Engineer or third party, and the Contractor shall cooperate with Owner, or its Engineer or third party, so that the works executed by others shall proceed in a smooth and orderly way.*
- 2.2 *The Contractor shall give the Owner, and the Engineer or third party, timely notice of the potential time and/or cost impacts and the Owner may be liable for such cost and/or time impacts pursuant to Articles 19, 21, and/or 24 that result from the Owners notice during the Works execution of the need to coordinate with the execution of other, closely related works, and the Owner shall be liable for such cost and/or delay; provided that the Contractor is not the cause for such needed coordination.*

Article 3 - BILLS OF QUANTITIES AND WORK PROGRAM

- 3.1 *Based on the Contract Documents, the Contractor shall prepare prices for each of the quantities specified in the New Standard Conditions of Contract Part B – Particular Conditions and this Bills of Quantities (hereinafter referred to as "BQ") shall include all the Contractor's costs related to an individual items and when each item costs are added together they reflect the total cost of the Tender for the Works, and the Work Program that meets the requirements established in Article 3.2, and submit the Work Program to the Owner or its Engineer as provided in the New Standard Conditions of Contract Part B – Particular Conditions. The BQ and the Work Program shall be approved by the Owner.*

Note: The BQ is normally submitted by the Contractor with its Tender. The Owner's approval is meant to provide the Owner with assurance that the Contractor as provided the full scope and quality that it requires and provide the Contractor with assurance that it has included the full scope of the Works in its Tender. If the BQ contains provisional sums, such quantities are to be used. The submission of the

Work Program shall be in conformance with the Tender, and, if required, as provided in the New Standard Conditions of Contract Part B – Particular Conditions.

- 3.2 *The Work Program shall conform with the requirements and timing established in the New Standard Conditions of Contract Part B – Particular Conditions.*
- 3.3 *The BQ and the Work Program shall be binding on the Owner or the Contractor, and shall not be altered without approval of the Owner. The BQ and the Work Program shall be the basis for measuring all Variations, Changes and/or Extensions of Time as provided in these Contract Documents.*

Article 4(A) - CONTRACT GUARANTEE

- 4.1 The Contractor shall submit one of the following five Items to the Owner as a Contract guarantee immediately upon the conclusion of this Contract. However, if the Contractor elects to secure the Performance Bond Insurance (Item v.), the Contractor shall entrust the Performance Bond Insurance Policy to the Owner promptly after the Performance Bond Insurance Contract is concluded, *but not more than 10 calendar days after the Notice to Proceed.*
- i. Deposit of the Contract Guarantee Money.
 - ii. Deposit of negotiable securities or other negotiable instruments as collateral in lieu of the Contract Guarantee Money.
 - iii. A written guarantee from a bank or other financial institution approved by the Owner covering any and all damages that may arise from the default on its obligations under this Contract.
 - iv. A guarantee covering any and all damages that may arise from the default on its obligations under this Contract in the form of Public Works Performance Bond Certificate.
 - v. Conclusion of the Performance Bond Insurance Contract covering any and all damages that may arise from the defaults on its obligations under this Contract.
- 4.2 The amount of the Guarantee Money or the amount of the guarantee or the insurance specified in Article 4.1 (referred to as the “Guaranteed Amount” in Article 4.4) shall be no less than []-tenth(s) of the Contract Price.
- 4.3 When the Contractor submits the contract guarantee in the form of negotiable securities or a written guarantee from a financial institution (as specified in Items ii. and iii. of Article 4.1), these Items shall be deemed as collateral submitted in lieu of the deposit of the Contract Guarantee Money. When the Contractor submits the contract guarantee in the form of the Public Works Performance Bond or the Performance Bond Insurance (as specified in Items iv. and v. of Article 4.1), the Contract shall be deemed exempt from the obligation for deposit of the Contract Guarantee Money.
- 4.4 In the event of an increase in the Contract Price, the Owner may claim an increase in the Guaranteed Amount, provided that the Guaranteed Amount shall be no more than []-tenth(s) of the new Contract Price.

Note: Article 4(A) should be incorporated into the General Conditions where a monetary guarantee is required. The figure “1” could, for example, be inserted into the sections marked by the blank symbol [], *and should be specified in the New Standard Conditions of Contract Part B – Particular Conditions.*

Article 4(B) - CONTRACT GUARANTEE - ALTERNATIVE

- 4.1 The Contractor shall submit to the Owner a guarantee for the performance of the Contractor's obligations under this Contract in the form of Public Works Performance Bond Certificate (said certificate shall be backed by exclusive collateral warranty) as a contract guarantee immediately upon the conclusion of this Contract.
- 4.2 The amount of the contract guarantee specified in Article 4.1, shall be no less than []-tenth(s) of the Contract Price.
- 4.3 In the event of an increase in the Contract Price, the Owner may claim an increase in the amount of the contract guarantee, provided that the amount of the contract guarantee shall be no more than []-tenth(s) of the new Contract Price. In the event of a decrease in the Contract Price, the Contractor may claim a decrease in the amount of the contract guarantee, provided that the contract guarantee shall be no less than ()-tenth(s) of the new Contract Price.

Note: Article 4(B) should be incorporated into the General Conditions where a job guarantee is required: the figure "3" could, for example, be inserted into the sections marked by the blank symbol [], *and should be specified in the New Standard Conditions of Contract Part B – Particular Conditions.*

Article 5 - TRANSFER OF RIGHTS AND OBLIGATIONS

- 5.1 The Contractor shall not transfer or convey any of the rights or obligations arising under this Contract to any third party without a prior written approval of the Owner.
- 5.2 The Contractor shall not transfer, lend or lease, mortgage or pledge, or otherwise use as collateral to any third party the Work Objects or the Construction Materials (hereinafter including manufactured products) that have passed inspection as stipulated in Article 13.2 or that have been confirmed for partial payments as stipulated in Article 37.3 without prior written approval of the Owner.

Article 6 - PROHIBITION OF ENTIRE SUBCONTRACT

The Contractor shall not assign or subcontract the entire Works, or the primary parts of the Works, or the entire works for any structure that functions independently from the rest of the Works, to any third party without a prior written approval of the Owner.

Article 7 - NOTIFICATION OF SUBCONTRACTOR

The Contractor shall notify the Owner of the trade names, names, and other necessary information about any and all of the subcontractors.

Article 8 - PATENT RIGHTS

When the Contractor utilizes the Construction Materials and the Work Methods covered by patent rights, utility model rights, design rights, trademark rights, or any other rights belonging to the third party protected by the laws of Japan (hereinafter referred to as "Patent Rights"), the Contractor shall bear any and all responsibility concerning the utilization of the such Construction Material or the such Work Methods. However, when the Owner stipulates the utilization of the such Construction Materials or the such Work Methods are subject to the Patent Rights, and when the Contractor is unaware that the such Construction Materials or the such Work Methods are subject to the Patent Rights, the Owner shall bear all costs and expenses involved in the utilization of the such Construction Materials or the such Work Methods.

Article 9 – THE OWNER’S ENGINEER

- 9.1 The Owner *shall assign an Engineer* to manage the Works. The Owner shall notify the Contractor of the name of the *Engineer*. Whenever the *Engineer* is changed, the Owner shall notify the Contractor of the name of the new *Engineer*.
- 9.2 In addition to those powers specified elsewhere in *the Contract Documents* and to any powers vested to the Owner in accordance with *the Contract Documents* that the Owner deems necessary to entrust to the *Engineer*, the *Engineer* shall have the following powers as stipulated in the Drawings and Specifications.
- i. Instructions, approvals, and consultations with the Contractor or the Superintendent of the Contractor regarding the execution of this Contract.
 - ii. Preparation and delivery of detailed drawings, etc. for the execution of the Works based on the Drawings and Specifications, or approval of detailed drawings, etc. prepared by the Contractor.
 - iii. In accordance with the Drawings and Specifications, management and observation of the process of the Works; inspection of the execution of the Works; and testing, inspection (an approval) of the Construction Materials.
- 9.3 If the Owner assigns two or more *Engineers* to manage the Works and divides the powers stipulated in Article 9.2, the Owner shall notify the Contractor of the content of the powers entrusted to each of the *Engineers*; and if the Owner entrusts any of the powers vested to the Owner in accordance with *these Contract Documents* to the *Engineer(s)*, the Owner shall notify the Contractor of the content of the powers that have been entrusted to the *Engineers(s)*.
- 9.4 Instructions and approvals by the Project Manager as stipulated in Article 9.2 shall be made in writing.
- 9.5 If the Owner assigns *an Engineer*, aside from those items expressly stipulated in the *Contract Documents*, all claims, requests, notifications, reports, offers, approvals and termination specified in this Contract Form are to be conveyed to the Owner via the *Engineer*. In this case, the date upon which such items are received by the *Engineer* shall be treated as the date upon which such items are received by the Owner.
- 9.6 If the Owner does not *specify an Engineer*, all powers that are vested in the *Engineer*, as stipulated in *the Contract Documents* shall revert to the Owner,

provided that those functions requiring a licensed Engineer pursuant to the Professional Engineering Act, April 2000, are fulfilled by a licensed engineer.

Note: Additionally, while not addressed herein, the current Professional Engineering Act applicable to both government engineers, as well as engineers working for corporations and consulting engineering companies, and that both are required to abide by its mandates. Thus, the New Standard Conditions of Contract Part A - General Conditions reflect that civil works infrastructure construction will have an "Engineer" and that such engineer, whether "in house" or "retained," is suitably recognized under the Construction Business Law. The Engineer will be a licensed professional that is held accountable for the quality and efficacy of design, and can make all required technical decisions.

Article 10 – THE CONTRACTOR’S SUPERINTENDENT AND ENGINEERS

10.1 The Contractor shall assign the following personnel to the Construction Site, and in accordance with the Drawings and Specifications, shall notify the Owner of the personnel's names and other necessary information. The Contractor shall also notify the Owner whenever there is a change in said personnel.

- i. Superintendent.
- ii. (A) ☐ Chief Engineer
(B) ☐ Supervisory Engineer.
- iii. Special Engineer (hereinafter, referred to as an Engineer stipulated in Article 26.2 of the Construction Business Act).

Note: Item (B) should be incorporated into the General Conditions within the purview of Article 26.2 of the Construction Business Act, and Item (A) should be incorporated into the General Conditions outside the purview of Article 26.2 of the Construction Business Act. When the Works fall within the purview of Article 26.3 of the Construction Business Act, the phrase "Resident" should be inserted into the blank ☐. However, when the Works fall within the purview of Article 26.4 of the Construction Business Act, the phrase "Resident Supervisory Engineer who has been properly issued a supervisory certificate" should be inserted into the blank ☐.

10.2 The Superintendent shall be resident at the Construction Site, and shall be responsible for managing and supervising the Works regarding the execution of this Contract. The Superintendent may exercise all powers vested to the Contractor under this Contract, except for powers to adjust the Contract Price, to claim and to receive payments for the Contract Price, to receive claims under Article 12.1, to determine and notify as stipulated under Article 12.3, and to terminate this Contract.

10.3 Regardless of the stipulations of Article 10.2, when the Contractor intends to exercise certain powers vested to the Contractor directly, without entrusting said powers to the Superintendent, the Contractor shall, beforehand, notify the Owner of powers which the Contractor shall exercise directly.

10.4 The Superintendent may also serve as the Chief Engineer (Supervisory Engineer) or the Special Engineer.

Article 11 - PROGRESS REPORT

In accordance with the *Contract Documents*, the Contractor shall report to the *Engineer periodically in conformance with the New Standard Conditions of Contract Part A - Particular Conditions* regarding the execution of this Contract. *Failure to make complete and timely submissions and periodic reporting shall entitle the Owner to withhold progress payments to the Contractor until it has complied with the requirements.*

Article 12 - CLAIMS ON ACTION REGARDING SUPERINTENDENT, ENGINEER, CHIEF ENGINEER, SUPERVISORY ENGINEER AND SPECIAL ENGINEER

- 12.1 When the Owner deems that the Superintendent (who may also be serving as the Chief Engineer) is conspicuously incapable of exercising the duties, the Owner may claim in writing with the reasons for the claim, that the Contractor shall take whatever action is necessary.
- 12.2 When the Owner or the *Engineer* deems that the Chief Engineer, the Supervisory Engineer, or the Special Engineer (when these individuals are not also serving as the Superintendent), or other subcontractor, laborer, etc. employed by the Contractor is conspicuously incapable of executing or managing the Works, the Owner or the Project Manager may claim, in writing with the reasons for the claim, that the Contractor take whatever action is necessary.
- 12.3 When the Contractor receives a claim pursuant to Articles 12.1 or 12.2, the Contractor shall determine response to the claim and notify the Owner of the said determination within ten days after receiving the said claim.
- 12.4 When the Contractor deems that the *Engineer* is conspicuously incapable of exercising the duties, the Contractor may claim, in writing with the reasons for the claim, and the Owner take whatever action is necessary.
- 12.5 When the Owner receives a claim pursuant to Article 12.4, the Owner shall determine response to the claim and notify the Contractor of the said determination within ten days after receiving the said claim.

