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Front End Specifications and the Propagation of Construction Claims

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FRONT END SPECIFICATIONS AND THE PROPAGATION OF CONSTRUCTION CLAIMS

by

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ABSTRACT OF THE DISSERTATION

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Front End Specifications represent the administrative, organizational, performance and payment requirements for construction projects. The vast majority of construction contracts use Front End Specifications, either from an independent source or prepared in-house. In spite of the crucial role of Front End Specifications, little is known regarding whether Front End Specifications increase or decrease claims in construction. Further, no published reports to date have investigated whether construction claims are systematically related to Front End Specification complexity, partnering, business size or document authorship.

In the present quantitative study, participants (n = 150) from the construction industry, including contractors, subcontractors, designers and owners, completed an on-line survey of sixteen multi-part questions detailing common Front End Specifications and the impact of those specifications on claims.

Results indicate that disputes and claims from Front End Specifications impose significant costs on construction projects, with scheduling specifications/requirements, summary

(scope) of the work and coordination being the most common causes of claims. Perceptions of claims were not related to business size or document authorship. Partnering participants trended towards perceiving Front End Specifications as decreasing claims. Regulatory Requirements were generally perceived as too complex and participants who perceived Front End Specifications Regulatory Requirements as too complex were significantly more likely to believe that Front End Specifications would cause more claims.

Results are discussed in the context of ConsensusDOCS® library of construction forms, practical implications for construction project management, limitations of the present study and areas for future research.

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Chapter 1

Introduction

Front End Specifications are a crucial, integral component of construction documentation. Little is known regarding whether Front End Specifications increase or decrease claims in construction. Further, whether construction claims are related to Front End Specification complexity, partnering, business size or document authorship has been unclear.

Determining the impact of Front End Specifications on claims is important. Construction is a very complex process requiring the cooperation and coordination of many skilled professionals from multiple organizations. For example, a small to medium-sized ($5-10 million) project may require fifty or more contractors and organizations (LePatner 2007). With so many participants and activities occurring at any given time, managing the construction process requires more than technical skills. Business acumen and organizational expertise can dictate the ultimate success of a project, but only if all parties agree to their roles in advance. Therefore, it is important for the parties to agree to specifications before work begins.

Modern construction documentation incorporates both procedural ("administrative") and technical requirements to establish the policies and procedures necessary to govern the project's lifecycle. The administrative and organizational requirements are contained in the first part or parts of the project specifications and are commonly referred to as the "Front End" specifications.[1] Specifically, the Front End Specifications delineate the rights and responsibilities of the parties involved in the contract, as well as their subcontractors and the way in which the contract will be administered.

[1] The phrase "General Conditions" is synonymous with Front End Specifications.

As an experienced construction lawyer, the author has a long-standing professional interest in how construction contracts are administered and managed. It has been the author's experience that the Front End Specifications can often complicate an already complex situation with "fine print". Rather than reduce or eliminate confusion and uncertainty, specifications may have the contrary result. However, the anecdotal experiences of the author are no substitute for the scientific application of objective measures with representative samples of multiple levels of job titles within the construction industry, including contractors, subcontractors, designers and owners.

The purpose of the present study was to objectively determine whether Front End Specifications have a tendency to increase or decrease claims in the construction industry and further, to determine whether construction claims are related to Front End Specification complexity, partnering, business size and document authorship. The present study addressed the following research questions:

- Do the Front End Specifications cause disputes and claims?
- If Front End Specifications do cause claims, which are the most significant and have the most significant impact on projects?
- Do significant costs or lost profits result from claims?
- Are Front End Specifications perceived as being either too simple or too complex?
- Would the use of performance-based Front End Specifications increase or reduce disputes and claims?
- Is Partnering related to perceptions of whether the Front End Specifications increase or decrease claims?
- Is document authorship significantly related to perceptions of whether Front End Specifications increase or decrease disputes and claims?
- What methods are used to resolve claims?

This doctoral dissertation is arranged in five (5) chapters. In Chapter 2, the Literature Review, with a primer in Front End Specifications, is provided in the context of modern construction documentation. Next, representative Front End Specifications are compared, including Front End Specifications in use at Washington University in St. Louis. Causes of disputes and claims follow. This chapter ends with a summary of the literature and an overview of the present study.

Chapter 3, the Research Methodology, details the design, participants, instrumentation and determination of which Front End Specifications to include in the present study, and those procedures and data analyses used to address the research questions.

Chapter 4 begins with descriptives of participants. Then the research results for each of the research questions are detailed, including analyses to objectively address the research questions.

Chapter 5 discusses the present findings towards improving Front End Specifications and then provides a critique of a recently-released standardized documents protocol (ConsensusDOCS®). Suggestions for future research and the conclusions of the present study are then offered.

To guide the reader, Glossary and Acronyms are presented in Appendix G.

Chapter 2

Literature Review

This Literature Review begins with a primer in Front End Specifications in the context of modern construction documentation. Front End Specifications vary greatly and a side-by-side comparison of Front End Specifications from Washington University and Rochester Institute of Technology highlight the stark differences in Front End Specifications. This chapter ends with a Summary of the Literature Review and an overview of the present study.

2.1 A Primer in Front End Specifications

The purpose of this section is to define and discuss the role of the Front End Specifications in the context of modern construction documentation and project administration.

The purpose of the Front End Specifications is to provide guidance and direction for the non-technical aspects of the work by addressing numerous administrative issues. Examples include specifying the executive and senior-level individuals (such as project manager and senior scheduler) that a contractor (whether designer, construction manager or prime contractor) must provide for the job, the physical spaces (such as offices and work cubicles) to be provided for the benefit of the owner and the company employees or consultants and often the scheduling software that will be utilized. Other project management requirements may direct the type and number of copies of reports

to be produced, to what extent a contractor may change its work sequence without the prior written approval of the owner and in what form and format the contractor will keep its books of account and project records. Similar directives regarding the administration of the project (notice requirements and addresses, form of notice, approval requirements*, etc.*) are also commonly included.

In an attempt to reduce inconsistencies as well as reduce costs, the Front End Specifications are frequently recycled from one project to another[2] and from one owner to another; it is thought that such "standardized" language removes or minimizes the effects of uncertainty from one project to the next (Patterson 2001).[3] If this were true, the language would be so precise that it would eliminate the possibility of (or need for) claims and litigation over the meaning of the "standardized" specifications.[4] As is well documented, claims and litigation have increased over the years[5]; it is conceivable that the language an owner inserts into the contract documents as protective measures may, in fact, be responsible for the same disagreements that the owner sought to avoid in the first place.[6]

These disagreements may result because the "administrative" provisions are in conflict with project execution. For example, owners generally state (and the specifications often provide) that the contractor is solely responsible for the "means and methods" of the

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[2] "Of particular interest are the general conditions (boilerplate) that tend to be used unaltered from project to project." Hinze and Tada (1993)

[3] This is not unique to the construction and engineering world: see, for example, Faustle, Fugini & Damiani 1996 (software) and Whittle 2002 (manufacturing).

[4] Standardized specifications, as distinguished from commonly-used Front End Specifications, are discussed in Chapter 5.

[5] See, for example, Cohen, Thomas H., "Civil Justice Survey of State Courts, 2001"; U.S. Department of Justice, January 2005; NCJ 207388, and Court Statistics Project, State Court Caseload Statistics, 2005 (National Center for State Courts 2006)

[6] A brief general background review is contained in Appendix I.

construction.[7] In practice, project requirements may be construed by constructors as dictates by the owner amounting to an assumption of the "means and methods" by the owner and any problems that result are arguably the responsibility and financial obligation of the owner (Klinger and Susong 2006; Mincks and Johnson 2004).

One must look at the process in its entirety to find the common denominator that may lead to disputes and claims. While poorly drafted plans and construction documents contribute to disputes, little investigation into what this means has been conducted (Netherton 1983). It is conceivable that overly restrictive Front End Specifications may be contributing to these problems.

It is appropriate to discuss some of the more common Front End Specifications (see Table 2.1 below) and review their use in actual project examples. Since even with the "standard forms" there are variations in the actual language utilized on any particular contract,[8] it is not possible to dissect every variation of such examples.[9]

As was briefly introduced in the opening paragraphs, the Front End Specifications provide the general organizational and administrative directives for the project (Bubshait and Almohawis 1994). In reality, there are no minimum requirements for Front End Specifications; indeed, a construction contract need only meet the basic legal requirements (offer, acceptance, consideration, legality, mutuality, capacity to contract)[10] in order to be binding. As noted in the well-known Schexnayder and Mayo (2004) publication, *Construction Management Fundamentals,* typical topics (in no particular order) in a "short form" example may include:

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[7] See, for example, Sabo, Werner, "Legal Guide to AIA Documents, 4th Ed., Aspen Publishers Online, 2001. IL: Riverwoods at 264.

[8] See, for example, Hinze and Tada (1993)

[9] A potential for additional research could be analyzing the variations in any one owner's utilization of its own "standard form" documents.

[10] See, for example, "Legal Elements of a Contract", accessed at http://cpa.state.tx.us/procurement/pub/contractguide/LegalElementsofaContract.pdf.

- Administration of the contract
- Terms and Definitions
- Changes in the Work
- Time and Schedules
- Payments and Completion
- Safety
- Insurance and Bonding
- Corrections to the Work
- Terminations and Suspension of the Work

Table 2.1: Front End Specifications for a Complex Project[11]

Summary of Work	**Use of Owner's Facilities**
Measurement and Payment	Coordination
Coordination with Owner's Operation	Cutting and Patching
Connections to Existing Facilities	Field Engineering
References	Applications for Payment
Equipment Rental Rates	Project Meetings
Progress Schedule	Survey Data
Project Submittal Requirements	Samples
Construction Photographs	Quality Control
Construction Facilities and Temporary Controls	Control of Work
Construction Aids	Security
Protection of the Work and Property	Access Roads and Parking Areas
Soil Erosion and Sedimentation Control	Maintenance and Protection of Traffic
Project Identification and Signs	Field Offices, Sheds and Communications Equipment
Material and Equipment	Starting and Placing Equipment in Operations
Contract Closeout	Cleaning
Project Record Documents	Operating and Maintenance Manual
Warranties and Bonds	Spare Parts, Maintenance Items and Tools
Training	

[11] Source: City of Detroit River Rouge Reconstruction project.

At the other end of the spectrum, and most often utilized on complex projects, a detailed topical listing may contain the topics shown in Table 2.1 above. The standard form advocated by the Construction Management Association of America (CMAA) has fifteen topical titles as shown in Table 2.2 below:

Table 2.2: CMAA Form CMAR-3 Topics

Contract Documents	Protection of Persons and Property
The Designer	Insurance
The Owner and Construction Manager	Changes
The Contractor	Uncovering and Correction of Work
Subcontractors	Termination
Work by the Construction Manager or by Separate Contractors	Dispute Resolution
Time	Other Provisions
Payments and Completion	

It must first be recognized that more topical content together with additional detail does not guarantee a better document. Moreover, topical titles, even if identical, do not automatically result in identical content. How and to what extent the various subjects are handled may vary significantly from document to document and project to project, even if utilized by the same owner or builder (Hinze and Tada 1993). Even within a project there can be major differences, both coordinated and conflicting, as prime contractors strive to follow the owner's rules and then pass those same rules, together with their own, on to the subcontractors on the project. This remains true regardless of the project's owner and whether the owner is private or public. To the extent that the rules become more complex or cumbersome (admittedly, a subjective term), such as with the Federal Acquisition Regulations ("FARs"), the costs associated with such complexities become part of the contract price, whether itemized or not.

Before starting this research, it was appropriate to first determine if persons other than the author saw the Front End Specifications as a potential source of disputes and claims. During this same time frame, the Construction Management Association of America ("CMAA") issued a "Request for Grant Proposal" solicitation, which focused on how a professional construction manager could reduce claims on a project. CMAA's interest in the topic remained high and discussions with Bruce D'Agostino, Executive

Director of CMAA, resulted in CMAA assisting in the distribution of research instruments for this research project.[12]

To further determine if the proposed research had merit beyond CMAA's interest, a short survey of twenty-four (24) construction professionals (the details of which are included as Appendix B) was conducted by the author during a claims avoidance presentation and training session at the American Subcontractors Association's 2005 Business Forum and Convention in Orlando, Florida on March 17, 2005. The ASA is a national organization whose membership is comprised primarily of commercial specialty trade contractors.[13]

In response to the opening question asking if the contract or specifications' language itself caused claims or disputes, 92% of the attendees answered in the affirmative. With one exception (an attorney), the attendees were all specialty contractors and may have had one or more claims experiences that added some bias to their perspectives. Comments by the participants convinced the author that additional research, which would include owners, prime and specialty contractors and construction managers, was warranted.

This research project was undertaken to determine if commonly used Front End Specifications promote or reduce the number of construction claims. Additionally, the findings of this research complement recent efforts to establish wide acceptance for standardized Front End Specifications that address many of the concerns identified by survey participants. Two major advantages result by utilizing standardized Front End Specifications. First, the cost of creating "new" Front End Specifications is eliminated,

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[12] Discussion with Bruce D'Agostino, Executive Director of CMAA, February 23, 2005, in San Antonio, Texas, while the author was attending the mid-year meeting of the American Council of Construction Education.

[13] For clarification, a subcontractor is one who performs work for a prime or general contractor. A specialty contractor, also frequently called a "trade contractor", performs a limited scope of work such as mechanical, steel erection or concrete work. A specialty contractor can be either a subcontractor or a prime contractor; the status is defined by the contractual relationship between the parties and this is true regardless if the project is public or private, commercial, industrial or residential.

thereby reducing initial project document drafting costs. Second, the use of consistent language, accepted in advance by the endorsing participants, should reduce the problems which arise from inconsistent interpretation of "new" language introduced by an unfamiliar set of Front End Specifications. With consistent usage and understanding, fewer disputes and claims should result. To demonstrate the extent of the problem, the next section compares Front End Specifications between universities.

2.2 Front End Specifications Compared

With the many forms of Front End Specifications available, drawing a comparison between similar project documents places the problem in context. To that end, the author acquired copies of "standard" form Front End Specifications from a number of educational institutions, rationalizing that many universities have common goals in their building programs. For example, all schools, public or private, are cost-conscious, safety-aware, have the need for accessible facilities and generally want the construction completed by a specific date, often tied to the beginning of the school year or a semester break. The Front End Specifications from four educational institutions[14] (including Washington University in Saint Louis, Los Angeles Community Colleges, UC Berkeley and the Rochester Institute of Technology) were selected for comparison purposes; a review of those four documents (See Table 2.3) yields interesting discussion points.[15] A comparison of selected provisions from the AIA, EJCDC and ConsensusDOCS® follows the institutional comparison.

[14] These particular school documents were selected based on the length of the specifications, similarities to the AIA form document and page counts. The two California schools were selected to contrast with the more comprehensive building codes and litigious nature of the state.

[15] Copies of each of the referenced documents are included in the Appendices.

Table 2.3: Quantitative Specifications Summary

	Washington University Facilities	LACC	UC Berkeley	RIT
Total # Pages	28	135	47	32
# of Heading	9	15	15	14
# of Sections	29	378	100	43
Definitions	13	157	39	20

Note. LACC = Los Angeles Community Colleges, RIT = Rochester Institute of Technology

Comparing the total number of pages (or another arbitrary classification) does not rate content or completeness of the documents. "Quality is more important than quantity" applies in the case of both legal and construction documentation. Nonetheless, it is of interest that there is such a large difference in the relative sizes of the various documents, primarily given the arguably consistent goals of each institution.

In terms of inclusiveness, the Washington University and Rochester Institute of Technology Front End Specifications are comparable. They are of similar length and their language often closely parallels that of the AIA documents. The two larger documents are from institutions in California and go into much more detail (as well as covering additional topics) than the non-California institutions.[16] It is beyond debate that a good lawyer keeps a client out of court by anticipating issues and providing mechanisms for resolution beforehand; hence, the lengthy LACCD document tries to address all potential problems, including those unique to California law.

To demonstrate the similarities and differences between the two documents, selected sections are highlighted in the following tables. By presenting the comparable provisions side-by-side, one can see the nuances in document drafting. We begin by comparing the topic of "defined terms" which is set forth in Table 2.4 below.

Headings alone do not provide a complete description of the contents of each section. For example, not only does Washington University define "as-built drawings" in its

[16] This is not surprising: California has some of the most comprehensive construction codes, statutes and court decisions in the nation and is a very litigious venue.

definition section, there is a section (GC-4) devoted exclusively to the subject. Similarly, RIT has a section (9.9) on the topic but does not include it in its definitional area and its coverage is somewhat less than that of Washington University.

Table 2.4: Comparison of Defined Terms

Washington University	Rochester Institute of Technology
Contract Documents	The Contract Documents
The Contract	The Contract or Agreement
The Work	The Work
Owner	
Architect/Engineer	
Contractor	
Subcontractor	
Furnish	Furnish
Install	Install
As-Built Documents	
Shop Drawings	
Samples	
General Conditions	
	The Project
	Approved
	Provide
	Specifications
	Requirements
	Drawings
	Final Completion
	Governmental Authority
	Hazardous Materials
	Product
	Project Manual

Note. Items in the RIT documentation have been re-ordered for comparison purposes.

Beyond the headings, the content is most important. Looking at some of these provisions in more detail (Table 2.5), we find that the definitions of Contract Documents are very similar:

Table 2.5: Contract Documents Definitions Compared

Washington University	Rochester Institute of Technology
The Contract Documents consist of the Agreement between Owner and Contractor, these General Conditions, Drawings, Project Manual and Specifications, addenda issued before execution of the Agreement, other documents listed in the Agreement, and modifications issued after execution of the Agreement. A modification is a written amendment signed by both parties, a change order, a construction change directive, or a written order for a minor change in the Work issued by the Architect/Engineer.	The Contract documents consist of: the Advertisement/Request For Proposal, Form of Proposal, Owner-Contractor Construction Agreement, General Conditions of Contract for Construction, Supplementary General Conditions of the Contract for Construction (and all Enclosures, Appendices and Exhibits thereto), Specifications, Drawings, and any Addenda issued prior to the execution of the Owner-Contractor Agreement and all Modifications thereto. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a written interpretation issued by the Architect pursuant to Subparagraph 2.2.5, or (4) a written order for a minor change in the Work issued by the Architect pursuant to Paragraph 12.4.

The differences are subtle with the RIT definition being more inclusive. In addition to the actual contract for construction, the "Contract Documents" (*i.e.*, all the components of the agreement) include the general conditions (*i.e.*, the Front End Specifications) as well as the supplemental conditions and addendum, together with any modifications and change orders together with "written order[s] for minor work." Drawings are also included. The RIT document also includes both the solicitation for and the contractor's response (proposal) but not the project manual. Washington University's definition does not include the solicitation or proposal and does include the Project Manual as well as any "construction change directive". Washington University's provision is similar to the language in the AIA document:

> The Contract Documents consist of the Agreement between Owner and Contractor (hereinafter the Agreement), Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to

> the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include other documents such as bidding requirements (advertisement or invitation to bid, Instructions to Bidders, sample forms, the Contractor's bid or portions of Addenda relating to bidding requirements). (2005, GC-3)

There is no significant difference between the Washington University provision and that of the AIA form while the RIT specification essentially mimics the AIA language and specifically includes the solicitation and responsive documentation.

Compared next is the "Contract for Construction" language (Table 2.6). This provision defines what documents comprise the "contract" as a whole, beyond the single document which carries the title of "Agreement" or "Contract" or even "Contract for Construction".

Table 2.6: Contract for Construction Language Comparison

Washington University	Rochester Institute of Technology
The Contract Documents form the Contract for construction and represent the entire integrated Agreement between the Owner and Contractor, and shall not be construed to create a contractual relationship of any kind between any parties other than the Owner and the Contractor.	The Contract Documents form the Contract for Construction. This Contract represents the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification as defined in Subparagraph 1.1.1. The Contract Documents shall not be construed to create any contractual relationship of any kind between the Architect and the Contractor, but the Architect shall be entitled to performance of obligations intended for his benefit, and to enforcement thereof. Nothing contained in the Contract Documents shall create any contractual relationship between the Owner or the Architect and any Subcontractor or Sub-subcontractor.

In essence, the RIT specification includes all of the language included in the Washington University provision, supplemented by how the contract can be modified. The AIA language is even broader:

> The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or

> modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Architect and Contractor, (2) between the Owner and a Subcontractor or Sub-subcontractor, (3) between the Owner and Architect or (4) between any persons or entities other than the Owner and Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

Neither the RIT nor Washington University specifications address relationships with any lower tier contractors (referred to as either subcontractors or sub-subcontractors), the effect of which should insulate each institution from direct claims by subcontractors.[17] Note that the AIA document also includes language making the Architect a third-party beneficiary under the contract between the Owner and the Contractor. Finally, as within the definitional areas of these documents, compare "The Work" (Table 2.7). The Work defines what is to be done and is also known in the industry by the terms "scope of work" and "summary of the work", which are used interchangeably in this document. If the work is not fully defined, problems arise and claims and disputes follow. While it would be preferable to have all the details of the contractor's obligations in one place, that is not practicable.

Table 2.7: "The Work" Defined

Washington University	Rochester Institute of Technology
The Work comprises the completed construction required by the Contract Documents and includes all labor necessary to produce such construction and all materials and equipment incorporated in such construction.	The Work comprises the completed construction required by the Contract Documents and includes all labor and supervision necessary to produce such construction, and all materials and equipment incorporated or to be incorporated in such construction or required for the construction.

Both documents' definitions are nearly identical and closely parallel the AIA language:

[17] Some jurisdictions do not require privity of contract for a subcontractor to enforce a claim directly against an owner. The discussion of this topic is beyond the scope of this paper. See, for example, Cameron, John G., *A Practitioner's Guide to Construction Law*, New York: ALI-ABA, 2000.

> The "Work" means the construction and services required of the Contractor by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

The reader may wonder whether the nuances justify the use of custom forms when a readily available "generic" document such as the AIA or ConsensusDOCS® forms (discussed in Chapter 5) is readily available.

Construction contracts would be improved, and claims avoidance success increased, by better aligning the interests of owners and contractors.[18] By better defining and documenting what is expected, the uncertainty is, to a great extent, eliminated and the contractor can focus on getting the project constructed. As CII noted:

> … negotiating a contract [to establish] the intent and effect of [contract] clauses [will result in] language [that] can be adopted that both parties agree is clear and appropriate for the work at hand. (CII 1986, 6)

Changes occur during the course of the project, for any one of a number of reasons. As a result, it is necessary to revise the drawings to reflect the various changes. Looking at the content of the "as-built drawings" requirement more closely, Table 2.8 provides a side-by-side comparison of the relevant language.

Table 2.8: Comparison: As-Built Drawings Specification

Washington University	Rochester Institute of Technology
GC-4 AS-BUILT DRAWINGS A. Contractor shall maintain on-site and submit for approval of Owner's Representative upon completion of the work, a complete set of "As-Built" drawings and specifications of the Contract Documents which clearly show with dimensions any variation from working drawings in the installation of materials and equipment. B. On-Site Requirements: Contractor shall maintain a complete bound set of all drawings,	1. AS BUILT DRAWINGS 9.9.1 The Contractor shall red mark blue line prints of the project indicating all changes to the drawings and submit them to the A/E prior to submitting final request for payment. 9.9.2 Where coordination drawings have been prepared in CAD format, the Contractor shall also submit these CAD files. 4.11 DOCUMENTS AND SAMPLES AT THE

[18] See, for example, the Construction Industry Institute (1986) study cited in the Literature Review.

specifications, addenda, approved shop drawings, change orders and other modifications of the Contract Documents for inspection at any time by Owner's Representative. Contractor shall mark up the on-site set each day to record measurements, changes and deviations from the design and additions and deletions thereto, as approved, as well as existing facilities encountered in the course of the work, which are not shown on the drawings. It is mandatory that the on-site set of record drawings be kept up-to-date by Contractor. C. Form of Submittals: "As-Built" drawings submitted by Contractor to Architect or Engineer for approval shall be red-lined prints, fully marked up to show all changes approved by Change Orders, approved Field Change Requests or changes approved by Owner's representative.	SITE 4.11.1 The Contractor shall maintain and make available at the site for the Owner and Architect one record copy of all Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to record all changes made during construction, and approved Shop Drawings, Product Data and Samples. These shall be delivered to the Owner upon completion of the Work. In addition, Contractor shall be responsible for providing the Architect with record drawings on a CAD disk.

The AIA language is similar to that contained in subparagraph 4.11.1 of the Washington University document:

> The Contractor shall maintain at the site for the Owner one record copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to record field changes and selections made during construction, and one record copy of approved Shop Drawings, Product Data, Samples and similar required submittals.

As noted earlier, the differences are minor and utilization of a generic, standardized form would satisfy the needs of either institution.

These provisions have subtle differences. The topic is covered in one singular location by Washington University's documentation; RIT's document addresses the same topic in two sections some ten (10) pages apart. Separated as such, the opportunity to miss something exists by virtue of being addressed in two separate locations. Also, note that §4.11.1 requires the contractor to mark up the drawings "currently" while §9.9.1 has no requirement of contemporaneous preparation. While a minor point, this always has the potential of being an issue of contention should a dispute arise between the parties. It would be better to include all the language in one place under the singular topic as in the example below:

> The Contractor shall maintain and make available at the site for the Owner and Architect one record copy of all Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently in red on the blue line prints of the project to record all changes made during construction, and approved Shop Drawings, Product Data and Samples. The Contractor shall submit the marked up drawings to the A/E (on behalf of the Owner) prior to submitting its final request for payment.

The language is similar, but with everything regarding the topic in one place, there is less chance of overlooking the additional language.[19] The point of this discussion is that consistency defines standardization and standardization will reduce claims by eliminating the uncertainty inherent in variations on a theme (See the comments contained in Appendix F).

The project schedule is, without a doubt, one of if not the most important document created after the contract is signed. It provides the basis for measuring progress and, when there are delays, a basis for determining the effect of the delay(s). Compare the project schedule and weather specifications are next compared in Tables 2.9 and 2.10.

[19] While this change might simplify the specification, allowing it to remain split does not relieve the contractor of the need to fully review and understand the contract documents.

Table 2.9: Comparison of Schedule Requirements

Washington University	Rochester Institute of Technology
GC-27 PROJECT SCHEDULE A. Contractor shall confer with Owner's Representative to determine a mutually acceptable schedule. B. Contractor shall submit written copies of schedule for approval. Schedule shall be related to calendar periods and indicate starting and completion dates of major and critical items of the work and the various stages of construction. Should changes become necessary, Contractor shall follow approved Project Schedule unless Owner subsequently approves rescheduling individual items of the work. Should changes become necessary, Contractor shall revise the schedule and re-submit for approval. C. Almost all of the Work must be scheduled in advance to permit Owner to make necessary adjustments in Owner's operations, which will allow Contractor to perform his work. Contractor shall follow approved Construction Project Schedule unless Owner subsequently approves rescheduling individual items of the Work. D. Items scheduled shall be sufficiently small in scope and detailed to permit ready evaluation of the progress of completion of the item. Division of the Work into scheduled items may be specific items, class or type of work or by area as may best serve for monitoring progress of the item. E. The dollar value of each scheduled item from the Schedule of Values shall be listed on the Project Schedule. F. Items of Subcontractor work shall be scheduled in similar detail. G. The Project Schedule shall be plainly related to calendar dates to permit identification of scheduled starting and completion dates for phases of each item of work and events. H. If the value to be claimed on Project Schedules is not linear and continuous with completion schedule, percentages shall be indicated at appropriate points on the item schedule line. I. Progress Schedules shall be submitted with each application for partial payment. The schedule for each scheduled item shall be distinctively marked to show completion claimed for payment and the total value claimed shall be written on the schedule.	4.10 PROGRESS SCHEDULE 4.10.1 The Contractor, immediately after being awarded the Contract, shall prepare and submit for the Owner's and Architect's review and approval an estimated progress schedule for the Work. The progress schedule shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work. The schedule shall state the proposed starting and completion dates for the various subdivisions of the Work as well as the totality of the Work and identify the Project's critical path. 4.10.2 With the Progress Schedule, the Contractor shall provide Owner, and Architect, with copies of a table showing the projected monthly drawdown for value of work completed throughout the contract period. 4.10.3 The Progress Schedule shall be monitored and updated at the job meetings and copies supplied to Owner and Architect as updated. Each schedule shall contain a comparison of actual progress with the estimated progress for such point in time stated in the original schedule. 4.10.4 If, in the opinion of Owner, Contractor falls behind the latest Progress Schedule, the Contractor shall take whatever steps may be necessary to improve its progress and shall, if requested by Owner, submit operational plans demonstrating how the lost time may be regained. The Contractor is responsible to maintain its schedule so as not to delay the progress of the Project or the schedules of other contractors. If Contractor delays the progress of its work or the work of other Contractors, it shall be the responsibility of Contractor to increase the number of men, the number of shifts, the days of work and/or, to the extent permitted by law, to institute or increase overtime operations, all without additional cost to Owner in order to retain any time lost and maintain the Progress Schedule then in effect as established by Owner.

The AIA document references the construction schedule in no less than six places, providing an impediment to simplification and understanding. By way of example,

> § 3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.
>
> § 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each separate contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with other separate contractors and the Owner in reviewing their construction schedules when directed to do so. The Contractor shall make any revisions to the construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, separate contractors and the Other until subsequently revised.

Notably absent from the AIA specification is any mention of the type of schedule to be provided or the level of detail required. While a small, simple project may justify the use of a simple bar chart (timeline), larger complex projects, especially those with long overall durations, require the use of more complex scheduling techniques such as Critical Path or Linear schedules. The RIT specification references the project critical path; the Washington University document is silent on the topic.[20]

The weather specifications (Table 2.10) are again similar. Depending somewhat upon the length and location of the project, as well of the specifics (*e.g.*, interior or exterior or both), the weather provisions may or may not be actually necessary, though a good draftsperson would include the language in any event.

[20] Issues surrounding scheduling methodologies and techniques are outside the scope of this study. Countless references to those and related subjects are available in libraries and on the Internet.

Table 2.10: Weather Specifications

Washington University	Rochester Institute of Technology
(Weather) J. Contractor shall revise the Project schedule whenever Owner requests. Contractor may revise the Project Schedule at any time. Revised Project Schedules are subject to Owner's approval. The Project Schedule shall be revised and resubmitted when the project is 15 percent, 40 percent, 75 percent and 90 percent complete. K. The project schedule shall include an allowance of 63 bad weather days per year. This allowance is divided into the following monthly breakdown: January 8 days February 8 days March 8 days April 6 days May 5 days June 3 days July 3 days August 3 days September 3 days October 4 days November 5 days December 7 days In the event that weather-related conditions preclude performance of 60% of critical path activities scheduled for a particular day, the day may be claimed by the contractor as a weather day and charged against the allowance included for that project. If good weather conditions prevail throughout the contract period and the allowed number of weather days are not encountered, the Contractor will not be required to complete the contract correspondingly ahead of the contract completion date. If poor weather conditions prevail such that all of the allowed bad weather days are exceeded, a no cost change order extending the date of scheduled completion will be executed. preclude performance of 60% of critical path activities scheduled for a particular day, the day may be claimed by the contractor as a weather day and charged against the allowance included for that project. If good weather conditions prevail throughout the contract period and the allowed number of weather days are not encountered, the Contractor will not be required to complete the contract correspondingly ahead of the contract completion date. If poor weather conditions prevail such that all of the allowed bad weather days are exceeded, a no cost change order extending the date of scheduled completion will be executed.	(Weather) 12.3.4 Owner shall not be liable to any Contractor or Subcontractor for damages caused by any breach of contract, delay in performance or other act of neglect by any other Contractors or Subcontractors having Contracts for performance of any portion of the Work or by bad weather, or any causes designated Acts of God or force majeure by any court of law or any cause outside Owner's reasonable control.

A much more pronounced difference in content and potential for disagreement is evident in these specifications. It is a given that both Rochester, New York, and St. Louis, Missouri get "winter" weather (snow, ice, *etc.*) on a regular basis.[21] Rochester does not define what constitutes "bad weather"; in contrast, Washington University allows for 19" of rain between March and May even though 33" is the "norm" (NOAA 2007).[22] Granted, contractors can often work in adverse weather conditions; however, leaving "normal" undefined invites dispute.

The AIA specification takes yet a third approach, requiring the contractor to meet three requirements:

> If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction.

Meeting these requirements should be straightforward for the contractor. Reference to historical data (such as that maintained by NOAA) establishes abnormality and addresses the issue of anticipation. Simple analysis would address the impact on the scheduled construction. This language also addresses an issue that could arise under the Washington University specification: what happens if all the "allowed" rainfall occurs at an unexpected time? The ability to "carry back" or "carry forward" un-utilized weather days could address the issue and avoid potential disputes.

