CHAPTER 3

ABOUT ISO 9000

3.1 The Definition of Quality

There are many versions of definition for quality.

The Japanese definition is the by now famous axiom: "Quality is to satisfy a customer's needs."

Dr. Juran in the US gives the following definition about Quality: "......an essential requirement of products is that they meet the needs of those members of society who will actually use them. It applies to all goods and services without exemption and since a popular term for 'fitness for use' is quality, the basic definition becomes: Quality means fitness for use."
ISO 8402 (International Standard Quality vocabulary), defines quality as the totality of features and characteristics of a product or service that bear on its ability to satisfy stated or implied needs.

And for the construction and property industry, the most appropriate definition shall be:

"Quality is that of the finished project or structure, judged by how well it serves society: physically, emotionally, and environmentally."

3.2 What is ISO 9000?

The ISO 9000 series of standards is just one of over 8,800 international standards developed and published to date. The series were released in 1987 by the International Organization for Standardization (ISO). Based in Geneva, Switzerland, ISO is a consortium of virtually all the world's industrialized nations—from Albania to Zimbabwe. Actually, it is comprised of about 96 countries called "National Standard Bodies."

ISO 9000 is not a product standard, but a quality system standard. It applies not to products or services, but to the process which creates them. It is designed and intended to apply to virtually any product or service made by any process anywhere in the world.
To achieve this generic state, ISO 9000 refrains from mandating specific methods, practices, and techniques. It emphasizes principles, goals and objectives. ISO 9000 also requires that every business activity affecting quality be conducted in a three-part, never-ending cycle: planning, control, and documentation.

ISO 9000 is not new or radical. It is good, hardheaded, common business sense in codified, verifiable and easily adapted form.

3.3 A Short History of ISO 9000

Before going into the history of ISO 9000, it would be more appropriate to go through the explanation of what ISO is, and what it does.

ISO, the International Organization for Standardization, is an international organization whose members are the national standards bodies of some 96 countries (one member for each country). ISO is closely associated with the International Electrotechnical Commission (IEC). ISO and IEC operate as a single system and service to facilitate the development of global consensus agreements on international standards.
ISO and IEC are nongovernmental organizations, and their standards are voluntary in nature. They are not part of the United Nations, but have many technical liaisons with the specialized UN agencies. The ISO / IEC international standardization process operates in approximately 900 specialized technical committees and sub-committees, the members of which are delegations from member countries. The work in these committees results in the publication of approximately 800 new and revised international standards every year.

It was in 1979 that a member of International Standards Organization (ISO) and International Electrotechnical Commission (IEC), the British Standards Institute (BSI), submitted a formal proposal to ISO, which suggested that a new technical committee should be formed to develop international standards relating to quality assurance and quality management systems techniques and practices.

The new technical committee was approved and assigned a number (ISO / TC 176); it was also given a title (Quality Assurance), a scope, a time table, and a secretariat, according to ISO / IEC procedures.

Initially, twenty ISO member countries decided to become active participants in the work of this newly created committee when it was set up and another fourteen countries opted to follow the development as observers. Today, the number of countries actively
involved in the ISO / TC 176 Committee are forty-two active participant members and twenty-one observer members.

When ISO / TC 176 embarked on the idea of making generic quality management standards for worldwide application, there had already been a substantial base of national experience in the UK and Canada. In the UK, the BS-5750 standards were well on their way to broad acceptance, and in Canada, a series of national standards known as CSA-Z299 were also widely used.

Other countries with well-developed quality management practices were also starting to take a keen interest in the subject, so the program of ISO / TC 176 quickly became a very substantial work effort. It was clear from the beginning that the international standards produced by TC 176 would need to have national equivalents, not only in the UK and Canada but also in many other countries. In this sense, it can be said that BS 5750 and CSA-Z299 were the mother and father of the ISO 9000 standards, but only if it is understood that the offspring has now become the parent.

The first edition of the ISO 9000 standards (ISO 9000 - 9004), were completed in 1986 and published in early 1987.
3.4 The ISO 9000 Standards Series

The ISO 9000 Standards have been written in terms of "quality systems objectives" to be accomplished within an organization or company. These standards do not describe how to achieve these objectives, but leave that task up to the individual companies and organizations. In other words, no standardized quality system approach is dictated.

The ISO 9000 Standards series applies to all four generic product and industry categories, namely hardware, software, processed material, and services.