Article 13 - QUALITY AND INSPECTION OF CONSTRUCTION MATERIALS

- 13.1 The quality of all Construction Materials shall be in accordance with the *Contract Documents*. When the quality of any Construction Materials is not expressly stipulated in the *Contract Documents*, than such Construction Materials shall be of medium quality.
- 13.2 When the *Contract Documents* specify that certain Construction Materials are subject to the inspection, including approval by the *Engineer*, the Contractor shall use the Construction Materials that have passed the inspection by the Project Manager for the said Construction Materials. In this case, the direct costs involved with the inspection shall be borne by the Contractor.

- 13.3 When the Contractor requests that the *Engineer* inspect certain Construction Materials stipulated in Article 13.2, the *Engineer* shall comply with the request within 10 days after the request is made or as specified in the New Standard Conditions of Contract Part B – Particular Conditions.
- 13.4 The Contractor shall not remove any Construction Materials that have been carried into the Construction Site outside the Construction Site without the approval of the *Engineer*.
- 13.5 Regardless of the stipulations of Article 13.4, the Contractor shall remove any and all Construction Materials that have failed the inspection to outside of the Construction Site within [] days after receiving the notification of the inspection.

Article 14 - OBSERVANCE BY ENGINEER AND WORK RECORDS SUBMITTED TO THE ENGINEER

- 14.1 When the *Contract Documents* specify that certain Construction Materials shall be prepared in the presence of the *Engineer*, or that samples of the such prepared Construction Materials are subject to the inspection by the *Engineer*, the Contractor shall use Construction Materials that have been prepared in the presence of the *Engineer* or Construction Materials whose samples have passed the inspection by the *Engineer*.
- 14.2 When the *Contract Documents* specify that certain works shall be executed in the presence of the *Engineer*, the Contractor shall execute the said works in the presence of the *Engineer*.
- 14.3 In additions to Article 14.1 and 14.2, when the Owner deems specially necessary, and when Construction Materials are being prepared or construction works are being executed for which the *Contract Documents* require preparation of records such as samples and work photographs, the Contractor shall prepare the such records in accordance with the *Contract Documents*, and shall, upon the *Engineer's* request, submit said records to the *Engineer* within [] days after receiving the request.
- 14.4 When the Contractor requests the presence of the *Engineer* or requests that the *Engineer* inspect samples of certain Construction Materials as stipulated in Article 14.1 or Article 14.2, the *Engineer* shall comply with the request within [] days after receiving the request.
- 14.5 If the *Engineer*, without any justifiable reasons, does not comply with the request form the Contractor specified in Article 14.4 within [] days after receiving the request, and this hinders the continued progress of the scheduled Works, upon notifying the *Engineer*, the Contractor may then proceed with the preparation of the Construction Materials or the execution of the said works without the presence of the *Engineer* or the inspection of samples by the *Engineer*. In this case, the Contractor shall prepare records, such as samples and work photographs to document that the preparation of the pertinent Construction Materials or the execution of the pertinent works have been properly conducted and, upon the *Engineer's* request, shall submit the such records to the *Engineer* within [] days after receiving requests.

- 14.6 All direct costs and expenses involved in the inspection of samples and in the preparation of records, such as samples and work photographs specified in Article 14.1, Article 14.3, and Article 14.5 shall be borne by the Contractor.

Article 15 - SUPPLIED MATERIALS AND FURNISHED EQUIPMENT

- 15.1 Regarding Construction Materials that the Owner supplies to the Contractor (hereinafter referred to as "Supplied Materials") and construction equipment that the Owner lends to the Contractor (hereinafter referred to as "Furnished Equipment") to the Contractor, the item names, quantities, quality, and specifications or functions of the Supplied Materials and the Furnished Equipment, as well as the delivery time and delivery place shall be as stipulated in the *Contract Documents*.
- 15.2 The *Engineer* shall inspect the Supplied Materials and the Furnished Equipment in the presence of the Contractor at the Owner's expense, when delivering the Supplied Materials and the Furnished Equipment to the Contractor. In this case, as a result of the said inspection, if the Contractor finds that the item names, quantities, quality, or specifications or functions of the Supplied Materials and the Furnished Equipment differ from the stipulations in the *Contract Documents* or are not suitable for the Works, the Contractor shall immediately notify the Owner to this effect.
- 15.3 Within [] days after receiving the Supplied Materials or the Furnished Equipment the Contractor shall submit a receipt of the Supplied Materials or a rental document of the Furnished Equipment to the Owner.
- 15.4 If, sometime after the delivery of the Supplied Materials or the Furnished Equipment, the Contractor finds some latent defects in the Supplied Materials or Furnished Equipment that were difficult to discover during the inspection stipulated in Article 15.2, and determines that the Supplied Materials or the Furnished Equipment are not suitable for the Works, the Contractor shall immediately notify the Owner to this effect.
- 15.5 When the Owner receives the notification from the Contractor pursuant to Article 15.2 or Article 15.4, the Owner shall, if necessary, either deliver other Supplied Materials or Furnished Equipment to the Contractor as substitutes; or make changes to the item names, quantities, quality, or specifications or functions of the Supplied Material or the Furnished Equipment; or request in writing with the reasons, that the Contractor used the Supplied Materials or Furnished Equipment.
- 15.6 In addition to the stipulations of Article 15.5, if the Owner deems necessary, it may change the items, quantities, quality, or specifications or functions of the Supplied Materials and Furnished Equipment, or change the deliver time and delivery place.
- 15.7 Under the conditions stipulated in Article 15.5 or 15.6, the Owner shall adjust the Construction Period or the Contract Price, if necessary, and shall bear damages incurred by the Contractor, if any.
- 15.8 The Contractor shall manage the Supplied Materials and the Furnished Equipment with due care of a good manager.
- 15.9 In accordance with the *Contract Documents*, the Contractor shall return the Supplied Materials and the Furnished Equipment that are no longer necessary to the Owner because of the completion of the Works or changes to the *Contract Documents*.

- 15.10 If the Contractor destroys or damages any of the Supplied Materials or the Furnished Equipment due to either bad faith or negligence, or if it becomes impossible to return the Supplied Materials or the Furnished Equipment in original state to the Owner for any reason, the Contractor shall return substitute Supplied Materials or the Furnished Equipment to the Owner within time period specified *in the New Standard Conditions of Contract Part B – Particular Conditions*, or the Contractor shall restore the Supplied Materials or the Furnished Equipment to its original state and then return the Supplied Materials or the Furnished Equipment to the Owner or the Contractor shall pay monetary compensation for the damages *at rates specified in the New Standard Conditions of Contract Part B – Particular Conditions* to the Owner in lieu of returning the Supplied Materials or the Furnished Equipment to the Owner.
- 15.11 When the methods of using any of the Supplied Materials or the Furnished Equipment are not clearly specified in the *Contract Documents* or *could not reasonably determined by the Contractor when the Supplied Materials or the Furnished Equipment were delivered*, the Contractor shall *notify the Owner of deficiency as soon as the Contractor is aware of such deficiency, and shall notify and follow the Engineer's instructions concerning the use of the Supplied Materials or the Furnished Equipment.*

Article 16 - ACQUISITION OF LAND FOR WORKS

- 16.1 The Owner shall acquire or otherwise secure the use of all land to be used for the Works and of any other land necessary for the execution of the Works (hereinafter referred to as "Land") as specified in the *New Standard Conditions of Contract Part B – Particular Conditions* by the date(s) *indicated in the New Standard Conditions of Contract Part B – Particular Conditions*. (When a date is explicitly specified in the *New Standard Conditions of Contract Part B – Particular Conditions*, this shall be deemed as the date necessary for the execution of the Works).
- 16.2 The Contractor shall manage the Land with due care of a good manager.
- 16.3 When the Land is no longer necessary for the execution of the Works because of the completion of the Works or changes to the *requirements of the Contract Documents*, the Contractor shall remove *within the time required the New Standard Conditions of Contract Part B – Particular Conditions*, all Construction Materials, construction equipment, temporary structures, and other items owned or controlled by the Contractor (hereinafter, also including items owned or controlled by subcontractors) from the Land; restore, clean up, and otherwise place the Land into good order; and vacate and deliver the Land to the Owner.
- 16.4 If the Contractor does not move pertinent items or does not properly restore or clean up the land as stipulated in Article 16.3 within *the time required by the New Standard Conditions of Contract Part B – Particular Conditions* and without justifiable reasons, the Owner may dispose of the pertinent items and restore and clean up the Land directly in place of the Contractor. In this case, the Contractor may not petition for objections to the Owner's disposal or restoration or cleaning of the Land and shall bear all the costs and expenses incurred by the Owner in the said disposal, restoration and cleaning, *or the Owner may retain an amount sufficient to cover the expense from the payments due to the Contractor.*

Article 17 - RECONSTRUCTION AND DESTRUCTIVE TESTING

- 17.1 The *Engineer* may request that the Contractor reconstruct any parts of the Works that are not in conformity with the *Contract Documents*, and the Contractor shall comply with any such request, *unless the Contractor believes that such request is unreasonable. In such event, the Contractor shall follow the procedure in Article 52.* In this case, if the lack of conformity is due to the *fault of the Owner's or the Engineer*, the Owner *may be liable for any adjustment of the Works Program and/or the Contract Price* if necessary.
- 17.2 If the Contractor is in violation of the stipulations of Article 13.2, Article 14.1, Article 14.2, or Article 14.3, the *Engineer* may, if necessary, conduct destructive testing on pertinent parts of the Works.
- 17.3 In addition to the stipulations of Article 17.2, if the *Engineer reasonably* judges that a part of the Works is not in conformity with the *Contract Documents*, after notifying the Contractor of these reasons, the *Engineer* may, if necessary, conduct destructive testing on the pertinent part of the Works, minimizing the destruction from such testing as much as possible.
- 17.4 When destructive testing is carried out in accordance with Article 17.2 or Article 17.3, the Contractor *may be liable for all the direct costs and expenses involved with the testing and the pertinent restoration works, subject to determination pursuant to Article 52.*

Article 18 - DIFFERING SITE CONDITIONS

- 18.1 If the Contractor finds any of the following facts during the execution of the Works, the Contractor shall promptly notify the *Engineer* to that effect, and request that the *Engineer* confirm the said facts.
- i. The *Contract Documents* and/or written responses to the explanatory documents are inconsistent, *and such inconsistency is not solved by the order of precedence established in Article 1.13.*
 - ii. The *Contract Documents* contain errors or omissions.
 - iii. The *Contract Documents* contain ambiguous or unclear expressions.
 - iv. The actual natural or artificial conditions, such as, but not so as to limit the generality of the foregoing, land configuration, nature of soil, ground water, and limiting factors for the execution of the Works at the Construction Site are different from those expressed in the *Contract Documents*.
 - v. Unforeseeable special situations occur in the conditions that are not specified in the *Contract Documents*.
- 18.2 When the *Engineer* is requested to confirm certain facts stipulated in Article 18.1, or when the *Engineer* finds such facts by *itself*, the *Engineer* shall conduct surveys in the presence of the Contractor *within 14 days*. However, if the Contractor does not agree to be present at such surveys, the *Engineer* may conduct such surveys without the presence of the Contractor.
- 18.3 After hearing the options of the Contractor, the *Engineer* shall formulate a survey result (including instructions for any necessary measures based on the survey result,

if any) and shall notify the Contractor of the results of the aforementioned surveys within 14 days after the surveys are completed.

Note: If the Engineer is unable to comply with the number of days, the Engineer should notify the Contractor before the expiration of the time period specified, including the reasons therefore.

18.4 When the results of the surveys stipulated in Article 18.4 confirm any of the facts listed on Article 18.1, the *Contract Documents* shall, if necessary, be revised or changed as stipulated below.

- i. If it is necessary to revise the *Contract Documents* because of the facts listed in Article 18.1, items i., ii., or iii., the revision shall be made by the *Engineer and confirmed in writing by the Owner*.
- ii. If it is necessary to revise the *Contract Documents* and the Work Objects because of the facts listed in Article 18.1, items iv. or v., the change shall be made by the *Engineer promptly and they shall be confirmed in writing by the Owner*.
- iii. If it is necessary to change the *Contract Documents* without changing the Work Objects because of the facts listed in Article 18.1, items iv. or v., the changes shall be made by the *Engineer promptly and they shall be confirmed in writing by the Owner, all within 14 days*.

18.5 When the *Contract Documents* are revised or changed in accordance with Article 18.4, the Owner shall adjust the Construction Period or the Contract price, if necessary, and *may be liable for damages incurred by the Contractor, if any, subject to determination pursuant to Article 52*.

Article 19 - CHANGES AND VARIATIONS TO THE CONTRACT DOCUMENTS

19.1 The *Engineer* may, when the Owner deems necessary, make any Changes or direct Variations to the *Contract Documents*, subject to (a) *notifying the Owner unless such change falls outside any limitations on its authority in the New Standard Conditions of Contract Part B – Particular Conditions, in which case the Owner shall direct the Engineer to issue the Change or Variation*, and (b) notifying the Contractor of the details of the Changes and Variations. The Owner shall adjust the Construction Period or the Contract Price, if necessary, *may be liable for damages incurred by the Contractor, if any, subject to determination if the Contractor does not agree pursuant to Article 52, that the Contractor shall execute the directed Change or Variation while such determination is being made*.