In the next example, Table 2.11, the Schedule of Values specifications are compared. RIT's language is straightforward while Washington University's borders on micromanagement. In the end, both institutions will acquire the same product,

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[21] According to records maintained by the National Oceanic and Atmospheric Administration (NOAA), Rochester averages about 85-93" of snowfall and 160" of rain while St. Louis can reasonably expect 19" of snow and 108" of rain per year.

[22] Information obtained from NOAA's National Weather Service Weather Forecast Office, last accessed on 1/20/2007 at www.crh.noaa.gov/lsx/climate/STL/annual_snowfall.php and www.erh.noaa.gov/buf/climate/roc_snownorm.htm.

regardless of the language, provided that the individuals reviewing the reports understand the underlying process and procedures.

Table 2.11: Comparison of Schedule of Values; Payments

Washington University	Rochester Institute of Technology
GC-26 SCHEDULE OF VALUES A. Contractor shall submit to Owner for approval a breakdown showing portions of the Contract Sum as the value of each item of the work. B. Contractor's schedule of values shall be subdivided for each item of work identified in the Contract Documents and additional value subdivisions for each subcontractor. GC-9 PROGRESS PAYMENTS A. Owner shall pay Contractor value of work in place and materials stored on site upon approval of Application for Progress Payments submitted by Contractor not more than once per month. The Owner will attempt to make payment within ten days of receipt of invoice to Contractors that have sub-contracted with MBE and WBE firms. Direct payment will be made to the MBE and WBE firms. The application for payment shall be submitted on AIA Document G702 or it's equivalent with continuation sheets. The continuation sheets shall be complete showing individual lines for each specification section and contractor. B. Owner shall retain ten (10%) percent of each scheduled value of each payment to contractor to ensure the proper performance of the contract. C. With application for Progress Payment Contractor(s) shall furnish notarized waivers of lien for the value of the progress payment, and subcontractors and material suppliers shall furnish notarized waivers of lien for the prior progress payment, conforming to the requirements of Chapter 429 RSMo. D. With Application for Progress Payment, Contractor shall submit a copy of the Construction Progress Schedule, which shall show the portions of the work claimed as completed for payment as related to the Schedule of Values. Application for payment shall show retainage as a line item for each scheduled value. E. Storage of Materials Off site and Payment (1) The Contractor and his Subcontractors shall obtain prior written approval from the Owner through the Architect for permission to store only materials to be incorporated in and made a permanent part of the Work, for which Progress Payments will be requested, at off site locations. Any and all charges for storage, including insurance, and any and all	9.2 SCHEDULE OF VALUES 9.2.1 At least 30 days before the first Application for Payment, the Contractor shall submit to the Owner and the Architect for approval a schedule of values which in the aggregate equals the total Contract Sum, divided so as to facilitate payments to Subcontractors, supported by such data or evidence of correctness as the Architect may direct or as required by the Owner. This schedule, when approved by the Architect and Owner, shall be used to monitor the progress of the Work and to compute the amounts of the various payments requisitioned on the Certificates For Payment. All items with entered values will be transferred by the Contractor to the "Application and Certificate For Payment," and shall include the latest approved Change Orders. Change Order values shall be broken down to show the various subcontracts. The Application For Payment shall be on a form as provided by the Architect and approved by Owner. Each item shall show its total scheduled value, value of previous applications, value of the application, percentage completed, value completed and value yet to be completed. All blanks and columns must be filled in, including every percentage complete figure. No Application for Payment shall be required to be approved until after the Schedule of Values has been approved by the Owner and Architect. 9.2.2 The Schedule of Values and Applications for Payment shall be prepared by the Contractor using a modified version of A.I.A. Forms G-702 and G-703, "Application & Certification for Payment". The Schedule of Values shall be submitted to the Owner and the Architect for approval a minimum of thirty (30) days before the first Application for Payment. A milestone payment schedule may be required by the Owner, and shall be made a part of the Schedule of Values when agreed upon by the parties. Profit and general office overhead shall be included in each item. All Applications for Payment, Change Orders, and other documents involving monetary statements shall have totals rounded off to the whole dollar amount for 0 cents through 50 cents. All items above 50 cents through 99 cents to the next dollar.

charges for transportation to the site shall be borne solely by the Contractor. Before approval, Owner requires that off-site materials be stored in an approved warehouse, with proper proof of insurance and a letter stating the following information. (a) The name of the Contractor and/or Subcontractor leasing the storage space. (b) The location of such leased space. (c) The leased area: the entire premises or certain areas of a warehouse giving the number of floors or portions thereof. (d) The date on which the material was first stored. (e) The value of the material stored. (2) The Contractor and his Subcontractors shall notify the Architect and the Owner, at least once each month, to visit the warehouse where the materials are being stored. (3) The Contractor and his Subcontractors shall mark each sealed carton with the name of the project and the Architect. (4) A perpetual inventory shall be maintained for all materials held in storage for which payment has been requested. (5) Payments for materials stored off site in an approved warehouse and insured shall be at the sole discretion of the Owner. Any additional costs to the Owner resulting from storage of material off site for which payment is requested, such as, but not limited to, travel expenses and time for inspectors, shall be back charged to, and paid by the Contractor. Title to materials stored off site shall be transferred to the Owner when the Owner pays for such stored materials. F. All applications for payment shall be submitted on AIA document G702, Application and Certificate for Payment. Applications for payment shall reflect all items detailed in the approved schedule of values with corrections made for new items or Contractors as Work progresses. G. On projects greater than $300,000 in value, Contractor shall furnish a bound monthly project report with the Application for Progress Payment. The report shall contain the following information: (1) A cover letter describing the general status of construction activities as they relate to the project schedule and description of activities anticipated during the next month. (2) An activity report describing items completed during the month for each individual construction task. Include a log of daily weather conditions and temperatures. (3) A manpower summary for the month indicating daily manpower levels for each contractor and trade. (4) A minority report summarizing the daily workforce composition by ethnic group and gender for the month. (5) A log of change requests. (6) A log of submittals. (7) A log of requests for information. (8) All project meeting and conference call notes for the month. (9) Engineers' certifications for the month. (10) Four 8-inch by 10-inch color	

photographs of work progress recorded during the month. (11) List of unresolved issues that may impede meeting project milestones or schedule. H. In the event Contractor or any subcontractor tenders substitute security, the following shall apply: (1) All such substitute security shall be solely in the name of "Washington University". (2) Contractor at its sole cost shall cause all substitute security to at all times be held by a financial institution, title company or other third party custodian in the St. Louis, Missouri metropolitan area acceptable to Owner under terms which permit Owner to take immediate possession of any or all substitute security on demand at any time during normal business hours with or without cause. (3) Contractor at its sole cost and as agent for Owner shall administer any and all substitute security as required by applicable law including without limitation making release thereof and payment of interest and income thereon to itself and/or to subcontractors as and when required by the Contract Documents and applicable law. (4) Not less often than monthly, Contractor at its sole cost shall provide Owner a written certification and report of all substitute security itemized by subcontractor and in detail reasonably satisfactory to Owner. (5) Contractor hereby agrees to indemnify, defend and hold harmless Owner and its trustees, officers and employees against any and all claims, demands or liabilities arising out of the negligent or otherwise improper administration by Contractor of substitute security and/or any negligence of the custodian.I. Applications for Progress Payment shall not include costs for items that are not a direct expense of the work. Costs that are not authorized include, but are not limited to the following: (1) Professional dues for contractors and their employees. (2) Cumulative rental costs for equipment that exceeds their purchase price. (3) Workers' Compensation Insurance credits – Credits given by the insurance company shall be reflected as a credit to the Owner.	

The Washington University provision is seemingly simple and to the point. In actuality, when read in conjunction with the Progress Payment specification (GC-9), it is much lengthier than the corresponding RIT provision. It is very detailed as to how payments are to be made, varies the requirements somewhat based on contract size, requires lien releases with each payment, and, in the final section, specifically excludes certain items. It requires the contractor to provide progress photographs with each payment

application (neither the RIT nor AIA documents have comparable requirements) and discusses "substitute security"[23] for the contractual obligations. Again, both the AIA and RIT have no similar language.[24] From Washington University's perspective this appears to be beneficial, yet there is a potential claim, if not a lawsuit, in the language. Looking at section GC-9.H(2), Washington University (Department of Facilities Planning and Management 2005, p. GC-8) has claimed the right to

> "... take immediate possession of any or all substitute security <u>on demand at any time during normal business hours with or without cause</u>." (Emphasis added)

On its face, the language allows Washington University to arbitrarily claim the security for any reason whatsoever, appearing to be penal in nature. It is unlikely that the University would exercise that power in the absence of compelling facts (at least from its perspective). While the University is a non-public institution and not subject to the same due process claims as a public body, a court could easily find that the language is against public policy, at least to the extent that cause is not required for the University to act, and a contractor subjected to its application might well raise the issue even though it voluntarily signed the contract document. A minor change in the language might possibly avoid having the language stricken:

> ... take immediate possession of any or all substitute security on demand at any time during normal business hours *when the Owner has a good faith belief that performance of the contract is jeopardized and possession of the security is necessary to protect its interests*.

While there is no guarantee that the suggested change will avoid any potential dispute, it does serve to eliminate the argument that the University has acted capriciously.

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[23] Substitute security is a mechanism for protecting the owner's interest. The most common security is a performance bond; substitutes (alternatives) could be cash, assignments of interest or receivables or similarly acceptable assets.

[24] The language in the AIA specifications runs some three pages in length. The end result is similar with the most significant difference being that approvals are performed by the architect and not the owner as is the case with the RIT and Washington University requirements.

There is always the issue of too little versus too much detail. There is no one right answer; the decision is often driven by business and legal considerations. Table 2.12 compares the level of overall detail in the RIT and Washington University specifications:

Table 2.12: Comparison: Detail Level

Washington University	Rochester Institute of Technology
A. GENERAL PROVISIONS	2. 1. CONTRACT DOCUMENTS
GC-1 Definitions/Authority	
GC-2 Codes, Permits, Laws and Regulations	3. 1.1 Definitions
	4. 1.2 Execution Correlation & Intent
B. DRAWINGS AND	5.
SPECIFICATIONS	6. 2. ARCHITECT
GC-3 Contract Drawings and Specifications	
GC-4 As-Built Drawings	7. 2.1 Definition
	8. 2.2 Administration of the Contract
C. STANDARDS OF WORK	9. 2.3 Job Meetings
GC-5 Administration, Inspection/Authority	10.
	11. 3. OWNER
GC-6 Interpretation and Decision	12. 3.1 Definition
GC-7 Correction of Work	13. 3.2 Information & Services Required of Owner
GC-8 Warranties and Guarantees	
	14. 3.3 Right To Stop Work
D. PAYMENTS	15. 3.4 Right to Carry out Work
GC-9 Progress Payments	16. 3.5 Right to Audit Contractor's Records
GC-10 Extras/ Changes to Work	17.
GC-11 Substantial Completion and Acceptance	18. 4. CONTRACTOR
GC-12 Final Inspection, Acceptance, Payment	19. 4.1 Definition
	20. 4.2 Review of Contract Documents
E. PURCHASED MATERIALS	21. 4.3 Supervision & construction Procedures
GC-13 Equipment and Materials	22. 4.4 Labor & Materials
GC-14 Purchase of Material and Equipment	23. 4.5 Warranty
GC-15 Shop Drawings and Samples	24. 4.6 Taxes
GC-16 Samples and Testing	25. 4.7 Permits, Fees & Notices
	26. 4.8 Allowances
F. WORK ON CAMPUS	27. 4.9 Superintendent
GC-17 Contractor's Working Conditions on Campus	28. 4.10 Progress Schedule
	29. 4.11 Documents & Samples at the Site
GC-18 Responsibilities of Contractor	30. 4.12 Shop Drawings, Product Data & Samples
GC-19 Equal Employment Opportunity	31. 4.13 Use of Site
GC-20 Job Site Safety and Security	32. 4.14 Cutting & Patching of Work
GC-21 Hazard Communication	33. 4.15 Cleaning Up
	34. 4.16 Communications
G. INSURANCE	35. 4.17 Royalties & Patents
GC-22 Builder's Risk Insurance	36. 4.18 Indemnification
GC-23 Insurance/Indemnification	37. 4.19 Representations and Warranties
GC-24 Insurance Requirements	38.
	39. 5. SUBCONTRACTORS
H. SUBCONTRACTS	
GC-25 Subcontracts	40. 5.1 Definition
	41. 5.2 Award of Subcontractors & Other

I. SCHEDULES GC-26 Schedule of Values GC-27 Project Schedule GC-28 Performance of Work GC-29 Extension of Scheduled Time of Substantial Completion	Contracts for Portions of the Work 42. 5.3 Subcontractual Relations 43. 44. 6. WORK BY OWNER OR BY SEPARATE CONTRACTOR 45. 6.1 Owners Right to Perform Work & To Award Separate Contracts 46. 6.2 Mutual Responsibility 6.3 Owners Right to clean Up 7. MISCELLANEOUS PROVISIONS 7.1 Governing Law 7.2 Successors and Assigns 7.3 Written Notice 7.4 Claims for Damages 7.5 Performance Bond & Labor & Material Payment Bond 7.6 Rights & Remedies 7.7 Tests 7.8 Interest 7.9 Dispute Resolution 7.10 Waiver of Remedies 8. TIME 8.1 Definition 8.2 Progress & Completion 8.3 Delays & Extensions of Time 9. PAYMENTS & COMPLETION 9.1 Contract Sum 9.2 Schedule of Values 9.3 Application for Payment 9.4 Certificates for Payment 9.5 Progress Payments 9.6 Payments Withheld 9.7 Substantial Completion 9.8 Final Completion & Final Payment 9.9 As Built Drawings 10. PROTECTION OF PERSONS & PROPERTY 10.1 Safety Precautions & Programs 10.2 Safety of Persons & Property 10.3 Emergencies 10.4 Hazardous Materials 11. INSURANCE 11.1 Contractor's Liability Insurance 11.2 Commercial General Liability Policy 11.3 Certificates of Insurance 11.4 Subcontractor Insurance 11.5 Builders Risk Insurance 11.6 Miscellaneous Provisions 12. CHANGES IN THE WORK/SUBSTITUTIONS

	12.1 Change Orders 12.2 Concealed Conditions 12.3 Claims for Additional Cost 12.4 Minor Changes in the Work 12.5 Substitutions 13. UNCOVERING & CORRECTION OF WORK 13.1 Uncovering of Work 13.2 Correction of Work 13.3 Acceptance of Defective or Non-Conforming Work 14. TERMINATION OF THE CONTRACT 14.1 Termination by the Contractor 14.2 Termination by the Owner 14.3 Termination by the Owner for Convenience

It is possible that each of these sets of specifications has been developed and evolved as a result of the experiences of the institution and the people who represent it. Certainly, also at play is the influence of the institutions' respective legal counsels whose role and goal is to protect the institutions' interests. This is no different, of course, from the role legal counsel plays in any other enterprise, regardless of the nature of the business. However, adding complexity does not automatically result in improved results. Tailoring specifications to a particular project was recommended by the 1986 CII study. Long, "boilerplate" documents such as the Washington University (and, to a greater extent, the even longer AIA document) add additional bulk and complexity to a project's documentation.

2.3 Identifying the Sources of Claims

A "claim" need not be reduced to a matter in arbitration or litigation. A "claim" starts with notice to the superior participant (*e.g.*, from subcontractor to prime, from prime contractor to owner, *etc.*) of a potential demand for additional time, money or both. Many times the notices are provided on an "abundance of caution" basis; most construction contracts require that notice be provided within a given number of days of knowledge or occurrence of an event, incident or awareness. For example, a Front End specification may provide the following:

> Notwithstanding any other provision of the Contract, if the Contractor intends to claim any additional payment pursuant to any Clause of these Conditions or otherwise, he shall give notice of his intention to the Engineer, with a copy to the Employer, within 28 days after the event giving rise to the claim has first arisen (*Federation Internationale Des Ingenieurs-Conseils* 1987, 1988, 1992, §20.).

In this section, previous research efforts focusing on the Front End Specifications are reviewed and, where appropriate, the effect on this research is noted. While much time and effort has gone into research about construction claims, little has been documented about the role of Front End Specifications in that arena.

Project specifications are divided into two general categories. The largest category is comprised of the design or building specifications (requirements) such as soil compaction requirements, interior finishes and plumbing and mechanical requirements. These technical specifications have traditionally been set forth as Divisions Two through Sixteen of the construction specifications, following the guidelines of the Construction Specifications Institute (CSI 2003). The other category is comprised of the administrative requirements, which are most often contained in Division One of the contract specifications (Jellinger 1981; Rosen 1974). These Division One specifications are known as the Front End Specifications and are also referred to as the General Conditions.[25]

2.3.1 Background

Reams of paper have been devoted to the related topics of construction disputes and claims. Washington University's library system contains no less than eighty volumes. Few of the publications (less than 10%) specifically discuss Front End Specifications to any significant extent, though there are often generalized references to the contract specifications. While these non-judicial published materials tend to focus on the

[25] "Division One" refers to the location of the provisions in the format developed by the Construction Specifications Institute. For more information, please visit CSI's website at http://www.csinet.org.

technical specifications, court cases resulting from the disputes and claims process often emphasize the Front End Specifications as the basis for a case's outcome. The "disconnect" between the two focus areas frames the hypothesis addressed in this paper.

Reported court decisions analyze the one or two issues underlying the subject dispute, sometimes identifying the manifestation of the problem (*e.g.*, late payment, delay, alleged construction defect), and sometimes reproducing the actual document language in dispute, if any. What limits the extensive analysis of the reported decisions is the fact that courts generally only discuss items that allow them to dispose of the case, even if issues (major or otherwise) remain unaddressed (See, *e.g.*, *National Cable & Telecommunications Association, Inc. v. Gulf Power Company* (2002) 534 U.S. 327). In addition, it is not easily determined how many disputes made it into the court system but not beyond the trial court level.[26] For the many disputes resolved outside of the courtroom, either by settlement or some form of alternative dispute resolution such as mediation or arbitration, the facts are not available since these are resolved privately, often barred from disclosure by confidentiality agreements. Professional commentary, therefore, is based primarily on the available published judicial decisions.

To make available the court decisions and professional analyses and opinions, publishers such as Matthew Bender and Company, Aspen Publishing, the American Society of Civil Engineers and McGraw-Hill provide extensive libraries of construction-specific publications. Additionally, the American Bar Association and American Institute of Architects, among others, publish treatise-length materials as well as monthly and quarterly publications, often addressing various aspects of the construction dispute arena. Additionally, dozens of commentators routinely write about dispute topics, and together with groups such as the American Arbitration Association, present single and multi-day seminars on the prevention, prosecution and defense of

[26] It is estimated that about 97% of civil litigation is settled prior to trial. Cohen, Thomas H., "Civil Justice Survey of State Courts, 2001"; U.S. Department of Justice, January 2005; NCJ 207388.

construction claims, often focusing on one narrow topic or a recent published court decision.[27]

Yet, with less than a handful of exceptions, these widely available materials focus on the effect, rather than the root cause, of the dispute. Almost in lockstep, authors and commentators address what happened rather than why it happened, often with nary a mention as to the basis of the dispute.

There is wide consensus as to "why" certain claims occur: differing site conditions, failure to meet schedule milestones and deadlines, changes in scope (real or perceived) and "defective" plans and specifications, among others. In turn, many have written about how to address these issues; Jon Wickwire and James Zack, for example, discussed the issues surrounding scheduling (Wickwire 2007; Zack 1991, 1995). While scheduling requirements, for example, are frequently delineated in fine detail in the Front End Specifications, overall administration of the schedule remains within the purview of human intervention and requires experience and judgment. How people administer those specifications, and the resulting impact on any resulting claims, has only been superficially explored in the past. This lack of detailed exploration, discussed in the balance of this chapter, identified the need for this research effort.

2.3.2 Previous Research

A number of studies have been conducted over the years to answer the question of why claims arise in construction (and engineering) projects. None has focused on a particular area; for example, the factors that make a specification "defective" or the association between particular conditions within Front End Specifications and construction claims. Only a few studies, for example, the CII (Construction Industry Institute) study and the

[27] To the reader unfamiliar with the legal system, trial court decisions are generally not reported. The most common exceptions to this "rule" are the decisions of the various administrative boards within the Department of Defense, the Veterans Administration and other public agencies. Additionally, a very small number of Federal District Court decisions are published. For the most part, state court decisions are limited to the appellate and supreme courts of each state. As a general rule, at least within the judicial system, as opposed to administrative courts, the appellate courts review only matters of law and not of fact.

Yogeswaran study (Yogeswaran, Kumaraswamy, and Miller 1997) have focused on a narrow area of interest.

One of the earliest efforts at research focusing on the administration of construction contracts and specifications was the Construction Industry Institute (CII) study entitled "Impact of Various Construction Contract Types and Clauses on Project Performance" (CII 1986). The stated purpose of the study was to "seek ways of increasing construction cost effectiveness" (CII 1986, v) based on project delivery methods and contractual relationships. Conducted some twenty years ago by the University of Texas affiliated organization, the study produced two salient recommendations:

- Identify mechanisms to more closely align the objectives of the owner and the contractor, and Changes in the Work
- Develop a better understanding of options for allocating risk and techniques for adapting [contract language] to any particular project.

Addressing the Front End Specifications, the CII analysis (CII 1986, v) concluded that contract clauses most often involved in construction problems and disputes dealt with scope, changes and project control issues.

It should be first noted that the CII study (1986) did not examine "model" clauses, that is, clauses found in standard form contracts and specifications such as the AIA (AIA Document 201) or AGC documents (AGC 2000).[28] CII (1986) focused on proprietary agreements at the owner and prime contractor level and, by design, ignored issues of interest to subcontractors, as well as the specific wording of individual clauses. The CII survey (1986) population was limited to thirty-six (36) member companies (twenty-one owners and fifteen prime contractors) and further limited each respondent to a discussion of one discrete project. Conversely, the parameters for this research project did not limit the study population.

[28] A short glossary is contained in Appendix VII.

The CII study statistically reviewed forty-one of ninety-six clauses. The primary clauses, each of which is a significant component of the Front End Specifications, generally relate to cost, schedule, quality and safety (CII 1986, 4). The review found three (3) problematic areas:

- scope definition: omissions, ambiguities, inconclusiveness
- change clauses
- project control clauses

Table 2.13 details the allocation among these groups.

Table 2.13: CII (1986) "Problem Areas"

	Omissions	**Ambiguity/Definition**	**Inconsistency**
Work Scope	X	X	X
Change Clauses		X	
Project Controls		X	
Risk Allocation		X	

As noted above, the study did not analyze individual clauses. It did offer some generalizations about the various contract and Front End Specifications clauses it reviewed:

- contract clauses may create conflicts of interest
- by definition, given the competing interests of the owner and contractor, a fixed price contract creates a potentially adversarial relationship since by its very nature, a fixed price contract expects the contractor to anticipate all potential variables
- change clauses, then, become that much more important
  - clauses needing the most improvement were
    - from the owner's perspective: rework, scope definition, mechanical completion, change clauses [and]
    - from the contractor's perspective: incentives, cost reporting and control, care of the site, scope definition[29]

[29] CII (1986), Section 3.

The CII study "acknowledged" that developing a job-specific, tailored agreement was not practiced in the norm (CII 1986, 7). Owners continually attempt to drive down costs by cutting back on planning and design fees. In doing so, owners often attempt to shift design costs to the contractor through the shop drawing process which, in some respects, converts a fixed price, construction contract to a form of design-build contract. While doing so, though, the owner retains the authority to approve the design without being responsible; the general contractor, similarly, attempts to pass this same responsibility to the subcontractor. This long-held premise is challenged by the ConsensusDOCS® discussed in Chapter 5.

Excerpts from the study (CII 1986) highlight its relevance to this Front End Specifications research project, finding that

> Contract language should be tailored to fit the circumstances of each individual project. "Standard" clauses should be used with care, giving consideration to contractor input. It is vital that both owner and contractor representatives reach a complete and common understanding of both the content and the intent of the agreement between the parties at the outset of the project. (CII 1986, 10, Recommendations)[30]

While standard forms and other documents containing "boilerplate" language are all too common, they are just as frequently one-sided and inherently unfair (Mumma 2007). Whether the specific document is appropriate for the project is often speculative; until a project is totally completed, no one can be certain that all issues and contingencies were adequately covered. Drafting project documentation specific to the particular project should result in a more relevant and potentially less contentious package. Indeed, CII (1986, 6) recognized this:

> These findings highlight the need for further discussion at the time of negotiating a contract of the intent and

[30] The application of this recommendation is more fully explored in Chapter 5.

> effect of these clauses, so that language can be adopted that both parties agree is clear and appropriate for the work at hand.

The CII (1986) study also noted that

> The ideal contract - the one that will be most cost-effective - is one that assigns each risk to the party that is best equipped to manage and minimize that risk, recognizing the unique circumstances of the project.

Moving beyond the generalities of the CII (1986) study and utilizing an approach similar to that used in this research project, Yogeswaran, et al (1997) focused on two existing sets of conditions commonly used in Hong Kong. The results of the Yogeswaran (1997) study were based on questionnaire responses from fifty-six construction professionals; the results were tabulated and weights assigned to various clauses in order to rank the perceptions of the various participants. Earlier studies relied upon by Yogeswaran as a basis for his research lumped all specifications into one group, *i.e.*, "specification problems" (Yogeswaran 1997, 4) without specificity.

The Yogeswaran, *et al*, study, the purpose of which was to "study possible ways to minimize the frequencies and magnitudes of construction claims in civil engineering projects in Hong Kong", utilized a questionnaire survey directed to "senior construction industry" personnel "well-versed with construction claims" (Yogeswaran, *et al*, 1997, 3). The study, which considered the specifications (administrative and technical) and the contract documents as a single group, ranked "specification problems" in the middle of perceived causes of construction claims and offered no way forward. Even with such a prominent position in the rankings, Yogeswaran did not address the Front End Specifications for further investigation as a source of claims.[31]

[31] Without a doubt, the specifications are a part of the contract documents, all of which are a subset of the project documentation. The contract documents set the tone of the project since they are developed early, often prior to or in conjunction with the construction drawings and technical requirements.

Following Yogeswaran (1997), Kumaraswamy (1998) analyzed 91 projects in Hong Kong. Unlike Yogeswaran, Kumaraswamy looked behind the results into the origins, attempting to trace the roots of common disputes and claims (Kumaraswamy 1998, 3). Interestingly, the study noted early on that the root cause of many claims is built into the construction documentation,[32] yet Kumaraswamy did not delve further.

The Kumaraswamy (1998) study includes two tables, one entitled "Frequencies and Magnitudes of Time Claims in the surveyed sample" [sic] and the second entitled "Frequencies and Magnitudes of Cost Claims in the surveyed sample" [sic]. In neither table are the specifications (general or technical) mentioned; in one instance, "ambiguity in documents" is listed and in the overall rankings assigned as sources of claims, "ambiguity in contract documents" and "inadequate contract documentation" rank sixth of the "top ten" categories (Kumaraswamy 1998, 5). In the second study discussed by Kumaraswamy, "specification interpretation" ranked equally with "inadequate site investigation" as one of the "relatively more significant sources" of claims (Kumaraswamy 1998, 8). Unfortunately, Kumaraswamy did not pursue the discussion beyond the statistic. Thus, while including the Front End Specifications in their respective discussions, neither Kumaraswamy nor Yogeswaran looked at the Front End Specifications beyond the summary conclusion that the Front End Specifications contributed to claims and they instead focused on the technical specifications.

In the few discussions truly focused on claims causation, one widely cited study is that conducted by Diekmann and Nelson (1985). The authors looked at twenty-two Federally funded and administered projects that gave rise to some 427 claims. The purpose of the study was to "ascertain the frequency, severity, and possible causal factors of various types of construction claims" (Diekmann and Nelson 1985, 74). The definition used by the authors in that study, however, was markedly different from other researchers: Diekmann and Nelson (1985, 74) defined a claim as the

[32] Citing Matyas, which in turn cited Rubin's 1992 study, it notes that bad documentation, drawings and contractual risk allocation often give rise to claims and disputes.

> seeking of consideration or change, or both, by one of the parties to a contract based on an implied or express contract provision. Once the claim has been presented, the owner and contractor can come to an agreement concerning the claim and, thereby, create a change order or a modification, or they may disagree and create a construction contract dispute.

What makes the above discussion significant is that the authors went on to state that "since the majority of claims result in change orders or modifications" (Diekmann and Nelson 1985, 74), they disregarded any claims which were not resolved by agreement, *i.e.*, involved mediation, arbitration, or the courts. The authors provided no basis in support of the claim that the "majority" of claims (as defined by them) were settled without resort to third-party intervention. Moreover, they separated "claims" from "disputes," a unique result when compared to the literature in the field (Carmichael 2000; Rose 1992).[33]

Front End Specifications are a contractual component of the project that may establish the basis for and outcome of disputes, whether resolved amicably or otherwise. Not unexpectedly, Diekmann and Nelson found that one cause for claims was the ubiquitous "ambiguity in plans and specs" (Diekmann and Nelson 1985, 75) though that was not identified as a basis for claims within the body of the report.[34] To the extent that the Front End Specifications are "ambiguous", they will be part of the problem and not of the solution, a result not inconsistent with Diekmann and Nelson's conclusions.[35]

[33] For purposes of this research, "claims" and "disputes" were used interchangeably.

[34] While not germane to the instant research, the authors found that design "error" or owner initiated changes accounted for 72% of the claims.

[35] It should be noted that whether a specification or other provision is "ambiguous" is often less than clear and may ultimately be decided by an arbiter, judge or jury.

Other authors similarly touched on the subject without further exploration. In an early discussion of the use of "standard" forms,[36] Hart (1976) recognized that the then-current AIA (no date specified)[37] forms contained a number of contract provisions that would lead to problems and left the topic at that point; he made no suggestions as to revisions or substitutions that could lead to a reduction in construction claims.

Similarly, another oft-cited publication in the claims arena, Rubin (1983) discussed the review, analysis and presentation of a construction claim without looking beyond the end result, citing an American Society of Civil Engineers' survey on contract provisions and the results of a paper prepared by the Los Angeles Public Works Department. The ASCE study, discussed in "Can better specifications cut construction costs?" [sic] (1979), focused on the technical specifications and only discussed the general requirements (Front End Specifications) in one short section. Moreover, no survey of the Front End Specifications was discussed; the entire review of that section incorporated the comments of one individual.

In the Los Angeles paper (contained in Rubin's (1983) book), there was a general discussion of changes that could be made to various contract documents, based on the Department's perspective. As with the ASCE study, no external evidence validated the stated conclusions.

Given that virtually every construction contract has administrative specifications and requirements, it was surprising to find a dearth of publications on the topic. In one of the very few titles that focuses exclusively on the drafting of construction project specifications, Rosen (1974) paid scant attention to the general requirements sections, devoting the vast bulk of his efforts to the technical specifications. Unfortunately, his interpretation of those non-technical specifications inaccurately concludes that they are

[36] In this context, "standardized" forms refer to prepared (*e.g.*, preprinted or "fill in the blank") documents such as those available from the AIA, CMAA and others.

[37] American Institute of Architects.

"legal" (that is, having the effect of statutes) rather than merely being contractual in nature and frequently modified (successfully) by the issuance of "Supplemental Conditions."[38] Moreover, he opined that having withstood the "test of time" (at 83), the specifications are for the most part fully acceptable to all parties on most projects. Given the hundreds of pages listing the thousands of published court decisions contained in the AIA Citator,[39] as well as the hundreds of court cases interpreting non-AIA but comparable provisions, his position is unsupportable and was also called into serious doubt by the CII study discussed earlier.

One document that specifically considered a common provision of the Front End Specifications is the recently published "Planning for Concealed Site Conditions" (Russell 2007), a guide written for architects to deal with the ever-difficult subject of differing site conditions.[40] Two of the suggestions contained in the practice guide directly address issues identified in this study's research.

The first recommendation is to coordinate the construction documents to avoid inconsistencies. The suggestion is not limited to the Front End Specifications alone; it goes (appropriately) to a number of areas where potential problems can arise:

> ... it is important that the construction documents are consistent. Site work specifications, site work drawings, structural specifications, structural drawings, "Front End" specifications, and unit price specifications should all be coordinated in terminology and should not include contradictory information that may contribute to a dispute regarding the contractor's scope of work (Russell 2007, 3).

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[38] "Legal" means that the law mandates compliance, hence the reference to statutory compliance.

[39] The AIA Citator, contained in two volumes of the *Construction Law* multi-volume treatise available from Aspen Publishers, tracks reported decisions mentioning provisions of the AIA documents.

[40] The reader will later see that differing (or concealed) site conditions is a documented recurring source of claims and disputes.

The other recommendation addresses a commonly discussed topic: that of timely preparation of change orders. This timing issue is frequently addressed in the Front End Specifications, though not consistently. For example, one school of thought argues that all change orders should be deferred until the end of the project and resolved through a "global" settlement. Many advocates of this position take into account the fact that most owners and contractors do not extensively document a project on a day-to-day basis and, absent documentation, the other party may be hard-pressed to "prove up" its position, especially if litigation is on the horizon. This group believes that money (sometimes large sums) can be saved using this method (Russell 2007).