The first standard in the series is ISO 9000 - "Quality Management and Quality Assurance Standards - Guidelines for Selection and Use." This standard serves as an overview and contains basic guidelines for clarifying the applications and the purpose of quality concepts and its relationship to each other as represented in the ISO 9001 through 9003 Standards Series. The ISO 9000 Standard also provides guidelines for the selection and use of an appropriate Quality System Model as it applies to ones product and service. This standard also provides guidelines for all industries in quality management matters.

ISO 9001 - "Quality System Model for Design, Development, Production, Installation, and Servicing." It is the standard with the widest scope of application since it applies to situation where the supplier is responsible for the design and development, as well as the
production, installation and servicing of the product. This standard may be used where a contract between the supplier (producer) and purchaser (customer) dictates quality management and quality assurance requirements in product design, manufacturing, installation and service. The primary intent of this standard and its quality system requirements, is to help prevent nonconformity at all stages - from product design to manufacturing and the consequent servicing of such products. This quality standard is the most comprehensive of all three standards with regard to quality elements and stringency requirements.

ISO 9002 - “Quality System Model for Quality Assurance in Production and Installation.” This standard is applicable in cases where the supplier is not responsible for design or development or servicing of the product. It is a recommended Quality System Model for subcontractors to ISO 9001 companies which provide manufacturing, machining and related services - where drawings, specifications, and written instructions are provided by customer or other external sources. This quality system also finds application in the service and processed materials industry.

ISO 9003 - “Quality Systems Model for Quality Assurance in Final Inspection and Test.” This international standard represents a Quality System Model that is limited to quality assurance during final inspection and test and is applicable in cases where the product is sufficiently simple to make design, installation and similar aspects less relevant. It is a recommended Quality System Model for companies and industries which
do not use "value added processes" and can accept a product on the basis of final inspection and test only. It serves companies such as hardware and related product distributors, calibration and test laboratories and any other related service provides.

ISO 9004 - "Quality Management and Quality System - Guidelines." As the title already implies, this international standard gives general guidelines for developing and implementing the kinds of quality management systems that are requirements of ISO 9001, ISO 9002 and ISO 9003. The standard considers management responsibility, quality system principles, structure, auditing and review. It also contains general considerations on the economics of quality - related cost analysis as well as quality considerations in marketing, specification, design, procurement, production, training and motivation. ISO 9004: part 2 published in August 1991 was developed for quality management systems in the service sectors.

Table 1 provides the Cross Reference List for easy identification and comparison of quality element and stringency requirements between ISO 9001, ISO 9002 and ISO 9003.
Cross-reference list of quality system elements ISO 9001-9003

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<thead>
<tr>
<th>ISO 9001 Requirement</th>
<th>ISO 9001</th>
<th>ISO 9002</th>
<th>ISO 9003</th>
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</thead>
<tbody>
<tr>
<td>4.1 Management responsibility</td>
<td>4.1</td>
<td>4.1</td>
<td>4.1</td>
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<tr>
<td>4.2 Quality system</td>
<td>4.2</td>
<td>4.2</td>
<td>4.2</td>
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<tr>
<td>4.3 Contract review</td>
<td>4.3</td>
<td>4.3</td>
<td>.........</td>
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<tr>
<td>4.4 Design control</td>
<td>4.4</td>
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<td>4.5 Document control</td>
<td>4.5</td>
<td>4.4</td>
<td>4.3</td>
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<tr>
<td>4.6 Purchasing</td>
<td>4.6</td>
<td>4.5</td>
<td>.........</td>
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<tr>
<td>4.7 Purchaser supplied product</td>
<td>4.7</td>
<td>4.6</td>
<td>.........</td>
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<tr>
<td>4.8 Product identification &amp; traceability</td>
<td>4.8</td>
<td>4.7</td>
<td>4.4</td>
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<td>4.9 Process control</td>
<td>4.9</td>
<td>4.8</td>
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<td>4.10 Inspection &amp; testing</td>
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<td>4.5</td>
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<td>4.11 Inspection, measuring &amp; test equipment</td>
<td>4.11</td>
<td>4.10</td>
<td>4.6</td>
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<tr>
<td>4.12 Inspection and test status</td>
<td>4.12</td>
<td>4.11</td>
<td>4.7</td>
</tr>
<tr>
<td>4.13 Control of nonconforming product</td>
<td>4.13</td>
<td>4.12</td>
<td>4.8</td>
</tr>
<tr>
<td>4.14 Corrective action</td>
<td>4.14</td>
<td>4.13</td>
<td>.........</td>
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<tr>
<td>4.15 Handling, storage, packaging &amp; delivery</td>
<td>4.15</td>
<td>4.14</td>
<td>4.9</td>
</tr>
<tr>
<td>4.16 Quality records</td>
<td>4.16</td>
<td>4.15</td>
<td>4.10</td>
</tr>
<tr>
<td>4.17 Internal quality audits</td>
<td>4.17</td>
<td>4.16</td>
<td>.........</td>
</tr>
<tr>
<td>4.18 Training</td>
<td>4.18</td>
<td>4.17</td>
<td>4.11</td>
</tr>
<tr>
<td>4.19 Servicing</td>
<td>4.19</td>
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<tr>
<td>4.20 Statistical techniques</td>
<td>4.20</td>
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**Key**
- ● Full requirement
- ☐ Less stringent than ISO 9001
- ☐ Less stringent than ISO 9002
- ..... Element not present