19.2 *Variations may include Works Program alterations, provided that such alterations are not necessary because of causes for which the Contractor is responsible.*

19.3 *The Contractor can submit in writing to the Engineer at any time Value Engineering suggestions, provided that the suggestions result if accepted by the Owner and results in either/or:*

- i. *An acceleration of the Works Completion Date;*
- ii. *Reducing the cost of executing, maintaining or operating the Works;*
- iii. *Improving the value of the completed Works;*
- iv. *Otherwise is of benefit to the Owner.*

But nothing obligates or requires the Owner to accept any Value Engineering suggestion. The Contractor will submit all information that the Engineer reasonably

requires to enable evaluation of the Value Engineering suggestion, and shall not proceed until the Value Engineering suggestion is accepted by the Owner.

- 19.4 *The Engineer may also request a proposal to execute a Change or Variation. The Contractor shall not execute the Change or Variation until it is accepted by the Engineer.*

Article 20 - SUSPENSION OF WORKS

- 20.1 If it is determined that the Contractor cannot execute the Works because the Land cannot be secured, or because the Work Objects have been damaged or the site conditions have been differed by violet storms, torrential rainfall, flooding, flood tides, earthquakes, landslides, land subsidence, fires, riots, civil unrest, or any other acts of God or man (hereinafter referred to as "Disasters") that is beyond the Contractor's control, the *Engineer* shall order the Contractor to temporarily suspend all or any part of the Works. In this case, the *Engineer* shall notify the Contractor of the details of the suspension.
- 20.2 Without prejudice to the stipulations under Article 20.1, the *Engineer*, when the *Engineer* deems *such necessary and with the concurrence of the Owner*, also may order the Contractor to temporarily suspend all or any part of the Works. In this case, the Owner shall notify the Contractor of the details of the suspension.
- 20.3 If the *Engineer* orders the Contractor to temporarily suspend the Works in accordance with Article 20.1 or Article 20.2, the Owner shall, if necessary, adjust the Construction Period of the Contract Price, and *may be liable for damages, such as*, additional costs and expenses, if any, incurred by the Contractor *in compliance with* the suspension of the Works, including, but not limited to, costs and expenses to maintain the Construction Site, to keep laborers and construction equipment in preparation for the resumption of the Works, and any other damages incurred by the Contractor.

Article 21 - EXTENSION OF CONSTRUCTION PERIOD

- 21.1 If the Contractor is unable to complete the Works within the Construction Period because of *Disasters as defined in article 20.1, Changes or Variations, delay for which the Owner bears responsibility*, or for reasons not due to the Contractor's liability, the Contractor may claim an extension adjustment of the Construction Period against the Owner, subject to *timely notification and submission of the required proofs relating to the Works Program contained in the New Standard Conditions of Contract Part B – Particular Conditions*.
- 21.2 *If no agreement is reached within 28 days after the date of notice on an Extension to the Contract Period, the Engineer shall determine the amount of Extension that is required with in 14 days thereafter, and if the Contractor is not in agreement, the Contractor upon notification may seek a determination pursuant to Article 52.*
- 21.3 *The approved Works Program for the Remaining Construction Period and any adjustment necessary to the approved BQ shall be made to reflect the Time Extension.*

Article 22 - ACCELERATION OF CONSTRUCTION PERIOD

- 22.1 If the Owner deems it necessary to complete the Works before the date for completion, *the Owner through the Engineer* may order an acceleration adjustment of the Construction Period *and the Contractor shall comply*.
- 22.2 In cases where the *Engineer* should extend the Construction Period in accordance with other Articles of these Contract *Documents*, the Owner may, for special reasons, assert that the Construction Period be adjusted to a time period shorter than that which would normally be considered necessary.
- 22.3 If the Construction Period is *accelerated* in accordance with Article 22.1 or Article 22.2, the Owner shall adjust the Contract Price, if necessary, and shall bear damages incurred by the Contractor, if any.

Article 23 - PROCEDURES FOR ADJUSTMENT OF CONSTRUCTION PERIOD

- 23.1 Any adjustment of the Construction Period *sought by the Contractor* shall be determined through *the procedures established regarding the Works Program contained in the New Standard Conditions of Contract Part B – Particular Conditions*.
- 23.2 *When the parties cannot reach agreement with respect to a request from the Contractor within 28 days after submission of the request or as set forth in the procedures established regarding the Works Program contained in the New Standard Conditions of Contract Part B – Particular Conditions, the Engineer shall decide the amount of adjustment within 14 days thereafter, if any. If the Contractor is dissatisfied with the Engineer's decision, the Contractor upon notification may seek a determination pursuant to Article 52.*
- 23.3 *The approved Works Program shall be adjusted in accordance with the provisions in the New Standard Conditions of Contract Part B – Particular Conditions.*

Article 24 - PROCEDURES FOR ADJUSTMENT OF CONTRACT PRICE

- 24.1 *The BQ and the Works Program shall be used to determine the value of Changes or Variations to adjust the Contract Price if a quantity is provided for the item and provided that the final quantities are between [] percent and [] percent of the quantities the BQ approved by the Engineer pursuant to Article 3.1.*

Note: Usually the percentages to be used in shall be between 90% and 110% of the quantities that are specified in the BQ. If the BQ contains provisional sums, they are shall be used in determining the Contract Price at the time of Award to the Contractor.

- 24.2 *Where the quantity for an item covered by the BQ falls outside of the range established in Article 24.1, the price for the Change or Variation shall be adjusted from the amount established by the BQ, but in the event that agreement is not reached in 28 days, the Engineer shall decide the value within 14 days thereafter, if any. If the Contractor is dissatisfied with the Engineer's decision, the Contractor upon notification may seek a determination pursuant to Article 52.*
- 24.3 *If the item is not covered by the BQ, the parties shall agree upon a value or cost provided that the Contractor substantiates the costs or damages that it has incurred in conformance with the Public Accounting Law, Law No. 35, 1947), but in the event*

that agreement is not reached in 28 days, the Engineer shall decide the 14 days thereafter, if any. If the Contractor is dissatisfied with the Engineer's decision, the Contractor upon notification may seek a determination pursuant to Article 52.

- 24.4 Upon adjustment of the Contract Price, the BQ shall be updated to reflect the new Contract Price and the addition of any items.

Article 25 - ADJUSTMENT OF CONTRACT PRICE DUE TO PRICE LEVEL CHANGE

- 25.1 If, at least twelve months have passed since the date upon which this Contract is concluded and within the Construction Period, the Owner or the Contractor deems that the Contract Price is no longer appropriate because of change in the prevailing wage level or price level in Japan, either the Owner or the Contractor may claim adjustment of the Contract Price against the other party.
- 25.2 When the Owner of the Contractor receives a claim as stipulated in Article 25.1, the party receiving the claim shall agree to adjust the Contract Price by the portion of the Difference that exceeds 1.5 percent of the Price of Remaining Works before such wage level or price level Change (*hereinafter as used in Article 25, the Change*). The Price of Remaining Works before Change is defined as the total Contract Price minus the corresponding price to the parts of the Works that have been completed at the time said claim is made. The Price of Remaining Works after Change is defined as a recalculated price on the Price of Remaining Works before Change on the basis of the prevailing wage level and price level after the change. The Difference is defined as the difference between the Price of the Remaining Works before Change and the Price of Remaining Works after Change.
- 25.3 The Price of Remaining Works before Change and the Price of Remaining Works after Change shall be determined between the *Engineer* and the Contractor based on
- (A) The BQ and [] at the time the claim is made.
 - (B) The BQ and price indices, etc. at the time the claim is made.

However, if an agreement is not reached within 28 days, *the Engineer shall decide within 14 days* the Price of Remaining Works before Change and the Price of Remaining Works after Change, and notify the Contractor of these Prices. *If the Contractor is dissatisfied with the Owner's decision, the Contractor upon notification may seek a determination pursuant to Article 52.*

Note: The name of the pertinent document(s) (such as periodic, public documents prepared by the Japanese government or by Japanese quasi-governmental entities) should be inserted in the blank denoted by the symbol [].

- 25.4 After adjustment has been made to the Contract Price in accordance with Article 25, further claim may be made in accordance with Article 25.1. In this case, Article 25.1 to Article 25.3 shall apply, replacing the phrase "the date upon which this Contract is concluded" in Article 25.1 by the phrase "the date which served as a standard day for the most recent adjustment of the Contract Price under this Article."
- 25.5 Without the prejudice to the rights of the Owner and the Contractor stipulated in Article 25.1 to Article 25.4, the Owner or the Contractor may claim adjustment of the

Contract Price when the Contract Price is no longer appropriate because of extreme change in the prevailing price levels of the primary Construction Materials in Japan within the Construction Period due to special factors.

- 25.6 If an extreme inflation or deflation is caused in Japan during the Construction Period by unforeseeable special conditions, and consequently the Contract Price is clearly no longer appropriate, the Owner or Contractor may, regardless of the above stipulations of Article 25.1 to Article 25.5, claim adjustment of the Contract Price.
- 25.7 The adjustment of the Contract Price in accordance with Article 25.5 and 25.6 shall as provided in Articles 25.2 and 25.3.
- 25.8 The date on which *the adjustment* stipulated under Article 25.3 or Article 25.7 is *effective* shall be the date upon which the claim is delivered to the other party as set forth in Article 1.5.
- 25.9 The BQ shall be adjusted for Remaining Work accordingly for all remaining quantities to reflect any adjustment made.

Article 26 - EMERGENCY WORK

- 26.1 When the Contractor deems that a certain work is necessary for the prevention of Disaster or for other purposes, the Contractor shall implement such work. In this case, if the Contractor deems necessary, the Contractor shall ask the opinion of the *Engineer* beforehand, unless urgent and unavoidable reasons exist.
- 26.2 If the Contractor implements the work stipulated in Article 26.1, the Contractor shall promptly notify the *Engineer* of details of the said work.
- 26.3 If the *Engineer* deems the work especially necessary for Disaster prevention or otherwise regarding the execution of the Works, the Superintendent may request the Contractor to implement necessary emergency work.
- 26.4 When the Contractor implements emergency work in accordance with Article 26.1 or Article 26.3, the Owner shall bear the costs and expenses of any such work, provided that such costs and expenses should not appropriately be borne by the Contractor within the scope of the Contract Price.

Article 27 - GENERAL PROVISION FOR DAMAGES

- 27.1 Prior to the possession of the Work Objects, the Contractor shall bear the costs and expenses of any damages that occur to the Work Objects or to the Construction Materials and of any other damages that occur during the execution of the Works (except for those damages specified in Article 28.1, Article 28.2, or Article 29.1), *provided that such damages do not exceed an amount specified in the New Standard Conditions of Contract Part B – Particular Conditions.*
- 27.2 The Owner shall bear any damages due to the Owner's liability among such damages (except for damages covered by the Insurance stipulated in Article 51.1).
- 27.3 *If the Owner and the Contractor cannot agree on the responsibility or the allocation of damages within 28 days after notice to the other, the Engineer shall decide within 14 days. If the Contractor is dissatisfied with the Engineer's decision, the Contractor upon notification may seek a determination pursuant to Article 52.*

Article 28 - DAMAGES UPON THIRD PARTY

- 28.1 When any damages are inflicted upon the third party related to the execution of the Works, the Contractor shall indemnify such third party against such damages. However, the Owner shall bear any damages due to the Owner's liability among such damages (except for damages covered by the Insurance stipulated in Article 51.1).
- 28.2 Regardless of Article 28.1, when damages are inflicted upon the third party by normally unavoidable events under construction, without limiting the generality of the foregoing, normally unavoidable noise, vibration, land subsidence, the interruption of ground water, the Owner shall bear any such damages. However, the Contractor shall bear any damages that are caused by the Contractor's failure to exercise due care of a good manager related to the execution of the Works, among such damages.
- 28.3 When any disputes arise within the third party stipulated in Article 28.1 or Article 28.2 or otherwise regarding the execution of the Works, the Owner and the Contractor shall cooperate in settling such disputes.

ARTICLE 29 - DAMAGES FROM FORCE MAJEURE

- 29.1 Prior to the possession of the Work Objects, if the Disasters (for those items with standards specified in the *Contract Documents*, this is limited to forces exceeding the pertinent standards) that are beyond control of the Owner and the Contractor (hereinafter referred to as "Force Majeure") cause any damages to the Work Objects, to temporary structures, or to the Construction Materials or construction equipment that has been brought onto the Site, the contractor shall notify the *Engineer* of the actual conditions of such damages promptly after such damages occur.
- 29.2 When the *Engineer* receives the notification stipulated in Article 29.1, the *Engineer* shall promptly, *but no less than 7 days after the notification*, conduct an inspection to confirm the actual conditions of the pertinent damages (hereinafter in this Article, except for damages cause by the Contractor's failure to exercise due care of a good manager and damages covered by the Insurance stipulated in Article 51.1) and notify the Contractor of the results of said inspection *within 14 days of such inspection*.
- 29.3 When the actual conditions of the damages have been confirmed in accordance with Article 29.2, the Contractor may claim that the Owner bear the said damages.
- 29.4 When the *Engineer* receives the claim from the Contractor for the said damages stipulated in Article 29.3, the Owner shall bear a portion of the Total Damage Amount (hereinafter, this means a sum of the amount of the said damages that occurred to the Work Objects, to temporary structures, to the Construction Materials and construction equipment that have been brought onto the Site, and that may be confirmed by inspection, on-site inspection, or the Contractor's work records under the stipulations of Article 23.2, Article 14.1, Article 14.2, or Article 37.3 plus the amount necessary to clean up from the said damages) that exceeds one percent of the Contract Price to the Contractor.
- 29.5 The amount of the said damages shall be calculated for each of the following types of damaged items as stipulated below based on the *then current* BQ.