The other school, and the one endorsed in the practice guide, argues that the timely preparation and approval of change orders is preferable. As the guide notes (Russell 2007, 3),

> One reason to process timely paperwork is to avoid memory loss. It is easier and more accurate to document agreed conditions when the event or subject is fresh in your mind.

The guide (Russell 2007, 2) similarly acknowledges that unaddressed concealed site condition issues can lead to disputes and delay claims, recognizing that

> … allowing weeks or months to pass can lead to disagreement as parties to the original agreement produce different recollections of procedures, scope, terms, costs, and schedule.

Summarizing Russell, the AIA guide states that inconsistency between construction documentation and the failure to document and submit change orders on a timely basis can lead to claims. Both of these potential issues are generally addressed in the Front End Specifications. Other publications similarly discuss claims in generic terms.

For example, Zwick & Miller (2004), writing in the *Journal of Construction Engineering and Management*, opined that the general contractor verifies the completeness of the

subcontractor's bid and, at the end of the "buyout" period,[41] the two parties sign a contract that "defines [the] ambiguities in the scope of work and they together set a negotiated price for the work" (Zwick and Miller 2004, 245). The research results discussed below contradict this statement. Experienced construction people know that contract forms (especially in the public works arena) are often not open to negotiation; similarly, general contractors often present subcontractors with documents to sign on a "take it or leave it" basis.

According to Zwick (2004, p 245, citing Mincks and Johnson 1997),

> … each bid is reanalyzed to ensure that the sum of all the scopes of work provides adequate coverage for the entire project as specified in the bid documents.

If this statement is literally true, there would be no basis for litigation during or after the project is completed. Zwick's (2004) position appears to be in conflict with an earlier publication discussing the role of the construction manager's contract administration challenges wherein Barrie (1981, 331-332) pointed out that

> Claims almost always arise because the contract provisions are not clear. It is the owner's opinion that certain work is a part of the contractor's obligation under the contract and the contractor thinks otherwise. In this situation the burden of proof is on the contractor, for he usually is required by the provisions of the contract document to do the work first and attempt to recover his cost later. A contractor who attempts to coerce the owner into making a settlement before the work is done on the threat of not carrying out the work runs the risk of a serious default under his contract that can easily have much greater repercussions than an attempt to recover for the disputed work."

Subcontractors have always been claims-conscious. Looking at claims occurrence from the subcontractor's perspective, Teets (1976, 135) advocated a defensive posture:

[41] The transitional period between contract award and the start of construction. (Zwick & Miller 2004).

> The legal recourses established in the contract are made available on the most part to the owner and/or general contractor in the event of specific failures by the subcontractor. The subcontractor must prevent these recourses from being executed by preventing the failures. To prevent the failures, he must be aware of the legal recourses available to the owner and/or general contractor. When evaluating the contract, the subcontractor should make a list of all these legal recourses and a list of the legal recourses available to him against others. The subcontractor must realize that all the provisions of a contract have, at one time or another, been legally enforced against some other subcontractor and that he is not immune from such enforcement. He must be prepared to prevent or defend himself against all the legal recourses established in the contract.

Unfortunately, this was as close as Teets came to discussing the contract documents as a source of claims. Of all the published material reviewed, the most in-depth analysis was found in a National Transportation Research Board report (Netherton 1983, 1). Netherton's analysis was that

> Although data on causation and settlement of contract claims are not systematically compiled or published nationally, a sampling of contractor and contracting agency experience indicates that the occurrence of claims increases with the levels of risk present in construction contracts.

Netherton (1983, 5) went on to say that

> Although perceived to be substantial, the 'claims problem' is not documented by any regularly or rigorously complied statistics. There is an almost total lack of nationwide data on the claims experience of highway agencies and construction contractors from which general conclusions can be drawn or trends predicted.

While his statements were made in the context of highway construction, the same is arguably true for all segments of the industry. Netherton (1983, 8-10) made the following statements to help define the research:

> Claims may also be classified by reference to sections of the contract documents or the law that authorizes remedies and prescribe criteria for relief (e.g., 'changed Conditions clause' claims, or liquidated damages).
> …
> Closely related to excessively narrow interpretations is a perception that some specifications are more restrictive than necessary to achieve their construction objectives -- that they are more prescriptive than end-result oriented.

While informative reading, Netherton's conclusions (1983) were based on "personal communications" and not on "hard" data, the same approach used by Zwick and Miller (2004).

While information regarding construction starts and building permits issued is available from public sources, the same cannot be said for how many construction projects utilized either one form of contract or another or even if a written contract was utilized at all.

2.4 Partnering

Partnering is a cooperative relationship between two or more parties (Hj, 2008; Mak, 2005; Zhang, 2008). Partnering may impact disputes leading to claims related to Front End Specifications. Because partners share mutual objectives (Mak, 2005), and because partnering fosters cooperative problem resolution (Mak, 2005), partnering relationships may reduce claims (Roe & Jenkins 2003), and foster dispute resolution at the lowest possible level (Zhang, 2008) and as quickly as possible (Zhang, 2008).

Zhang (2008) suggests that the best strategy for dispute resolution is to prevent those disputes and conflicts from ever occurring. While successful partnering depends on proper partner selection and clear agreement among partners (Hj, 2008), partnering can help ensure clear terms and conditions in advance (Hj, 2008) and thereby reduce dependence on adversarial contracts and legal assistance (Kubal 1994). It is possible that partnering reduces claims and dependence on legal assistance in dispute resolution. This presents an empirical question addressed in the present research.

Further, while Roe and Jenkins (2003) suggest that partnering can lower costs associated with disputes in general, no published reports to date systematically explore the relationship between partnering and disputes related to Front End Specifications. Further, no reports to date investigate whether partnering participants, with the cooperative expertise from multiple sources that would not otherwise be combined without the partnering relationship, perceive Front End Specifications as less complex than participants who have not engaged in partnering.

2.5 Literature Summary and Overview of the Present Study

2.5.1 Summary of Literature Review

This review of current construction management literature demonstrates that Front End Specifications are an integral part of construction management. However, Front End Specifications vary greatly. The side-by-side comparison of the Washington University and Rochester Institute of Technology documentshighlight the stark differences in Front End Specifications.

Published reports on the impact of Front End Specifications as a source of claims failed to explore specific provisions beyond generic, all-inclusive, higher level categories (Bubshait, 1994; CII 1986; Hinze 1993). For example, Yogeswaran and colleagues (1997) utilized a higher level category of "specification problems" to encompass all

administrative and technical specifications in contract documents, failing to provide the crucial lower-level breakdown of specific provisions such as project scope, schedules, use of symbols, closeout procedures, coordination, regulatory requirements and payment. Similarly, Kumaraswamy (1998) used a category of "inadequate contract documentation" without isolating whether the inadequate contract documentation was in the area of project scope or submittals or the scheduling of specific project procedures. Further, no published reports have systematically investigated added costs from disputes and claims or profit that would have been retained because of disputes and claims arising from Front End Specification provisions.

Perceived ambiguity of Front End Specification provisions may be related to the complexity of provisions, claims from Front End Specifications may be related to document authorship and partnering may reduce Front End Specification disputes and claims because partnering fosters clarity and cooperation, but these empirical questions are not answered in the current construction industry literature.

2.5.2 Overview of the present study

The objective of the present research was fill the gaps in the construction claims literature by determining whether commonly used Front End Specifications promote or reduce claims, in addition to determining the possible effects of partnering, business size, document authorship and Front End Specification complexity on claims in construction management. Derived from the literature review and in consultation with doctoral committee members, the goal of the research was to address the following questions:

- Do the Front End Specifications cause disputes and claims?
- If Front End Specifications do cause claims, which are the most significant and have the most significant impact on projects?
- Do significant costs or lost profits result from claims?
- Are Front End Specifications perceived as being either too simple or too complex?

- Would the use of performance-based Front End Specifications increase or reduce disputes and claims?
- Is Partnering related to perceptions of whether the Front End Specifications increase or decrease claims?
- Is document authorship significantly related to perceptions of whether Front End Specifications increase or decrease disputes and claims?
- What methods are used to resolve claims?

In the next chapter we address the research methodology utilized to answer these questions.

Chapter 3

Research Methodology

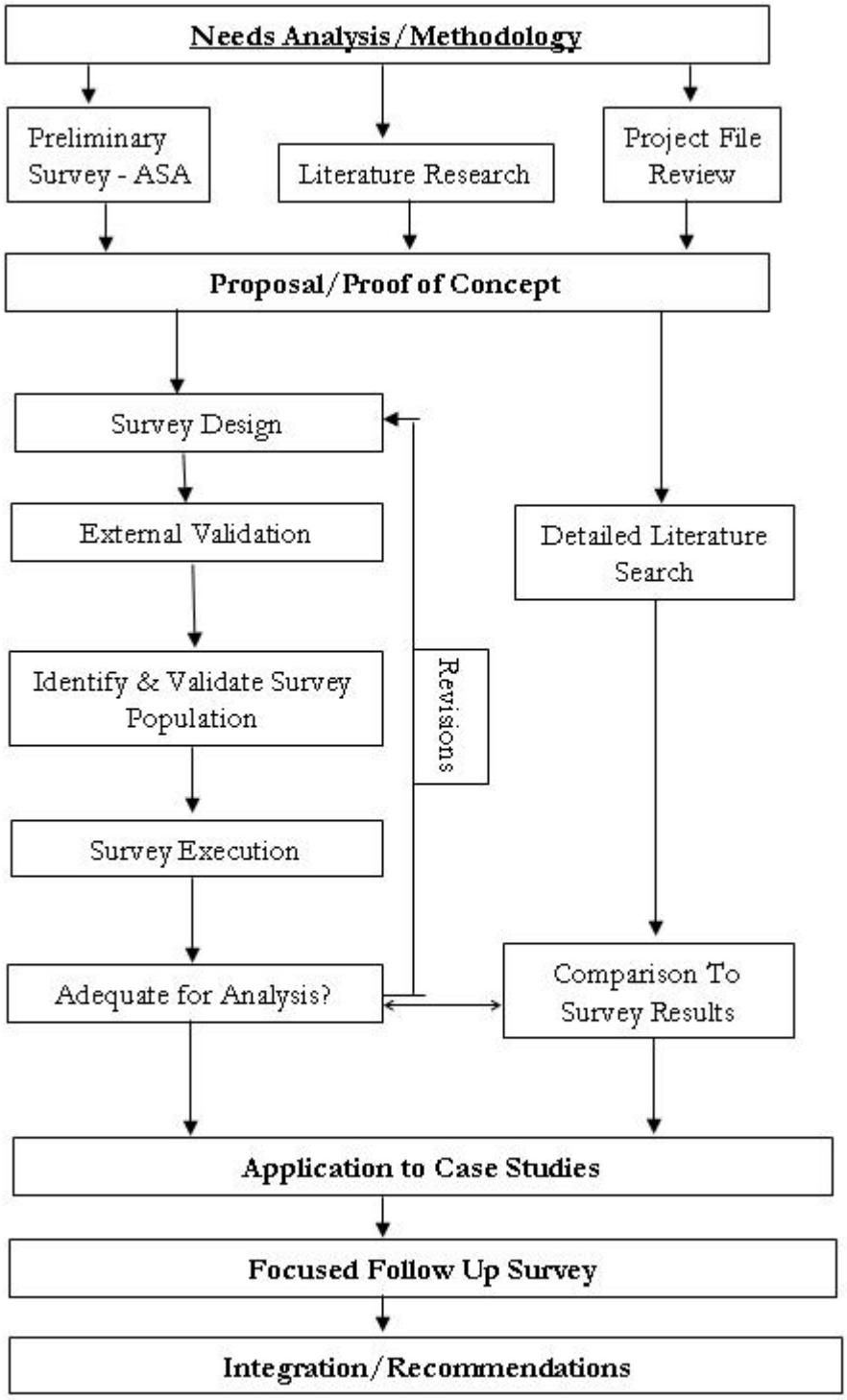
This chapter details the methodology employed in the present study. This chapter is arranged in five parts. Following a review of the research design and the needs analysis methodology, participants are detailed, followed by the instrumentation, including the methodology employed towards identification of provisions to include in the formal data collection instrument. Procedures include recruitment and data collection. This chapter ends with an overview of the analytical means used to measure the survey results.

3.1 Research Design

The research included a preliminary survey of 24 construction individuals with a seminar-style interview immediately following, a web-based survey derived from the preliminary survey (Appendix B) and a follow-on survey targeting construction claims specialists. The methodology used in constructing the project was based on a multi-method approach similar to that outlined by Robert K. Yin (Yin 2003). In addition to the cited materials, general background information used to frame and develop the research instruments was obtained from various American Bar Association publications, including "The Construction Lawyer", "Under Construction," and the "Public Contract Law Journal." The survey design followed the processes discussed by Weber and Oppenheim but was modified to reflect the nature of the research goals (Oppenheim 1992; Weber 1990). Similar methodologies have been utilized in the past by CII (1986) and Barnes and Mitrani (1992). The needs analysis methodology for the present study is displayed in Figure 3.1 beginning with the initial survey, the literature review and project file review towards formulating a dissertation proposal for formal defense, to the

research methodology delineated in the present chapter, leading towards the results chapter and then the integrations and recommendations in the discussion chapter.

Figure 3.1: Needs Analysis Methodology



3.2 Participants

To reach a diverse cross-section of the construction population, assistance in distributing notice of the survey by email through national trade and professional organizations within the industry was solicited. Assistance was provided by AACEI (also known by its previous name of the Association for the Advancement of Cost Engineering International), the Associated Builders and Contractors (ABC), the American Subcontractors Association (ASA), the Construction Management Association of America (CMAA) and the National Association of Women in Construction (NAWIC). Additionally, WPL Publishing (publisher of online and print materials relating to construction claims as well as project controls) made the survey available to its subscribers and mailing list members. Of 220 who responded to the survey request, seventy had either no claims experience or didn't complete the survey, providing a final sample size of N = 150 participants for analysis.

3.3 Instrumentation

3.3.1 Survey Instrument

The primary measuring instrument for the present study was a 16-item survey (Appendix D). This survey instrument was developed using multiple sources of cogent information, consistent with the procedures outlined by Zeller and Carmines (1980) and based on the foundational works of Nunally (1967) and Cronbach and Meehl (1955). The present survey instrument was developed from four sources: the literature reviewed in Chapter 2, input from construction industry members (See Appendix B, seminar presentation, American Subcontractors Association Annual Meeting, Orlando, Florida, March 17, 2005), input from dissertation committee members and the manual charting of Front End Specification provisions which follows.

3.3.2 Identification of Provisions

To identify appropriate Front End Specification provisions for the present study, 76 contract documents were considered. These documents were chosen to reflect a cross-section of use across the country, to address both public and private works of improvement and to encompass vertical and horizontal construction contracts without regard to regional limitations or licensing issues. Government contracts (n = 30), educational contracts (n = 20), commercial contracts (n = 22) and generic contracts (n = 4) were included for this determination. Provisions that were common (topically as opposed to having identical or near-identical language) across documents were selected for inclusion in the study. Table 3.1 outlines the contract documents used by the author to initially identify the specifications utilized in the research instrument.

Table 3.1: Front End Specifications Distribution

	Generic	Government	Educational	Commercial
Number of documents reviewed	4	30	20	22
Summary (Scope) of the Work	A	A	A	A
Allowances	S	S	S	N
Measurement & Payment	A	A	A	A
Alternates/Alternatives	A	S	S	S
Coordination	S	F	F	F
Field Engineering	M	F	F	F
Regulatory Requirements	A	A	A	A
Abbreviations & Symbols	N	N	N	F
Identification Systems	N	F	N	N
Reference Standards	M	M	M	M
Special Project Procedures	S	F	S	F
Project Meetings	F	F	F	S
Submittals	A	A	A	A
Scheduling	A	A	A	A
Contract Closeout Procedures	N	F	N	N

Legend:
All – all specification sets reviewed contained relevant language
Most – between 76-99% contained relevant language
Some – between 25-75% contained relevant language
Few – less than 25% contained relevant language
None – not contained in any of the reviewed documents

From this exploration of existing contracts, together with readings and the researcher's experience as a construction lawyer, it was determined that sixteen (16) Front End Specification provisions would be included in the formal study. Summary (Scope) of the Work, Allowances, Measurement & Payment, Alternates/Alternatives, Coordination, Field Engineering, Regulatory Requirements, Abbreviations & Symbols, Identification Systems, Reference Standards, Special Project Procedures, Project Meetings, Submittals, Scheduling Specifications/Requirements and Contract Closeout, plus an additional category of Other Project Control Requirements to ensure that no provision would be excluded because of inadequately comprehensive categories.

3.4 Procedures

3.4.1 Recruitment

The assistance of national trade and professional organizations within the industry was solicited to recruit participants for the present study. Assistance was provided by AACEI (also known by its previous name of the Association for the Advancement of Cost Engineering International), the Associated Builders and Contractors (ABC), the American Subcontractors Association (ASA), the Construction Management Association of America (CMAA) and the National Association of Women in Construction (NAWIC). Additionally, WPL Publishing (publisher of online and print materials relating to construction claims as well as project controls) made the survey available to its subscribers and mailing list members.

3.4.2 Data Collection

Data for the present study were collected through SurveyMonkey, an on-line survey tool (www.surveymonkey.com). The present survey was first entered into SurveyMonkey, then after piloting the look and feel of the interface and accuracy of downloads utilizing a dozen associates, potential participants were invited to log in to the survey site and formal data collection began. SurveyMonkey downloads are datasets in spreadsheet format, including a record of the time and Internet address to aid in detection of

participants who chose to take the survey more than once. Confidentiality of participants was ensured because no names or uniquely identifying personal information was asked of participants and because SurveyMonkey uses firewall and intrusion prevention and encoded password protection for any downloads.

Prospective participants[42] were contacted by electronic mail and asked to complete a web-based survey. Participants clicked on an email link, which brought them directly to the survey via their internet browser and then participants used their computer keyboard and mouse clicks to complete survey questions. The survey took roughly fifteen minutes to complete. Participants were thanked for their time; no additional compensation was provided. Upon survey completion, data were downloaded for statistical analysis.

3.5 Data Analysis

Descriptive data are expressed as means, standard deviations (SD), frequency counts and percentages, as appropriate, in text and in tables. For example, in some instances, weighting factors were assigned and the data reexamined to determine impacts and rankings.

In the next chapter, the survey results and analysis are presented.

[42] The researcher was not provided with a listing of the recipients of the various emails due to the proprietary nature of the organizations' membership lists. We also don't know the "bounce" rate, that is, bad email addresses and the like, of the multiple mailings. It was confirmed that between WPL Publishing and AACE, at least 6657 emails were sent. AACE stated that its average bounce rate was 10-12%; WPL did not make that information available.

Chapter 4

Research Results

This chapter begins with the assumptions and limitations of the survey process and participant descriptives (Section 4.1) towards demonstrating that the present sample is adequate to investigate the research questions. The results of the research are then presented beginning with answering the baseline question. First, in asking whether Front End Specifications ("FES") cause claims (4.2), the research documents that the FES do cause claims. Having determined that the FES do cause claims, we then look at the frequency at which various FES lead to claims and which FES have the most significant impact on projects. The results indicate that the coordination, scheduling and scope of work clauses are both the most frequent and have the highest impact on projects (4.3). The additional costs arising from claims is then explored; not surprisingly, 90% of the respondents reported that claims increased costs by as much as 40% (4.5). Next, the research looked to the possible relationships between FES complexity and claims (4.6) and determined that most Front End Specification provisions were acceptable to a high percentage of survey participants, an unexpected result. The use of performance-based FES was next investigated, resulting in no significant statement of preference for their use (4.7). The effects of partnering on claims was next considered with the result being an almost even split on opinion. Finally, methods of claims resolution, with and without the use of partnering, is analyzed with a finding that partnering is beneficial in claims resolution (4.8). This Research Results chapter ends with a summary and brief preliminary discussion of the present research results (4.9) to prepare the reader for the full Discussion Chapter that completes this dissertation.

4.1 Survey Assumptions, Limitations, and Participant Descriptives

This subchapter sets forth the assumptions and limitations of the survey method utilized, followed by participant descriptive statistics. Participant employment sectors, business size, subsidiary status, job title, number of projects, the values of those projects and the authorship of Front End Specifications documents are described in frequencies, percentages, means and standard deviations or graphical displays, as appropriate. This descriptives section ends with a summary of the appropriateness of this sample for investigating the research questions.

4.1.1 Assumptions and Limitations

The present survey focused on claims which were not resolved during the course of the project's execution period and prior to closeout. This choice was made to highlight contentious matters with the potential for third-party resolution (through mediation, arbitration or litigation) if resolution between parties could not be achieved. In conducting the survey, assumptions included:

1. That the observations of participants regarding claims and their resolution would be generally representative of the respondents' overall historical outcomes without belaboring details of specific individual claims. Inherent in this assumption is that survey respondents would have sufficient recall of projects and their experiences to provide accurate responses.

2. Since each construction project has the potential to spawn zero claims or numerous claims, it was assumed that the number of projects would differ from the number of claims.

3. That the majority of the responses would come from contracting and consulting personnel more than from owners. This was because contractors, not owners, generally have the burden of pursuing a claim under most construction contracts. Owners do pursue claims, often for late completion or lost profits;

contractors, though, pursue the vast majority of claims and have the most experience with claims resolution.

4. To reach a broader audience and obtain distributed responses, national organizations were solicited to help with the survey process. Discussions with knowledgeable professionals helped identify those organizations. It was assumed that the responses received would reflect a national, rather than a regional, perspective.

Certain limitations were also inherent in the survey process:

1. Only broadly-based information was acquired from participants, with no tracking of any individual claim or dispute. Therefore, the effects of individual claims and the manner of pursuing any given claim was not explored. Thus, the resulting data provides us with tendencies rather than absolutes in addressing claims effects of the Front End Specifications, either as a whole or by component.

2. This investigation was limited to data regarding projects and claims between January 1, 1995 until November 20, 2005, which may or may not be representative of other timeframes due to any number of factors, including economic conditions.

3. Initial project contract values were used as a means to measure the frequency and impact of the Front End Specifications, but no direct measure of FES claims values were included.

4. The outcome of any particular claim may hinge on very specific facts. It was the goal of the research to get overall "dimensions" of the problems, or perceived problems, rather than specifics.

5. It is important to note that variations in state and federal laws and the number of jurisdictions in the United States may limit the generalization of present findings. Contract law is most often determined by state law. Federal Courts will apply either state or federal law, depending on the facts and circumstances of individual cases. As a result, it is potentially misleading to assume that the law of one jurisdiction will apply in all instances with similar facts.[43]

[43] Law students take a class in conflicts of law to address questions related to jurisdiction and application of laws in specific instances. Advice of counsel is advised to determine which law or laws will apply to any dispute.

4.1.2 Employment Sectors Represented

To reach a broad segment of the construction industry involved in the claims and claims resolution processes (see assumption number 4, *supra*), invitations to participate were sent to members of AACEI[44], the Associated Builders and Contractors (ABC), the American Subcontractors Association (ASA), the Construction Management Association of America (CMAA) and the National Association of Women in Construction (NAWIC). Additionally, WPL Publishing (publisher of online and print materials relating to construction claims as well as project controls) made the survey available to its subscribers and mailing list members. These groups count among their membership contractors, subcontractors and owners and, in many cases consultants, and were selected to reach a wide national audience. The majority of participants were employed in the private sector with the remaining participants employed by governmental and not-for-profit agencies. Employment sector representation is summarized in Table 4.1.

Table 4.1: Employment Sectors

Employment	Frequency	Percent
Not-for-profit Agency	2	1.3
Federal Agency	3	2.0
State Agency	5	3.3
Municipal Agency	9	6.0
Private Entity	131	87.3
Total	150	100

4.1.3 Business Size

Participants in the private sector were asked to classify the size of their business utilizing one of three definitions:

- Small: Annual revenues less than $10,000,000 per year
- Medium: Annual revenues between $10,000,000 and $100,000,000 per year
- Large: Annual revenues in excess of $100,000,000 per year

[44] AACEI was formerly known as the Association for the Advancement of Cost Engineering International.

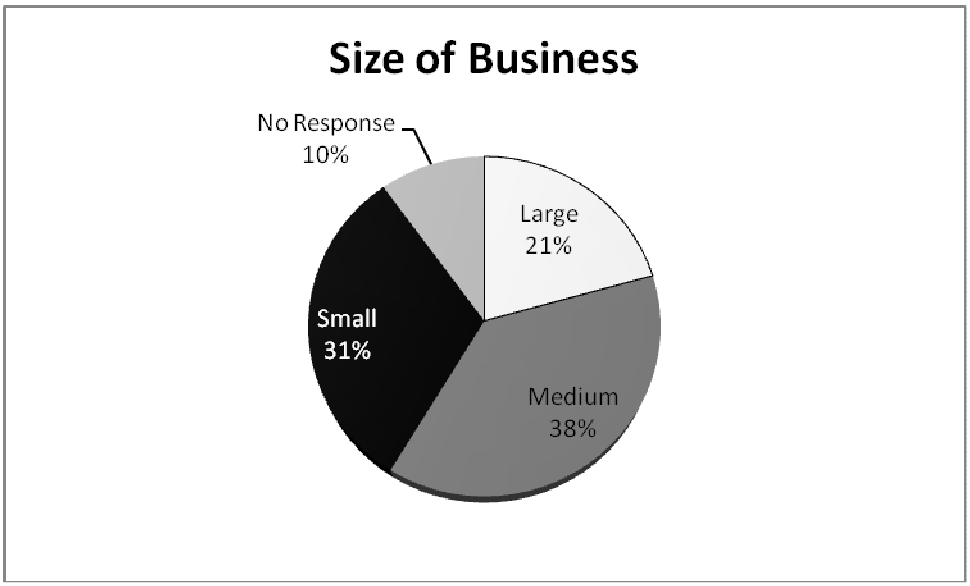
Participants were well-divided among large-, medium- and small-sized businesses. Business Size descriptives are displayed in Table 4.2.

Table 4.2: Business Size

Size	Frequency	Percent
Small	31	21
Medium	57	38
Large	47	31
Total	135	90
No Response	15	10
Total	150	100

Graphically, the business size by segment is as shown in Figure 4.1 below:

Figure 4.1: Business Size (by segment)



Note. Percentages based on 150 participants.

4.1.4 Subsidiaries

Participants were asked if they worked for an entity that was a subsidiary of a larger company. The majority of participants (118/150, 79%) were not working for a subsidiary of a larger company, while 27 of 150 (18%) reported working for a subsidiary of a larger company, and 5 of 150 (3%) did not respond to this survey question.

Participant frequencies and percentages by Subsidiaries are summarized in Table 4.3 below.

Table 4.3: Subsidiary Company

Subsidiary	Frequency	Percent
No	118	79
Yes	27	18
No Response	5	3
Total	150	100.0

4.1.5 Employment Role (Job Title)

More than one-third (57) of the participants identified themselves as being a contractor's project or construction manager. The next largest group consisted of project and construction managers for owners followed by owners or representatives of owners. Claims consultants were represented by twelve percent (12%) of the participants and the legal profession had four (4) persons participating. Only one person represented her/himself as a representative of the financial or surety profession and twenty-five (25) persons did not identify their employment role or job title. The results of this inquiry are set forth in Table 4.4.

Table 4.4: Employment Role/Job Title

Job Title	Frequency	Percent
Project/Construction	57	38.0
Owner's Project/Cons	26	17.3
No Response	25	16.7
Owner	19	12.7
Consultant	18	12.0
Attorney	4	2.7
Surety or Financial	1	0.7
Total	150	100.0

4.1.6 Number of Projects

Participants were requested to identify the number of projects in which they were involved during the study period, approximating the number if necessary. More than forty percent stated that their company or agency had been involved with 300 or more projects in the period from January 1, 1995 until November 20, 2005. The balance were somewhat evenly divided amongst the choices. The spread of the number of projects is shown in Table 4.5.

Table 4.5: Number of Projects

Number of Projects	Frequency	Percent
1-50	22	15
51-100	19	13
101-200	29	19
201-300	17	11
300+	63	42
Total	N=150	100

4.1.7 Contract (Project) Values

Participants were asked the initial value of project contracts described in the survey. Contract values were highest for the smallest project size (<$100k, M = 415.5), with successively lower values for each succeeding larger size category up to the largest size category (>$50m, M = 18.7). The summary of project value responses is shown in Table 4.6.

Table 4.6: Project Value Summary

Descriptive	<$100k	$100k-$1m	$1m-$10m	$10m-$50m	>$50m
Mean	415.7	365.0	70.3	40.5	18.7
N	150	150	150	150	150
SD	3755.7	3672.1	100.2	72.9	55.1
Min	0	0	0	0	0
Max	45000*	45000*	500	500	300
SEM	306.7	299.8	8.2	6.0	4.5

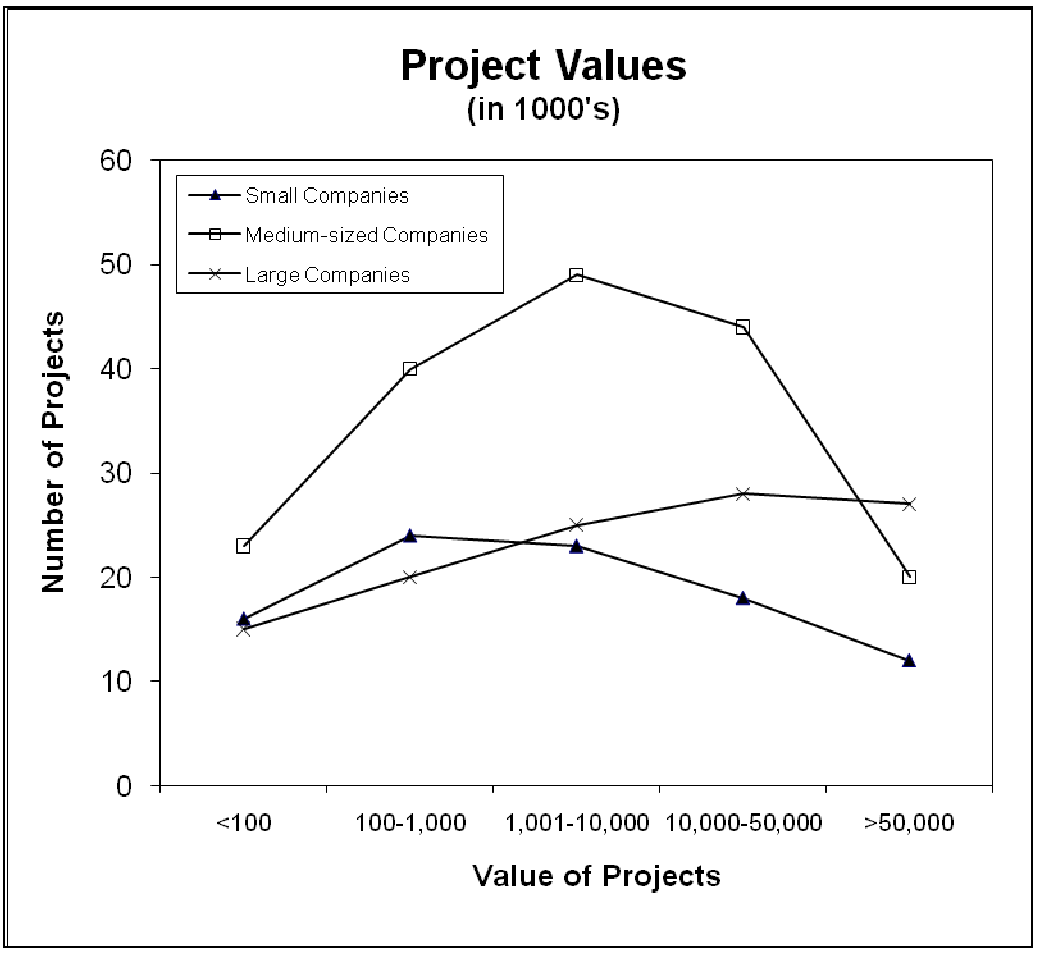
Note. N = Number of participants. One respondent claimed a total for 45,000 projects.[45]

Bonding ability (see Glossary) often dictates the size of a project that a company can undertake – larger companies may take on bigger projects since they generally have a greater bonding capacity. All other things being equal, the large companies, and especially the largest of the big firms, do not undertake small projects. In general, this is because of their overhead and corporate structures as well as their desire to devote their resources to large, long-duration projects. Figure 4.2 reflects the respondents' description of the contract values (project sizes) undertaken within each of the three groups.

Not surprisingly, Figure 4.2 reflects that the larger companies take on a greater number of larger value contracts than their smaller competitors. This can be attributed to the higher capital requirements and more extensive organizational infrastructure necessary to support larger projects. While the medium-sized company responses reflect the anticipated project spread, which was anticipated, what was not expected was the number of large value contracts undertaken by the smaller contractors, given their generally reduced ability to bond and finance large projects.