Table 1
3.5 The Future of ISO 9000

The pace at which ISO 9000 has developed is truly amazing. Since its introduction and progressive implementation, the ISO 9000 series of standards has established itself as a major factor in global trade. To date, over ninety countries have adopted the standard. The recognition and adoption of common quality assurance standards has greatly reduced the need for second party (purchaser) audits of suppliers.

However, there have been forces moving against standardization. Several industries and business sectors have developed their own derivatives of the ISO 9000 series or have introduced documented guidelines for their application. In addition, it has become apparent that the specification of controls on processes need to take account of the categories of products such as processed materials, services, hardware and software.

The ISO technical committee, ISO / TC 176 is addressing these issues and has agreed the following strategic goals:

* To promote universal acceptance by ensuring continuous review and improvement, discouraging the proliferation of sector-specific standards;

* To harmonize the numbering system of the individual clauses of the three Quality
System Assurance Models so that the user can more easily cross reference from one standard to the other;

* To maintain forward compatibility by minimizing the number and scope of any revisions and, as far as possible, make sure that they are accepted by existing as well as new contracts; and

* To allow forward flexibility by structuring future supplements in the way that they allow new features to be blended into the parent document of a later version.

ISO standards are reaffirmed and revised at approximately five year intervals. The first official revision to the 1987 published ISO 9000 standards was released in mid 1994. Work on the second revision has already started and a further, far reaching revision is scheduled for 1996.

In addition, the International Organization for Standardization and its partner, the International Electrotechnical Commission are going to set up the Quality System Assessment Recognition (QSAR) Board in order to accredit ISO 9000 registrars anywhere in the world, i.e. give formal recognition that the registrars are competent. Market confidence in ISO 9000 certificates can be increased when those certificates are issued by registration bodies which have been accredited by the QSAR Board. This
objective is often summed up in the phrase, "one quality system audit, one ISO 9000 certificate-accepted everywhere."

ISO has also launched the ISO 9000 Forum which consists of access to consolidated information from experts and problem solvers, in order to help managers applying ISO 9000 standards. Technical committee TC 176 is aware of the need to be market oriented and client requirements are being highlighted in the ISO 9000 and ISO 9004 guidelines. There may be a general shift towards total quality management (TQM) and becoming "world class companies". Safety orientation and environment protection are also likely to be covered in the new guidelines. Such developments would make ISO 9000 more effective for construction related industries.

In fact, business in every sector of private enterprise have shifted their emphasis to the quality side of the quality/price equation because they believe that doing so is absolutely necessary to remain competitive in today's global markets. Many political leaders and their governments have initiated and implemented National Quality Policies intended to stimulate the competitiveness and economy vitality of their nations' productive capacity. Even in noncompetitive sectors such as government administrations, the push for quality and client satisfaction is at an all-time high.

Because ISO 9000 standards are significantly different from what might be called
"normal" engineering standards such as (standards) for units of measure, terminology, test methods, product specifications, etc. and its concept is that certain generic characteristics of management practice could be usefully standardized, giving mutual benefit to producers and users alike; the standards have been directly adopted, without change, as national standards in at least 51 countries, including all of the European Community (EC) and European Free Trade Association (EFTA) countries, Japan, the USA and some third world countries.

In short, the future of ISO 9000 can be summarized into what Mr. Anthony Coggeshall of Adhesives Research Inc. from the United State of America has said. "Looking into the future, within two years, give or take a year, you won't be able to do business in Europe without ISO 9000 registration. Within five years, you won't be able to work with a U.S. government agency, or a company supplying a government agency without ISO 9000 certification. Within five or ten years, it'll be tough to do business in the United State without it." We did not have to wait very long, because it soon became apparent that the ISO 9000 standards would enjoy the most widespread recognition in industry and the most rapid adoption by the international community.