- i. Damages to the Work Objects: The amount of the damages to the Work Objects shall be valued as the corresponding part of the Contract Price to the Work Objects that have suffered damages, deducting the appraised residual value, if any, of the damaged Work Objects.
 - ii. Damages to the Construction Materials: The amount of the damages to the Construction Materials shall be valued as the corresponding part of the Contract Price, and shall be limited normal costs of the damaged Construction Materials, deducting the appraised residual value, if any, of the Construction Materials.
 - iii. Damages to Temporary Structures and Construction Equipment: The amount of the damages to temporary structures and construction equipment shall be valued at (total depreciation costs allocated for the said Works) minus (any depreciation costs corresponding to the said Work Objects at the time that the damages occurred), and shall be limited to normal costs of the damaged structures and equipment. However, when the functions of any of these structures and equipment may be repaired, and when the costs of such repairs are less than the aforementioned value, the amount of the damages to these structures and equipment shall be valued as equal to the costs of repairing these structures and equipment.
- 29.6 When the Total Damage Amount becomes cumulative due to repeated damages from the Force Majeure, from the second time of the such damages, Article 29.4 shall apply, replacing the phrase “the cumulative amount of the said damages”, the phrase, “the amount necessary to clean up from the said damages” with the phrase: the cumulative amount necessary to clean up from the said damages”, and the phrase “the Total Damage Amount” in the first paragraph with the phrase “the Total Damage Amount minus whatever payments for the damages have already been made.”

Article 30 - ALTERNATIVE TO ADJUSTMENT OF CONTRACT PRICE

- 30.1 When the Owner shall increase the Contract Price or bear certain costs, expenses or damages in accordance with Article 8, Article 15, Article 17 through Article 22, Article 25 through Article 27, Article 29 or Article 33, and the Owner has special reasons, it may change the *Contract Documents* as an alternative to increasing the Contract Price or as an alternative to bearing said costs, expenses or damages in whole or in part. In this case, the details of the changes in the *Contract Documents* shall be determined through *agreement* between the *Engineer* and the Contractor. However, if an agreement is not reached within 28 days *after notification the Engineer shall determine the Price of Remaining Works before Change and the Price of Remaining Works after Change, and notify the Contractor of these Prices within 14 days. If the Contractor is dissatisfied with the Engineer's decision, the Contractor upon notification may seek a determination pursuant to Article 52.*
- 30.2 The date on which the consultations stipulated in Article 30.1 are initiated shall be the date the *Engineer notifies the Contractor of the Owner's intention*. However, if the *Engineer* does not notify the Contractor of this date within 10 days after the date on which the conditions to increase the Contract Price or to bear certain costs are met, the Contractor shall chose the date on which the consultations shall be initiated, and notify the Owner of this date.

Article 31 - INSPECTION AND POSSESSION

- 31.1 When the Contractor has completed the Works, the Contractor shall notify the *Engineer* to that effect.

- 31.2 When the *Engineer* has received notification stipulated in Article 31.1, the *Engineer* shall, within 14 days after receiving the said notification, in the presence of the Contractor, and in accordance with the *Contract Documents*, complete an inspection to confirm an appropriate completion of the Works and notify the Contractor of the results of this inspection. In this case, the *Engineer* may, if necessary, conduct a minimal amount of destructive testing to the Work Objects, provided that the Owner notifies the Contractor of the reasons for conduction such testing.
- 31.3 Under the case stipulated in Article 31.2, the Contractor shall bear direct costs and expenses of the testing and the pertinent restoration work.
- 31.4 After the *Engineer* has confirmed to the Owner and the Contractor that the Works have been completed through the inspection stipulated in Article 31.2, and the Contractor has requested that the Owner take possession of the Work Objects, the Owner shall promptly take possession of the Work Objects.
- 31.5 If the Contractor does not request possession of the Work Objects stipulated in Article 31.4, the *Engineer on behalf of the Owner* may request that the possession of the Work Objects be taken to the Owner simultaneously with the completion of payments of the Contract Price. In this case, the Contractor shall immediately comply with the request.
- 31.6 If the Works do not pass the inspection stipulated in Article 31.2, the Contractor shall promptly conduct repairs to the Works and undergo an additions inspection by the *Engineer*. In this case, the completion of the repairs shall be treated as the completion of the Works, and Article 31.1 through Article 31.5 shall then apply.
- 31.7 *The Engineer and the Contractor shall agree on the inspection results, and, if the Contractor and the Engineer cannot agree completely within 28 days after the inspection, the Engineer shall decide within 14 days. If the Contractor is dissatisfied with the Engineer's decision, the Contractor upon notification may seek a determination pursuant to Article 52.*

Article 32 - PAYMENTS

- 32.1 The Contractor may claim the full payment of the Contract Price when the Works have passed the inspection specified in Article 31.2.
- 32.2 When the Owner has received the claim specified in Article 32.1, the Owner shall complete payments within 40 days (the "Agreed Period" hereinafter) after receiving said claim.
- 32.3 When the *Engineer*, by reasons due to the *Engineer or the Owner*, fails to conduct the inspection within the terms stipulated in Article 31.2, the number of days by which the *Engineer* is late in conducting the said inspection shall be deducted from the period for the payments of the Contract Price (hereinafter referred to as the "Agreed Period") specified in Article 32.2. In this case, if the number of days by which the Owner is late in conducting the said inspection is greater than the Agreed Period, the Agreed Period shall be considered as expired on the date that the number of days by which the *Engineer* is late in conducting the said inspection exceeds the Agreed Period.

Article 33 - USE PRIOR POSSESSION

- 33.1 The Owner may use the Work Objects in whole or in part prior to the full possession of the Work Objects as specified in Article 31.4 and Article 31.5 *upon notification to the Contractor*.
- 33.2 If the Owner uses a part of the Work Objects in accordance with Article 33.1, the Owner shall use the said part of the Work Objects with due care of a good manager.
- 33.3 If the Contractor suffers any damages from the Owners use of the Work Objects in whole or in part in accordance with Article 33.1, the Owner shall bear such damages.

Article 34 - ADVANCE PAYMENTS

- 34.1 The Contractor may claim advance payments against the Owner not to exceed []-tenth(s) of the Contract Price, provided that the Contractor concludes a guarantee contract (hereinafter referred to as the "Advance Payment Guarantee Contract") as defined in Article 2.5 of the Act Concerning Surety Business for Advance Payments in Public Works (Law No. 184, 1952) with a surety company (hereinafter referred to as "Surety Company") as defined in Article 2.4 of the same Act, with a guarantee period until the date for completion stipulated in the Contract Agreement, and entrusts the certificate to the Owner.

Note: The Advance Payment percentage shall be disclosed in the New Standard Conditions of Contract Part B – Particular Conditions, taking into account the nature, conditions, and size of the contract.

- 34.2 When the Owner receives the claim stipulated in Article 34.1, the Owner shall make advance payments to the Contractor within 14 days after receiving the said claim.
- 34.3 If the Contract Price has been substantially increased, the Contractor may claim advance payments against the Owner, not to exceed []-tenth(s) of the increased Contract Price minus any advance payments that have already been received. In this case, Article 34.2 shall apply mutatis mutandis.
- 34.4 If the Contract Price has been substantially decreased, and if the advance payments that have been received exceed []-tenth(s) of the decreased Contract Price, the Contractor shall return the difference between the advance payments and () tenth(s) of the decreased Contract Price to the Owner within 30 days after the Contract Price has been decreased.
- 34.5 If the said difference stipulated in Article 34.4 is substantially large, and if returning a whole amount of the difference is recognized as distinctly inappropriate considering the conditions of how the advance payment has been used, a portion of the difference to be returned to the Owner shall be determined through consultations between the Owner and the Contractor. However, if an agreement is not reached within [] days after the Contract Price has been decreased, the Owner shall determine the said portion, and notify the Contractor of the said portion.

NOTE: The number to be inserted into the section marked by the blank symbol [] may, for example, be equal to the rate specified in Article 8 of the Act Concerning Surety Business for Advance Payments in Public Works (Law No. 184, 1952) to prevent delay of payments for Government Contracts.

Article 35 - REVISION OF ADVANCE PAYMENT GUARANTEE CONTRACT

- 35.1 When the Contractor claims additional advance payments, aside from advance payments which it has already received, in accordance with Article 34.3, the Contractor shall conclude a revised Advance Payment Guarantee Contract beforehand, and entrust a revised certificate to the Owner.
- 35.2 When the Contract Price has been decreased, and revision has been made to the Advance Payment Guarantee Contract, the Contractor shall promptly entrust a revised certificate to the Owner.
- 35.3 When the Construction Period has been adjusted without change in the amount of advance payments, the Contractor shall, in place of the Owner, promptly notify the Surety Company to that effect.

Note: Article 35.2 should be incorporated into the General Conditions when the Owner specifies that the Contractor shall represent the Owner in making notifications regarding adjustment of the Construction Period to the Surety Company.

Article 36 - USE OF ADVANCE PAYMENTS

The Contractor shall not use advance payments for expenditures other than necessary costs for the Construction Materials, labor costs, rental costs of machinery and tools, purchase costs of machinery (limited to the part of the purchase price that shall be depreciated for the execution of the Works), power costs, transportation costs, repair costs, temporary work costs, workers' compensation insurance premium, and surety payments for the execution of the Works.

Article 37 - PARTIAL PAYMENTS

- 37.1 In accordance with Article 37.2 to Article 37.7, the Contractor may claim, prior to the completion of the Works, partial payments equivalent to less than or equal to []-tenth(s) of corresponding price of the Contract Price (hereinafter and this Article, referred to as "Corresponding Contract Price") to parts of the Works that have been completed and to the Construction Materials that have been brought onto the Site [and to manufactured products that are located at the manufacturing plant]. For those items that shall be inspected by the Superintendent under Article 13.2, this refers to items that have passed the said inspection by the Superintendent. For those items that do not have to be inspected by the Superintendent, this refers to items that are subject to partial payments in accordance with the *Contract Documents*. However, the claim for partial payments shall not be made more than [] times during the Construction Period.

Note: The number "9" may, for example, be inserted into the section marked by the blank symbol [] denoting the percentage of the corresponding price of the Contract Price to the parts of the Works that have been completed. When there are no manufactured products that are subject to partial payments, the phrase inside the brackets [] should be deleted. The number to be inserted into the section marked by the blank symbol [] denoting the number of times that partial payments may be demanded should be an appropriate number based on due consideration of the Construction Period and the Contract Price.

37.2 When the Contractor claims partial payments, the Contractor shall, beforehand, request that the *Engineer* confirm the pertinent parts of the Works that have been completed or the Construction Materials that have been brought onto the Site [or manufactured products that are located at the manufacturing plant].

Note: When there are no manufactured products that are subject to partial payment, the phrase inside the brackets [] should be deleted.

37.3 When the *Engineer* receives the claim stipulated in Article 37.2, the *Engineer* shall, in all the presence of the Contractor and in accordance with the *Contract Documents*, conduct an inspection for the confirmation stipulated in Article 37.2 and notify the Contractor of the results of the said inspection within 14 days after receiving such claim from the Contractor. In this case, the *Engineer* may, if necessary, conduct a minimal amount of destructive testing on the pertinent parts of the Works that have been completed, provided that the Owner notifies the Contractor of the reasons for conducting the testing.

37.4 If the testing is conducted in accordance with Article 37.3, the Contractor shall bear all direct costs and expenses of the testing and the pertinent restoration work.

37.5 The Contractor may claim partial payments after the *Engineer* has confirmed in accordance with Article 37.3. In this case, the Owner shall remit the pertinent partial payments within 14 days after receiving the said claim from the Contractor.

37.6 The amount of the partial payments shall be calculated in accordance with the following formula: $P \leq C \times \{(\quad)/10\} - A/T$ where:

P=the amount of the Partial Payments;
C=the Corresponding Contract Price;
A=the amount of Advance Payments; and
T=the amount of the total Contract Price.

In this case, the Corresponding Contract Price shall be determined in accordance with the *approved BQ*.

Note: The number to be inserted into the section mark by the blank symbol () denoting the number of days should be less than “10”. The number to be inserted into the section marked by the blank symbol [] in the formula should be the same number inserted into the section marked by the blank symbol [] in Article 37.1 denoting the percentage of the Corresponding Contract Price.

37.7 After the partial payments have been made in accordance with Article 37.5, and when the Contractor claims additional partial payments, the phrase “the Corresponding Contract Price for Partial Payments” in Article 37.1 and Article 37.6 shall be replaced by the phrase “the Corresponding Contract Price for Partial Payments minus any partial payments that have already been made to the Contractor”.

Article 38 - PARTIAL POSSESSION

38.1 When the *Contract Documents* specify that the Owner is to take possession of certain parts of the Work Objects prior to the completion of the entire Works (hereinafter referred to as “Specified Parts”), and when work on the pertinent Specified Parts is completed, the phrase “Works” in Article 31 shall be replaced by the phrase “works relating to the Specified Parts, the phrase “Work Objects” shall be

replaced by the phrase "Contract Price" in Article 31.5 and in Article 32 shall be replaced by the phrase "Price for Partial Possession" and the above-mentioned Article shall apply mutatis mutandis.