[45] While this number appears questionable, certain specialty contractors could have high project counts and, most likely, relatively low project values. For example, roofing, siding and plumbing contractors may have ten or fifteen (or more) crews in the field at any given time. Since the identity of the respondent reporting this figure is unknown, it was decided to accept the number as being accurate.

Figure 4.2: Project Frequency by Project Value



The distribution of project values was consistent with expectations, with one exception. At the larger extreme, projects over $50,000,000 are common, but not plentiful and because of bonding requirements, attract a limited number of contractors. At the other extreme, smaller projects are more plentiful and often serve as an "incubator" for smaller companies. As companies grow, the desire (and ability) to take on larger projects increases, so the relatively steep climb to the apex of the data plot was expected. What was surprising, given the economies of scale and the bonding requirements of larger jobs, was how many smaller companies reported taking on larger projects. This could be due to the number of research participants within each study group or the practices of those companies. This suggested tendency could be the topic of further empirical

research. To summarize these findings, companies take on different project values, regardless of company size.

4.1.8 Authorship of Front End Specifications Documents

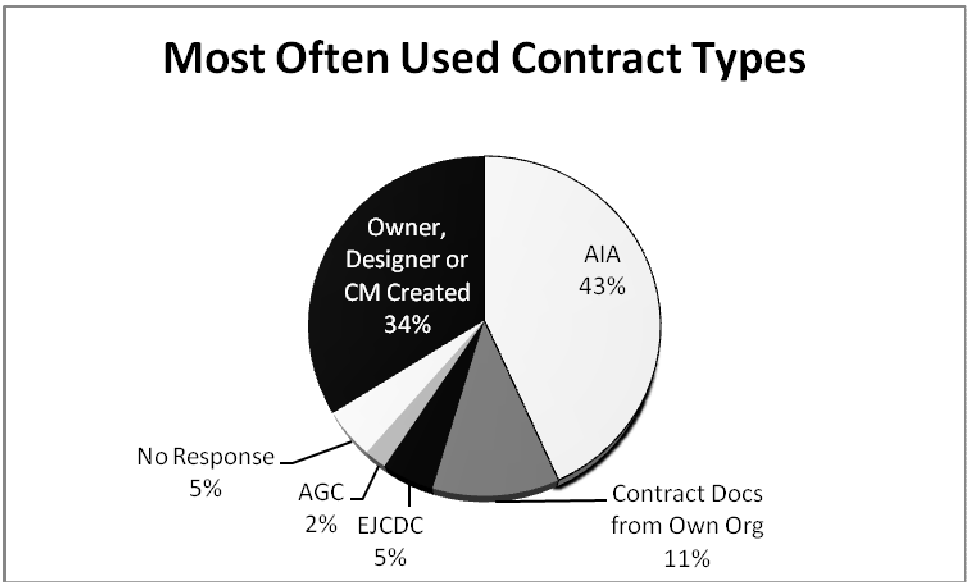
Every construction project utilizes a contract of some sort. Many contractors and owners use preprinted forms supplied by trade associations and groups such as the American Institute of Architects (AIA), the Engineers Joint Contract Documents Committee (EJCDC) and the Associated General Contractors (AGC). The intent of this question was to see the relative usage of each of the document forms rather than to determine the extent (percentage) of usage. In this context, the following question was asked of the survey respondents:

Which contract form do you encounter most often on your projects?

Respondents could select from six choices: "AGC; AIA; EJCDC; CMAA; Owner, Designer or CM-created; Contract documents created by/for your own organization; or Other". A respondent could use one type of form one-third or 80% of the time within the definition of "most often"; no attempt at scaling was being attempted. The data show that the source (that is, "document authorship") of the contract documents is not related to perceptions of whether Front End Specifications increase claims.

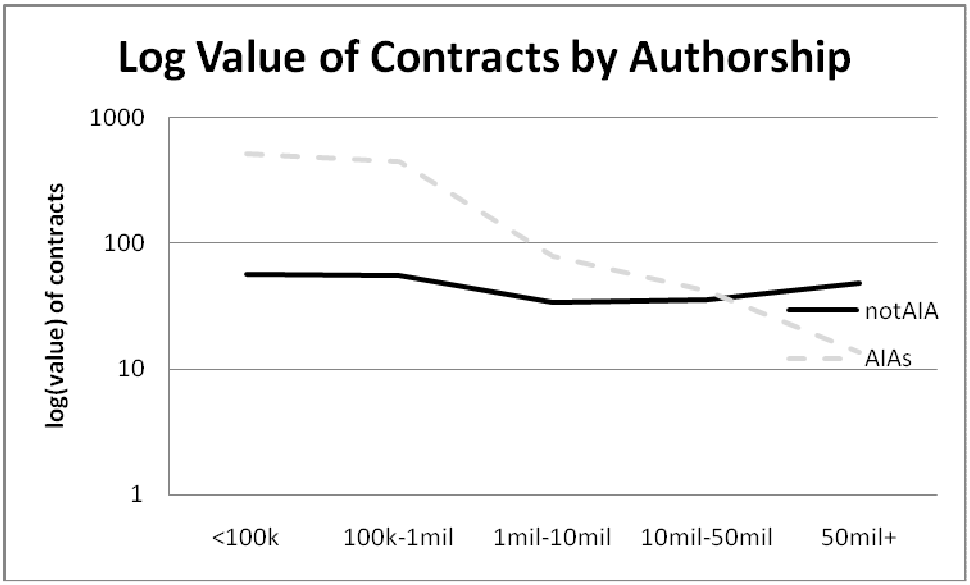
Forty three percent (43%) of the respondents reported using the forms published by the American Institute of Architects ("AIA"), with roughly one-third (34%) using owner, designer or CM-created documents. Neither the forms published by the Associated General Contractors ("AGC") (2%) nor the Engineers Joint Contract Documents Committee (5%) were well represented. Even though CMAA members participated, none reported using CMAA's own forms. Figure 4.3 presents this information graphically.

Figure 4.3: Most Often Used Standard Form Contract Types



As the following graph (using log values) shows, the AIA documentation is used extensively on smaller projects and decreases significantly as the project value increases, while non-AIA authored documents were essentially flat across project value categories (Figure 4.4).

Figure 4.4: Authorship by Project Value



These results were expected. Architects are utilized primarily on "vertical" construction, that is, buildings. Infra-structure projects (highways, bridges, water/wastewater treatment facilities, etc.) are designed by civil and structural engineers who do not, as a rule, use the AIA documents. With larger vertical construction projects, owners and developers often develop and utilize their own documents. Another possibility is that many larger projects are "multi-prime" (that is, a construction manager oversees the project's development rather than a general contractor) and different contract forms are used by different vendors such as electrical and plumbing contractors. Given the high usage of AIA documents for projects less than $50,000,000, the anticipated relationship between claims and the use of AIA documents does not exist.

4.1.9 Summary of Participant Descriptives

Of 150 participants, most were engaged in the private sector. Small, medium and large sized businesses were well represented. Half were project and construction managers. Most had been involved in more than 100 projects during the research period of ten years, with four-in-ten stating that they had been involved in more than 300 projects during that same time period. Project sizes varied greatly, as did the consolidated contract values per participant. Contract document authorship was divided among AIA and owner created categories. These data thus provide a diverse sample sufficient to address the substantive inquiry goals of the present study.

We next address the survey questions which addressed the Front End Specifications and claims: Do Front End Specifications ("FES") cause claims (*Hypothesis 1*; §4.2); Do some FES cause more claims than others (*Hypothesis 1a*) and which FES have the greatest impact on projects (*Hypothesis 1b*; §4.3); Do claims arising from the FES impose additional costs or lost profits on companies (*Hypothesis 2;* §4.4); Is the complexity of FES provisions related to claims (*Hypothesis 3*; §4.5); Would the use of performance-based front end specifications ("PB-FES") increase or reduce claims (*Hypothesis 4*; §4.6); Does partnering affect the incidence of claims from the FES (*Hypothesis 5*; §4.7); and

Does partnering impact claims resolution (*Hypothesis 6*; §4.8). This Research Results Chapter ends with a summary and brief discussion of the present research results. Importantly, before conducting extensive analyses, it must be first established that front end specifications actually cause claims.

4.2 Do Front End Specifications Cause Claims? (*Hypothesis 1*)

Construction projects generally utilize some form of Front End Specifications ("FES"). These FES are often contained in a set of standard form (boilerplate) documents. As part of the project contract documentation, it is incumbent on the participants to understand each obligation imposed upon them, including those in the FES. Yet, with the time constraints often imposed on bidders, it is not unusual for contractors and others to skim or even ignore the FES, focusing on the plans and technical specifications.

It is possible that FES cause claims, but this must be empirically established before proceeding. To determine if FES cause claims and, if so, which FES cause the most frequent claims and which FES have the most impact on the project, participants were asked about the frequency of claims, segregated by project value, which arose from the categories of Non-Technical Specifications, Technical Plans, Plan Mistakes and Jurisdictional disputes. These are then discussed in series to establish the relative frequency and impact of each identified specification. These are discussed as hypotheses (expressed as tendencies) beginning with the following question:

> *For the projects identified in the preceding question, please indicate if claims or disputes arose for any of the following reasons and indicate the appropriate contract value amounts. Multiple answers are allowable.*

Answers to this question provided data for separate analyses, addressed as Hypothesis 1a and 1b. The FES as a source of claims is discussed as Hypothesis 1a; the frequency

by which specific FES generate claims and those FES that have the most impact is covered in Hypothesis 1b. That the FES are responsible for a significant percentage of claims provides a telling statistic given that the purpose of the FES is to provide administrative guidance and set forth the ground rules for execution of the project. By all rights the FES should be clear enough to not cause controversy in their own right, but such is not the case. As Table 4.7 (below) shows, the FES may cause claims as often as the technical specifications or bad plans, in any given instance.

Hypothesis 1a: The top line of data in Table 4.7 shows that claims from Non-Technical Specifications (the Front End Specifications) occurred in 37% of projects initially valued at less than $100,000 to 13% of initial project values greater than $50 million. Over 25% of claims (236 of 923) reported here were from FES. These data demonstrate that the Front End Specifications tend to cause, rather than reduce, claims.

Table 4.7: Frequency of Claims by Project Value

Source	Claims from	<$100k		$1k-$1m		$1m-$10m		$10m-$50m		>$50m		Total
		n	%	n	%	n	%	n	%	n	%	
FES	**NonTechnical Specs**	56	37	58	39	54	36	48	32	20	13	236
Other	**Technical Plans**	51	34	59	39	77	51	51	34	27	18	265
	Plan Mistakes	48	32	64	43	72	48	55	37	31	21	270
	Jurisdiction	81	54	28	19	16	11	17	11	10	7	152
Total	**Total**	236		209		219		171		88		923

Note. Multiple responses were allowed, so total exceed 100%. n = number of responses.

This finding that FES causes claims justifies the present study as a valid area of inquiry, and provides adequate empirical evidence to proceed with further investigation, beginning with a demonstration that FES claims impose significant costs or reduce profits that would have been retained. Even with FES as a source of claims, this investigation can only be worthwhile in the real world if it can be shown that FES claims have a meaningful impact.

4.3 Which Front End Specifications Cause Claims? (*Hypothesis 1b*)

The results for *Hypothesis 1b*, the determination of which Front End Specifications cause claims, is presented in three parts. First, the raw frequency and percent of claims by FES is discussed. Second, the weighting and normalization process is presented.[46] Third, the normalized data are presented, ranked from highest to lowest, such that the highest rankings indicate which FES cause the most claims. These normalized rankings are presented for small, medium, and large sized companies. This section ends with a summary of which FES have the greatest claims impact. Based on the Review of Literature, sixteen (16) Front End Specification categories (with their abbreviations in parentheses) were included in the present survey:

- Summary (Scope) of the Work (SCOPE)
- Allowances (ALLOW)
- Measurement & Payment (MEAS)
- Alternates/Alternatives (ALT)
- Coordination (COORD)
- Field Engineering (FIELD)
- Regulatory Requirements (REG)
- Abbreviations & Symbols (ABRV)
- Identification Systems (IDENT)
- Reference Standards (REF)
- Special Project Procedures (SPECL)
- Project Meetings (MEET)
- Submittals (SUBMT)
- Scheduling Specifications/Requirements (SCHED)
- Other Project Control Requirements (OTHRP)
- Contract Closeout (CLOUT)

To determine which Front End Specifications cause claims, participants were asked:

> *The following questions are intended to elicit your claims and disputes experiences with certain non-technical specifications generally found in most engineering, construction and construction management agreements and specifications. For each enumerated item, please identify the frequency (expressed as a percentage of the*

[46] The data were normalized to account for the fact that the number of survey responses was inconsistent.

time) with which each resulted in a claim or dispute that was not resolved prior to completion of the project, as defined earlier.

This question solicited the frequency of unresolved claims at the end of the project for each of sixteen (16) Front End Specification categories, segregated by project value.

4.3.1 Raw Front End Specification Claims by Cause

The raw data presented in Table 4.8 shows that Coordination had the tendency to result in the highest frequency of unresolved claims at a project's conclusion. Scheduling was similarly high in unresolved claims. At the lower end of the frequency scale, abbreviations and identification were identified most often as leading to unresolved claims (Table 4.8).

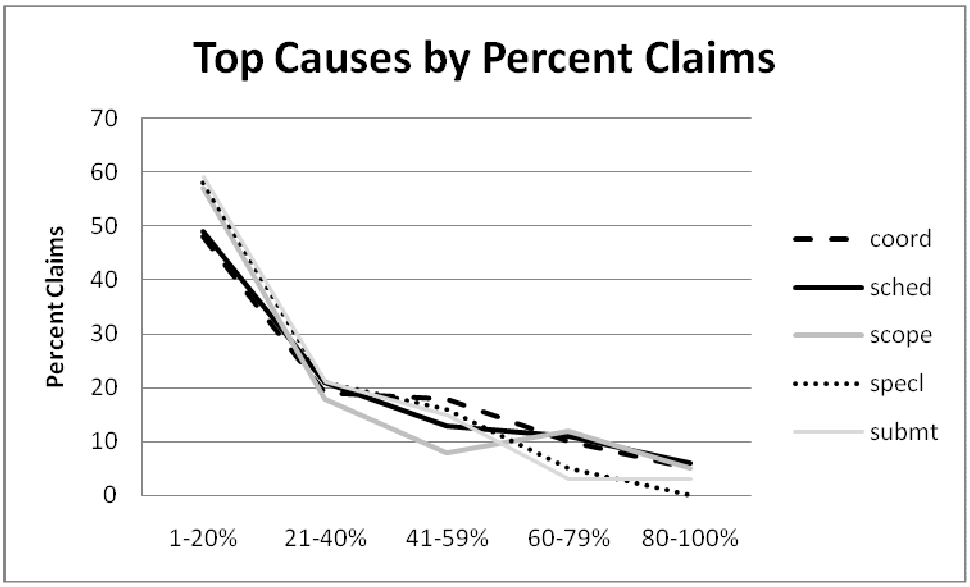
Table 4.8: Frequency of Claims, by Rate of Occurrence, of Front End Specification, All

Specification	1-20%		21-40%		41-59%		60-79%		80-100%		Total
	n	%	n	%	n	%	n	%	n	%	
coord	43	38.1%	24	21.2%	24	21.2%	15	13.3%	7	6.2%	113
sched	49	43.4%	26	23.0%	15	13.3%	14	12.4%	9	8.0%	113
scope	49	47.1%	23	22.1%	11	10.6%	14	13.5%	7	6.7%	104
specl	55	52.4%	24	22.9%	20	19.0%	6	5.7%	0	0.0%	105
submt	59	53.2%	24	21.6%	20	18.0%	4	3.6%	4	3.6%	111
othrp	54	51.9%	19	18.3%	15	14.4%	11	10.6%	5	4.8%	104
meas	68	60.2%	29	25.7%	6	5.3%	8	7.1%	2	1.8%	113
field	58	56.9%	19	18.6%	19	18.6%	3	2.9%	3	2.9%	102
clout	63	58.3%	19	17.6%	12	11.1%	9	8.3%	5	4.6%	108
alt	64	64.6%	24	24.2%	8	8.1%	1	1.0%	2	2.0%	99
ref	66	66.0%	22	22.0%	10	10.0%	2	2.0%	0	0.0%	100
reg	67	66.3%	30	29.7%	3	3.0%	1	1.0%	0	0.0%	101
allow	62	71.3%	16	18.4%	7	8.0%	1	1.1%	1	1.1%	87
meet	76	78.4%	12	12.4%	5	5.2%	2	2.1%	2	2.1%	97
ident	88	90.7%	9	9.3%	0	0.0%	0	0.0%	0	0.0%	97
abrv	91	93.8%	4	4.1%	2	2.1%	0	0.0%	0	0.0%	97
Mean	102.8	68.6	24.3	16.1	13	8.7	6.6	4.5	3.4	2.3	150
SD	20.5	13.6	7.7	5.2	8.1	5.4	6.4	4.2	2.8	2	

Note. SCOPE = Summary (Scope) of the Work, ALLOW = Allowances, MEAS = Measurement & Payment, ALT = Alternates/Alternatives, COORD = Coordination, FIELD = Field Engineering, REG = Regulatory Requirements, ABRV = Abbreviations & Symbols, IDENT = Identification Systems, REF = Reference Standards, SPECL = Special Project Procedures, MEET = Project Meetings, SUBMT = Submittals, SCHED = Scheduling Specifications/Requirements, OTHRP = Other Project Control Requirements, CLOUT = Contract Closeout. n = number of responses.

Looking at the five most common claims arising from the FES, the tendency appears to be that no one topic is responsible for a majority of claims more than 20% of the time. In other words, the frequency of claims occurrence drops off quickly after the 1-20% incidence rate. This finding is graphed in Figure 4.5 below.

Figure 4.5: Top Causes of Claims, by Percent



To further hone in on the claims impact from the Front End Specifications, we next look at that data after normalization and weighting. Without normalization and weighting, the raw values could potentially be misleading in determining the leading causes of FES claims.

4.3.2 Front End Specification Claims, Normalized

To determine which FES cause claims, data were weighted and normalized. Using the weighting values shown in Table 4.9, the responses were re-expressed to incorporate the import of a particular specification relative with the degree of risk perceived by the respondents. The methodology used here is derived from the works of Diekmann and Nelson (1985), Kumaraswamy (1998) and Naoum (2003). These rankings indicate the

propensity of each of the identified specifications to give rise to a claim. Rankings are based on the number of responses measured against the total number of respondents.

Table 4.9: Ranking Weights (All Size Categories)

Likelihood of Unresolved Claim Generation	Weight
1-20%	1
21-40%	2
41-59%	3
60-79%	4
80-100%	5

4.3.3 Impact of Front End Specification Claims, Normalized

Hypotheses 1b is also concerned with the impact of claims arising from the FES. Using the weighting values from Table 4.9 and applying those to the small, medium and large companies, and then by calculating overall results, each of the specifications was ranked on a normalized, weighted basis, then ranked from highest to lowest, as shown in Table 4.10. This ranking equates to the impact factor of each of the specific specifications.

The participants reported that coordination and scheduling had the greatest impact of all Front End Specifications; that is, those two specifications had the highest tendency as the basis for an unresolved claim. The scope of work (summary) specification was the third-highest specification tending to result in an unresolved claim. At the other end of the scale were abbreviations & symbols and identification systems, having the least tendency to result in unresolved claims. These data express all companies together, so we next turn to the normalized rankings of specification claims for small, medium and large companies.

Table 4.10: Normalized Claims Rankings, All Companies

Rank	Specification	Small	Medium	Large	Overall
1	Coordination	1.55 *	1.47 *	1.46 *	1.49 *
2	Scheduling	1.50 *	1.45 *	1.30 *	1.42 *
3	Summary (Scope) of the Work	1.22	1.23	1.32 *	1.25
4	Other Requirements	1.19	1.23	1.12	1.18
5	Submittals	1.09	1.20	1.19	1.16
6	Contract Closeout	1.17	1.19	1.04	1.13
7	Special Project Procedures	1.04	1.05	1.24	1.11
8	Measurement & Payment	1.24	1.05	0.98	1.09
9	Field Engineering	0.98	0.96	1.04	0.99
10	Alternates/Alternatives	0.88	0.92	0.98	0.92
11	Reference Standards	0.78	0.89	0.85	0.84
12	Project Meetings	0.75	0.75	0.85	0.78
13	Regulatory Requirements	0.70	0.77	0.73	0.73
14	Allowances	0.72	0.70	0.63	0.69
15	Identification Systems	0.62	0.58	0.63	0.61
16	Abbreviations & Symbols	0.57	0.58	0.65	0.60
	Mean	1.00	1.00	1.00	1.00
	Standard Deviation (SD)	0.30	0.28	0.26	0.28

Note. *** = Score => 1 SD**.
SCOPE = Summary (Scope) of the Work, ALLOW = Allowances, MEAS = Measurement & Payment, ALT = Alternates/Alternatives, COORD = Coordination, FIELD = Field Engineering, REG = Regulatory Requirements, ABRV = Abbreviations & Symbols, IDENT = Identification Systems, REF = Reference Standards, SPECL = Special Project Procedures, MEET = Project Meetings, SUBMT = Submittals, SCHED = Scheduling Specifications/Requirements, OTHRP = Other Project Control Requirements, CLOUT = Contract Closeout.

4.3.3.1 Normalized Specification Claims Rankings, Small Sized Companies

For small companies, coordination, scheduling, measurement & payment and summary (scope) of the work were the highest ranked sources of claims (Table 4.11).

Table 4.11: Normalized Claims Rankings, Small Companies

Rank	Specification	n	Weighted Score	Normalized Score
1	Coordination	25	60	1.55
2	Scheduling	27	58	1.50
3	Measurement & Payment	26	48	1.24
4	Summary (Scope) of the Work	23	47	1.22
5	Other Requirements	24	46	1.19
6	Contract Closeout	26	45	1.17
7	Submittals	24	42	1.09
8	Special Project Procedures	25	40	1.04
9	Field Engineering	23	38	0.98
10	Alternates/Alternatives	24	34	0.88
11	Reference Standards	23	30	0.78
12	Project Meetings	22	29	0.75
13	Allowances	22	28	0.72
14	Regulatory Requirements	22	27	0.70
15	Identification Systems	22	24	0.62
16	Abbreviations & Symbols	22	22	0.57
	Mean	23.75	38.63	1.00
	Standard Deviation (SD)	1.65	11.62	0.30

Note. *** = Score => 1 SD**. Normalized scores based on mean weighted score value of 38.63.
SCOPE = Summary (Scope) of the Work, ALLOW = Allowances, MEAS = Measurement & Payment, ALT = Alternates/Alternatives, COORD = Coordination, FIELD = Field Engineering, REG = Regulatory Requirements, ABRV = Abbreviations & Symbols, IDENT = Identification Systems, REF = Reference Standards, SPECL = Special Project Procedures, MEET = Project Meetings, SUBMT = Submittals, SCHED = Scheduling Specifications/Requirements, OTHRP = Other Project Control Requirements, CLOUT = Contract Closeout. n = number of responses.

4.3.3.2 Normalized Specification Claims Rankings, Medium Sized Companies

For medium-sized companies, (Table 4.12), coordination, scheduling, and summary (scope) of the work were the highest ranking sources of claims.

Table 4.12: Normalized Claims Rankings, Medium Sized Companies

Rank	Specification	n	Weighted Score	Normalized Score
1	Coordination	47	109	1.47 *
2	Scheduling	49	108	1.45 *
3	Summary (Scope) of the Work	48	91	1.23
4	Other Requirements	41	91	1.23
5	Submittals	44	89	1.20
6	Contract Closeout	48	88	1.19
7	Special Project Procedures	49	78	1.05
8	Measurement & Payment	42	78	1.05
9	Field Engineering	42	71	0.96
10	Alternates/Alternatives	45	68	0.92
11	Reference Standards	39	66	0.89
12	Regulatory Requirements	42	57	0.77
13	Project Meetings	38	56	0.75
14	Allowances	37	52	0.70
15	Identification Systems	38	43	0.58
16	Abbreviations & Symbols	38	43	0.58
	Mean	42.94	74.25	1.00
	Standard Deviation (SD)	4.30	20.88	0.28

Note. *** = Score => 1 SD**. Normalized scores based on mean weighted score value of 74.25.
SCOPE = Summary (Scope) of the Work, ALLOW = Allowances, MEAS = Measurement & Payment, ALT = Alternates/Alternatives, COORD = Coordination, FIELD = Field Engineering, REG = Regulatory Requirements, ABRV = Abbreviations & Symbols, IDENT = Identification Systems, REF = Reference Standards, SPECL = Special Project Procedures, MEET = Project Meetings, SUBMT = Submittals, SCHED = Scheduling Specifications/Requirements, OTHRP = Other Project Control Requirements, CLOUT = Contract Closeout. n = number of responses.

4.3.3.3 Normalized Specification Claims Rankings, Large Sized Companies

For large companies, coordination, summary (scope) of the work, scheduling, and special project procedures were the highest ranking sources of claims, as shown in Table 4.13.

Table 4.13: Normalized Claims Rankings, Large Companies

Rank	Specification	n	Weighted Score	Normalized Score
1	Coordination	39	90	1.46 *
2	Summary (Scope) of the Work	33	81	1.32 *
3	Scheduling	39	80	1.30 *
4	Special Project Procedures	38	76	1.24
5	Submittals	39	73	1.19
6	Other Requirements	39	69	1.12
7	Field Engineering	37	64	1.04
7	Contract Closeout	38	64	1.04
8	Measurement & Payment	38	60	0.98
8	Alternates/Alternatives	37	60	0.98
9	Reference Standards	38	52	0.85
9	Project Meetings	38	52	0.85
10	Regulatory Requirements	34	45	0.73
11	Abbreviations & Symbols	37	40	0.65
12	Allowances	23	39	0.63
12	Identification Systems	37	39	0.63
	Mean	36.50	61.50	1.00
	SD	3.98	16.08	0.26

Note. *** = Score => 1 SD**. Normalized scores based on mean weighted score value of 61.50.
SCOPE = Summary (Scope) of the Work, ALLOW = Allowances, MEAS = Measurement & Payment, ALT = Alternates/Alternatives, COORD = Coordination, FIELD = Field Engineering, REG = Regulatory Requirements, ABRV = Abbreviations & Symbols, IDENT = Identification Systems, REF = Reference Standards, SPECL = Special Project Procedures, MEET = Project Meetings, SUBMT = Submittals, SCHED = Scheduling Specifications/Requirements, OTHRP = Other Project Control Requirements, CLOUT = Contract Closeout. n = number of responses.

Table 4.14: Top Five Normalized Claims Rankings, All Companies

Rank	Specification	Small	Medium	Large	Overall
1	Coordination	1.55*	1.47*	1.46*	1.49*
2	Scheduling	1.50	1.45*	1.30	1.42
3	Summary (Scope) of the Work	1.22	1.23	1.32	1.25
4	Other Requirements	1.19	1.23	1.12	1.18
5	Submittals	1.09	1.20	1.19	1.16

The items highlighted by asterisks in Table 4.14 above warrant additional discussion. Coordination generally covers two situations on a construction project. The first, and most common, is the coordination between trades, for example, plumbers and electricians. Briefly stated, when the trades attempt to operate in the same work space, conflicts can arise due to order of installation, priorities and supplies and equipment "being in the way". Coordination is less of a problem when a single prime (general) contractor is in charge; the potential for dispute is much stronger on a multi-prime job. Coordination problems can frequently be avoided by proper planning in conjunction with the trade contractors.

Scheduling issues arise from poor planning, bad estimates, lack of coordination, delayed and late deliveries, weather and many other reasons. Problems may also arise where the contractor does not fully understand its reporting obligations under the contract. Originally a planning tool, the schedule has become both a sword and a shield to owner and contractor alike, oftentimes being utilized to justify liquidated damages for late performance or claims for additional amounts for extended overhead and the like. Like coordination issues, scheduling problems can often be avoided by involving contractors in the schedule development process.

4.3.4 Summary of Which Front End Specifications Cause Claims

overall, coordination, scheduling, and summary (scope) of the work were the highest ranking sources of claims, as indicated by both raw and normalized data. For small companies, measurement & payment category ranked high; Measurement & payment does not appear to be a significant concern for larger companies. This may be a reflection of capitalization values and the financial strength of the larger companies or that the larger companies contract more frequently with public agencies and larger clients where the ability to pay is less often an issue. Special project procedures ranked higher for large companies than for medium or small companies, possibly because large companies encounter special project procedures more often than do smaller companies. Across company size, coordination, scheduling, and summary (scope) of the work were

the highest ranking source of claims. With sources of claims identified, we next turn to the economics of claims arising from the Front End Specifications.

4.4 Front End Specifications Claims: Additional Costs Incurred and Profits Lost (*Hypothesis 2*)

To document the impact of claims on company costs and profits (*Hypothesis 2*), participants were asked to estimate the additional costs (expressed as a percentage of the total project value) of resolving claims. Additionally, participants were asked to estimate the additional profit that would have been retained had there been no claims on projects:

> *For Non-Private Agency Entities, Including All Indirect Costs (that is, included in your normal costs such as salaries, etc.), What Is Your Estimate of the Additional Costs (expressed as a percentage of the total) That Resolving Claims and Disputes Cost?*
>
> and
>
> *For Private Businesses, and Including All Indirect Costs (that is, included in your normal costs such as lost time, salaries, etc.), What Is Your Estimate of the Additional Profit (expressed as a percentage of the total) That You Would Have Retained Had There Been No Claims or Disputes on Your Projects?*

These are two separate questions. All entities have costs, though not all entities have profits. For example, many governmental entities have no independent revenue stream, being funded by a legislature or Congress. Others cover their costs, in whole or in part, by generating revenues from third-parties, *e.g.*, state and federal parks. Private sector entities need to generate both revenues and profits in order to survive. To recognize these differences, the questions were presented separately.

4.4.1 Additional Costs

While 69% of participants reported that FES claims add 1-20% in additional costs (Table 4.15, top left), it is important to note that the remaining 31% of participants reported that FES claims are responsible for more than 20% in additional costs. In 8% of cases, more than 41% was added in additional costs because of FES claims, including one participant who reported that FES claims add 80-100% in additional costs.

Table 4.15: Additional Costs and Profit that Would Have Been Retained

	1-20%		21-40%		41-59%		60-79%		80-100%		
Cost	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**Total**
Additional Costs	103	69	32	21	9	6	1	1	2	1	147
Lost Profit	103	69	28	19	15	10	2	1	1	1	149

The additional costs were expected: professional services (attorneys, consultants, *etc.*) cost money.

4.4.2 Profits Lost

Data regarding additional profit that would have been retained had there been no claims mirrored the additional costs data, showing that 31% of participants reported that more than 20% of additional profit would have been retained if not for FES claims. The bottom of Table 4.8 shows that one-eighth of participants (12%) reported that more than 40% in profit would have been retained in the absence of claims.

The collected data establish that the costs of claims are significant and that profits correspondingly suffer. This is not surprising: claims take time and money to resolve. Some of the costs involved are direct (e.g., legal and consulting fees) while others are indirect (for example, lost productivity and management distraction). Not only do these costs impact the project burdened with the claim, the potential interference with obtaining new work as a result of management distraction or damage to reputation can also result. Moreover, and depending upon the situation, a company could spend more

pursuing a claim than the claim is worth. This possibility mandates the need for informed management decision making.

4.5 Complexity and Front End Specifications (*Hypothesis 3*)

To address the questions raised by *Hypothesis 3*, Participants were asked the following question:

How Would You Rate Each of the Following General Requirements Specifications?

Respondents could choose from four choices: Too Simplistic; Of Acceptable Complexity; Too Complex; and Not Required.

4.5.1 Front End Specifications and Complexity, All Companies

Utilizing a three-point scale (Too Simple = - 1, Acceptable = 0, Too Complex = +1), participants indicated their perceptions of FES complexity by category. These data were then normalized to account for variations in the number of responses; the results are shown in Table 4.16 with primary sorting based on acceptability.

Table 4.16 details the normalized perceived complexity of the enumerated Front End Specifications across all companies. On average, FES were considered to be of acceptable complexity by two-thirds of participants (67%). Regulatory requirements ranked first as too complex (29%), while scope of work (summary) was the least-often cited as being too complex (4%).