- 38.2 When a claim for payments is to be made in accordance with Article 32.1 applied mutatis mutandis by Article 38.1, the Price for Partial Acceptance shall be calculated in accordance with the following formula: $P=C \times (1-A/T)$ where:

P=the price for Partial Possession

C= the corresponding price of the Contract Price to the Specified Parts;

A=the amount of the Advance Payments; and

T=the amount of the total Contract Price.

In this case, the corresponding price of the Contract Price to the specified Parts shall be determined in accordance with the *approved* BQ. However, if an agreement is not reached within 14 days after the *Engineer* receives a claim stipulated in Article 32.1 applied mutatis mutandis by Article 38.1, the *Engineer* shall determine the said corresponding price of the Contract Price to the Specified Parts, and notify the Contractor.

Article 39 - SPECIAL PROVISION FOR CONTRACTS WITH LONG TERM CONTRACT AUTHORIZATION

- 39.1 When the Contract involves the Long Term Contract Authorization, the maximum contract Price that shall be paid during each fiscal year (hereinafter referred to as "Maximum Payable Amount") shall be as follows:

Fiscal Year: Yen

Fiscal Year: Yen

Fiscal Year: Yen

- 39.2 The Projected Value of Completed Works corresponding to the Maximum Payable Amount for each fiscal year is as follows:

Fiscal Year: Yen

Fiscal Year: Yen

Fiscal Year: Yen

- 39.3 The Owner may change the Maximum Payable Amount specified in Article 39.1 or the Projected Value of Completed Works specified in Article 39.2 based on budgeting factors or as otherwise necessary, *provided that the Owner is liable for damages sustained by the Contractor, if any.*

- 39.4 *The Remaining Construction Period shall be adjusted accordingly and the approved Works Program and the approved BQ shall be adjusted correspondingly with the revised Long Term Contract Authorization.*

- 39.5 *The Engineer and the Contractor shall agree on the amount of such damages, if any, within 28 days of the Contractor's notification. However, if an agreement is not reached within 28 days after notification, the Engineer shall determine the amount of damages, if any, and notify the Contractor of these Prices within 14 days. If the Contractor is dissatisfied with the Engineer's decision, the Contractor upon notification may seek a determination pursuant to Article 52.*

Article 40 - SPECIAL PROVISION FOR ADVANCE PAYMENTS UNDER LONG TERM CONTRACT AUTHORIZATION

- 40.1 For the executions of advance payments under the contract with Long Term Contract Authorization, in Article 34 the phrase “the date for completion stipulated in the Contract Agreement” shall be replaced by the phrase “the date for completion stipulated in the Contract Agreement (for fiscal years other than the final fiscal year, at the end of each fiscal year)” and in Article 34 and Article 35 the phrase “the Contract Price” shall be replaced by the phrase “the Projected Value of Completed works for the pertinent fiscal year [when the Corresponding Contract Price at the end of the previous fiscal year exceeds the Projected Value of Completed Works by the previous fiscal year, and when partial payments have been rendered at the beginning of the pertinent fiscal year, the such excess payments shall be subtracted from the Projected Value of Completed Works for the pertinent fiscal year]” and the above-mentioned Article shall apply mutatis mutandis. However, in fiscal years other than the fiscal year in which this Contract is concluded (hereinafter referred to as the “Initial Fiscal Year”) the Contractor shall not claim advance payments before such time as the budget can come into effect.
- 40.2 Under the stipulations of Article 40.1, when the *Contract Documents* stipulate that no advance payments shall be made during the Initial Fiscal Year, regardless of the stipulations of Article 34.1 as amended under the stipulations of Article 40.1, the Contractor shall not claim advance payments for the Initial Fiscal Year.
- 40.3 Under the stipulations of Article 40.1, when the *Contract Documents* stipulate that the advance payments for the Initial Fiscal Year shall include the advance payments of the Fiscal Year following the Initial Fiscal Year, regardless of the stipulations of Article 34.1, as amended under the stipulations of Article 40.1, the Contractor may, in the Initial Fiscal Year, claim advance payments (within [] yen) for the next fiscal year of the Initial Fiscal Year in addition to advance payments for the Initial Fiscal Year.
- 40.4 Under the stipulations of Article 40.1, when the Corresponding Contract Price at the end of the previous fiscal year is less than the Projected Value of Completed Works by the previous fiscal year, regardless of the stipulations of Article 34.1 as amended under the stipulations of Article 40.1, the Contractor shall not claim advance payments for the pertinent fiscal year until such time as the Corresponding Contract Price equals the Projected Value of Completed Works by the previous fiscal year.
- 40.5 Under the stipulations of Article 40.1, when the Corresponding Contract Price at the end of the previous fiscal year is less than the Projected Value of Completed works by the previous fiscal year, the guaranty period for advance payment shall be extended until such time as the Corresponding Contract Price equals the Projected Value of Completed Works by the previous fiscal year. In this case, the stipulations of Article 35.3 shall apply mutatis mutandis.

Article 41 - SPECIAL PROVISION FOR PARTIAL PAYMENTS UNDER LONG TERM CONTRACT AUTHORIZATION

- 41.1 For the partial payments under a contract with the Long Term Contract Authorization, when the Corresponding Contract Price at the end of the previous fiscal year is less

than the Projected Value of Completed Works by the previous fiscal year, the Contractor may claim partial payments for such excess (hereinafter referred to as the "Excess over Projected Value") at the beginning of the pertinent fiscal year. However, in fiscal years other than the Initial Fiscal Year, the Contractor shall not claim partial payments before such time as the budget can come into effect.

- 41.2 Under this Contract, regardless of the stipulations of Article 37.6 and Article 37.7, the amount of partial payments when advance payments have been received shall be calculated in accordance with the following formula: $P \leq [C \times () / 10] - [P_1 + P_2] - [C - (P_1 + E)] \times A / Pr_2$; where

P = the amount of the Partial Payments;
 C = the Corresponding Contract Price;
 P_1 = the amount of payments made by the previous fiscal year;
 P_2 = the amount of the Partial Payments for the pertinent fiscal year;
 Pr_1 = the Projected Value of Completed Works by the Previous Fiscal Year;
 Pr_2 = the Projected Value of Completed Works for the Pertinent Fiscal Year;
 E = the amount of an excess of completed Works over Projected Value; and
 A = the amount of Advance Payments for the Pertinent Fiscal Year.

Note: The number to be inserted into the section marked by the blank symbol [] should be the same number inserted into the blank symbol [] denoting the percentage of the Contract Price in Article 37.1.

- 41.3 The number of times in which partial payments may be claimed in each fiscal year is as follows.

Fiscal Year:	Time(s)
Fiscal Year:	Time(s)
Fiscal Year:	Time(s)

Article 42 - RECEIPT OF PAYMENTS BY THIRD PARTY

- 42.1 Upon gaining the Owner's approval, the Contractor may appoint a third party to serve as the Contractor's proxy in receiving payments of the Contract Price, in whole or in part.
- 42.2 When the Contractor has appointed a third party to serve as the Contractor's proxy in accordance with Article 42.1, the Owner shall render payments to said proxy for the pertinent invoices issued by the Contractor, when the Contractor has clearly stated on the invoices that said third party shall serve as its proxy, in accordance with Article 32 (including Article 32 applied mutatis mutandis by Article 38) and Article 37.

Article 43 - SUSPENSION OF WORKS AGAINST DELAY PAYMENTS

- 43.1 If the Owner is late in rendering payments in accordance with Article 32 applied mutatis mutandis by Article 34, Article 37 or Article 38, and despite the fact that the Contractor requested said payments giving an appropriate period of time for payments the Owner still does not render payments for the invoiced amount, the Contractor may temporarily suspend the execution of the Works in whole or in part. In this case, the Contractor shall notify the Owner *within seven (7) days* to that effect in writing, specifying the reasons for the temporary suspension.
- 43.2 If the Contractor temporarily suspends the execution of the Works in accordance with Article 43.1, the Owner shall, if necessary, adjust the Construction Period or the

Contract Price, and shall, if any, bear additional costs and expenses incurred by the Contractor accompanying the suspension of the Works including but not limited to costs and expenses to maintain the Construction Site and to keep laborers and construction equipment in preparation for the resumption of the Works, and any other damages incurred by the Contractor.

Article 44 - LIABILITY FOR DEFECTS

44.1 If there are any defects in the Work Objects, the Owner may claim that the Contractor repair said defects within an appropriate period of time, or claim indemnity payments from the Contractor in place of, or in addition to, the repair of said defects. However, when the defects are not serious, and when the repair of such defects would require excessive costs, the Owner may not claim that the Contractor repair such defects.

44.2 The claim for the repair of, or indemnity payments for, defects stipulated in Article 44.1 shall be made within [] years after the Owner's possession of the Work Objects stipulated in Article 31.4 or Article 31.5 (including Article 31.4 or 31.5 applied mutatis mutandis by Article 38). However, when the effects are due to the Contractor's bad faith or serious negligence, the period within which the said claim may be made shall be [] years.

Note: In principle, the number to be inserted into the section marked by the first blank symbol [] should be "1" for construction works for wooden structures, etc.; "2" for construction works for concrete structures, civil engineering works, and other infrastructure works, and "1" for construction works for facilities and equipment, etc. The number to be inserted into the section marked by the second blank symbol [] may, for example, be "10".

44.3 Regardless of the stipulations of Article 44.1, if the Owner knows that there are some defects in the Work Objects at the time that the Owner takes possession of the Work Objects, and if the Owner does not promptly notify the Contractor to the effect, the Owner may not claim any repairs of, or indemnity payments for, the said defects thereafter, unless the Contractor is aware of the said defects.

44.4 When the Owner suffers damage or loss because of defects in the Work Objects as stipulated in Article 44.1, the Owner shall exercise his rights in accordance with Article 44.1 within the period stipulated in Article 44.2 or within 6 months period from the time that said damages or loss occurs, whichever occurs earlier.

44.5 The stipulations of Article 44.1 shall not apply if the defects in the Work Objects are due to the nature of the Supplied Materials or to the instructions of the Project Manager or the Owner, unless the Contractor was aware that said Supplied Materials or instructions were inappropriate and did not notify of this fact.

Article 45 - LIQUID DAMAGES FOR ARREARS

45.1 If the Works cannot be completed within the Construction Period by reasons due to the Contractor's liability, the Owner may claim indemnity payments from the Contractor.

45.2 (A) The amount of the indemnity payments stipulated in Article 45.1 shall be calculated at an annual rate of [] percent for the number of delayed days applied to a sum equal to the Contract Price minus the corresponding price of the Contract

Price to parts of the Works that have been completed prior to the expiration of the Contract Period.

Note: The number to be inserted into the section marked by the blank symbol [] may, for example, be equal to the rate specified in Article 8 of the Act to Prevent the Delay of Payments for Government Contracts.

45.2 (B) The amount of the indemnity payments stipulated in Article 45.1 shall be calculated at an annual rate of [] percent for the number of delayed days applied to a sum equal to the Contract Price minus the corresponding price of the Contract Price to parts of the Works which the Owner has taken possession prior to the expiration of the Construction Period.

Note: 45.2 (B) should be applied when the Owner expects beforehand to suffer a substantial loss from the delay in the completion of the Works. The number to be inserted into the section marked by the blank symbol [] may, for example, be equal to the rate specified in Article 8 of the Act to Prevent the Delay of Payments for Government Contracts.

45.3 If the Owner is late in rendering the payments of the Contract Price as stipulated in Article 32.2 (including Article 32.2 applied mutatis mutandis by Article 38) by reasons due to the Owner's liability, the Contractor may claim payments of interest for arrears against the Owner to be calculated at an annual rate of [] percent of a sum equal to the unpaid part of the Contract Price for the number of days the payment is late.

Note: The number to be inserted into the section marked by the blank symbol [] may, for example, be equal to the rate specified in Article 8 of the Act to Prevent the Delay of Payments for Government Contracts.

Article 46 - PUBLIC WORKS PERFORMANCE BOND CERTIFICATES

46.1 While the Contractor has submitted a guarantee for the execution of the Contractor's obligations under this Contract to the Owner in the form of a Public Works Performance Bond Certificate under the accordance with Article 4.1, and the Contractor falls under one of the conditions specified in Article 47.1, the Owner may claim the guarantor to arrange for the completion of the Works by another contractor in accordance with said Public Works Performance Bond Certificate.

46.2 When another contractor that has been selected by the guarantor and that has been recognized as appropriate by the Owner in accordance with Article 46.1 (hereinafter referred to as "Substitute Contractor") has notified the Owner that the Substitute Contractor shall take over the rights and obligations vis-à-vis the Owner under this Contract from the Contractor as specified below, the Contractor shall let the Substitute Contractor take over said rights and obligations.

- i. Rights to claim the Contract Price (except for parts of the Contract Price that have already been paid corresponding to advance payments, partial payments and partial acceptance).
- ii. Obligations to complete the Works.
- iii. Obligations under the warranty for defects in the Work Objects (except for obligations concerning defects in the parts of the Work Objects that have already been completed by the Contractor).
- iv. Rights to terminate this Contract.

- v. All other rights and obligations under this Contract (except for obligations for indemnity payments for damages inflicted upon third parties related to the execution of the Works executed by the Contractor stipulated in Article 28.
- 46.3 Upon receiving the notification from the Substitute Contractor specified in Article 46.2, the Owner shall accept that the Contractor's rights and obligations as specified in Article 46.2 are transferred to the Substitute Contractor.
- 46.4 When the Contractor claims in accordance with Article 46.1 and when surety money has been paid to the Owner by the guarantor in accordance with the stipulations of the pertinent Public Works Performance Bond Certificate, the Contractor's obligations to render indemnity payments to the Owner and all other obligations to bear costs and expenses under this Contract (including penal payments that arise after the payments of the said surety money) shall be terminated if the said obligations are less than the amount of said surety money.

Article 47 - TERMINATION BY OWNER FOR CAUSE

- 47.1 The Owner may terminate this Contract *by notification to the Contractor seven (7) days of the date of termination* when the Contractor falls under one of the conditions specified below:
- i. When the Contractor fails to commence the execution of the Works without justifiable reasons, even after the date to commence the execution of the Works has passed.
 - ii. When the Contractor, by reasons due to the Contractor's liability, fails to complete the Works within the Construction Period, or when it is determined that there is evidently no prospect that the Contractor will complete the Works within an appropriate period of time after the expiration of the Construction Period.
 - iii. When the Contractor fails to assign the personnel specified under Article 10.1(88).
 - iv. In additions to those conditions specified in items i., ii, and iii, when the Contractor is in violation of this Contract, and when it is deemed impossible to realize the goals of this Contract because of any such violation.
 - v. When the Contractor requests the termination of this Contract for any reasons other than those specified in Article 49.1.
- 47.2 When this Contract is terminated in accordance with Article 47.1, the Contractor shall make penal payments equivalent to []-tenth(s) of the Contract Price within a time period to be specified by the Owner.
- Note: The number to be inserted into the section marked by the blank symbol [] may, for example, be "1".
- 47.3 When penal payments are to be paid in accordance with Article 47.2, and when the contract guarantee has been secured in the form of deposit of the Contract Guarantee Money or submission of collateral in lieu of the Contract Guarantee Money in accordance with Article 4, the Owner may appropriate said Contract Guarantee Money or collateral for the penal payments.

Note: Article 47.3 should be incorporated into the general conditions that also incorporate Article 4(a).

47.4 *The Engineer and the Contractor shall agree on the responsibility or the damages within 28 days after notice to the other, the Engineer shall decide within 14 days. If the Contractor is dissatisfied with the Engineer's decision, the Contractor upon notification may seek a determination pursuant to Article 52.*

Article 48 - TERMINATION BY OWNER *WITHOUT CAUSE*

48.1 In addition to the stipulations of Article 47.1, if the Owner deems necessary, the Owner may terminate this Contract until such time as the Works are completed *upon twenty-eight (28) days notice to the Contractor.*

48.2 If the Owner inflicts any damages on the Contractor from the termination of this Contract in accordance with Article 48.1, the Owner shall compensate the Contractor for said damages.

48.3 *The Engineer and the Contractor shall agree on the responsibility or the damages within twenty-eight (28) days after notice to the other, the Engineer shall decide within fourteen (14) days. If the Contractor is dissatisfied with the Engineer's decision, the Contractor upon notification may seek a determination pursuant to Article 52.*

Article 49 - TERMINATION BY CONTRACTOR

49.1 The Contractor may terminate this Contract under any of the following conditions *upon twenty-eight (28) days notice to the Owner..*

- i. When the Contract Price has decreased by at least two-thirds because of changes to the *Contract Documents* stipulated in Article 19.
- ii. When the Works have been suspended in accordance with Article 20 for a period of longer than []-tenth(s) of the Construction Period (or []-months when []-tenth(s) of the Construction Period is longer than []-months); however, when said suspension applies only to a part of the Works, when the suspension has not removed at least []-months after all other parts of the Works have been completed.
- iii. When the Owner is in violation of this Contract, and when it is impossible to execute this Contract because of any such violation.

49.2 *The Engineer and the Contractor shall agree on the responsibility or the damages within twenty-eight (28) days after notice to the other, the Engineer shall decide within fourteen (14) days. If the Contractor is dissatisfied with the Engineer's decision, the Contractor upon notification may seek a determination pursuant to Article 52.*

Article 50 - MEASURES AFTER TERMINATION

50.1 When this Contract has been terminated, the *Engineer* shall conduct an inspection of all parts of the Works that have been completed, take possession of the pertinent parts of the works that pass said inspection and of the Construction Materials that have been the subject of partial payments, and upon taking possession the Owner shall pay the Contractor for that part of the Contract Price corresponding to the delivered items. In this case, the *Engineer* may, if necessary, conduct a minimal amount of destructive testing on the pertinent portions of the Work Objects, provided

that the *Engineer* notifies the Contractor *within seven (7) days of the inspection* of the reasons for conducting such testing.

50.2 Under the case stipulated in Article 50.1, the Contractor shall bear all direct costs and expenses of the testing and the pertinent restoration work.

50.3 Under the case stipulated in Article 50.1, and when advance payments have been made in accordance with Article 34 (including Article 34 applied mutatis mutandis by Article 40), the amount of any such advance payments (when partial payments have been made in accordance with Article 37 or Article 41, this excludes any advance payments that have been covered by said partial payments) shall be deducted from the part of the corresponding price of the Contract Price to the completed parts of the Works stipulated in Article 50.1. In this case, if this Contract has been terminated in accordance with Article 47, the Contractor shall return this excess amount together with interest to be calculated at the annual rate of [] percent of the number of days between the date of the pertinent advance payments and the date upon which the excess is returned to the Owner. Moreover, if this contract has been terminated in accordance with Article 48 or Article 49, the Contractor shall return this excess amount to the Owner.

Note: The number to be inserted into the section marked by the blank symbol [] may, for example, be equal to the rate specified in Article 8 of the Act To Prevent the Delay of Payments for Government Contracts.

50.4 When this Contract has been terminated, and when there are Supplied Materials, the Contractor shall return all Supplied Materials to the Owner, except for those Supplied Materials that have been used for any part of the Works that has been completed and passed inspection in accordance with Article 50.1. In this case, if any of the pertinent Supplied Materials have been destroyed or damaged due to the bad faith or negligence of the Contractor, or used for parts of the Works that have been completed but have not passes inspection, the Contractor shall deliver substitute materials to the Owner, or restore the Supplied Material to their original condition and then deliver the Supplied Materials to the Owner, or restore the Supplied Materials to the original condition and then deliver the Supplied Materials to the Owner, or the Contractor shall pay monetary compensation for the damages to the Owner in lieu of returning the Supplied Materials to the Owner.

50.5 When this Contract has been terminated, and when there is Furnished Equipment, the Contractor shall return all Furnished Equipment to the Owner. In this case, if any of the pertinent Furnished Equipment has been destroyed or damaged due to the bad faith or negligence of the Contractor, the Contractor shall deliver substitute equipment to the Owner, or restore the Furnished Equipment to the Owner, or the Contractor shall pay monetary compensation for damages to the Owner in lieu of returning the Furnished Equipment to the Owner.

50.6 When this Contract has been terminated, the Contractor shall remove all Construction Materials, construction equipment, temporary structures, and other items owned or controlled by the Contractor (hereinafter in this Article also including items owned or controlled by the subcontractors) from the Land, restore, clean up, and otherwise place the Land into good order; and vacate and deliver the Land to the Owner.

50.7 If the Contractor does no remove the pertinent items or does not properly restore or clean up the Land as stipulated in Article 50.6 within an appropriate period of time

and without justifiable reasons, the Owner may dispose of the pertinent items and restore or clean up the Land directly, in place of the Contractor. In this case, the Contractor may not petition for objections to the Owner's disposal of the pertinent items or restoration or cleaning of the Land, and shall bear all costs and expenses incurred by the Owner in said disposal and restoration or cleaning works.

- 50.8 The appropriate time periods and methods whereby the Contractor shall return supplied Equipment or Furnished Materials to the Owner as specified in Article 50.4 and Article 50.5 shall be determined by the *Engineer* when this Contract is terminated in accordance with Article 47 *and notification given to the Contractor* when this Contract is terminated in accordance with Article 48 and Article 49. The appropriate time periods and methods whereby the Contractor shall return substitute Supplied Equipment or Furnished Materials or their equivalent to the Owner as specified in Article 50.4 and Article 50.54 and for the actions specified in Article 50.6 shall be determined by the *Engineer*.

Article 51 - FIRE INSURANCE

- 51.1 The Contractor shall in accordance with the *Contract Documents*, take out appropriate insurance such as fire insurance and contractor's all risks insurance (hereinafter in this Article including equivalents) covering the Work Objects and the Construction Materials (hereinafter in this Article including the Supplied Materials).
- 51.2 When the Contractor concludes insurance contracts in accordance with Article 51.1, the Contractor shall promptly present the pertinent certificates or equivalents to the *Engineer*.
- 51.3 When the Contractor insures the Work Objects and the Construction Materials by means other than the types of insurance stipulated in Article 51.1, the Contractor shall promptly notify the *Engineer* to that effect.

Article 52 - CLAIM, DISPUTES AND ARBITRATION

- 52.1 *If the Contractor considers any action, decision, or failure to make a decision required by Contract Documents to be in error or the Contractor and the Engineer are unable to agree within the time provided by the Contract Documents, the Contractor shall give notice to the Engineer of the Contractor's claim, describing the event or circumstance give rise to such claim. The notice shall be given as soon as practicable, if not otherwise specified in the Contract Documents, but not later than 28 days after the Contractor becomes aware, or should have become aware, of the event or circumstance. If not provided in the Contract Documents, the Engineer shall render his opinion within a further fourteen (14) days. If the Contractor agrees with the Engineer, then the matter will be the subject of a Change Order or Variation pursuant to Article 19 and 20, whichever is appropriate or both to the matter.*
- 52.2 *If a dispute of any kind whatsoever arises between the Owner and the Contractor in connection with or arising out of the Contract Documents, or the execution of the Works, including issues that are required to be determined by the Engineer and the Engineer has rendered the required determination and either party objects, then either Party may refer the dispute in writing to the Disputes Adjudication Board (DAB) that has been constituted pursuant to the Contract Documents for its decision, with copies to the other Party and the Engineer, provided that a party gives notice to the other within twenty-eight (28) days after the Engineer's determination, if required, or the issue or event is known or should have been known by the party, the party*

making the claiming a dispute shall serve notice to the Engineer and the other party of the dispute within twenty-eight (28) days.

- 52.3 *The parties shall each appoint one member of the DAB at the time of Tender (the Owner in the Bid Documents and the Contractor with his Tender) who shall become noticed to the other party as the date of the Contract Agreement. The other party shall provide written acceptance of the proposed member within a further fourteen (14) days of the Notice to Proceed. Once accepted by the other party, and in consultation with the parties, a third member of the DAB shall be chosen within a further fourteen days (14) days. Failure of a party to object to an appointment within the periods provided shall constitute acceptance. The Parties shall enter into a contract with each DAB member within seven (7) days of the acceptance of the appointment by both parties and shall each equally and jointly pay for the DAB's services.*
- 52.4 *Proposed members of the DAB shall be independent and not have any affiliation of any nature with one of the parties in the preceding five years. Proposed DAB member shall have demonstrated experience with the type of Works over a period of at least ten (10) years, or meet the criteria established in the Tender documents. If both parties agree, a member of the DAB may be replaced. If a member of the DAB can no longer serve or is dismissed, the parties shall use the same approach as specified for the appointment of the third member.*
- 52.5 *If the opposing party does not accept a proposed DAB member, the other party shall propose a alternate within seven (7) days of the rejection, and the objecting party shall have a further seven (7) days to accept or reject the alternative proposed member. If after two proposed members by one party, the other party has not accepted the proposed DAB member, the entity specified in the Contract Documents in the New Standard Conditions of Contract Part B – Particular Conditions for such purpose shall appoint the member(s) within twenty-eight (28) days of the last allowed rejection by either party.*
- 52.6 *Both Parties shall promptly make available to the DAB all such information, further access to the Site, and appropriate facilities, as the DAB may require for the purposes of making a decision on such dispute. The DAB shall be deemed to be not acting as arbitrator(s). Within 84 days after receiving reference of such dispute, or within such other period as may be proposed by the DAB and approved by both Parties, the DAB shall give its decision, in writing which shall be reasoned and reference appropriate sections of the Contract Documents. The decision shall be binding on both Parties, who shall promptly give effect to it unless and until it is revised in an amicable settlement or an arbitral award as described below. Unless the Contract has already been abandoned, repudiated or terminated, the Contractor shall continue to proceed to construct the Works in accordance with the Contract Documents.*
- 52.7 *If either Party is dissatisfied with the DAB's decision, then either Party may, within 28 days after receiving the decision, give notice to the other Party of its dissatisfaction. If the DAB fails to give its decision within the period of 84 days (or as otherwise approved) after receiving reference of a dispute, than either Party, within 28 days, after this period has expired, may give notice to the other Party of its dissatisfaction. If the DAB has given its decision as to a matter in dispute, and no notice of dissatisfaction has been given by either Party within 28 days after receiving the DAB's decision, then the decision shall become binding and the Engineer shall issue a Change Order or Variation pursuant to Article 19 and 20, whichever is appropriate or both to the matter. When notice of dissatisfaction has been given under this*

Article, both Parties shall attempt to settle the dispute amicably before the commencement of arbitration. However, unless both Parties agree otherwise, arbitration may commence after the 56th day after the day of which notice of dissatisfaction was given, even if no attempt at amicable settlement has been made.