Table 4.16: Normalized Complexity Response Proportions, All Companies

TOTAL	n	Too Simple	Acceptable	Too Complex
Sched	128	34%*	49%	17%
Coord	124	36%*	49%	15%
Reg	125	12%	59%	29%*
Clout	125	18%	60%	22%*
Alt	122	25%	61%	13%
Specl	125	22%	62%	16%
Othrp	122	28%	63%	9%
Field	123	24%	68%	8%
Ref	124	15%	69%	16%
Scope	128	27%	70%	4%
Submt	127	13%	71%	16%
Meet	126	22%	71%	6%
Allow	120	21%	73%	7%
Meas	124	10%	81%	9%
Ident	118	11%	82%	7%
Abrv	121	12%	83%	5%
Mean	123.9	21%	67%	12%
SD	2.8	8%	10%	7%

Note. SCOPE = Summary (Scope) of the Work, ALLOW = Allowances, MEAS = Measurement & Payment, ALT = Alternates/Alternatives, COORD = Coordination, FIELD = Field Engineering, REG = Regulatory Requirements, ABRV = Abbreviations & Symbols, IDENT = Identification Systems, REF = Reference Standards, SPECL = Special Project Procedures, MEET = Project Meetings, SUBMT = Submittals, SCHED = Scheduling Specifications/Requirements, OTHRP = Other Project Control Requirements, CLOUT = Contract Closeout. n = number of responses. * = Equal to or more than one standard deviation (SD) above the mean.

The tendency to describe the Front End Specification regarding regulatory regulations as being overly complex reflects the inconsistencies between designers and governmental jurisdictions in aligning the various building and construction requirements. It is not unknown for a building department, for example, to approve a set of drawings only to have an inspector reject the work due to personal perspectives.[47]

The fact that roughly one-quarter of the participants found almost half (7 of 16) of the FES too simple suggests that either those participants want or need more definitive direction or that they don't truly understand the stated requirements. With scheduling and coordination being rated too simple by one-third of the respondents and those

[47] This has nothing to do with nefarious activities on the part of the inspector. The inspector may interpret the code requirements differently than the office staff. While this is something that should be resolved internally by the government organization, often times it falls on the contractors to get the matter resolved.

topics being available for a significant number of claims and subsequent litigation, there is clearly a disconnect between the written language and the actions taken based on the contract terminology.

Overall, these findings suggest that over-simplicity may be a problem. However, this analysis is insensitive to potential differences in FES and complexity based on company size. Therefore, we next turn to FES and complexity for small, medium and large companies.

4.5.2 Front End Specifications and Complexity, Small Sized Companies

For small businesses, 69% of sources were considered to be of acceptable complexity. On balance, responses of too simple (23%) were of greater abundance than responses of too complex (9%). Two Front End Specifications stood out for this group: Some participants perceived contract closeout and alternates/alternatives as too simple, while other participants considered them as too complex (Table 4.17).

Table 4.17: Normalized Complexity Response Proportions, Small Companies

SMALL	n	Too Simple	Acceptable	Too Complex
Sched	29	34%*	48%	17%*
Alt	28	29%	54%	18%*
Coord	28	43%	54%	4%
Clout	29	21%	55%	24%*
Field	28	36%*	57%	7%
Othrp	27	33%	63%	4%
Submt	30	17%	67%	17%
Specl	29	28%	69%	3%
Reg	28	7%	75%	18%
Ref	28	18%	75%	7%
Scope	28	25%	75%	0%
Meas	29	14%	76%	10%
Allow	26	23%	77%	0%
Meet	28	21%	79%	0%
Ident	24	4%	88%	8%
Abrv	26	12%	88%	0%
Mean	27.8	23%	69%	9%
SD	1.5	11%	12%	8%

Note. SCOPE = Summary (Scope) of the Work, ALLOW = Allowances, MEAS = Measurement & Payment, ALT = Alternates/Alternatives, COORD = Coordination, FIELD = Field Engineering, REG = Regulatory Requirements, ABRV = Abbreviations & Symbols, IDENT = Identification Systems, REF = Reference Standards, SPECL = Special Project Procedures, MEET = Project Meetings, SUBMT = Submittals, SCHED = Scheduling Specifications/Requirements, OTHRP = Other Project Control Requirements, CLOUT = Contract Closeout. n = number of responses. * = More than one standard deviation (SD) above the mean.

Identified in Table 4.17 as being too complex, smaller companies appear to have more challenges with closeout procedures as well as scheduling and alternates. But while 17% said that the scheduling specifications were too complex, twice as many (34%) said that the same provisions were too simple. Coordination was largely perceived to be too simple (43%), as was field engineering, with both reporting standard deviations greater than 1. These results are not consistent with those from the medium- and larger-sized companies. Regulatory requirements, though, were more likely to be perceived as too complex (18%) than too simple (7%) which follows with the other groups.

4.5.3 Front End Specification and Complexity, Medium Sized Companies

For medium sized businesses, FES were considered to be of acceptable complexity (62%) on average. Responses of too simple (23%) were of greater abundance on

average than opinions of too complex (15%). Similar to the small companies, medium-sized companies had complexity concerns about regulatory requirements (.29) and closeout (23%). Coordination was perceived as either too simple (40%) or as too complex (21%) by a majority of participants (Table 4.18).

Table 4.18: Normalized Complexity Response Proportions, Medium Companies

MEDIUM	n	Too Simple	Acceptable	Too Complex
coord	53	40%*	40%	21%
sched	54	35%*	48%	17%
specl	50	28%	52%	20%
alt	51	31%	53%	16%
reg	52	15%	56%	29%*
othrp	51	31%	57%	12%
ref	51	18%	61%	22%
clout	52	15%	62%	23%*
submt	53	19%	62%	19%
scope	55	33%*	64%	4%
meet	53	21%	68%	11%
allow	50	22%	68%	10%
meas	52	15%	75%	10%
field	53	17%	75%	8%
abrv	51	12%	76%	12%
ident	49	16%	76%	8%
Mean	51.9	23%	62%	15%
SD	1.6	9%	11%	7%

Note. SCOPE = Summary (Scope) of the Work, ALLOW = Allowances, MEAS = Measurement & Payment, ALT = Alternates/Alternatives, COORD = Coordination, FIELD = Field Engineering, REG = Regulatory Requirements, ABRV = Abbreviations & Symbols, IDENT = Identification Systems, REF = Reference Standards, SPECL = Special Project Procedures, MEET = Project Meetings, SUBMT = Submittals, SCHED = Scheduling Specifications/Requirements, OTHRP = Other Project Control Requirements, CLOUT = Contract Closeout. n = number of responses. * = More than one standard deviation (SD) above the mean.

4.5.4 Front End Specifications and Complexity, Large Sized Companies

Consistent with the small and medium sized companies, most responses (72%) from large company participants indicated that Front End Specifications were of overall acceptable complexity. Regulatory requirements were more likely to be perceived as too complex (36%) than too simple (11%) by participants from Large Sized Companies, as

were special project procedures (20% v 13%). Overall, responses of too simple (17%) were received more often than too complex (12%) (Table 4.19).

Table 4.19: Normalized Complexity Response Proportions, Large Companies

LARGE	n	Too Simple	Acceptable	Too Complex
sched	45	31%*	51%	18%
reg	45	11%	53%	36%*
coord	43	28%*	58%	14%
clout	44	20%	61%	18%
specl	46	13%	67%	20%
field	42	24%	67%	10%
othrp	44	20%	70%	9%
meet	45	24%	71%	4%
ref	45	11%	73%	16%
scope	45	20%	73%	7%
allow	44	18%	75%	7%
alt	43	16%	77%	7%
submt	44	5%	84%	11%
abrv	44	14%	86%	0%
ident	45	9%	87%	4%
meas	43	0%	93%	7%
Mean	44.2	17%	72%	12%
SD	1.0	8%	12%	09%

Note. SCOPE = Summary (Scope) of the Work, ALLOW = Allowances, MEAS = Measurement & Payment, ALT = Alternates/Alternatives, COORD = Coordination, FIELD = Field Engineering, REG = Regulatory Requirements, ABRV = Abbreviations & Symbols, IDENT = Identification Systems, REF = Reference Standards, SPECL = Special Project Procedures, MEET = Project Meetings, SUBMT = Submittals, SCHED = Scheduling Specifications/Requirements, OTHRP = Other Project Control Requirements, CLOUT = Contract Closeout. n = number of responses. * = More than one standard deviation (SD) above the mean.

4.5.5 Summary of Front End Specifications and Complexity

Front End Specifications were perceived to be of adequate complexity by two-thirds of participants. However, regardless of business size, FES were perceived as too simple roughly twice as often as too complex.

Importantly, coordination, scheduling, and summary (scope) of the work, the three FES categories causing the highest rate of claims (Section 4.4), demonstrated an interesting pattern. Regardless of company size, coordination, scheduling, and summary (scope) of

the work were each more likely to be perceived as too simple than as too complex. This would appear to be a contradiction in terms though it is possible that those opining on the simplicity of the scheduling specification have a good command of the topic and have no claims arising from scheduling disputes. Conversely, those same respondents may have significant claims from scheduling because the scheduling specification isn't clearly understood. More study of this apparent dichotomy could be warranted.

Table 4.20 highlights those Front End Specifications where the standard deviations for too simplistic and too complex were greater than or equal to 1.0.

Table 4.20: Simplicity/Complexity Where SD >=1

		Too Simple	Too Complex	High Impact
Regulatory Requirements	All		2.43	
	Large		2.67	
	Medium		2.00	
	Small			
Schedule	All	1.63		1.14
	Large	1.75		1.04
	Medium	1.33		1.17
	Small	1.00	1.00	1.20
Coordination	All	1.88		1.21
	Large	1.38		1.20
	Medium	1.89		1.19
	Small			1.25
Scope of Work (Summary)	All			
	Large			
	Medium	1.11		
	Small			
Closeout	All		1.43	
	Large			
	Medium		1.14	
	Small		1.88	
Alternatives	All			
	Large			
	Medium			
	Small		1.13	

FES where responses of Too Simple/Too Complex are >= 1 Standard Deviation and Tendency to Result in Claim is >=1 Standard Deviation (Null Entry < 1 Standard Deviation)

These findings suggest FES vary greatly in perceived complexity across business sizes. While regulations ranked first as too complex, more than 10% of participants at each company size perceived regulations as too simple. While these findings fall short of providing conclusive proof that FES complexity directly causes claims, these data provide empirical evidence of a relationship between FES and perceived complexity. The industry should eliminate complexity (real or perceived) from the Front End Specifications. The use of truly standardized documents such as the ConsensusDOCS® is a solid first step.

However, these complexity data can not reveal whether the use of performance-based Front End Specifications would increase or reduce claims.

4.6 Would the Use of Performance-Based Front End Specifications Increase or Reduce Claims? (*Hypothesis 4*)

This research question (*Hypothesis 4*) is answered in two parts. First, the use of Performance-Based FES (PB-FES) and their Potential Effect on Claims is detailed (*Hypothesis 4a*). Then, to see if the use of PB-FES might affect the occurrence of claims, the potential relationship between document authorship and PB-FES is explored as *Hypothesis 4b*.

Performance-based specifications can be explained as follows:

> Performance based specifications focus on outcomes or results rather than process, and the required goods and services rather than how the goods and services are produced. Conversely, design specifications outline exactly how the contractor must perform the service or how the product is made. Performance based specifications allow participants to bring their own expertise, creativity and resources to the bid process without restricting them to predetermined methods or detailed processes. This allows the participants to provide the product or service at less cost and shifts some of the risk to the contractors. For example, if a state agency utilizes a design specification for a unit of laboratory equipment, and the equipment does not work correctly, then the results may be the fault of the specification. However, if the agency wrote a performance based specification, the unit must operate properly in order to meet the performance standards.[48]

[48] "Specification Types", most recently accessed 5 October 2009 at http://www.window.state.tx.us/procurement/pub/contractguide/SpecificationTypes.pdf,

A number of owners are exploring the move from prescriptive specifications to performance-based specifications including NRMCA[49] and the Department of Defense.[50] Many of the topics included in the FES could be successfully converted to performance-based requirements. The question for the survey participants was whether doing so would be beneficial, detrimental or result in no meaningful difference. Participants were asked:

> *With Reference to the General Requirements (Front End) Specifications only, Do You Believe that the Use of Performance-based Requirements Would Lead to More or Fewer Disputes Involving Those Topics?*

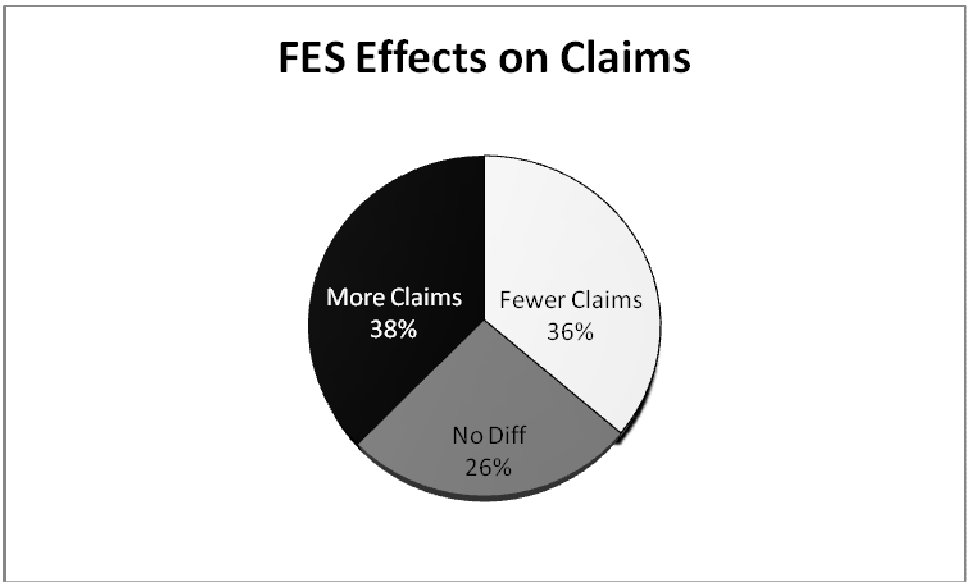
4.6.1 Performance-Based Front End Specifications and Potential Effect on Claims (*Hypothesis 4a*)

Participants were asked whether Performance-Based Front End Specifications ("PB-FES") would increase or decrease claims. Results are shown in Figure 4.6.

[49] APA: "Study details advantages of performance-based specifications. (News & Events)." Concrete Construction. 2006. Retrieved October 05, 2009 from accessmylibrary: http://www.accessmylibrary.com/coms2/summary_0286-19733109_ITM.

[50] "Guidebook for Performance-Based Services Acquisition (PBSA) in the Department of Defense" from http://www.acquisition.gov/comp/seven_steps/library/DODguidebook-pbsa.pdf.

Figure 4.6: Performance-Based Front End Specifications and Claims



Overall, 53 of 146 reported that PB-FES would increase claims (36%), 38 of 146 reported that PB-FES would neither increase nor decrease claims (26%) and 55 of 146 reported that PB-FES would decrease claims (38%). These opinions were clearly split as to whether PB-FES would increase or decrease claims, but the high rates of more claims and the similarly high rate of fewer claims suggest that participants may have differing views regarding the effects of PB-FES on claims.

While a potential benefit of PB-FES is that contractor performance is judged solely on results, some contractors might see the lack of detailed, directive FES as a problem. Where a contractor prefers to rely on the specifications as an excuse for late or non-performance, the use of PB-FES would work against it. How often this might occur or to what degree such a position might affect the industry, or any particular segment of it, is unknown. Empirical research focusing on the use of Performance-Based Front End Specifications would be necessary to address the question.

4.6.2 Document Authorship and Front End Specification Effects on Claims (*Hypothesis 4*)

To investigate if any Document authorship and PB-FES relationship would increase or decrease claims (*Hypothesis 4*), the same document authorship data discussed in section 4.1.8 above was revisited. Table 4.21 shows that perceptions are similar across Document authorship identities, with "increase claims", "decrease claims" and "no effect on claims", each well represented by participants using American Institute of Architects (AIA), Internal Contracts, owner designer or CM-created documents (Owner/Designer/CM), or the Engineers Joint Contract Documents Committee (EJCDC) publications.

Table 4.21: Document Authorship and Front End Specifications Claims

Document Authorship	Statistic	Use of PB-FES would ___ Claims			Total
		Decrease	No Diff	Increase	
AGC	Count	3	-	-	3
	%	100	-	-	100
AIA	Count	24	15	24	63
	%	38	24	38	100
Internal Contract	Count	6	5	6	17
	%	35	30	35	100
EJCDC	Count	2	2	2	6
	%	33	33	33	100
Owner/Designer/CM	Count	15	15	20	50
	%	30	30	40	100
Other	Count	3	1	3	7
	%	43	14	43	100
Total	Count	53	38	55	146
	%	36	26	38	100

Note. Count = number of responses.

The findings for *Hypothesis 4* are inconclusive. With the exception of the three people referencing the AGC documents, the remaining respondents were more or less evenly split as to whether Performance-Based FES would make any difference in reducing claims. An opportunity for additional research arises from this: if provided with sample PB-FES language, would the outcome of the research as to this question change significantly?

4.6.3 Summary of Whether the Use of Performance-Based Front End Specifications Increase or Reduce Claims

Participants were well-divided in perceptions regarding whether the use of PB-FES would increase or decrease claims. Further, present findings provide no empirical evidence supporting a nexus between document authorship and perceptions of whether PB-FES increase claims. The next section looks at the effect of partnering on FES claims generation.

4.7 Partnering and Front End Specifications: Claims and Resolution (*Hypothesis 5*)

Partnering is the process by which stakeholders in the project meet early on to address potential areas of dispute and develop a mechanism for the resolution of claims at the lowest levels. Of 150 participants, 82 had utilized partnering sessions (55%) and 68 had not engaged in partnering sessions (45%).

4.7.1 Partnering and Claims Resolution

Participants were asked about their experiences using partnering and the resolution of claims. Of particular interest was determining whether resolution by "Negotiation Between The Parties Without Utilizing Attorneys" was significantly higher where partnering was utilized. However, Table 4.22 shows that resolution without the use of

attorneys ("Parties Resolution") was generally similar across partnering and non-partnering participants.

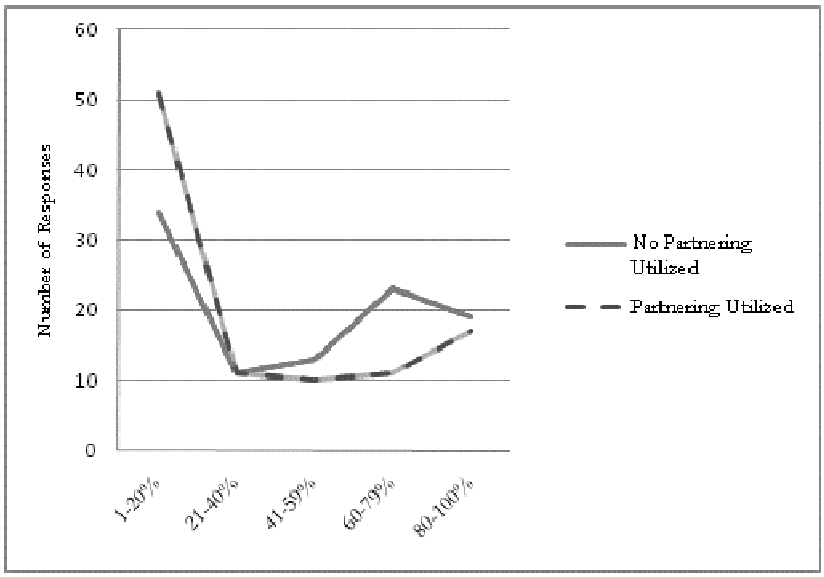
Table 4.22: Partnering and Negotiation between the Parties without Utilizing Attorneys

Parties Resolution	1-20%		21-40%		41-59%		60-79%		80-100%		
	n	%	n	%	n	%	n	%	n	%	Total
Partnering	32	51	7	11	6	10	7	11	11	17	63
Non-Partnering	27	34	9	11	10	13	18	23	15	19	79
Total	59	42	16	11	16	11	25	18	26	18	142

Note. Parties Resolution = Negotiation Between The Parties Without Utilizing Attorneys. n = number of responses.

When expressed graphically (Figure 4.7), it is clear that there is a strong tendency amongst those who utilized partnering to settle claims without attorneys in a majority of cases.

Figure 4.7: Partnering and Negotiation between the Parties without Utilizing Attorneys



The resolution of claims without the use of attorneys would be consistent with a willingness to discuss matters at the earliest stage, as partnering encourages, which would theoretically lead to the prompter resolution and disposal of potentially significant disputes. Since outside lawyers cost money, the willingness to resolve claims without the use of attorneys is an inherent goal of the partnering process. However,

present findings provide no empirical evidence supporting higher FES claims resolution by parties without the use of attorneys on projects utilizing partnering.

4.7.2 Partnering and Front End Specifications: Effects on Claims

Partnering and non-partnering participants were contrasted in their perceptions of whether the use of performance-based front end specifications would increase or decrease (or have no effect on) claims. Frequencies and percentages of Front End Specifications claims by partners and non-partners are displayed in Table 4.23.

Table 4.23: Performance-Based Front End Specifications Claims by Partnering and Non-Partnering

Partnering Status	Statistic	Use of P/B FES would ___ Claims			Total
		Decrease	No Diff	Increase	
Non-Partnering	n	20	15	31	66
	%	30	23	47	100
Partnering	n	33	23	24	80
	%	41	29	30	100
Total	n	53	38	55	146
	%	36	26	38	100

Note. n = number of responses.

Partnering and non-partnering participants differed in perceptions. Partnering participants were more likely to perceive that performance-based FES would increase claims (41%) rather than decrease claims (30%). In contrast, non-partnering participants were more likely to perceive that performance-based FES would decrease claims (47%) rather than increase claims (30%).

One possible reason for this difference in perception is a recognition of the purpose of partnering. When successfully utilized, partnering encourages parties to resolve differences (disputes, potential and existing claims) at the lowest level. To the extent that occurs, it is possible that upper management never even knows about the issue(s).

4.7.3 Summary of Partnering and Front End Specifications: Claims and Resolution

Partnering participants were more likely to perceive that Performance-Based Front End Specifications would increase, not decrease claims. No relationship was found between partnering and claims resolution.

4.8 Claims Resolution

The finality of any claim is the resolution, and depending on the resolution, the time and cost can vary significantly. Generally, resolution from negotiation between the parties without utilizing attorneys is the preferred resolution path, given that other paths to clams resolution generally cost significant money and time.

To develop some information as to how claims were resolved by the participants at the completion of the project, respondents were asked:

> *Of the claims and disputes that were not resolved prior to completion of the project, what percentage was resolved by [one of the listed categories]?*

Participants could choose between seven categories of resolution:

- Negotiation Between the Parties (without utilizing attorneys)
- Negotiations Involving Attorneys
- Formal Mediation (Using a neutral third party)
- Arbitration
- Other Alternative Dispute Resolution Method (mock trial, etc.)
- Litigation Settled Before Trial
- Judgment After Trial

The costs of each of these methods can vary substantially.[51] To the extent that parties can resolve their own differences without the employment of outside professionals (*e.g.*,

[51] The costs of claims resolution was not a topic of the research.

attorneys and consultants), it stands to reason that the costs of claims resolution will be significantly lower for all concerned.

Table 4.24 displays the proportion of claims resolved by each method across five percentage ranges. Notice that the top right of Table 4.24 indicates 19% of participants reported claims were resolved between parties 81-100% of the time.

Table 4.24: Proportion of Claims by Resolution Method

Type	Method	n	1-20%	21-40%	41-60%	61-80%	81-100%
Preferred	**parties**	127	42%	13%	13%	14%	19%
Less Preferable	**lawyers**	131	45%	27%	12%	11%	4%
	mediat	123	69%	17%	8%	5%	1%
	arb	121	72%	17%	5%	4%	2%
	otherres	116	92%	3%	3%	2%	0%
	beforetr	125	67%	16%	7%	4%	6%
	aftertr	120	86%	8%	2%	2%	3%
Average	**Average**	123.3	68%	15%	7%	6%	5%

Note. Parties = Negotiation Between The Parties Without Utilizing Attorneys, Lawyers = Negotiations Involving Attorneys, Mediat = Formal Mediation Using A Neutral Third Party. Arb = Arbitration, Otherres = Other Alternative Dispute Resolution Method (mock trial, etc.), Beforetr = Litigation Settled Before Trial, Aftertr = Judgment After Trial. n = number of responses.

This finding suggests that owners and contractors alike recognize the benefits of resolving their disputes without outside assistance. While negotiation between the parties without utilizing attorneys may be the preferred path, whether partnering effects FES claims resolution was unclear.

4.9 Research Results – Summary and Preliminary Discussion

4.9.1 Summary Research Results

The present study of 150 construction professionals revealed that FES cause claims and that FES claims are financially expensive. Coordination, scheduling and summary (scope) of the work were identified as having the greatest potency as the most frequent sources of claims across company sizes. Further, the measurement & payment

provisions ranked high for small companies only, while special project procedures ranked high for large companies but not for medium or small companies. Complexity findings were surprising in that the FES were more likely to be perceived as too simple rather than as too complex with the regulatory requirements and scheduling appearing to be somewhat of dichotomies. Regardless of company size, coordination, scheduling and summary (scope) of the work (the greatest sources of claims among FES) were each more likely to be perceived as too simple than as too complex. Importantly, essentially regardless of which FES or size of company, each of the FES was too simple for some participants and too complex for others. While resolution between parties was the most common FES claims resolution method, no relationship was found between partnering and claims resolution. Partnering participants were more likely to perceive that performance-based FES would increase, not decrease, claims.

4.9.2 Research Results: Preliminary Discussion

Previous research grouped the individual Front End Specifications provisions, without differentiation, into one generalized "bucket" called “Specifications”. Those research efforts were also significantly limited, either by the survey population’s size or limitation of the target population. Other differences included geography (such as Yogeswaran's and Kumaraswamy's Hong Kong studies) or the design-imposed limitations of the CCI study.

This research is also differentiated from previous research by the breadth of the target population. The survey was available to respondents without regard to geographic limitation (*c.f.*, the Barnes and Mitrani survey (1995), which was limited to Florida contractors only), the type of construction performed or to one specific project (*c.f.*, the CII study). As a result, responses were received from a more diverse mix of participants and provide a much wider basis for analysis and reference than either the CII (1986) or Barnes and Mitrani (1995) studies. See Table 4.25 below.

Table 4.25: Summary of Survey Responses

Survey	Responses
Construction Industry Institute (CII)	36
Barnes and Mitrani (Florida only)	270
Hymes – Initial Survey	150
Hymes – UFES (follow-on) Survey	17

The CII (1986) study was limited to owners and general contractors only, each of whom was limited to discussing a single project. The Barnes and Mitrani study (1995) reached out to both general and specialty contractors but only within the state of Florida. The Barnes study, unlike either the CII or present studies, utilized a blind mailing to obtain data resulting in a significant number of returns, according to the published report; Both CII and Hymes contacted active businesses and individuals. The current study reached out nationally to owners, general and specialty contractors and consultants and others, representing a wider cross-section of the industry. The follow-on survey is discussed in Chapter 5.

Looking at other discussion points, roughly half of participants reported that scope of work clauses caused problems, a seemingly low number considering how often claims regarding "out of scope" work are reported in the litigated cases. Since the scope of work clause defines what is to be accomplished, the significance of this response suggests a lack of planning and communication on the part of the specification draftsperson. Other issues were also frequently mentioned as problems. The measurement of work and payments for work were identified as potential claim topics. Regulatory requirements, which can include a multitude of things, including non-compliant work and a lack of understanding of what was required under one or more code provisions on the part of the contractor, were cited as a problem by the participants. Project meetings as an issue were probably highlighted more for the amount of time consumed than for actual problems created. (This is a subjective, experienced-based observation).

It is clear that the size of the project does not dictate a likelihood or dearth of claims. While the raw data suggests that smaller projects have a larger number of claims, larger projects are not problem-free; indeed, the converse could well be the case. It is more likely that the numbers reflect the fact that there are significantly more "small" jobs performed than large projects. Similarly, large projects often have a more sophisticated claims resolution arrangement in place, for example, appointment of a project neutral or claims resolution board. By the same token, though, the larger claims, if not resolved, may well spark the publicly reported litigated cases, given the larger dollar amounts involved, or they may result in an unreported arbitration result.

While three-in-four participants reported that the Front End Specifications were "acceptable," roughly half also said that those same topics created problems in many of the situations where there were claims. This suggests that the "norm" of acceptability may not be performing adequately in setting forth the drafter's expectations for performance.

For all of the enumerated items in Question #10 of the survey (listing sixteen of the most common Front End Specifications provisions) roughly two-thirds of participants reported that the FES were of an acceptable level of complexity. Given this level of acceptance, it may first appear that the FES neither add to the complexity of the project nor pose a significant administrative burden to contractors. The present findings demonstrate that Technical Plans and Plan Mistakes account for more than twice as many claims as the FES. Nonetheless, the present research results demonstrate that the Front End Specifications contribute significant claims and costs to construction management.

There are some general remarks to be made regarding the survey responses. Just under half (43%) of the respondents reported using the forms published by the American Institute of Architects ("AIA"). In perspective, this suggests that use of a "standard" form (such as the AIA's or the new ConsensusDOCS®) has strong support, since roughly half the respondents use such documents. The research did not inquire about

any modification to standard forms. Obviously, a modified "standard" document differs from the "standard" document, introducing additional variables, impacting the "credibility" of those "standard" documents. And to what degree such modification would change the outcome of this research is unknown.[52]

The importance of the Front End Specifications cannot be overstated, as they provide the framework for administering the contract and tracking a project's progress. For example, the rules of project scheduling and contractor payments and the change order process are contained in the Front End Specifications. These rules and requirements ("specifications") often are referenced as the baseline when a claim or dispute arises as, for example, when a provision requires written notice to be given within a specified time period. Such specifications may set up the basis for a later claim by an aggrieved party, as detailed in Chapter 5, the Discussion.

[52] As with any other research, some answers lead to additional questions which could be the basis for additional research.

Chapter 5

Discussion

The objective of this doctoral dissertation research was to determine whether Front End Specifications promote, rather than reduce, the number of construction claims. For the first time, detailed data regarding specific Front End Specifications have been developed and a reference benchmark now exists to base further investigation in this important new area of research.

5.1 Review of Present Findings

Multiple questions were addressed from the data gathered and its analysis. It is now documented that the Front End Specifications do cause disputes and claims. The claims add costs and result in reduced profits of 20% or more. The results are similar regardless of the size of the company, the author of the Front End Specifications or the initial project value. Regarding the use of performance-based Front End Specifications, the data was inclusive with no clear weight toward one outcome or another.

The use of partnering does not significantly reduce the incidence of disputes and claims. Partnering does provide related benefits and was used by roughly half the participants, with more widespread use by the larger companies.

The majority of the Front End Specifications were perceived to be of acceptable complexity by the research participants. Exceptions were those Front End Specifications dealing with regulatory requirements, scheduling and coordination, each of which was identified as the genesis for disputes and claims.

Finally, the sources of the Front End Specifications documents were explored with the findings being that a document's authorship was not a significant source of disputes and claims.

5.2 Implications

Reviewing the findings of the research, suggestions for improving the Front End Specifications become apparent. Some are obvious, others more subtle. These observations and suggestions have application to each of the participants, both in general application as well as to individual owners, designers and contractors, and are here set forth in summary form.

Implications for General Application

- Regulatory requirements are too complex. Clearer language is a reasonable goal. Professional consultation may reduce misunderstanding.
- Coordination and Scheduling generate significant disputes and claims. Achieving clarity on these organizational issues up front will require more time and effort invested. This form of informal insurance or a quality investment that pays significant dividends indirectly by reducing expensive and distracting disputes and claims.
- Partnering is a worthwhile investment as there are strong indications that it does reduce the incidence of disputes and claims. Overall, partnering does not appear to reduce the need for attorneys in settling disputes and claims.

Implications for Owners

- Consistent Front End Specifications should reduce uncertainty about the meaning of common provisions recurring from project to project.
- Risk-sharing provisions of the Front End Specifications would become clearer with participants assuming the risk that they can best handle.

- Do not recycle Front End Specifications unless those requirements and details truly apply to the specific project.
- Utilizing partnering gives the participants the opportunity to address uncertainties about any of the Front End Specifications.
- As a source of disputes and claims, the scope of work frequently needs more detail before a project begins. This is solely within the purview of the owner and designer and is easily remedied with a small up-front investment.

Implications for Contractors

- Regulatory requirements was identified as one Front End Specification giving rise to disputes and claims as being too complex. This indicates that contractors need to fully review and understand the regulatory requirements before they undertake the work, even acquiring outside assistance if necessary.
- Use of consistent, unmodified Front End Specifications, such as the AIA forms or ConstructDOCS®, should eliminate uncertainty for the contractor. The same benefit should flow down to the contractor's subcontractors.
- Use of standardized Front End Specifications (like ConstructDOCS®) indicates an industry approved standard of practice and balancing of interests.
- Utilizing partnering gives the participants the opportunity to address uncertainties about any of the Front End Specifications and should allow for earlier and less contentious dispute resolution.
- The contractor must understand the scheduling and coordination requirements before starting work. On a multi-prime project, the owner or its representative(s) should be responsible for coordination. If the contractor can not meet the coordination requirements, it should consider passing on the project.
- The contractor must understand the scheduling requirements up front and

get outside assistance if necessary to comply.

- The contractor must understand the scope of work and the accompanying expectations before starting work. Get clarifications if necessary and be clear as to what is included, and what is excluded, from the contractor's scope of work.

Implications for Designers

- If uniformed Front End Specifications were available, there would be no need to draft new Front End Specifications for each project. The designer could then focus on the plans and technical specifications.

Many of these suggestions can be implemented quickly and at little or no cost. The simplest improvement to initiate, and at no direct cost, is to read and understand the Front End Specifications in their entirety, especially the coordination, regulatory requirements and scheduling provisions, as well as the scope of work description (regardless of its location in the documents). If the language isn't clear and unambiguous, inquiry should be made to obtain clarification. Vague or ambiguous language is a disputes and claims magnet, virtually guaranteed to create problems during the course of the work. In some cases, the contractor may be better off passing on the work rather than taking on a project guaranteed to be problem-filled.

Owners (or whoever is preparing the the project documents) should make the investment of preparing Front End Specifications appropriate for the specific project. Some provisions truly can be recycled; others should be tailored to the job. At the very least, a comprehensive review periodically is appropriate.

Another option is to utilize the ConstructDOCS® set of forms. Developed by a consortium of owners and contractors, these Front End Specifications (and other documents) are the most balanced of the oft-utilized published forms. No set of standard forms will be perfect for every project, yet a set of Front End Specifications

which takes each party's interests into account, such as the ConstructDOCS®, will likely need the least modification to be fully acceptable.

Once the Front End Specifications have been agreed to, project participants should resist the urge to waive provisions to accommodate special requests or avoid paperwork. If changes need to be made, do so in writing. An adage of experienced lawyers, especially those in the construction field, is that "if it's not in writing, it didn't happen" (Hedley 2004), mimicking the quote attributed to movie-mogul Samuel Goldwyn: "A verbal contract isn't worth the paper it's written on." Disputes are rarely decided promptly; thus, the "paper trail" often becomes the only way to establish what did or did not occur. Contracts frequently acknowledge this fact by requiring a "writing" to effect a change or modification:

> *This contract shall not be changed, modified, or terminated and none of its terms or conditions shall be waived orally, but only in writing signed by the Owner and by an officer of the Contractor. A waiver at any time of any of the terms and conditions of this contract shall not be considered a modification, cancellation, or waiver of such terms and conditions.*
>
> Scott County (Iowa) Standard Specifications (2006)

As many of the cited commentators noted, construction projects seem to invite claims. Many of these are settled without the need for lawyers or third party intervention and few make it to the courts as reported decisions. Yet, it would seem that with all of the time and effort that goes into a project from concept to completion, both on paper and on the ground, ways could be found to further minimize the time and costs incurred in the dispute resolution process.

5.3 Improving the Front End Specifications

This Discussion section considers individual improvements to the Front End Specifications that will benefit the industry by reducing disputes and claims. Various families of Front End Specifications forms utilized in the construction industry are also discussed. Additionally, the benefits potentially available from a truly standardized set of

Front End Specifications are discussed in the context of the recently released ConsensusDOCS® library of forms.

As documented in the previous chapter, profitability suffers as a result of disputes and claims. Claims, though, are obviously not the only cause of increased costs and decreased profits. Many factors contribute to reduced profitability, including operational effectiveness and efficiency. These increased costs can be direct, such as salaries, or indirect, such as lost productivity due to implementation, training and new process and technique "learning curves." To the extent that these additional costs can be controlled or eliminated, efficiency and profits can be maintained with benefits to owner and contractor alike. One way these excess costs can be addressed is through consistency of process and the implementation of standards, a concept which cuts across virtually all industries.

While project types and sizes vary greatly, the Front End Specifications generally cover similar topics. The Front End Specifications map the administrative process. Much like mapping a travel route from point "A" to point "B", the Front End Specifications dictate a project's course from initiation (the Notice To Proceed date) through completion and the close out stage. Just as map reading is, for the most part, standardized and consistent, enabling different people to arrive at the same location, the same logic arguably applies to project administration. To the extent uncertainty and "customization" are eliminated, owners can reasonably expect lower costs associated with administering a project. Bubshait and Almohawis (1994, 133) stated the prospect clearly:

> One of the main advantages [of using standardized Front End Specifications] is the potential for improvement. By using the same standardized conditions over a long period of time, the clarity, fairness, and efficiency of the provisions will be tested, and areas of deficiency will be identified and subsequently corrected.

Even though the research documents that a majority of the participants believe the Front End Specifications are of the right complexity, that does not mean that simplification and standardization can not further improve the Front End Specifications. After all, roughly half of those surveyed responded that the Front End Specifications created problems. To the extent problems can be avoided (or resolved at the lowest level) costs will be reduced. While the AIA forms were a step in the right direction, going one step further is a major accomplishment; the ConsensusDOCS® library (discussed below) takes this to the next level.

To explain, the AIA forms are submitted to other organizations for their comments and "acceptance"; this limited "buy in" makes the forms appear to have widespread acceptance. For example, the Associated General Contractors (AGC) recognizes the usefulness of the AIA documents;[53] nonetheless, AGC has its own versions of the same document[54] and subscribes to the same belief as AIA, stating:

> The advantages of using industry-accepted standard form contracts are significant. If the standard form is an AGC form, industry experts—general contractors, owners, specialty contractors, construction law attorneys, and others—have collaborated in drafting it, an assurance that you have the best minds in the business crafting and scrutinizing each standard form. As a result, many industry viewpoints are weighed and considered, thereby ensuring an equitable balance of risks and responsibilities and an appropriate baseline for the parties' legal relationship.

While AIA and AGC have collaborated on their respective contract forms, they are not identical, leaving room for interpretation and dispute.

In the case of the AIA and AGC forms, while the designers and builders are "agreeing" on a standard form agreement for use by them with the owner, the owners are "not at

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[53] "This document has been approved and endorsed by The Associated General Contractors of America." *AIA 201-1997 General Conditions of the Contract for Construction*".

[54] See, for example, AGC 200.1.

the table" with either organization. In fact, one group of major owners (the Construction Owners Association of America) published its own "model" forms of construction contracts and specifications with some input from AGC. Yet another owners' group, the Associated Owners and Developers (AOD), which counts among its members such heavyweight companies as DuPont, Mercedes-Benz, Intel, Princeton University, Home Depot, and Marriott Hotels in addition to some major contracting firms, published its own "suggested" standard forms, which even before publication, "took on" the AIA forms as not representing the interests of owners (ENR 2002). Not to be left out of the debate, the American Council of Engineering Companies took a position between that of the AIA and the AOD (ACEC 2002). With numerous "standard" forms, it is clear that "standard" is not "standard":

> … substantially uniform and well established by usage in the speech and writing of the educated and widely recognized as acceptable.[55]

In what may ultimately prove to be a watershed event in the procurement of construction services, AOD recently published its own collection of sixty-two documents addressing all of the major project delivery methods (design/bid/build, design/build, *etc.*). Those documents were "developed through a collaborative effort of entities representing a wide cross-section of the construction industry" (AOD, 2007, cover page). Among the twenty endorsing organizations are the AGC, ABC, the Construction Industry Round Table, Construction Users Roundtable and COAA; without a doubt, these are entities with the power and resources to make things happen. Noticeably absent from the list of participants are the American Institute of Architects and representatives of the engineering disciplines. In the short term, there will be competing "standard" forms and Front End Specifications being utilized (likely even by ConsensusDOCS® participants) as owners transition from the traditional "standard form" documents to the ConsensusDOCS® offerings.

[55] Merriam-Webster's Online Dictionary.

The significance associated with the release of this library of construction forms cannot be overstated. While designers, and to a much lesser extent constructors, developed the contract documents utilized in obtaining both design and construction services, owners financed whatever issues arose as a result of drafting inconsistencies or bias in favor of one party or another. For the most part, owners (as a group) did not participate in the process and lived with the consequences as the designers and constructors navigated the process. With owners now taking the helm in the procurement process, designers have lost the ability to control the process using their own contract documentation. To be sure, designers will continue to have a strong voice in the development and construction process; to what extent those voices will be softened remains to be seen. Without question, though, the ConsensusDOCS® signatories are in the position of dictating terms that are much more favorable to owners, and which, due to the participation of AGC and ABC, should result in fewer claims on projects where the ConsensusDOCS® are utilized.[56]

The goal of the AOD effort is "identifying and utilizing best practices in the construction industry for standard construction contracts" (AOD 2007, 4). Incorporating the goals identified earlier, AOD 2007, 4) states

> By starting with better standard documents that possess unprecedented buy-in, you reduce your transaction time and costs in reaching final agreement.

AOD (2007) describes its efforts as follows:

> Currently there are a variety of construction associations that produce standard form construction contracts. However, standard contracts published by one association are perceived as ultimately favoring that association's membership. There is also a growing

[56] The participation of AGC and ABC is significant. AGC, a ninety year-old organization, claims to represent more than 32,000 construction firms in the U.S. (http://www.agc.org/cs/about_agc). ABC claims to represent an additional 25,000 firms. (http://www.abc.org/about_abc.aspx).

> industry frustration that heavily modified standard form documents hardly resemble the original text. Sometimes "modifications" are actually longer than the unrecognizable standard form.

Although not so stated, when taken in context with cited news releases, it is clear that the reference is to the AIA family of documents and the AIA Citator identified earlier. While protecting one's own interests is long-accepted behavior, the lack of balance in association published documents (AIA, EJCDC, *etc.*) was one justification in creating the new documents by AOD. In describing its efforts further, AOD (2007) makes the following statement:

> ConsensusDOCS® is the new choice in contract documents, because all the parties were invited to the drafting table and had a full vote in deciding final contract terms. All parties in a construction project deserve to work under a fair contract -one that they have confidence in because each of their respective associations had a true seat at the drafting table. The ConsensusDOCS® drafting process is similar to negotiations for a specific project contract. The drafting mantra was to represent the best interests of the project, rather than a singular party. At all times, the contracts employ best practices and fair risk allocation for all of the parties. Consequently, these contracts focus on yielding better project results and fewer disputes. This unprecedented effort is the most significant industry development in the last 20 years. The diverse buy-in amongst all parties will literally transform the industry.

As noted, neither the AIA nor the engineering organizations have endorsed the ConsensusDOCS® efforts or product specifications. Given an architect's role in a project, and that most architects initially get involved in the concept design stage, the opportunity for "full" buy-in (that is, from concept to completion) is not yet accomplished. Similarly, the absence of support by the engineering discipline potentially undercuts utilization of the ConsensusDOCS® library "across the board."[57]

[57] Even in the absence of the AIA and the engineers, the twenty members of the AOD have the power to impose the use of ConsensusDOCS merely by refusing to utilize other contract forms. The AOD document family includes agreements for architects and engineers; only time will tell if AOD members utilize those forms exclusively after a reasonable transition time.

A significant departure of the AOD family of documents from those of AIA and others is the integration of the Front End Specifications (referred to by the ConsensusDOCS® as the General Conditions) into the contract itself rather than presenting them as a standalone document. This benefits the participants by eliminating one major document, different versions of which are in common circulation, and also simplifying the "precedence of documents" analysis.[58] While lawyers frequently draft custom agreements with the Front End Specifications included as part of the contract document itself, none of the standard form agreements has done so until now. The resulting document is a more comprehensive basis for effecting the project (AIA, 1997).

While this may seem a subtle point, the effects could be significant. To anyone who has worked with standard form documents, the need to "jump" between documents for details or answers and the potential for unreconciled differences (and sometimes contradictions) invites omissions and confusion. To the extent that such problems survive quality assurance overview, disputes and claims can arise. Every step that eliminates uncertainty improves the prospects for minimizing and eliminating claims.

Another major departure from common standard form documents is the recognition that the contractor is under no mandate to discover design errors or omissions (AOD 2007). This results in risk residing with the party best able to handle it, the designer, and should result in fewer disputes resulting from undiscovered defects.[59] Along that same line, the contractor is now able to rely on worksite information provided by the owner and enumerates the owner's obligations in that regard (AOD 2007). The effect of this provision should be to eliminate disputes as to what information was actually provided and what information was implied. Information explicitly provided should not be debatable; that which is alluded to is always going to be subject to interpretation. Where

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[58] "Precedence of Documents", the order of reference, is defined in the glossary.

[59] This is not a new concept. See, for example, Jergas & Hartman (1996) and Zack (1995).

there is uncertainty, having the party best able to handle a risk area retain responsibility for it should result in reduced claims.

Similarly, the ConstructDOCS® document contains explicit provisions governing the schedule of work (including delays and changes), items identified in the study as contributing to disputes and claims. These provisions are not dramatically different from those contained in other standard form agreements. What is different is that, for the first time, leaders in the construction industry (absent the designers) have agreed on a library of consistent and coordinated documents. To the extent that the effort is successful, all parties should benefit. To be sure, this is not something that will occur quickly. While the private sector could transition to the AOD documents in short order, public agencies likely need to wait for enabling legislation, regulations and guidelines.[60]

Considering these points in context, it is a fair question to ask if one standard set of Front End Specifications is necessarily better or worse than another. To a great extent, the answer lies in one's perspective: for an architect seeking maximum authority with minimal responsibility, then compared to the AIA endorsed forms, the ConsensusDOCS® are seen as a "worse" selection. To an owner wanting to regain control of its projects, balance the playing field, and minimize the potential for claims, then the ConsensusDOCS® are potentially "better" than a set of forms advocated by designers or contractors. To the constructor which felt that its voice was not heard in the development of the AIA or EJCDC documents, the ConsensusDOCS® forms are likely more attractive. If that constructor is a member of AGC or ABC, its organization participated in the creation of the ConsensusDOCS® and its views (at least at the national level) are to some extent incorporated in those documents.

[60] As owners in their own right, states and municipalities have no obligation to utilize any particular form of document other than their own.

5.4 Towards Uniform Front End Specifications

Without reference to the AOD form set and based on earlier draft versions of this study, the author conducted a short follow-on survey to determine if there might be third-party interest in "Uniform Front End Specifications." More targeted than the initial survey, the survey request was sent to the "Claims & Disputes Resolution" and "Planning & Scheduling" committees of AACEI. These recipients were chosen based on the cross-section of owners, designers, contractors and consultants who are members of these two groups; a total of 375 persons were invited to participate.

The question posed was straight-forward:

> *Do you think that the mandatory use of a truly standardized Uniform Front End Specifications (that is, endorsed by owners, designers, contractor and subcontractors alike) would reduce claims and disputes on projects? The UFES would not necessarily be identical for public and private works. Why or why not?*

Responses were received from seventeen individuals representing designers, contractors and consultants. The majority (twelve) said that the UFES would (or could) reduce claims, though none provided an unqualified endorsement of the concept. Virtually all of the participants expressed concerns regarding variations in state and federal laws as a reason why the concept was possibly unworkable; a number of people pointed out (quite correctly) that getting all of the various participants to agree on one or more uniform standards would be a not insignificant challenge.[61]

No contract document can override statutory or court-made law. Every contract, whether issued by a private owner, trade association, or public agency (federal or state)

[61] Release of the ConstructDOCS® suggests that the challenge has been significantly addressed.

is subject to the law. Even with the "standard forms" now in circulation and use (AIA, CMAA, *etc.*), enforcement of the provisions will always be governed by legal requirements. Yet, no set of standard forms, including the UFES concept, discusses state or federal laws other than by requiring compliance.

Courts, though, always look first at the document itself, using what is known as the "four corners" test: does the document (for these purposes, the Front End Specifications) address the issue and provide the necessary guidance to enforce the contract; that is, is it complete?[62] By providing guidance and interpretations governing the underlying transaction (*i.e.*, the project) no "outside" input as to meaning and procedure is necessary.[63] Thus, standard forms serve that very valuable purpose, albeit with varying degrees of success; it is that level of success that the UFES would attempt to improve.

Looking at some of the comments made by study participants offers some insight into how construction professionals individually view both the Front End Specifications in general and the potential UFES specifically:[64]

> *I absolutely agree that mandatory use of a true set of GC's and GR's would assist in reducing claims and disputes on projects over the long run. For the same reason that mandatory use of the FAR clauses helps prevent many issues (because everyone involved knows clearly the intent of each provision, we are left arguing only over facts) use of a similar set of GC's and GR's would help outside the Federal sector.*
>
> *… once the UFES would be established sufficiently that all parties and their people would know the provisions, and there would be sufficient experience with resolution of disputes under their provisions to establish how the UFES should be interpreted, there*

[62] Courts and lawyers refer to this as a "rule of interpretation". See, for example, *Mitchell v. Lath* (Ct. of App. of N.Y, 247 N.Y. 377) – strict construction approach, and *California Public Interest Research Group, et al. v. Shell Oil Company*, 840 F. Supp. 712, 716 (N.D. Cal. 1993).

[63] This is referred to as the use of "extrinsic" evidence.

[64] All of the comments (with identity of authorship removed) are contained in Appendix V.

should be a reduction in claims and disputes. … The benefits of the true standardization could derive from more comprehensive use of any of the construction contract document sets currently available.

Even the most clearly written and understandable clause can come into dispute when people are pushed against a wall on a project that has issues. [However, i]f you are dealing with the same parties (contractors, owners, subcontractors, etc.) doing the same type of work then unified specifications like you describe is a positive for continuity.

… a consistent spec would create less confusion and possibly result in claims being addressed better during the project.

The one advantage I see with a UFES standard is that it would help create consistency with the relationship in which owners, designers and contractors work; however, I can see this working only on small projects.

I think the use of a standardized UFES would be highly effective in reducing disputes and claims on a project because it would contain a good prospective specification …

The use of a UFES certainly could avoid some claims and disputes merely because the people in the project may know what is contained in them.

The use of mandatory, truly standard UFES would indeed reduce claims and disputes on projects. Why change the rules of the game every time we play? (Emphasis added: why indeed?)

As noted earlier, not everyone agreed with the concept of the UFES:

I don't think using a mandatory UFES would reduce claims and disputes on projects …

I'm doubtful that the use of a UFES system would result in any meaningful reduction in claims. Consider that most claims involve disputed extra work, delays and acceleration, differing site conditions, failure to make payment, etc. UFES would help identify a uniform approach to resolving the claims but wouldn't prevent the claims from arising in the first place.

I think it will increase disputes. It may reduce claims in the area that you thought of ahead of time and stuck your finger in the hole

> *in the dike; but there's always something you didn't think of (like whack-a-mole).*
>
> *… specs do not cause claims to occur. The specifications may define the outer boundaries of the battleground, but the disputes are brought onto the battlefield, and only affected in certain ways by the terms of the contract.*

Even the naysayers acknowledge that standardization helps define boundaries and provide a uniform approach to resolving claims. One person summed up the benefits quite well, in the author's opinion:

> *Here is the thing about standardization – we standardize things so that we can reduced* [sic] *errors (by the contractor and the owner) and to reduce costs.*

The same person went on to state the following:

> *In addition, standardizing GC's – like using the AIA 201, reduces both the time it takes to review the specs, (generally because the estimators know where the killer terms are located and look for them in the Special Conditions) it also reduces uncertainty and hedging against uncertainty in the bidding process.*

Reviewing the narrative comments points out that people have preconceived beliefs as to why claims occur. These beliefs likely reflect each person's own experiences with the topic as well as his or her exposure through topical literature and interaction with other industry members. Paralleling the initial survey results, this second group acknowledged the role of the Front End Specifications in claims, though not unanimously or uniformly. As a group, the participants believe that standardization would be of benefit, mirroring the statements of the ConsensusDOCS® mission statement.

This second survey was conducted approximately three months after the public release of the ConsensusDOCS® library of standard forms. None of the participants mentioned

the ConsensusDOCS® documents release. This suggests that it will take time for the industry to become aware of the documents.[65]

With the ongoing introduction of the ConsensusDOCS® to the industry, comparisons to the existing published documents is inevitable. To provide some basic comparison and analysis, we take a look at selected provisions of the AIA A201-1997, EJCDC 700 and the comparable ConsensusDOCS® form. This is by no means a comprehensive in-depth study; rather, the purpose is to provide a side-by-side comparison to demonstrate relevant differences in the respective documents a with focus on the same (or similar, as the case may be) provisions highlighted earlier. Consider the specifications addressing the as-built and record drawings (Table 5.1).

Table 5.1: As-built and Record Drawings[66]

AIA A201-1997	EJCDC 700	ConsensusDOCS®
3.11.1. The Contractor shall maintain at the site for the Owner one record copy of the Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to record field changes and selections made during construction, and one record copy of approved Shop Drawings, Product Data, Samples and similar required submittals. These shall be available to the Architect and shall be delivered to the Architect for submittal to the Owner upon completion of the Work.	6.12.A. CONTRACTOR shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Written Amendments, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to ENGINEER for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to ENGINEER for OWNER.	3.14.4 Record copies of the following, incorporating field changes and selections made during construction, shall be maintained at the Project site and available to the Owner upon request: drawings, specifications, addenda, Change Order and other modifications, and required submittals including project data, samples and shop drawings.

Each of these provisions requires the contractor to maintain and provide a set of record drawings. Only the AIA provision specifically requires that the documents be "current."

[65] The ConsensusDOCS have a much broader coverage than the UFES. As proposed by the author, the UFES was limited to the front end specifications only; the ConsensusDOCS library includes agreements and goes far beyond the UFES's proposed scope.

[66] The AIA document is the 1997 version. AIA only recently released (in late 2007) a revised edition which is not in wide use as this is written.

The inclusion of that language suggests marking up documents contemporaneously as the changes are made; in practice, this is what happens. The practical effect of these provisions is the same: the contractor provides an annotated/marked- up set of contract documents as the history of the project. The language of the AIA and EJCDC documents makes their usage mutually exclusive; the ConsensusDOCS® language would work whether an architect or engineer, or both, were engaged on the project since the obligation is to provide the information to the owner.[67] The scheduling provisions (Table 5.2) present similar issues:

Table 5.2: Schedules

AIA A201	EJCDC 700	ConsensusDOCS® 200
3.10.1 The Contractor, promptly after being awarded the Contract, shall prepare and submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall not exceed time limits current under the Contract Documents, shall be revised at appropriate intervals as required by the conditions of the Work and Project, shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work.	2.07 Unless otherwise provided in the Contract Documents, at least ten days before submission of the first Application for Payment a conference attended by CONTRACTOR, ENGINEER, and others as appropriate will be held to review for acceptability to ENGINEER as provided below the schedules submitted in accordance with paragraph 2.05.B. CONTRACTOR shall have an additional ten days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to CONTRACTOR until acceptable schedules are submitted to ENGINEER. (Other related provisions (2.05, 2.07, 6.04) not included.)	6.2.1 Before submitting the first application for payment, the Contractor shall submit to the Owner, and if directed, its Architect/Engineer, a Schedule of the Work that shall show the dates on which the Contractor plans to commence and complete various parts of the Work, including dates on which information and approvals are required from the Owner. On the Owner's written approval of the Schedule of the Work, the Contractor shall comply with it unless directed by the Owner to do otherwise or the Contractor is otherwise entitled to an adjustment in the Contract Time. The Contractor shall update the Schedule of the Work on a monthly basis or at appropriate intervals as required by the conditions of the Work and the Project.

The AIA document requires the proposed schedule to be prepared and submitted for the owner's and architect's "information" while the other documents require approval by the engineer or owner. The AIA document requires a "prompt" submission; the EJCDC requires submission at least ten days before the first payment application; the ConsensusDOCS® requirement is for submission prior to the first application for

[67] The likelihood of contemporaneous usage occurring is possible on a multi-prime job.

payment. Each of these presents potential problems. The language addressing weather issues shown in Table 5.4.3 below highlights the problem.

Table 5.3: Weather

AIA A201	EJCDC 700	ConsensusDOCS® 200
4.3.7.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated and had an adverse effect on the scheduled construction.	12.03 Where CONTRACTOR is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of CONTRACTOR, the Contract Times (or Milestones) will be extended in an amount equal to the time lost due to such delay if a Claim is made therefore as provided in paragraph 12.02.A. Delays beyond the control of CONTRACTOR shall include, but are not limited to, acts or neglect by OWNER, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.	6.3 If the Contractor is delayed at any time in the commencement or progress of the Work by any cause beyond the control of the Contractor, the Contractor shall be entitled to an equitable extension of the Contract Time. Examples of causes beyond the control of the Contractor include, but are not limited to, the following: … adverse weather conditions not reasonably anticipated; …

With the EJCDC provision, the engineer can hold up payments until receiving a schedule that meets with approval; at what point does that affect the "means and methods" of the contractor? Only the ConsensusDOCS® language specifically addresses the issue of relieving the contractor when the owner directs the contractor to proceed differently. It will be interesting to see how this language is interpreted over the years ahead.

Both the AIA and EJCDC documents recognize weather delays as grounds for an extension of time and require the contractor to file a claim to obtain that relief. The ConsensusDOCS® language is not adversarial, acknowledges the contractor's right to an equitable extension of the contract time, and on its face, appears to be a more balanced approach to resolving a frequently occurring situation. This is likely the result of the inclusive nature of the document's creation by the endorsing entities, a distinct departure from how the AIA and EJCDC documents are drafted.

Looking next at the schedule of values requirements, Table 5.4, each provision requires the contractor to prepare and submit its allocation of the contract value. The AIA specification is stricter, requiring substantiation; each provision, though accomplishes the same goal of having a tracking metric for project performance and costs.

Table 5.4: Schedule of Values

AIA A201	EJCDC 700	ConsensusDOCS® 200
9.2.1 Before the first Application for Payment, the Contractor shall submit to the Architect a schedule of values allocated to various portions of the Work, prepared in such form and supported by such data to substantiate its accuracy as the Architect may require. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Application for Payment.	2.07.A.3. … CONTRACTOR's schedule of values will be acceptable to ENGINEER as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.	9.1 Within twenty-one (21) Days from the date of execution of this Agreement, the Contractor shall prepare and submit to the Owner, and if directed, the Architect/Engineer, a schedule of values apportioned to the various divisions or phases of the Work. Each line item contained in the schedule of values shall be assigned a value such that the total of all items shall equal the Contract Price.

The progress payment specifications are compared in Table 5.5.

Table 5.5: Progress Payments

AIA A201	EJCDC 700	ConsensusDOCS® 200
9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment for operations completed in accordance with the schedule of values. Such application shall be notarized, if required, and supported by such data substantiating the Contractor's right to payment as the Owner or Architect may require, such as copies of requisitions from Subcontractors and material suppliers, and reflecting retainage if provided for in the Contract Documents.	14.02.A.1 At least 20 days before the date established for each progress payment (but not more often than once a month), CONTRACTOR shall submit to ENGINEER for review an Application for Payment filled out and signed by CONTRACTOR covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that OWNER has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect OWNER's interest therein, all of which must be satisfactory to OWNER.	9.2.1 The Contractor shall submit to the Owner and the Architect/Engineer a monthly application for payment not later than the __ Day of the calendar month for the preceding thirty (30) Days. Contractor's applications for payment shall be itemized and supported by the Contractor's schedule of values and any other substantiating data as required by this Agreement. Payment applications shall include payment requests on account of properly authorized Change Orders or Interim Directed Change. The Owner shall pay the amount otherwise due on any payment application, as certified by the Architect/Engineer, no later than twenty (20) Days after the Contractor has submitted a complete and accurate payment application, or such shorter time period as required by applicable state statute. The Owner may deduct from any progress payment amounts as may be retained pursuant to Subparagraph 9.2.4

The end result is the same with the contractor having to submit documentation verifying amounts due; only the AIA form may require notarization, a meaningless requirement.[68] Only the ConsensusDOCS® language includes an obligation on the owner to pay within a specified time of receipt of the payment application. Both it and the AIA specification address the owner's right to withhold retainage; the EJCDC specification is silent on the point

[68] Notarization only verifies the identity of the signatory; it does not verify the accuracy of the contents.

The use of uniform FES has a number of demonstrated advantages. Yet, the success of moving in that direction is not without hurdles. As this is written, the ConsensusDOCS® pose both risks and unknowns. For example, The ConsensusDOCS® are untested. Thus, even with the input from owners and contractors, there are no guarantees that the language will be accepted without challenge on any given project. Given that the designers (architects and engineers) did not participate in the development of the documentation, resistance to the use of the ConsensusDOCS® is very possible and their objections will have to be addressed in one way or another. It could turn out that the uniform FES documentation is more suitable to one type of work than another, e.g., tilt-up construction versus high-rise residential. Few lawyers accept standard form documentation "as-is"; to what extent such modifications will affect and impact the use, and usability, of such documents is unknown. While private owners are free to use whatever form of FES and contract documentation they choose, public owners are often limited by law. Thus, some legislation could be necessary for a willing public owner to use the ConsensusDOCS® materials.

To summarize, uniform FES have the potential to reduce both costs and disputes and claims by eliminating the uncertainty that exists on comparable projects. It will take some time for uniform FES to get into circulation and be utilized. Once significant usage of uniform FES such as the ConsensusDOCS® has occurred, the actual impact of such utilization should be determined by way of empirical study.

An analogy is the adoption by many states and local jurisdictions of the National Electrical Code and the Uniform Building Code without modification. A designer need only be familiar with one set of requirements and a contractor should know what is expected. With such conformity, there is less likelihood of mistakes being made and contractors should realize some cost savings through the use of consistent processes.

Finally, one place where this can begin is in the public sector. It would be to a

community's advantage to standardize on the FES it uses in all departments. Use of the same FES eliminates the need for recurring reviews from project to project and allows contractors and suppliers to anticipate those requirements. The same course of action by cities, counties and at the state level should provide the same benefits.

Eliminating disputes and claims saves both taxpayers and contractors money and that's a good thing. Prior to the ConsensusDOCS®' release, owners and contractors complained about the bias of the AIA documents, in particular, in favor of the architect. This was noted earlier in this study and in the information which accompanied the release of the ConsensusDOCS® documentation. Under that scenario, architects had much authority but less responsibilities toward either the owner or the contractor, a point which the ConsensusDOCS® attempts to rectify. How this will actually play out remains to be seen. One strong advantage of the ConsensusDOCS® is the broad support provided by a large number of endorsing entities. With increased buy-in comes deeper awareness, support, and presumably, utilization.

In concluding this discussion regarding the development of Uniform Front End Specifications, it seems clear that there are potential benefits to such a document both at the "front end" of a project (estimating) and in possibly reducing claims.[69] However, it is too soon to know if the consensus approach to Front End Specifications, as envisioned by the ConsensusDOCS® forms, will be successful and reduce claims.

5.5 Suggestions for Future Research

Potential research topics that emanate from the present research include:

- What percent of claims, based on final outcomes, arise from the FES.
- Of the FES discussed, which of those represent the root cause of a claim.

[69] One person responded with " … one would think uniform contract requirements should be the Holy Grail." A little strong possibly, but not inconsistent with some of the other comments.

- Beyond the size of the company, does the type of company affect the role of FES in claims generation.
- Beyond the estimates provided by respondents, what actual economic return would result from eliminating or minimizing FES-based claims.
- The present study could be replicated with behavioral measures, including costs and claims, rather than rely on the memories and perceptions of participants.
- How cross-cultural factors affect the rate of FES claims.

Additionally, some topics touched upon in this research yield some additional research possibilities:

- What are the effects of ConsensusDOCS® on disputes and claims across states, localities, and types of construction projects, from school construction and supermarket construction, to bridge construction and hospital construction.
- Investigation of effective techniques for reducing the perceived complexity of regulatory requirements.
- Might benefits result from the compilation of a uniformed Front End Specification database towards reducing claims resulting from the Front End Specifications.

Without a doubt, the most beneficial future research should focus on the Holy Grail of the construction industry: a project free from disputes and claims, accomplished on time and on budget. To be sure, many, many projects are completed without a major "hiccup": the project is completed in line with the original expectations such that neither the public nor the courts are aware of any negative aspects. Others may have the results determined quietly by a private tribunal (such as an arbitration panel). Still others, such as the Central Artery/Tunnel Project (the "Big Dig"), grab the headlines with their respective problems.

Eliminating, or to the extent possible minimizing, issues with the Front End Specifications might well be accomplished by following a very simple formula:

> Contract Documents. During the design phase of a construction project, an owner's ideas, concepts and project requirements are transformed into detailed plans and specifications that will be used by the contractor to construct the project. It is important that an owner, in conjunction with the architect/engineer, exercise the utmost care and consideration when making decisions early in the design phase to minimize the impact of any disputes on project progress.
>
> Proper planning and careful review of project plans and specifications can substantially minimize the likelihood of disputes and provide a basis for timely resolution of any problem that may occur.
>
> It may be advisable for the owner to establish an independent contract document review team that will review the project documents as a whole. The contract review team should look for ambiguities, inconsistencies and conflicts in the project documents. Persons not involved in the preparation of the original documents may provide a fresh look and be better able to identify deficiencies in the documents than the people who prepared them (Ness 2000, p).