- 52.8 If either party is dissatisfied, the dispute shall be finally settled by way of arbitration under the Arbitration Law, revised in 2003 (Chusai Ho, Law No. 138, 2003). The arbitral decision is final and binding, and can be enforced under the Code of Civil Procedure.*

NEW STANDARD CONDITIONS OF CONTRACT

Part B – Particular Conditions

The Particular Conditions must be completed for every project and customized for the specific Works and for anything that has a special Requirement. Part A – General Conditions requires that further information at least be provided the following Articles:

- 1.3
- 1.5
- 1.6
- 1.7
- 1.8
- 1.9
- 2.1
- 3.1
- 3.2 – A sample of the text for this Article to be included in Part B follows.
- 4(A).4
- 4(B).3
- 13.3
- 15.10
- 16.1
- 16.3
- 16.4
- 19.1
- 20.1
- 23.1
- 23.2
- 23.3
- 27.1
- 34.1

The following Article contains the suggested language for the Works Program, etc.:

ARTICLE 2 WORKS PROGRAM

2.1 Summary

- A. Scheduling of Work shall be performed by the Contractor in accordance with requirements of this section.
 - 1. Development of schedule, cost and resource loading of the schedule, monthly payment requests and project status reporting requirements of the Contract shall employ computerized Critical Path Method (CPM) scheduling.
 - 2. The Contractor shall employ the latest version of the computerized Primavera Project Planner CPM software, or an equivalent system, provided the Contractor first obtains the Engineer's permission and supplies a copy of the complete software system to the Owner and the Engineer.
 - 3. The Works Program CPM Schedule shall be cost loaded, based on the BQ as approved by the Engineer.

- B. *Upon Award of Contract, the Contractor shall immediately commence development of Initial CPM schedules to ensure compliance with CPM schedule submittal requirements.*

2.2 Qualifications

- A. *The Contractor shall employ experienced scheduling personnel qualified to use the latest version of Primavera Project Planner. The experience level required is set forth below. After bid opening, the apparent bidder shall provide the Engineer written verification that the Contractor has the required personnel under its employ.*
 - 1. *The verification shall identify the individual(s) who will perform CPM scheduling.*
 - 2. *The capability and experience shall be verified by a description of the construction projects on which the individual(s) has successfully applied computerized CPM scheduling using the Primavera Project Planner system.*
 - 3. *The required level of experience shall include at least two projects of similar nature, scope and value not less than three-fourths the Total Bid Price of this Project. The written statement shall provide contact persons for referenced projects with current telephone and address information.*
- B. *The Engineer reserves the right to approve Contractor's scheduler, and the right to reject him or her at any time. The Engineer also reserves right to refuse replacement of Contractor's scheduler, if it believes such replacement will negatively affect Contract.*

2.3 General

- A. *The Progress Schedule shall be based on and incorporate milestone and completion dates specified in these New Standard Conditions of Contract Part B – Particular Conditions.*
- B. *Overall time of completion and time of completion for each Milestone shown on Progress Schedule shall adhere to times in these New Standard Conditions of Contract Part B – Particular Conditions, unless an earlier (advanced) time of completion is requested by the Contractor and agreed to by the Engineer. Any such agreement shall be formalized by a Change Order pursuant to Article 19 of New Standard Conditions of Contract Part A – Particular Conditions.*
 - 1. *The Engineer is not required to accept an earlier (advanced) schedule, i.e., one that shows early completion dates for the Contract Period.*
 - 2. *The Contractor shall not be entitled to extra compensation in event agreement is reached on an earlier (advanced) schedule and the Contractor completes its work for whatever reason, beyond completion date shown in the earlier (advanced) schedule, but within the original Contract Period.*

3. *A schedule showing the work completed in less than the Contract Period, which has been accepted by the Engineer, shall be considered to have Project Float. The Project Float is the time between the scheduled completion of the Works and the original Contract Period. Project Float is a resource available to both the Owner and the Contractor.*
- C. *Float Ownership: Neither the Owner nor the Contractor owns the float. The Project owns the float. As such, liability for delay of the Works Completion Date and any interim milestone date rests with the party, whose actions, last in time, actually cause delay to such date(s).*
1. *For example, if Party A uses some, but not all of the float, and Party B later uses remainder of the float, as well, as additional time beyond the float, Party B shall be liable for the time that represents a delay to such date(s).*
 2. *Party A would not be responsible for the time since it did not consume all of float and additional float remained; therefore, the Works Completion Date was unaffected.*
- D. *The Progress Schedule shall be the basis for evaluating job progress, payment requests, and time extension requests. Responsibility for developing Contract CPM schedule and monitoring actual progress as compared to Progress Schedule rests with Contractor and his onsite scheduling personnel.*
- E. *Failure of Progress Schedule to include any element of the Work or any inaccuracy in Progress Schedule will not relieve the Contractor from responsibility for accomplishing the Work in accordance with the Contract. The Engineer's acceptance of schedule shall be for its use in monitoring and evaluating job progress, payment requests, and time extension requests, and shall not, in any manner, impose a duty of care upon the Engineer or the Owner, or act to relieve the Contractor of its responsibility for means and methods of construction.*
- F. *Contractor shall transmit electronically the Works Program files and reports required herein in the form produced by Primavera Project Planner, unless the report required is narrative in nature, to the Engineer according to the periods that are required herein.*

2.4 Initial CPM Schedule

- A. *An initial CPM Schedule shall be submitted for review at the pre-construction conference shall serve as the Contractor's schedule for up to sixty (60) calendar days after the Notice to Proceed.*
- B. *Indicate detailed plan for the Works to be completed in first sixty (60) days of the Contract Period; including details of planned mobilization of plant and equipment. Show the Works beyond ninety (90) calendar days in summary form.*
- C. *Initial CPM Schedule shall be time-scaled.*

- E. *The Engineer and Contractor shall meet to review and discuss the Initial CPM Schedule within five (5) working days after it has been submitted to the Engineer.*
1. *The Engineer's review and comment on the initial schedule shall be limited to Contract requirements, sequencing, coordination, and milestone requirements.*
 2. *The Contractor shall make corrections to schedule necessary to comply with Contract requirements and shall adjust schedule to incorporate any missing information requested by the Engineer. The Contractor shall resubmit Initial CPM Schedule, if requested, to the Engineer.*
- F. *If during the first sixty (60) days after Notice-to-Proceed, the Contractor is of the opinion that any of the Work included on its Initial CPM Schedule has been impacted, the Contractor shall submit to the Engineer a written Time Impact Evaluation (TIE) in accordance with Clause 2.9. The TIE shall be based on the most current update of the Initial CPM Schedule.*

2.5 Baseline CPM Schedule

- A. *Submit a detailed proposed Original Baseline CPM Schedule to the Engineer for review and approval presenting an orderly and realistic plan for completion of the Work, in conformance with requirements as specified herein.*
- B. *The Engineer and Contractor shall meet to review and discuss the Original Baseline CPM Schedule within five (5) working days after it has been submitted to the Engineer, which submittal shall be no later than the first fifty (50) days of the Contract Period.*
1. *The Engineer's review and comment on the Original Baseline CPM Schedule shall be limited to Contract requirements, sequencing, coordination, and milestone requirements.*
 2. *The Contractor shall make corrections to schedule necessary to comply with Contract requirements and shall adjust schedule to incorporate any missing information requested by the Engineer. The Contractor shall resubmit Original Baseline CPM Schedule, if requested, to the Engineer.*
- C. *Progress Schedule shall include or comply with following requirements:*
1. *Time scales, cost and resource (labor and major equipment) loaded CPM schedule.*
 2. *No activity on schedule shall have duration longer than fifteen (15) workdays, with the exception of submittal, approval, fabrication and procurement activities, unless otherwise approved by Construction Manager. Activities should generally range in duration from 3 to 15 work days each.*
 3. *The start and completion dates of all items of Work, their major components and milestone completion dates, if any.*

4. *Owner-furnished and Contractor-furnished materials and equipment, if any, shall be identified as separate activities.*
5. *Activities for maintaining Work Record Documents.*
6. *Dependencies (or relationships) between activities.*
7. *Processing / approval of submittals and shop drawings for all required material and equipment in these Contract Documents. Activities that are dependent on submittal acceptance or material delivery shall not be scheduled to start earlier than expected acceptance or deliver dates.*
 - a. *Include time for submittals, resubmittals, and reviews by Construction Manager and Architect / Engineers. Coordinate with accepted schedule for submission of shop drawings, samples and other submittals. Submittal review times shall be scheduled at 30 calendar days.*
 - b. *Contractor shall be responsible for all impacts resulting from re-submittal of shop drawings and submittals.*
8. *Procurement of major equipment, through receipt and inspection at jobsite, identified as separate activity.*
 - a. *Include time for fabrication and delivery of manufactured products for the Work.*
 - b. *Show dependencies between procurement and construction.*
9. *Activity description; what Work is to be accomplished and where.*
10. *The total cost of performing each activity shall be the total of labor, material, equipment, and allocation of overheads and profit of Contractor. Overhead and profit of the General Contractor shall be shown as a single separate activity in the schedule. The sum of all costs for all activities shall equal total Contract value.*
11. *Resource required (labor, materials and major equipment) to perform each activity.*
12. *Responsibility code for each activity corresponding to Contractor or Subcontractor responsible for performing the Work.*
13. *Identify the activities which constitute the controlling operating or critical path. No more than 15% of the activities shall be critical or near critical. Near critical is defined as float in the range of one (1) to ten (10) work days.*
14. *Fifteen (15) workdays for developing punch list(s), completion of punch list items, and final clean-up for the Work or any designated portion thereof, for each element of the Works. No other construction activities shall be scheduled during this period.*

15. *Interface with the work of other contractors, pursuant to Article 2 of the New Standard Condition of Contract Part A – General Conditions, shall be shown.*
16. *Show detailed Subcontractor Work activities. In addition, furnish copies of Subcontractor schedules upon which CPM was built.*
 - a. *Also furnish for each Subcontractor, as determined by the Engineer, submitted on Subcontractor's letterhead, a statement certifying that Subcontractor concurs with Contractor's Original Baseline CPM Schedule and that Subcontractor's related schedules have been incorporated, including activity duration, cost and resource loading.*
 - b. *The Subcontractor schedules shall be independently derived and not a copy of Contractor's schedule.*
 - c. *In addition to Contractor's schedule and resource loading, obtain from the electrical, mechanical and plumbing Subcontractors, and other Subcontractors, as required by the Engineer, productivity calculations common to their trades, such as, units per person per day, feet of pipe per day per person, feet of wiring per day per person, and similar information.*
17. *Activity durations shall be in work days.*
18. *Submit with the schedule a list of anticipated non-work days, such as, weekends and holidays. The Progress Schedule shall exclude in its work day calendar all non-work days on which Contractor anticipates critical work will not be performed.*
19. *Training for the Owners personnel of not less than 15 calendar days prior to Works Completion or parts as contained in the Contract Documents.*
20. *Each O&M submittal review will be allocated not less than 21 calendar days.*
21. *Commissioning, checkout, and performance testing of systems and equipment as specified in the Contract Documents.*
22. *The Contractor's Progress Schedule shall be formulated with written allowance for adverse weather conditions as specified in the Contract Documents. The weather days shall be shown on the schedule, as a single weather activity, on the critical path, and the last activity before the Completion Date and any interim milestone dates. If the weather activity duration is not consumed for the prescribed month, it will become float at the end of the project schedule.*
25. *Constraints, with the exception of the Project completion date and Contract milestones will not be allowed without the Engineer's prior approval.*

26. *Sixty days prior to estimated completion of the Works or any interim milestone dates, the Contractor will provide a detailed closeout schedule of all activities to be completed including instructions, O&M, testing, training, inspection, clean-up, etc., yet to be completed.*
- C. *Original Baseline CPM Schedule Review Meeting: Contractor shall, within thirty (30) days from the Notice to Proceed Date, meet with the Engineer to review the original Baseline CPM Schedule submittal and the details of these requirements.*
 1. *Contractor shall have its Superintendent, Project Scheduler, and key Subcontractor representatives, as required by the Engineer, in attendance. The meeting will take place over a continuous one-day period.*
 2. *Review will be limited to submittal's conformance to Contract requirements, including, but not limited to, coordination requirements. However, review may also include:*
 - a. *Classifications of Contract Requirements.*
 - b. *Directions to include activities and information missing from submittal.*
 - c. *Requests to Contractor to clarify its schedule.*
 3. *Within five (5) days of the Schedule Review Meeting, the Contractor shall respond in writing to all questions and comments of the Engineer at the meeting.*