Proper planning and review can only help improve the process, because the more eyes on a plan, the higher the likelihood of catching errors and omissions and thereby reducing disputes and claims, a concept well-established in the engineering profession. Determining methods to foster proper planning and review on the front end will benefit all parties by reducing claims in construction.

5.6 Conclusions

The present research findings document that claims from Front End Specifications impose significant costs on the construction process. From this research, it is clear that various Front End Specifications have a tendency to lead to, if not result in, claims and disputes which remain unresolved at the completion of the project. In reality, no project is truly complete until all outstanding matters, including unresolved claims, have been

addressed and concluded. It should go without saying that the additional effort to resolve these matters cost money and distract from other business efforts.

The industry would be well served by the use of consistent, balanced Front End Specifications which eliminate uncertainty, confusion and complexity. To what extent the ConstructDOCS® can successfully meet this goal remains unknown. The strong backing of the ConstructDOCS® library holds strong promise for widespread adaption.

It appears that participation in partnering, and addressing Front End Specification issues prior to the start of construction, is beneficial. To be sure, not every issue can be anticipated prior to the project's start; yet, investing the necessary time and effort into understanding the Front End Specifications, and getting clarification early on, should result in claims avoidance from these provisions.

Cooperation and communications between the parties is the key to improved project success.

Appendix A

General Background Review

Not all that long ago, owners hired builders to construct bridges, factories, commercial and residential structures with not much more than a set of basic drawings. However, numerous societal and legal events have brought about an environment in which structures must be safer and more complex. Building and fire codes, brought about by serious and deadly tragedies, compelled owners and their contractors to provide life-safety elements while elevators and ventilation systems allowed us to build larger, higher and denser structures. In order to obtain the envisioned design and construction results, architects and engineers developed more comprehensive drawings and detailed written specifications. As projects became more complex, the supporting drawings and specifications, out of necessity, became more detailed: operable windows gave way to ventilation systems, subject to air change requirements and strict temperature controls. Simple "lifts" operated by individuals begat automated, high-speed, programmable conveyances. Progress: certainly, but at an increase in complexity. As a result, with each new advance, designers are compelled, or feel compelled, to communicate their thoughts and intent into more and more detailed information, often increasing the level of complexity.

While the designs and their components continued to challenge builders, owners (for the most part) turned projects over to the designer and builder, expecting only to receive a finished, functional, operational facility at project completion. The owner was generally indifferent to the sequence in which the builder performed, expecting only that the job be completed. So long as the contract price was not exceeded, the owner did not concern itself with issues of cost accounting, task durations or whether one aspect was five percent more than budgeted while another was three percent less than expected.

Fast forward to the present. Constructors must focus as much on administrative matters as on the construction itself. Monthly, if not more frequently, reports on schedule compliance, budgetary and estimation adherence and justification for twenty-four hour delays seem to consume vast amounts of time, attention and financial resources. Owners often believe that constructors spend more of their time generating change order requests than they do completing the underlying project and, indeed, some contractors are known more for their claims prowess than for their construction expertise.

In an attempt to address these issues and potential areas of abuse, the construction industry developed rules for these concerns and included them in the contracts for construction as well as within the technical specifications for the project. This "front-end" language dictates how the constructor will schedule the job, report on its progress, and communicate with the owner and its agents to the point where it is arguable that the constructor's role is almost robotic. While it is frequently stated that the contractor is responsible for the "means and methods" of construction, it is not unusual for the means and methods to be set forth in the specifications. Nevertheless, even while dictating how the constructor is to perform one or more aspects of the work, the owner or designer, or both, contractually disclaims responsibility for those same means and methods.

It should not be hard to accept that in the not so distant past, owners and builders dealt on the basis of handshakes; indeed, the concept of the master builder was based on the premise that the owner, in essence, described what he or she wanted and the constructor both designed and constructed the project. As the state-of-the-art progressed and projects became more complex, the ability of the owner to describe the end result became more difficult and the need for better communications developed. As the role of architects and engineers expanded, the communication tool similarly expanded: simple drawings became dozens, if not hundreds, and in some cases thousands, of pages. Concurrently, the need to provide detailed descriptions beyond what graphics and pictures could describe became a necessity and these written specifications (especially in commercial and industrial projects) became paramount.

Of course, with increased complexity comes the opportunity for increased

mistakes so it was not unexpected that the need for increased quality assurance also arose. The mechanics of the QA/QC process were embedded in the written specifications; while the constructor always had (and still has) primary responsibility for insuring that the project is constructed as designed, the specifications often dictated inspection criteria and frequently the need for the constructor to utilize the services of a third-party inspection entity.

Similarly, and reflecting the ever-increasing subscription to the doctrine that "time is money", owners began substituting their own construction schedules in lieu of the contractor's own time estimate: projects are now often put out for bid with the project duration specified in the bid documents. Presumably, the person developing the project duration has the skill and expertise to develop a realistic schedule. How, though, one can assume the sequence of construction without actually planning the job for execution is often a mystery and which leads to a large number of claims, as is discussed below. Nonetheless, owners assume that the successful contractor will build the project in the time allotted, regardless of the reasonableness of that assumption.

Appendix B

ASA Seminar Discussion

In an effort to determine if the proposed research premise has any justification beyond CMAA, a simple (and admittedly non-scientific) survey was conducted by the author during a claims avoidance presentation and training session he conducted at the American Subcontractors Association's 2005 Business Forum and Convention in Orlando, Florida on March 17, 2005. In the opening minutes of the workshop, the attendees (totaling 24) were asked the following series of questions:

How many of you believe that the contract or specifications language itself causes a claim or potential claim situation?

Twenty-two (22) responded "Yes".

How many of you believe that the contract language creates the potential or actual problem?

Twenty (20) responded "Yes".

How many of you believe that the Division One (General Conditions or "front-end" language causes the potential or actual problem?

Seven (7) responded with "Yes".

Which of the following clauses (noted as being offered in random order) cause significant problems?

Schedule updating (15 of 24 responded "yes")

Change directives (22 of 24 responded "yes")

Change order process (18 of 24 responded "yes")

Payment application process (6 of 24 responded "yes")

Disputes process (16 of 24 responded "yes")

Notice provisions (16 of 24 responded "yes")

Submittal process (15 of 24 responded "yes")

Again, while this "survey" most certainly does not qualify as a defensible inquiry, it does suggest that the topic area warrants research.

Before moving into the session's discussion of the various topics, the group was asked two additional questions:

> *What, in your (i.e., the group's) opinion, is the cause of claims? (The intent was to elicit discussion points for the workshop, rather than resulting in any kind of ranking.) The responses, as recorded, were:*
>
> Specifications
> Scope of work
> Customer Expectations
> Incomplete plans
> Lack of knowledge
> Lack of coordination
> Poor communications
> No follow through
> Scheduling and sequencing
> Out of scope work
> Cost increases
> Accidents and incidents
>
> The final question for the group was *"What, in your opinion, would do the most to avoid claims?*
>
> "Not work"
> "Be on the same page"
> Proper planning and set up
> Improved communications

It is interesting that while the first set of questions suggested that various document provisions "caused" construction claims, the group's responses to the penultimate question only identified two causes directly driven by either the contract or specifications language, the specifications themselves and the scheduling and sequencing issue. It must be further noted that the attendees (with one exception, an attorney) were all subcontractors and may have had one or more claims experiences which added some bias to their perspectives. Nonetheless, and the proposed research will address, claims are a part of the construction process. Possibly, though not presumably, the "survey" results would have differed if the mix had included owners, prime contractors and or construction managers; again, the proposed research will include those groups.

Appendix C

Survey Question Reviewers

The survey questions were submitted to the following individuals for review prior to initiating the research:

James E. Koch, PhD
Washington University in St. Louis

Roger W. Liska, Ed D
Clemson University

V. Paul Kelemen, PhD
Northlake College

Frank Giunta, PE, SVP
Hill International

Charles Bolyard, PSP
President & CEO
McDonough Bolyard Peck

William DuVall, PE
Skanska

Graham Myers
Bechtel Corporation

Appendix D

Survey Questions

General Demographics

How would you best describe your agency or business?

- Federal Agency
- State Agency
- Municipal Agency
- Not-for-profit Agency
- Private Entity

If you are a private entity, please categorize (for statistical purposes only) the size of your business:

- Large (annual revenues in excess of $100,000,000/year
- Medium (annual revenues between $10,000,000 and $100,000,000)
- Small (annual revenues less than $10,000,000/year

If you are a private entity, are you a member company/subsidiary of a larger company?

- Yes
- No

Since January 1, 1995, has your agency or business been involved (in any role) in a construction project which generated one or more claims or disputes that was not resolved prior to completion of the project? (For purposes of this survey, "completion of the project" should be deemed to be the point at which the final undisputed payment was made to the prime or general contractor.)

- No
- Yes

  If your answer to the preceding question was "No", your participation in the balance of the survey will not be required. Please be sure to submit your answers as they are statistically significant to the survey. Thank you for your time.

Please state the number of construction projects in which your agency or business has been involved in since January 1, 1995, approximating if necessary.

- 1-50
- 51-101
- 101-200

- 201-300
- More than 300 construction projects

Of the total number of projects included in your preceding response, how many had an initial contract value (determined prior to issuance of the Notice to Proceed) of:

- Less than $100,000
- $100,001 to $1,000,000
- $1,000,001 to $10,000,000
- $10,000,001 to $50,000,000
- More than $50,000,000

For all of the projects included in your response to Question No. __, how many involved claims or disputes involving:

- The technical plans and/or specifications
- Claimed defects/mistakes in the plans and/or specifications
- The non-technical specifications for the project such as procedural or administrative requirements. (These would be of the nature most often addressed in Division 01 of the CSI Master Format or in a comparable format.)
- Jurisdictional disputes
- Other

The following questions are intended to elicit your claims experiences with certain non-technical specifications generally found in most engineering, construction and construction management agreements and specifications. For each enumerated item, please identify the frequency (expressed as a percentage of the time) with which each resulted in a claim or dispute that was not resolved prior to completion of the project, as defined earlier.

For clarity, it is possible that there will be overlap between topics below. The purpose of these questions is to develop some guidelines as to how survey participants identify the various claim/dispute areas in which they've been involved. Claims in the amount of less than $1,000 should not be included in your responses.

- Summary (Scope) of the Work:
    - 1-20%
    - 21-40%
    - 41-59%
    - 60-79%
    - 80-100%

- Allowances:
    - 1-20%
    - 21-40%
    - 41-59%

    - 60-79%
    - 80-100%

- Measurement & Payment:
    - 1-20%
    - 21-40%
    - 41-59%
    - 60-79%
    - 80-100%

- Alternates/Alternatives:
    - 1-20%
    - 21-40%
    - 41-59%
    - 60-79%
    - 80-100%

- Coordination:
    - 1-20%
    - 21-40%
    - 41-59%
    - 60-79%
    - 80-100%

- Field Engineering:
    - 1-20%
    - 21-40%
    - 41-59%
    - 60-79%
    - 80-100%

- Regulatory Requirements:
    - 1-20%
    - 21-40%
    - 41-59%
    - 60-79%
    - 80-100%

- Abbreviations & Symbols:
    - 1-20%
    - 21-40%
    - 41-59%
    - 60-79%
    - 80-100%

- Identification Systems:
    - 1-20%
    - 21-40%
    - 41-59%
    - 60-79%
    - 80-100%

- Reference Standards:
    - 1-20%
    - 21-40%
    - 41-59%
    - 60-79%
    - 80-100%

- Special Project Procedures:
    - 1-20%
    - 21-40%
    - 41-59%
    - 60-79%
    - 80-100%

- Project Meetings:
    - 1-20%
    - 21-40%
    - 41-59%
    - 60-79%
    - 80-100%

- Submittals:
    - 1-20%
    - 21-40%
    - 41-59%
    - 60-79%
    - 80-100%

- Scheduling Specifications/Requirements:
    - 1-20%
    - 21-40%
    - 41-59%
    - 60-79%
    - 80-100%

- Other Project Control Requirements:
    - 1-20%
    - 21-40%

    - 41-59%
    - 60-79%
    - 80-100%

- Contract Closeout:
    - 1-20%
    - 21-40%
    - 41-59%
    - 60-79%
    - 80-100%

How Would You Rate Each of the Following General Requirements Specifications:

- Summary (Scope) of the Work:
    - Too Simplistic
    - Of Acceptable Complexity
    - Too Complex
    - Not Required

- Allowances:
    - Too Simplistic
    - Of Acceptable Complexity
    - Too Complex
    - Not Required

- Measurement & Payment:
    - Too Simplistic
    - Of Acceptable Complexity
    - Too Complex
    - Not Required

- Alternates/Alternatives:
    - Too Simplistic
    - Of Acceptable Complexity
    - Too Complex
    - Not Required

- Coordination:
    - Too Simplistic
    - Of Acceptable Complexity
    - Too Complex
    - Not Required

- Field Engineering:
    - Too Simplistic
    - Of Acceptable Complexity
    - Too Complex
    - Not Required

- Regulatory Requirements:
    - Too Simplistic
    - Of Acceptable Complexity
    - Too Complex
    - Not Required

- Abbreviations & Symbols:
    - Too Simplistic
    - Of Acceptable Complexity
    - Too Complex
    - Not Required

- Identification Systems:
    - Too Simplistic
    - Of Acceptable Complexity
    - Too Complex
    - Not Required

- Reference Standards:
    - Too Simplistic
    - Of Acceptable Complexity
    - Too Complex
    - Not Required

- Special Project Procedures:
    - Too Simplistic
    - Of Acceptable Complexity
    - Too Complex
    - Not Required

- Project Meetings:
    - Too Simplistic
    - Of Acceptable Complexity
    - Too Complex
    - Not Required

- Submittals:
    - Too Simplistic
    - Of Acceptable Complexity

    - Too Complex
    - Not Required

- Scheduling Specifications/Requirements:
    - Too Simplistic
    - Of Acceptable Complexity
    - Too Complex
    - Not Required

- Other Project Control Requirements:
    - Too Simplistic
    - Of Acceptable Complexity
    - Too Complex
    - Not Required

- Contract Closeout:
    - Too Simplistic
    - Of Acceptable Complexity
    - Too Complex
    - Not Required

- Which contract form do you encounter most often on your projects?
    - AGC
    - AIA
    - EJCDC
    - CMAA
    - Owner, Designer or CM-created
    - Contract documents created by/for your own organization
    - None

- With Reference to the General Requirements (Front End) Specifications only, Do You Believe that the Use of Performance-based Requirements Would Lead to More or Fewer Disputes Involving Those Topics:
    - More Disputes
    - Fewer Disputes
    - No Difference

Resolution of Claims and Disputes

Of the claims and disputes that were not resolved prior to completion of the project, what percentage was resolved by:

- Negotiation Between the Parties (without utilizing attorneys):
    - 1-20%
    - 21-40%

- 41-59%
- 60-79%
- 80-100%

- Negotiations Involving Attorneys:
  - 1-20%
  - 21-40%
  - 41-59%
  - 60-79%
  - 80-100%

- Formal Mediation (Using a neutral third party):
  - 1-20%
  - 21-40%
  - 41-59%
  - 60-79%
  - 80-100%

- Arbitration:
  - 1-20%
  - 21-40%
  - 41-59%
  - 60-79%
  - 80-100%

- Other Alternative Dispute Resolution Method (mock trial, etc.):
  - 1-20%
  - 21-40%
  - 41-59%
  - 60-79%
  - 80-100%

- Litigation Settled Before Trial:
  - 1-20%
  - 21-40%
  - 41-59%
  - 60-79%
  - 80-100%

- Judgment After Trial:
  - 1-20%
  - 21-40%
  - 41-59%
  - 60-79%
  - 80-100%

- Prior to Any Claim or Dispute Arising, Had a Formal Partnering Session Been Conducted:
    - Yes
    - No

Costs of Claims and Disputes

- For Non-Private Agency Entities, Including All Indirect Costs (that is, included in your normal costs such as salaries, etc.), What Is Your Estimate of the Additional Costs (expressed as a percentage of the total) That Resolving Claims and Disputes Cost:
    - 1-20%
    - 21-40%
    - 41-59%
    - 60-79%
    - 80-100%

- For Private Businesses, and Including All Indirect Costs (that is, included in your normal costs such as lost time, salaries, etc.), What Is Your Estimate of the Additional Profit (expressed as a percentage of the total) That You Would Have Retained Had There Been No Claims or Disputes on Your Projects:
    - 1-20%
    - 21-40%
    - 41-59%
    - 60-79%
    - 80-100%

Thank you for your participation in this survey. If you have any additional comments regarding the General Requirements Specifications that you'd like to offer, or if you'd be willing to participate in a telephone interview regarding this subject, please email sjhymes@wustl.edu.

Again, many thanks for your valuable time.

Appendix E

Sample Front End Specifications Documents

AppV.1: Washington University in Saint Louis

AppV.2: Rochester Institute of Technology

Appendix E.1: Washington University in Saint Louis

GENERAL CONDITIONS:
FACILITIES CONTRACTS

DEPARTMENT of FACILITIES
PLANNING and MANAGEMENT

Washington University – St. Louis
One Brookings Drive
Campus Box 1036
St. Louis, MO 63130

CONTENTS:

GC-1 DEFINITIONS/AUTHORITY

Terms used in the Contract Documents are defined:

A. "Contract Documents": The Contract Documents consist of the Agreement between Owner and Contractor, these General Conditions, Drawings, Project Manual and Specifications, addenda issued before execution of the Agreement, other documents listed in the Agreement, and modifications issued after execution of the Agreement. A modification is a written amendment signed by both parties, a change order, a construction change directive, or a written order for a minor change in the Work issued by the Architect/Engineer.

B. "The Contract": The Contract Documents form the Contract for construction and represent the entire integrated Agreement between the Owner and Contractor, and shall not be construed to create a contractual relationship of any kind between any parties other than the Owner and the Contractor.

C. "The Work": The Work comprises the completed construction required by the Contract Documents and includes all labor necessary to produce such construction and all materials and equipment incorporated in such construction.

D. "Owner": Washington University, a Missouri corporation. The work shall be under the general administration and subject to the inspection of the Administrator of Facilities Planning and Management, or his representative, and these are the only persons authorized to represent the Owner. The term Owner's Representative means the Administrator of Facilities Planning and Management.

E. "Architect/Engineer": The Architect or Engineer is the person lawfully licensed to practice architecture and/or engineering in the state of Missouri, identified as such in the Owner Contractor Agreement, and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The terms Architect and/or Engineer mean the Architect and/or his authorized representative. The Architect and/or Engineer and/or a designated construction coordinator, will be the representative of the Administrator of Facilities Planning and Management during construction and until final payment is due. The Architect and Engineer will have authority to act on behalf of the Owner only to the extent provided in their contract with the Owner.

F. "Contractor": The person, firm, or corporation with whom the contract is made by Owner.

G. "Subcontractor": A person, firm, or corporation, supplying labor and materials, or only labor for work at site of the project for and under separate contract or agreement with Contractor.

H. "Furnish": Purchase and deliver to the project site, complete with each and every necessary appurtenance, all as part of the contract work.

I. "Install": Coordinate delivery schedule; unload and handle from the delivery point at the project site; put into field storage as required; field assemble, if necessary; mount in position (with rigging, if necessary); connect and perform all other operations necessary for proper functioning, all as part of this work.

J. "As-Built Documents": Drawings and other records that are maintained to record all conditions which exist when the building construction is completed. This includes both the elements of the project itself and existing elements that are encountered during the course of project construction.

K. "Shop Drawings" are drawings, diagrams, illustrations, charts, brochures, and other data that are prepared by Contractor or any Subcontractor, manufacturer, supplier or distributor, for some portion of the work.

L. "Samples" are physical examples furnished to illustrate materials, equipment or workmanship, and to establish standards by which the work will be judged.

M. "General Conditions": The standardized contractual provisions describing the responsibilities, rights and relationships of the Owner and Contractor under the construction contract. Washington University provides a line for the General Contractor to list the cost of general conditions in the form of bidders proposal. The percentage identified on this line is to be used to calculate the value to provide general conditions for changes to the contract. The value is determined by multiplying the percentage for general conditions identified in the form of bidders proposal times the sum of approved material and labor costs associated with the change to the contract.

GC-2 CODES, PERMITS, LAWS AND REGULATIONS

A. All workmanship and materials used under this contract shall be in accordance with all local, city, state and national codes which may be applicable.

B. Contractor shall comply with all applicable laws, ordinances, rules and regulations of all authorities having jurisdiction over construction of this project. Where requirements of the Contract Documents differ from laws, ordinances, rules, regulations, orders, the Building Code or the requirements of authorities having jurisdiction, the more stringent requirements shall govern.

C. Contractor shall at his own expense, procure and maintain all licenses, permits, inspections and approvals necessary for the execution of the work. The Contractor shall include the time required to maintain permits in his project schedule. **The Washington University project number and project manager shall be indicated on the permit application.**

D. Contractor shall at his own expense, pay all fines and penalties which may be levied by authorities having jurisdiction over construction of this project for violations of building codes, building permits, licenses, inspections and approvals, including the penalty for starting construction without a permit.

GC-3 CONTRACT DRAWINGS AND SPECIFICATIONS

A. Information given in the Contract Documents is as exact as could be secured, but its extreme accuracy is not guaranteed. Contractor must, therefore, examine the locations carefully and verify all measurements, distances, elevations, clearances, etc., before starting work.

B. Contractor shall, upon discovery and before proceeding further, notify Architect or Engineer in writing, of any latent conditions differing materially from those indicated in the Contract Documents or unknown unusual physical conditions at the site. Architect or Engineer may, in writing, order changes in the work within the general scope of the contract.

C. Specifications and drawings of the Contract Documents shall be considered as mutually explanatory and any work required by one, but not by the other, shall be performed as if required by both.

D. The drawings indicate diagrammatically the desired arrangement and approximate location for the items of equipment, circuiting, piping and ductwork. In some instances, components have been distorted and/or exaggerated to avoid confusion. The entire installation is to be made in such a manner to avoid obstructions, preserve headroom, keep openings and passageways clear, and to overcome local difficulties, interference with structural conditions and coordination with other trades.

E. Measurements, dimensions, equipment space requirements, etc., shall be verified by Contractor. Contractor shall assume responsibility for proper installation and coordination of equipment in the space available. Work, which may be specified but not completely detailed on the drawings, shall be installed as dictated by common practice or as directed by Architect or Engineer.

GC-4 AS-BUILT DRAWINGS

A. Contractor shall maintain on-site and submit for approval of Owner's Representative upon completion of the work, a complete set of "As-Built" drawings and specifications of the Contract Documents which clearly show with dimensions any variation from working drawings in the installation of materials and equipment.

B. On-Site Requirements: Contractor shall maintain a complete bound set of all drawings, specifications, addenda, approved shop drawings, change orders and other modifications of the Contract Documents for inspection at any time by Owner's Representative. Contractor shall mark up the on-site set each day to record measurements, changes and deviations from the design and additions and deletions thereto, as approved, as well as existing facilities encountered in the course of the work, which are not shown on the drawings. It is mandatory that the on-site set of record drawings be kept up-to-date by Contractor.

C. Form of Submittals: "As-Built" drawings submitted by Contractor to Architect or Engineer for approval shall be red-lined prints, fully marked up to show all changes approved by Change Orders, approved Field Change Requests or changes approved by Owner's representative.

GC-5 ADMINISTRATION INSPECTION/AUTHORITY

A. The Administrator of Facilities Planning and Management and/or his representative is the only entity that will give orders and directions by authority of Owner under this contract. Contractor shall be responsible for any and all actions and omissions of all his employees and Subcontractors not so authorized.

(1) The Architect will not have control over or charge of and will not be responsible for construction means, methods, procedures, sequences or techniques, or for safety precautions and programs in connection with the Work, all of which are solely the Contractor's responsibility. The Architect will not be responsible for the performance of the construction contract(s), Work or products, or any defects, deficiencies, or effects resulting therefrom, of any Contractor, Subcontractor, manufacturer, supplier, fabricator, consultant, retained by the Owner, or any third party, including anyone working or acting on behalf of any of them.

B. Owner's Representative shall at all times, have access or Contractor shall provide facilities for access to the work whenever it is in preparation or progress. Owner's Representative shall be permitted and periodically will inspect all aspects of this contract including workmanship, materials, records, and other relevant items to determine the quality, acceptability and fitness of the work.

C. Owner's Representative may reject all workmanship and materials which do not conform with the intent of the Contract Documents, but failure to exercise power shall not be construed or held by Contractor as an admission on the part of Owner that the work, or any part thereof, has been faithfully performed in case the fact shall be otherwise.

GC-6 INTERPRETATION AND DECISION

A. Claims, disputes, and other matters in question relating to the execution of the work, progress, and/or interpretation of the Contract Documents shall be referred to a representative of the Administrator of Facilities Planning and Management for a decision.

B. Representative of the Administrator of Facilities Planning and Management or the Architect, or the Engineer, shall decide the meaning and intent of any portion of the Contract Documents where same may be in dispute.

C. All interpretations and decisions shall be consistent with the intent of the Contract Documents.

GC-7 CORRECTION OF WORK

A. Work covered contrary to the request of Owner's Representative shall, if required, be

uncovered and replaced at Contractor's expense.

B. Contractor shall uncover work for inspection at the request of Owner's Representative although the Owner's Representative had not specifically requested to observe said work prior to being covered. If the work is not in accordance with the Contract Documents, Contractor shall pay all costs. If the work is acceptable, Owner shall pay the cost of uncovering and replacement by change order.

C. Contractor shall promptly correct all work rejected by Owner's Representative whether observed before or after Substantial Completion.

D. All defective and non-conforming work shall be corrected to conform to the Contract Documents without cost to Owner.

E. If Contractor defaults, neglects to prosecute the work, and/or does not correct defective or non-conforming work, Owner may after seven days' written notice to Contractor and without prejudice to any other remedy he may have, make good such deficiencies. An appropriate Change Order shall be issued, deducting from the payments due Contractor, the cost of correcting such deficiencies. If the payments then or thereafter due Contractor are not sufficient to cover such amount, Contractor shall pay the difference to Owner.

GC-8 WARRANTIES AND GUARANTEES

A. Materials and Workmanship Warranty

(1) If within one year after the date of completion or within such longer period of time as may be prescribed by law or by the terms of any applicable special guarantee required by the Contract Documents, Owner finds any of the work to be defective or not in accordance with the Contract Documents, Contractor shall correct it promptly after receipt of a written notice from Owner to do so. Owner shall give such notice promptly after discovery of the condition.

(2) One-year warranty shall begin upon date of Final Acceptance and payment of retainage for work listed as uncompleted on Punch List at time of Substantial Completion.

(3) Defective work corrected by Contractor shall be warranted for an additional period of one year from date of Owner's acceptance of Contractor's corrections.

B. Landscape and Planting Warranty

(1) Warranty requirements are applicable to plant materials furnished by Contractor, planting materials installed by Contractor that are perennial or hardy, and to plantings which are part of the campus landscape, whether indoors or outdoors. This warranty requirement is not applicable to annual or seasonal plantings, which must be renewed on an annual basis.

(2) Contractor shall warrant plant material furnished and/or installed to be live and healthy, vigorous and thriving for a period of one year. If the one-year warranty expires in a dormant season, the warranty will be understood to extend into the next following growing season. Contractor, at Contractor's sole expense, shall promptly replace any plant material that is dead, moribund, not vigorous or thriving during the warranty period after receipt of the Owner's notice. Sod, seeding and ground cover planting wherever there is a bare spot or location 18 inches across in where there is not healthy, thriving grass or ground cover planting.

(3) Upon completion of the planting, Contractor shall furnish detailed written instructions for the Owner's care of planting materials.

(4) Contractor shall include all costs for warranty required by this section in the bid and such costs shall be part of the Contract Sum.

GC-9 PROGRESS PAYMENTS

A. Owner shall pay Contractor value of work in place and materials stored on site upon approval of Application for Progress Payments submitted by Contractor not more than once per month. The Owner will attempt to make payment within ten days of receipt of invoice to Contractors that have sub-contracted with MBE and WBE firms. Direct payment will be made to the MBE and

WBE firms. The application for payment shall be submitted on AIA Document G702 or it's equivalent with continuation sheets. The continuation sheets shall be complete showing individual lines for each specification section and contractor.

B. Owner shall retain ten (10%) percent of each scheduled value of each payment to contractor to ensure the proper performance of the contract.

C. With application for Progress Payment Contractor(s) shall furnish notarized waivers of lien for the value of the progress payment, and subcontractors and material suppliers shall furnish notarized waivers of lien for the prior progress payment, conforming to the requirements of Chapter 429 RSMo.

D. With Application for Progress Payment, Contractor shall submit a copy of the Construction Progress Schedule, which shall show the portions of the work claimed as completed for payment as related to the Schedule of Values. Application for payment shall show retainage as a line item for each scheduled value.

E. Storage of Materials Off site and Payment

(1) The Contractor and his Subcontractors shall obtain prior written approval from the Owner through the Architect for permission to store only materials to be incorporated in and made a permanent part of the Work, for which Progress Payments will be requested, at off site locations. Any and all charges for storage, including insurance, and any and all charges for transportation to the site shall be borne solely by the Contractor. Before approval, Owner requires that off-site materials be stored in an approved warehouse, with proper proof of insurance and a letter stating the following information.
   (a) The name of the Contractor and/or Subcontractor leasing the storage space.
   (b) The location of such leased space.
   (c) The leased area: the entire premises or certain areas of a warehouse giving the number of floors or portions thereof.
   (d) The date on which the material was first stored.
   (e) The value of the material stored.
(2) The Contractor and his Subcontractors shall notify the Architect and the Owner, at least once each month, to visit the warehouse where the materials are being stored.
(3) The Contractor and his Subcontractors shall mark each sealed carton with the name of the project and the Architect.
(4) A perpetual inventory shall be maintained for all materials held in storage for which payment has been requested.
(5) Payments for materials stored off site in an approved warehouse and insured shall be at the sole discretion of the Owner. Any additional costs to the Owner resulting from storage of material off site for which payment is requested, such as, but not limited to, travel expenses and time for inspectors, shall be back charged to, and paid by the Contractor. Title to materials stored off site shall be transferred to the Owner when the Owner pays for such stored materials.

F. All applications for payment shall be submitted on AIA document G702, Application and Certificate for Payment. Applications for payment shall reflect all items detailed in the approved schedule of values with corrections made for new items or Contractors as Work progresses.

G. On projects greater than ***$300,000*** in value, Contractor shall furnish a bound monthly project report with the Application for Progress Payment. The report shall contain the following information:

(1) A cover letter describing the general status of construction activities as they relate to the project schedule and description of activities anticipated during the next month.
(2) An activity report describing items completed during the month for each individual construction task. Include a log of daily weather conditions and temperatures.
(3) A manpower summary for the month indicating daily manpower levels for each contractor and trade.

(4) A minority report summarizing the daily workforce composition by ethnic group and gender for the month.
(5) A log of change requests.
(6) A log of submittals.
(7) A log of requests for information.
(8) All project meeting and conference call notes for the month.
(9) Engineers' certifications for the month.
(10) Four 8-inch by 10-inch color photographs of work progress recorded during the month.
(11) List of unresolved issues that may impede meeting project milestones or schedule.

H. In the event Contractor or any subcontractor tenders substitute security, the following shall apply:

(1) All such substitute security shall be solely in the name of "Washington University".
(2) Contractor at its sole cost shall cause all substitute security to at all times be held by a financial institution, title company or other third party custodian in the St. Louis, Missouri metropolitan area acceptable to Owner under terms which permit Owner to take immediate possession of any or all substitute security on demand at any time during normal business hours with or without cause.
(3) Contractor at its sole cost and as agent for Owner shall administer any and all substitute security as required by applicable law including without limitation making release thereof and payment of interest and income thereon to itself and/or to subcontractors as and when required by the Contract Documents and applicable law.
(4) Not less often than monthly, Contractor at its sole cost shall provide Owner a written certification and report of all substitute security itemized by subcontractor and in detail reasonably satisfactory to Owner.
(5) Contractor hereby agrees to indemnify, defend and hold harmless Owner and its trustees, officers and employees against any and all claims, demands or liabilities arising out of the negligent or otherwise improper administration by Contractor of substitute security and/or any negligence of the custodian.

I. Applications for Progress Payment shall not include costs for items that are not a direct expense of the work. Costs that are not authorized include, but are not limited to the following:

(1) Professional dues for contractors and their employees.
(2) Cumulative rental costs for equipment that exceeds their purchase price.
(3) Workers' Compensation Insurance credits – Credits given by the insurance company shall be reflected as a credit to the Owner.

GC-10 EXTRAS/CHANGES TO THE WORK

A. Owner, without invalidating the agreement, may order changes to the work and such changes will be authorized by Change Order (C.O.) to the Contractor. All changes shall be executed under the applicable provisions of the Contract Documents and all changes requiring an adjustment in the Contract Sum or Time of Performance must be evidenced by a C.O. signed by Owner, Architect and Contractor.