2.6 Adjustments to CPM Schedule

- A. *Adjustments to Baseline CPM Schedule: Contractor shall have adjusted the Baseline CPM Schedule submittal to address all review comments from baseline CPM Schedule review meeting and resubmit network diagrams and reports for the Engineer review within 10 days.*
 1. *Within ten (10) days from date that Contractor submitted revised schedule, the Engineer will either:*
 - a. *Accept the schedule and resource loaded activities as submitted.*
 - b. *Advise the Contractor in writing to review any part or parts of schedule which either do not meet Contract requirements or are unsatisfactory for the Engineer to monitor the Works progress, resources and status or evaluate monthly payment requests by Contractor.*
 2. *The Engineer may accept schedule with conditions that the first monthly CPM schedule update be revised to correct deficiencies identified.*

3. *When schedule is accepted, it shall be considered as the "Baseline CPM Schedule" which will then be immediately updated to reflect the current status of the work.*
 4. *The Engineer reserves right to require the Contractor to adjust, add to, or clarify any portion of schedule which may later be discovered to be insufficient for monitoring of Work or approval or partial payment requests. No additional compensation will be provided for such adjustments, additions, or clarifications.*
- B. *Acceptance of the Contractor's schedule by the Engineer will be based solely upon schedule's compliance with Contract requirements.*
1. *By way of the Contractor assigning activity durations and proposing sequence of Work, Contractor agrees to utilize sufficient and necessary project management resources and other resources to perform work in accordance with the schedule.*
 2. *Upon submittal of a schedule update, the updated schedule shall be considered the "current" CPM schedule.*
 3. *Submission of the Contractor's schedule to the Engineer shall not relieve Contractor of total responsibility for scheduling, sequencing, and pursuing the Works so as to comply with requirements of the Contract Documents, including any adverse effects, such as, delays resulting from ill-times work.*
- C. *Submittal of Baseline CPM Schedule, and subsequent schedule updates, shall be understood to be the Contractor's representation that the Schedule meets requirements of Contract Documents and that the Works shall be executed in sequence on the schedule.*
- D. *The Contractor shall distribute Baseline CPM Schedule to Subcontractors for review and written acceptance, which shall be noted on Subcontractors' letterheads to Contractor and transmitted to the Engineer for the record.*

2.7 Monthly CPM Schedule Update Submittals

- A. *Following acceptance of the Contractor's Baseline CPM Schedule, the Contractor shall monitor progress of Work and adjust schedule each month to reflect actual progress and any anticipated changes to planned activities.*
1. *Each schedule update submitted shall be complete, including all information requested for the Baseline CPM Schedule submittal.*
 2. *Each update shall continue to show all work activities including those already completed. These completed activities shall accurately reflect "as built" information indicating when activities were actually started and completed.*
- B. *A meeting will be held on approximately the twenty fifth (25th) of each month to review schedule update submittal and progress payment application.*
1. *At this meeting, at a minimum, the following items will be reviewed: Percent complete of each activity; Time impact evaluations for*

Change Orders and Time Extension Request; actual and anticipated activity sequence changes; actual and anticipated duration changes; and actual and anticipated delays.

2. *These meetings are considered a critical component of overall monthly schedule update submittal and Contractor shall have appropriate personnel attend. At a minimum, these meetings shall be attended by Contractor's Superintendent and Project Scheduler.*
- C. *Within three (3) working days after monthly schedule update meeting, Contractor shall submit the updated CPM Schedule update electronically and in hard copy.*
- D. *Within three (3) work days of receipt of above noted revised submittals, the Engineer will either accept or reject monthly schedule update submittal.*
 1. *If accepted, percent complete shown in monthly update will be basis for the Application for Payment by the Contractor. The updated schedule shall be submitted as part of the Contractor's Application for Payment.*
 2. *If rejected, update shall be corrected and resubmitted by Contractor before the Application for Payment is submitted.*
- E. *Updating, changing or revising, if any report, curve, schedule or narrative submitted to the Engineer by Contractor under this Contract, nor the Engineers review or acceptance of any such report, curve, schedule or narrative shall not have the effect of amending or modifying, in any way, the Works Completion Date or milestones dates or of modifying or limiting, in any way, the Contractor's obligations under this Contract.*

2.8 Schedule Revisions

- A. *Updating the Schedule to reflect actual progress shall not be considered revisions to the Schedule. Since scheduling is a dynamic process, revisions to activity durations and sequences are expected on a monthly basis.*
- B. *To reflect revisions to the schedule, the Contractor shall provide the Engineer with a written narrative with a full description and reasons for each Work activity revised. For revisions affecting the sequence of work the Contractor shall provide a schedule diagram which compares the Baseline sequence to the revised sequence of work. The contractor shall provide the written narrative and schedule diagram for revisions two (2) working days in advance of the monthly schedule update meeting.*
- C. *Schedule revisions shall not be incorporated into any schedule update until the revisions have been reviewed by the Engineer. The Engineer may request further information and justification for schedule revisions and Contractor shall within three (3) days, provide the Engineer with a complete written narrative response to the Engineers request.*
- D. *If the Contractor's revision is still not accepted by the Engineer and the Contractor disagrees with the Engineers position, the Contractor shall proceed as provided in Article 52 of the New Standard Conditions of Contract Part A – General Conditions.*

- E. *At the Engineer's discretion, the Contractor can be required to provide subcontractor certifications of performance regarding proposed schedule revisions affecting said subcontractors.*

2.9 Recovery Schedule

- A. *If the Schedule Update shows a Works Completion Date twenty-one (21) calendar days beyond the Works Completion Date, the Contractor shall submit to the Engineer the proposed revisions to recover the lost time within five (5) work days. As part of this submittal, the Contractor shall provide a written narrative for each revision made to recapture the lost time. If the revisions include sequence changes, the Contractor shall provide a schedule diagram comparing the Baseline sequence to the revised sequence of work.*
- B. *The revisions shall not be incorporated into any schedule update until the revisions have been reviewed and approved by the Engineer.*
- C. *If the Contractor's revisions are not accepted by the Engineer, the Engineer and the Contractor shall follow the procedure in Article 2.8.C, 2.8.D and 2.8.E above.*
- D. *At the Engineer's discretion, the Contractor can be required to provide subcontractor certifications for any revisions affecting said subcontractors.*

2.10 Time Impacts Evaluation for Change Orders and Other Delays

- A. *When the Contractor is directed to proceed with changed work, the Contractor shall prepare and submit, within fourteen (14) calendar days from the direction to proceed, a Time Impact Evaluation (TIE) which includes both a written narrative and a schedule diagram depicting how the changed work affects other schedule activities. The schedule diagram shall show how the Contractor proposes to incorporate the changed work in the schedule, and how it the current change impacts the current critical path. The diagram must to explain any tie to the main sequence to the critical path of the schedule to enable the Engineer to evaluate the impact of changed work to the schedule critical path.*
- B. *The Contractor shall be required to comply with the requirements of Paragraph 2.9.A for all types of delays, such as, but not limited to, Contractor / Subcontractor delay, adverse weather delays, strikes, procurement delays, fabrication delays, etc.*
- C. *The Contractor shall be responsible for all costs associated with the preparation of Time Impact Evaluations, and the process of incorporating them into the current schedule update. The Contractor shall provide the Engineer with 4 copies of each TIE.*
- D. *Once agreement has been reached on a TIE, the Contract Period will be adjusted accordingly. If agreement is not reached on a TIE, the Contract Period may be extended in an amount the Engineer allows, and the Contractor may resort to determination pursuant to Article 52 of the New Standard Conditions of Contract Part A – General Conditions.*

- E. *The Contractor acknowledges and agrees that delays to non-critical activities (those with float) will not be the basis for a time extension. Non-critical activities are those activities which, when delayed, do not affect the Works Completion Date.*

2.11 Time Extensions

- A. *The Contractor is responsible for requesting time extensions for time impacts that, in the opinion of the Contractor, impact the critical path of the current schedule update.*
- B. *Where an event for which the Engineer is responsible impacts the projected Works Completion Date or Interim Milestone Date, the Contractor shall provide a written mitigation plan, including a schedule diagram, which explains how (e.g., increase crew size, overtime, etc) the impact can be mitigated. The Contractor shall also include a detailed cost breakdown of the labor, equipment and material the Contractor would expect to mitigate the time impact caused by the Engineer. The Contractor shall submit its mitigation plan to the Engineer within fourteen (14) calendar days from the date of discovery of said impact. The Contractor is responsible for the cost to prepare the mitigation plan.*
- C. *Failure to request a time extension, a TIE or provide the required mitigation plan will result in the Contractor waiving its right to a Time Extension and costs to mitigate the delay.*
- D. *The Engineer or Owner will not be obligated to consider any time extension request unless requirements of these Contract Documents are complied with.*
- E. *Failure of the Contractor to perform in accordance with the current schedule update shall not be excused by submittal of Time Extension requests.*
- F. *If the Contractor does not submit a TIE within fourteen (14) calendar days for any issue when it knew or reasonably should have known it was causing impact, it is mutually agreed that the Contractor does not require a Time Extension for said issue.*

2.12 Schedule Reports

- A. *Submit four (4) copies and an electronic file, of the following reports with the Initial CPM Schedule, the Baseline CPM Schedule, and each monthly Schedule update.*
- B. *Required Reports*
 - 1. *Two activity listing reports: one sorted by activity number and one by total float. These reports shall also include each activity's early/late and actual start/finish dates, the Baseline Schedule and remaining durations, float, responsibility code and the logic relationship of activities.*
 - 2. *Cost reports sorted by activity number, including each activity's associated cost, percentage of Work accomplished, earned value to-date, previous payments and amount earned for current update period.*

3. *Schedule plots presenting time scaled network diagram showing activities and their relationship with the controlling operations or critical path clearly highlighted.*
4. *A Cash Flow report calculated by early start, late start and indicating actual progress. Provide an exhibit depicting this information in graphic form.*
5. *Planned versus actual resource (for example, labor, major pieces of equipment, etc.) histogram calculated by early start and late start.*

C. *Other Reports*

In addition to the above reports the Engineer may request, from month-to-month, any two of the following reports. Submit four (4) copies of all reports and an electronic file.

1. *Activities by early start.*
2. *Activities by late start.*
3. *Activities grouped by subcontractors or selected trades.*
4. *Activities with scheduled early start dates in a given time frame, such as fifteen (15) work days or thirty (30) work days look ahead.*
5. *Any other report producible from the Primavera Project Planner scheduling software.*

2.13 Project Status Reporting

- A. *In addition to submittal requirements for CPM scheduling identified in this Article, the Contractor shall provide a monthly project status report (i.e., written narrative report) to be submitted in conjunction with each CPM Schedule as specified herein. Status reporting shall be in a form specified below.*
- B. *The Contractor shall prepare monthly written narrative reports of status of the Works for submission to the Engineer. Written status reports shall include:*
 1. *The status of major Works components and Interim Milestone Dates (percent complete, amount of time ahead or behind schedule) and an explanation of how Works will be brought back on schedule if delays have occurred.*
 2. *Progress made on critical activities indicated on Updated CPM Schedule.*
 3. *Explanations for any schedule changes, including changes to logic or to activity durations.*
 4. *Explanations for any lack of work on critical path activities planned to be performed during the preceding month.*

5. *List of critical activities scheduled to be performed next month.*
6. *Status of major material and equipment procurement.*
7. *Any delays encountered during reporting period.*
8. *Contractor shall provide a report indicating actual versus planned resource loading for each trade and each activity. This report shall be provided on a weekly and monthly basis.*
 - a. *Actual resource shall be accumulated in field by the Contractor, and shall be noted on the Contractor's daily reports. These reports will be basis for information provided in computer generated monthly and weekly printed reports.*
 - b. *The Contractor shall explain all variances and mitigation measures.*
9. *The Contractor may include any other information pertinent to status of the Works. The Contractor shall include additional status information requested by the Engineer at no additional cost.*
10. *Status reports, and the information contained therein, shall not be construed as claims, notice of claims, notice of delay, or requests for changes or compensation.*

2.14 Weekly Schedule Report

At a Weekly Progress Meeting, the Contractor shall provide and present a time scaled two week look ahead schedule that is based and correlated by activity number to the Current CPM Schedule (i.e., Initial, Baseline CPM, or Schedule Update). The weekly scheduling reports shall be derived from the most recent Works schedule and utilize Primavera Project Planner scheduling software. In addition to the graphic representation, the weekly update shall depict the associated activity numbers, float values and resource loading.

2.15 Daily Construction Reports

- A *On a daily basis, the Contractor shall submit a daily activity report to the Engineer for each workday, including weekends and holidays, when worked. Contractor shall develop the daily construction reports on a computer generated data-base capable of sorting daily Work, manpower, and manhours by Contractor, Subcontractor, area, sub-area, and change order work. The Contractor shall furnish the Engineer the software and data for this database within 30 calendar days of the Notice to Proceed and weekly data on the Tuesday following a week. The Contractor shall obtain the Engineer's written approval of daily construction report data base format prior to implementation.*
- B. *The Contractor shall include at least in the report:*
 1. *Project name and Project number.*
 2. *Contractor's and each subcontractor's name and address.*

3. *Weather, temperature and any visual site conditions.*
4. *A brief description and location of the day's scheduled activities and any special problems and accidents, including the work of Subcontractors. Descriptions shall be referenced to CPM scheduled activities.*
5. *Worker quantities for its own Work force and for Subcontractors of any tier.*
6. *Equipment, other than hand tools, utilized by Contractor and Subcontractors.*