B. Within five working days of receipt of the request for Changes to the Work from Owner or Architect, Contractor shall provide Owner with an estimate as to the proposed change in the Contract Sum or Time of Performance.

C. The value of any Change to the Work which results in an addition/deletion to the Contract Sum shall be determined in one or more of the following ways, at the option of the Owner and summarized in accordance with the Owner's Code of Accounts, which is the C.S.I. format:

(1) By estimate and acceptance of a lump sum change to the Contract Sum.
(2) By unit prices named in the Contract or subsequently agree upon.
(3) By a Not-To-Exceed time and material cost-plus a percentage of Contractor's Overhead and Fee as applicable.

D. In order to arrive at the value for any change, Contractor shall credit Owner with it's project cost(s) excluding Overhead and Fee for any work which was previously included, but which has

been deleted by any such change.

E. For all changes, all such estimates shall be substantiated with a detailed break-down of quantities, units, prices, man-hours, wage rates, Overhead & Fee and similar details clearly showing how the Contractor's and Subcontractor's estimated costs were determined. The Owner reserves the right to audit all Contractor, Subcontractor and Vendor records and accounts pertaining to the Change in Work.

F. In the event of a reduction from the Scope of Work, a fair and equitable deduction from the Contract Sum shall be made, which deduction shall be based upon the costs Contractor would otherwise incurred, excluding the Overhead & Fee to which the Contractor otherwise would have been entitled.

G. No claims for any extra work or materials shall be permitted by the Owner, unless the work is ordered in writing by the Owner's Representative. Change Orders shall not be in an application for progress payment until approved by the Owner in writing.

H. In consideration of the project schedule, the Owner may at his option approve Changes in the Work to proceed while continuing to negotiate the cost of such changes, with the Contractor.

I. Change Order Allowances:

(1) In the event that fees for overhead and profit were not specified by the Contractor on the Form of Bidders Proposal, Change Order allowances for overhead and profit combined, included in the total cost to the Owner shall be based on the following schedule:
   (a) For the Contractor for work performed by the Contractor's own forces, fifteen (15%) percent of the cost.
   (b) For the Contractor for work performed by his Subcontractor, five (5%) percent of the amount due the Subcontractor.
   (c) For each Subcontractor or second tier Contractor involved, for any work performed by that Contractor's own forces, fifteen (15%) percent of the cost.
   (d) For each Subcontractor for work performed by that Contractor, five (5%) percent of the amount due the second tier Contractor.

J. Costs to which overhead and profit is to be applied shall be limited to the following: cost of materials, including sales tax and cost of delivery; cost of labor, including social security, old age and unemployment insurance, and fringe benefits requires by agreement or custom; worker's or workmen's compensation insurance; bond premiums; rental value of equipment and machinery; and the additional costs of supervision and field office personnel directly attributed to the change. Without limiting the foregoing, costs to which overhead and profit shall be applied shall not include additional time or expenses of project managers or other administrative or managerial personnel regardless of where services are preformed. Fees may only be applied to the straight time portion of overtime wage rates.

K. Costs for General Conditions will be allowed per the proportion as submitted in Base Contract Schedule of Values. General Conditions are only allowed to the Prime Contractor.

L. Contractor shall review all submissions for extras prior to delivering to Owner. This shall include verification of materials and labor hours.

GC-11 SUBSTANTIAL COMPLETION AND ACCEPTANCE

A. Contractor shall notify Owner's Representative upon completion of all work. Owner's Representative shall inspect the work to determine completion and acceptance.

B. Date of Substantial Completion shall be date on which Owner accepts the facilities, or any part thereof as may be agreed, as being sufficiently completed by Contractor to permit Owner's occupancy and utilization of the facilities for the intended purpose.

C. When required by the Contract Documents, Orientation by Contractor of Owner's

personnel shall precede acceptance of Substantial Completion.

D. After inspection and upon acceptance of Substantial Completion, Owner's Representative shall list uncompleted items and items to be corrected on a Punch List. Failure to include any items on such list does not alter Contractor's responsibility to complete all work conforming to the requirements and intent of the Contract Documents. Substantial Completion will not be accepted if Punch List items interfere with Owner occupying facilities or utilizing facilities for the intended purpose. Substantial Completion will not be accepted if all Punch List items cannot be completed or corrected by Contractor within thirty consecutive calendar days after Owner's Representative inspection.

E. If Owner shall determine that a subcontractor's performance has been substantially completed (including without limitation, that all of the same items described in subsection C of GC-12 below required for approval of Contractors Application for final Payment for the entire project, as such items relate to each subcontractor's work, are complete, and especially including without limitation that As-Built Drawings, O & M Manuals, Owners Orientation, Warrantees, Final Lien Waivers and Attic Stock relative to such subcontractor's work have been submitted to and approved by Owner) and if Owner further determines that such subcontractor can be released prior to substantial completion of the entire project without risk to the Owner involving such subcontractor's work, Owner shall, upon request by Contractor, release retainage as necessary to allow Contractor to pay such subcontractor in full. The foregoing shall be without prejudice to Owners right to hold and/or continue to hold sums (in addition to and not as retainage), following default, neglect to prosecute the work and/or failure to correct defective or nonconforming work by Contractor or such subcontractor, to protect Owners interest in satisfactory performance of the Contract.

(1) Within thirty (30) days following substantial completion of the project, all retainage shall be released by Owner to Contractor less an amount equal to one hundred and fifty percent (150%) of the amount determined by Owner to be the cost to complete any remaining items. The foregoing shall be without prejudice to Owner's right to hold and/or continue to hold sums (in addition to and not as retainage), following default, neglect to prosecute the work and/or failure to correct defective or nonconforming work by Contractor or any subcontractor, to protect Owner's interest in satisfactory performance of the contract.

F. Owner Occupancy

(1) A Certificate of Substantial Completion will be executed for each specific portion of the work to be completed prior to Owner occupancy.
(2) Obtain a certificate of Occupancy from local building officials prior to Owner occupancy.

G. Use and Occupancy Prior to Acceptance

(1) The Owner may fully occupy the facility as soon as it is substantially completed. No provision in this document shall be construed to prevent partial occupancy by the Owner so long as the partial occupancy does not materially affect the construction process.
(2) Contractor agrees that the Owner, upon advance notification to Contractor in writing, will be permitted to occupy and use any completed or partially completed portions of the project when such occupancy and use is to the Owner's best interest.
(3) If such prior occupancy increases the cost of the Work or delays in its completion, provided that the same occur prior to the completion date fixed in the "Notice to Proceed", and as amended by contract change orders, and provided that the Contractor submits written notification of such cost increase or time delay, the Contractor shall be entitled to extra compensation or extension of time, or both.
(4) In case of partial occupancy prior to the stipulated completion date, the Owner shall secure endorsement from the insurance carrier and consent of the Surety permitting occupancy of the

building or use of the project during the remaining period of construction.

(5) In case of partial occupancy after the stipulated date, the Contractor shall extend all necessary insurance coverage until Final Acceptance of the product. The Owner's use and occupancy prior to Final Acceptance shall not relieve the Contractor of his responsibility to maintain the insurance coverage required by the Contract Documents.

(6) In case of such partial occupancy, guarantee/warranty period called for by the Contract Documents shall not commence until Substantial Completion of all work under the Contract.

(7) Occupancy of the building or any portion thereof by the Owner shall not constitute an acceptance of the Work or portion thereof nor relieve the Contractor of Responsibility to perform any work required by the Contract Documents but not completed at the time of occupancy.

(8) The Contractor shall not be required to pay maintenance costs on the portion of the building occupied under this agreement, nor be responsible for the wear and tear or damage resulting from such occupancy.

(9) The Contractor will not be required to furnish heat, light and water used in the building or the portion of the building so occupied, without remuneration therefore in accordance with Net Cost plus Percentage method as defined in the CONDITIONS OF THE CONTRACT.

H. The Contractor shall be responsible for all costs to the Owner resulting from failure to meet the scheduled completion date. The costs for extended general conditions and storage, double handling, reshipping, etc. of Owner furnished furniture and equipment resulting from delayed completion shall be paid by the Contractor. An appropriate Change Order shall be issued, deducting from payments due Contractor, the cost of these and any other items necessitated by the delayed completion. If the payments then or thereafter due Contractor are not sufficient to cover such amount, Contractor shall pay the difference to the Owner.

GC-12 FINAL INSPECTION, ACCEPTANCE, PAYMENT

A. Contractor shall notify Owner's Representative when the Punch List has been completed. Owner's representative shall determine if the Work has been fully completed and so notify the Contractor.

B. Contractors application for payment of retainage shall be made after the date of substantial completion. Owner shall make final payment and/or release of retainage within thirty days of approval of Contractor's Application for Final Payment. Payment of retainage will be reduced 1.5 times the estimated value of all work judged to be incomplete or non-conforming.

C. Approval of Contractor's Application for Final Payment requires:

(1) Receipt and approval of Contractor's As-Built drawings and Vendors Instruction Manuals. Owner will hold five percent (5%) of each subcontract value (in addition to and not as retainage) until the delivery of As-Built Drawings and Vendors Instruction Manuals.

(2) Receipt of Contractor's notarized affidavit stating that all monetary obligations to suppliers of materials, services, labor, and all Subcontractors have been completely discharged and fulfilled. Owner will hold one percent (1%) of Contractors fees (in addition to and not as retainage) until delivery of affidavit.

(3) Receipt of release liens from Contractor and all Subcontractors and suppliers. Owner will hold one percent (1%) of all subcontract values (in addition to and not as retainage) until delivery of final lien waivers.

(4) Receipt of Consent of Surety to final payment by Owner to Contractor when Payment and Performance Bond is required by Instructions for Bidders of the Contract documents

(5) Receipt of all guaranties, warranties and instructions as called for in the Contract

Documents. Owner will hold one percent (1%) of all subcontract values (in addition to and not as retainage) until delivery of guaranties, warranties and instructions.

(6) Correction of all Punch List items determined in final inspection.

(7) Return of all keys issued to Contractor by Owner. Owner will withhold $100.00 for each key not returned at the time of submittal of Contractor's Application for Final Payment.

GC-13 EQUIPMENT AND MATERIALS

A. All equipment and materials required for installation under these specifications shall be new and without blemish or defect. All electrical equipment shall bear labels attesting to Underwriters Laboratories approval.

B. Name brands or manufacturer's model designations are listed in the Contract Documents to set a minimum acceptable standard of quality. The words "or equal if approved by Owner" are implied, if not expressly stated.

C. Where type or quality of material or equipment is not indicated, a first class standard article shall be furnished, subject to Shop Drawing approval.

D. All equipment of one type (such as fans, pumps, coils, fixtures, hardware, etc. shall be the product of one manufacturer, unless otherwise specified.

E. When particular manufacturer's products or processes are specified for an item of Work, any one thereof is acceptable for the Contractor to choose. However, the Contractor at his option may offer a substitute product or process that completely fulfills the requirements of the Contract Documents. Substitutions will be considered only if the Contractor submits a written request to the Architect, and only under the following circumstances.

(1) When the specified product or process is discontinued and not available from the manufacturer.

(2) When, if a guarantee of performance is required, and in the judgment of the Contractor, the specified product or process shall not produce the desired results.

(3) When such substitution, in the opinion of the Architect, is in the interest of the Owner.

F. Requests for substitution of products or processes other than those specified shall be submitted by Contractor in writing to the Architect. A request shall be accompanied by such drawings, specifications, samples, performance data, and other information as may be necessary to assist the Architect in determining whether the proposed substitution is acceptable. The burden of proof rests solely upon the Contractor. Each request shall stipulate the following items.

(1) The substitution is equal in quality and serviceability to the specified item.

(2) The substitution shall not entail changes in details and construction of related Work.

(3) The substitution shall be acceptable in consideration of the required design and architectural effect.

(4) The substitution shall not involve additional cost to the Owner. Credits to the Owner shall be described in an accompanying request for a Change Order.

(5) The Contractor shall waive all claims for additional costs that may subsequently become apparent for Work associated with the substitution. The Contractor shall be responsible for the affect of a substitution upon related Work in the Project and shall pay any additional costs including the Architect's and/or Engineer's additional services associated with a substitution.

(6) The Owner reserves the right to approve substitutions.

G. Regardless of the evidence submitted, or any review or independent investigation by the Owner or the Architect, a request for substitution of products or processes is a warranty by the Contractor to the Owner that such substitution meets the foregoing requirements.

H. Contractor shall furnish necessary appurtenances required for complete installation of materials or equipment furnished to Contractor by Owner.

Contractor shall furnish all items required for installation of Owner furnished equipment. Unless specified otherwise, Contractor's responsibility is to receive, store and install Owner-furnished equipment and materials.

GC-14 PURCHASE OF MATERIAL AND EQUIPMENT

A. Owner represents that it is exempt from sales tax. For the purchase of material and equipment the following procedure shall be observed:

(1) The University will furnish a Project Tax Exemption Certificate with the Universities purchase order in accordance with 144.062 RSMO to the General Contractor for a given project. The certificate is renewable for the given project at the option of Washington University and only for the purpose of revising the certificate expiration date as necessary to complete the given project. The Contractor shall furnish a copy of the "Washington University Project Tax Exempt Certificate" to all subcontractors, and any contractor purchasing materials shall present a copy of this certificate to all material suppliers as authorization to purchase, on behalf of Washington University, all tangible personal property and materials to be incorporated into or consumed in the construction of the project and no other on a tax exempt basis. Such suppliers shall execute to the purchasing contractor invoices billable to the contractor and bearing the name of Washington University and the project identification number.

GC-15 SHOP DRAWINGS AND SAMPLES

A. Contractor shall submit to Owner's Representative, for approval, six (6) copies of Shop Drawings and descriptive literature for all equipment to be furnished under this contract, for checking sizes, etc. of the equipment. All Shop Drawings shall be certified.

B. Contractor shall retrieve all Shop Drawings prior to submission to Owner's Representative and shall note any deviations from established requirements in writing. Any deviations not so noted, and any misrepresentations by means of omission of pertinent data, will be the responsibility of the Contractor.

C. Contractor shall be responsible for any errors in Shop Drawings.

D. Approval of Shop Drawings shall be for design and performance only. Contractor shall be responsible for dimensions, quantities, and coordination with other trades. Approval of Shop Drawings does not authorize changes to specification requirements.

E. Contractor shall not purchase any equipment until after approval of Shop Drawings and/or descriptive literature.

F. Shop Drawings shall be furnished for approval even though there is no substitution of the specified item.

G. Approval of Shop Drawings, or other information submitted in accordance with requirements specified, does not assure that Architect, Engineer or Owner attests to the dimensional suitability of the material or equipment involved or the mechanical performance of equipment. Approval of Shop Drawings does not invalidate the plans and specifications if in conflict, unless written request of such change is submitted by Contractor and approved by Owner's Representative.

H. Contractor shall submit samples in kind and number required by the Contract Documents, labeled and identified.

I. Immediately after award of contract, the Contractor shall submit a schedule of submittals to the Owner and Architect for review. The schedule of submittals shall fully define the intended date of submission for each and every submittal required by the contract documents. This schedule shall be revised as requested by the Owner. In no case shall the submission of the required documents extend beyond 25% of the project duration.

GC-16 SAMPLES AND TESTING

A. Materials used in the construction, particularly those upon which the strength or durability of the project may depend, shall be subject to testing to verify conformance with the Contract Documents and suitability.

B. Contractor shall provide samples of material in kind and quantity required for testing, labeled and identified, without additional cost to Owner. Contractor shall patch shall patch and restore after removal of in-place samples.

C. Owner, at Owner's for testing services, will provide tests of samples furnished by Contractor except that, if test results indicate non-conformity with the Contract Documents or non-suitability, subsequent tests required shall be the expense of Contractor including replaced or substituted materials. Contractor is responsible for coordinating with Owner's testing laboratories.

D. Mill tests, when required of metals, pressure tests and certification of piping and vessels, shall be at Contractor's expense.

E. Copies of all test reports and test summaries shall be submitted to the Owner, Architect and St. Louis County Department of public works code enforcement.

GC-17 CONTRACTOR'S WORKING CONDITIONS ON-CAMPUS

A. Parking:

(1) Contractor, Subcontractors and material suppliers shall at all times adhere to Owner's parking policy. Failure to abide with the Parking Policy shall be cause to remove the owner/driver of the vehicle from the project.

(2) Parking is only permitted in marked construction-parking zone spaces. Contractor permits shall be obtained and displayed to grant parking in the construction-parking zone. Vehicles parking in zones other than the specified construction-parking zone, using the contractor permit are subject to tow without prior warning. Contractors who display fraudulent University permits are subject to tow, fine Facilities action and possible criminal prosecution.

(3) At the Owner's option, the Contractor may be able to use the Owner's off-site parking. Contractors are requested to discuss this with the Owner's Representative prior to obtaining parking permits.

(4) Parking shall not be permitted in the following areas:
   (a) Fire Lanes
   (b) In the proximity of fire hydrants and stand pipes
   (c) On lawns or landscape areas
   (d) On or obstructing sidewalks, pedestrian crosswalks and handicapped curb cuts, loading zones and truck docks
   (e) On roadways or other paved surfaces which are not marked for parking
   (f) Any vehicle parking in "no parking" areas (inner walkway of campus, promenade, grassy areas, fire lanes, etc.) without proper authorization is subject to tow without prior warning.

(5) The Contractor is responsible for all parking fines incurred by employees, subcontractors and material suppliers.

B. Work Area

(1) Contractor shall confine his work to the area indicated on the drawing.

(2) The area for storage of material shall be the immediate area for construction or as agreed to/or provided by owner. Contractor shall order and accept delivery of materials for this project in such a manner so as to avoid an excessive amount of stored material.

(3) In entering, passing through or working in any such space in the existing facility in the performance of the work, Contractor shall at all times furnish and maintain proper protection for the existing property of Owner and other contractors working in the area.

(4) Any item damaged, marred or otherwise rendered unacceptable to Owner due to this work, whether protected or not, shall be replaced or repaired to Owner's satisfaction without cost to Owner. This includes, but is not limited to, such items as lawns and landscaping, paving, curbs,

underground utilities, floors, ceilings, walls, columns, brickwork, piping, insulation, interior spaces, equipment, fixtures, furniture, etc.

(5) Contractor shall be responsible to Owner for the acts and omissions of all his employees and all subcontractors, and all other persons performing any of the work under the contract.

C. Coordination /Access

(1) All work should be carried out in such a manner as to cause the least interference with Owner's continuous operation and/or the work of other contractors.

(2) At no time shall contractor hamper Owner's use of the existing facility. Corridors, doorways and exits, shall be kept free of all materials at all times.

(3) Campus Roadways and walkways shall remain open except if the Contractor is actively working at the location. Contractor shall furnish road plates, barricades, temporary guardrails, temporary pedestrian footbridges and overhead shelters, duckboards and any other installation to permit traffic and pedestrians to cross the work area safely.

(4) Contractor shall not enter or have access to any space in the existing facility in order to perform the work without first having given timely notice to Owner's Representative and other contractors so that necessary arrangements may be made to enter or have access to such space.

(5) All work carried out at the site is to be done in a neat, workman like between the hours of 7:00 AM and 6:00 PM, except in residential areas, which the hours of work shall be 9:00 AM to 5:00 PM, local time. Contractor's work outside of these hours, and on Saturdays, Sundays, and University holidays require advance approval and coordination by Owner's Representative.

(6) There will be a $100 deposit for each key requested by Contractor's personnel and subcontractors. A company check must be presented to Customer Service representing the amount for the number of keys requested. The check will be deposited into a holding account until all keys are returned. Once all keys are returned a University check will be issued for the deposit. If keys are not returned at the end of the project, the deposit will be forfeited.

(7) There will be a $10, non-refundable, production fee for all new contractor cards used for entering card access controlled buildings after hours and for accessing traffic control devices. All lost or stolen ID cards should be reported as soon as possible to the Washington University Police Department at 935-5555. There will not be a fee to replace stolen ID cards as long as a report has been filed with the WUPD, but all lost cards will have a replacement fee of $5.

D. Existing Utilities

(1) Contractor shall work in such a manner so as to avoid interrupting the operation of the existing utility systems, which would interfere with the continuous operation of the existing facility. If it becomes necessary to interrupt service to make a connection, alteration or relocation to same, Contractor shall prearrange same with Owner's Construction Coordinator and make connections, alterations or relocations at time directed.

(2) Contractor shall obtain Owner's approval five days prior to actual shutdown of any existing system required to facilitate installation of new work. Utility systems shall be restored to service immediately after Contractor completes his connection or at the end of the working day if required by Owner.

(3) Whenever the Contractor requests shutdown of a system or branch of a system to permit demolition, tie-in or extension, he shall first schedule the shutdown with the Universities Project Manager. The Contractor shall attach a tag to the valve, switch or disconnect with the following information written on it: Name of Contractor, Purpose of Shutdown, and Expected Resumption of Service.

(4) All systems shutdown by the Contractor are to be plugged, capped, disconnected or made safe by the Contractor in as short a period as possible and building services restored.

(5) Whenever reactivation of a system could possibly cause personal injury or damage to property and the valve or switch is out of the direct control of the Contractor, a second prominent tag "DANGER - DO NOT OPERATE" shall be attached by the Contractor. The tag shall the identity of the person responsible (person who places and who will remove the danger tag), the Contractor or Subcontractor and 24-hour emergency telephone number written on it. The danger tag procedure applies to any system that is to remain shutdown past the end of any shift. It is intended that only the person who places the tag shall remove it, although another Contractor's employee may assume responsibility by signing the tag.

(6) The Contractor shall remove all tags when the project is completed and the system reactivated.

(7) Contractor shall mark surface with limits of any required excavation and shall mark location of existing underground structures, utilities, services or sewers indicated by the Contract Documents. Contractor shall not commence excavation until Owner's Construction Coordinator and local telephone company have reviewed on-site, marked additional underground interference and have given to Contractor approval to proceed.

(8) If unknown interference is encountered, Contractor shall cease excavation, demolition, or other work until Owner's Representative has approved method of further work.

(9) Except for telephone, isolated connections, etc., on-campus utility systems are University-owned. Upon notice by Contractor, Owner shall make arrangements with public utility services as may be required by the Contract Documents. Contractor shall not order any utility services for Owner's account.

(10) Underground Warning Tapes

(a) General: Contractor shall install printed underground warning tapes in trenches of underground pipes, conduits, wires, etc., installed on the project. Tapes shall be of polyethylene film not less than 3.5 mils thick and not less than 2 inches wide. Tapes shall be installed not less than 12 inches and not more than 18 inches below finished ground surface. Tapes shall be vividly color coded with "Caution" and identification of the buried service printed on the tape at frequent intervals.

Acceptable sources of underground warning tapes:

EMED Company Inc.
Allen Systems, Inc.
Seton Name Plate Corp.
W. H. Brady Co. –
Sigmark Division

(b) Non-metallic Underground Warning Tapes: Contractor shall install non-metallic warning tapes in trenches for installation of metal pipes, conduits and buried cables.

UNDER-GROUND COLOR	SERVICE	EMED	SETON	BRADY	ALLEN
Red	Elec. Line	UT27727	210ELE	91295/ 91296	0751415
Yellow	Gas Line	UT27735	210GAS	91294	0751311
Yellow	Pipeline	UT35279	210PIF	---	0751324
Green	Sewer Line	UT27741	210sew	91299	0751512
Orange	Elec. Line	UT27742	210TEL	91297	0751116
Orange	CATV Line	---	210TCL	---	0751122
Blue	Water Line	UT27743	210WAT	91298	0751214

(c) Metallic Underground Warning Tapes:

Contractor shall install metallic warning tapes in trenches for installation of plastic pipes, plastic water pipes, clay or cement water lines, and sewer lines, fiberglass-reinforced plastic pipe, plastic, clay and concrete sewer pipes, fiber optic transmission lines, plastic, conduit, etc. All underground non-metallic lines of any length shall have metallic underground warning tapes installed in the pipe trench. Ends of rolls of metallic underground warning tapes shall be bonded mechanically. Shallow buried metallic underground warning tapes shall be detected easily by any commonly used metal detector before digging.

UNDER-GROUND	EMED	SETON	BRADY	ALLEN
Electric	MT27727	2ELE	91601	711315
Gas	T27735	2GAS	91600	711311
Pipeline	---	2PIF	---	711324
Sewer	MT27741	2SEW	91604	711412
Telephone	MT27742	2TEL	91602	711116
Water	MT27743	2WAT	91603	711214

(d) Approval and acceptance: OWNER shall locate the metallic underground warning tape using any or all of the OWNER'S metal detectors before the Contractor shall be permitted to claim 100 percent completion for installation of underground piping, conduits and cables on Schedule of Values.

E. Tools, Scaffolding, etc.

Contractor shall furnish all transportation, labor, apparatus, scaffolding, barricades, safety devices and utensils necessary for performance of the work according to the intent of the Contract Documents.

F. Cutting and Patching

(1) Contractor shall be responsible for the cutting and patching required. Under no circumstances shall any structural members load bearing walls footings, etc., be cut without previous written consent of Owner's Representative.
(2) All patching shall be done at Contractor's expense. Contractor shall use the respective trades for performing the work.
(3) Contractor shall use Hot Work Permits when cutting, grinding, welding, soldering and during other activities requiring the use of an open flame. The hot work area shall be monitored for 4 hours after the job is completed.

G. Patching shall be in accordance with the requirements of the Contract Documents and finished patch and all finishes shall exactly conform to surrounding finishes.

H. Removal of Rubbish:

(1) Rubbish shall not be allowed to accumulate on the site. The premises shall be left neat and clean at all times. Rubbish and debris shall be specifically removed at any time when so directed by Owner's Representative. No open burning will be permitted.
(2) Construction debris shall not be deposited in Owner's dumpsters and receptacles.
(3) Contractor shall dispose of construction debris, demolished materials, trash and rubbish in compliance with all applicable laws, ordinances and regulations at Contractor's expense.
(4) Owner reserves the right to salvage any fixtures, material or equipment included in demolition by Contractor by the Contract Documents. Owner's Representative shall notify Contractor that materials are to be salvaged. Contractor shall place salvaged materials on Owner's pallet at the edge of the construction site.

I. Clean up

(1) On completion of the work, all rubbish and debris shall be entirely removed by Contractor so as to leave the premises clean and ready for use by Owner. Area shall be left in a "broom clean" condition when completed for inspection. Carpeted areas shall be vacuumed.
(2) All equipment with removable or detachable panels, plates, covers, etc., shall be cleaned on the inside before the apparatus is turned over for use by Owner.
(3) All marred finishes shall be repaired, touched up or replaced by Contractor.

J. The Contractor shall be responsible for the proper fitting of all work and the coordination of the operations of all trades or material and equipment engaged upon the Work. Contractor shall be prepared to guarantee each of the Subcontractors, unless otherwise specified elsewhere in the Contract Documents, the dimensions which they may require for the fitting of their work to all surrounding work and shall do or cause the Subcontractors to do all cutting, fitting adjusting and patching necessary to make the several parts of the Work come together properly and to fit the work to receive or be received by that of other contractors.

K. The Contractor shall give his personal supervision to the Work or have a competent superintendent on the Work at all times during the progress of the Work, with the authority to act for him, and provide an adequate staff for the proper coordination and expediting of his work.

L. The Contractor shall lay out his own work and be responsible for all lines, elevations,

and measurements of the building, grading, paving, and other work executed under the Contract. He shall exercise proper precaution to verify the dimensions shown on the Drawings before laying out the work and will be held responsible for any error resulting from his failure to exercise such precaution.

M. The Contractor shall be in charge of the entire Work and shall be responsible for the prompt coordination of all trades, as well as the Owner's separate contractors if they are on the job during the Contractor's operations, and become full familiar with all work required under the Contract.

N. Care shall be given to the proper scheduling, delivery, and installation of items to be built into rough construction which will affect the latter portions of the work, such as anchors, pipe sleeves, inserts, conduit pipes, lugs, clips, brackets, braces, hangers, bolts, miscellaneous metal and similar items. The Contractor shall ascertain that all are properly installed in their correct locations at the proper time, so as to prevent cutting and patching of finished work.

O. The Contractor shall be fully responsible for coordination of General Construction work with that of Subcontractors for PLUMBING, FIRE PROTECTION, ELECTRICAL, HEATING, VENTILATION AND AIR CONDITIONING and other specialized trades. He shall investigate, together with the Subcontractors involved, the routing of pipe, ductwork, and conduit with particular attention to interference of structural members, other pipes, ducts, and conduit cuts, headroom conditions, door and window openings, and swings, pipe chases, and similar features of the building which may affect installation and proper functioning of such items.

P. Changes in design locations, which may be necessary in the routing of pipes and ducts, or in the location of any mechanical, electrical or other equipment, shall be anticipated and made prior to installation. Additional compensation will not be allowed for costs incurred as a result of the Contractor's failure to anticipate the necessity of such changes.

Q. There shall be no change or variation in ceiling height, wall layout, shaft, chase, furring or other dimension shown on Drawings, without the specific written approval of the Architect.

R. The Contractor's responsibility for the coordination of all work under the Contract shall be complete. Where the Contract Documents allow an optional material or method of performing a portion of the Work, or where the Contractor is ultimately allowed or directed to perform a part of the Work using a substitute material or method, the Contractor shall provide all other coordination and additional work that such change necessitates without any additional cost to the Owner.

S. Prepare Coordination Drawings where close coordination is required for installation of products and materials fabricated off-site by separate entities, and where limited space necessitates maximum utilization of space for efficient installation of different components. All Coordination Drawings, including section through shafts shall be at not less than 3/8-inch scale.

T. Coordination Drawings shall indicate the necessary offsets for all ductwork, piping, conduit, and other items to clear the work of all other trades and to maintain the required ceiling height and partition layouts.

U. If any space conflicts cannot be resolved by the Contractor, he shall immediately notify the Architect.

V. Architect's review of the Coordination Drawings shall not relieve the Contractor from his overall responsibility for coordination of all work performed pursuant to the Contract or from any other requirement of the Contract.

W. For construction, repair, demolition road use and other activities that produce particulate matter emissions, Washington University requires control measures as necessary, to minimize or prevent emissions from going beyond the limits of the work. These control measures vary depending on the project or activity involved, but include, at minimum, the following:

(1) Wetting of construction areas.
(2) Planting of vegetative ground cover.
(3) Maintaining clean construction sites, including prompt removal of dust, trash and debris.
(4) Paving or frequent cleaning of roads, driveways, etc.
(5) Minimize the size of excavation and volume of particulate matter that can be disrupted.

GC-18 RESPONSIBILITIES OF CONTRACTOR

A. Before submitting bid, Contractor shall visit the site to satisfy himself to the nature and scope of all work to be done. The submission of a bid shall be taken as evidence that such an examination has been made and difficulties, if any, noted. Later claims for labor, work, materials and equipment required for any difficulties encountered, which could have been foreseen, shall not be recognized, and all such difficulties shall be properly taken care of by Contractor at no additional cost to Owner.

B. Contractor shall carefully study the Contract documents and at once shall report to Owner's Representative any error, inconsistency, or omission therein.

C. All work shall be done to Owner's complete approval and there shall be no deviation from the Contract Documents without approval. Should any difficulty arise in installing the facility or its components, Contractor shall promptly report same to owners' representative.

D. Contractor shall review field conditions and consult existing drawings of the various facilities on the project, and shall so plan and execute his work as to minimize obstructions, and to arrange routings in the most efficient and effective manner.

E. All work shall be done under the personal supervision of Contractor. Contractor shall provide a competent project engineer and a competent superintendent, approved by Owner, who shall be at the construction site and working full time on this project for layout, direction, coordination, sequencing and all other required activities, for the entire duration of and until final acceptance of the work.

F. Contractor shall at all times enforce strict discipline and good order among his employees and shall not employ any unfit person or anyone not skilled in the task assigned to him. Contractor shall require compliance with all of Owner's rules, regulations, and direction by his employees and those of subcontractors. Owner may direct Contractor to remove any person from Owner's campus.

G. Contractor shall at all times take such precautions as may be necessary to properly protect his apparatus from damage during construction.

H. All work shall be done by thoroughly skilled and experienced personnel, and shall at all times be under the supervision of a competent foreman.

I. Where specialized systems are to be installed, the apparatus shall be positioned, coupled, connected, assembled, installed or otherwise mounted such that all work is performed fully in accordance with the manufacturer's and/or designer's recommendations.

J. Vendors Instruction Manuals:

(1) Requirement: Contractor shall furnish Owner all information available from manufacturers and vendors of all machinery, fixtures, equipment, systems and devices installed as required by the scope of work of the Contract.
(2) Information Required: Such information shall include, wherever applicable, but not to be limited to: manuals of recommended installation, operation and maintenance; parts diagrams and lists; lists of recommended spare parts and current parts' price lists; identification of local vendor or manufacturer's representative; certified vendor drawings, assembly diagrams, wiring diagrams, service pipe and duct connection drawings; setting and required clearance diagrams; curves, graphs, or charts of operating range with design point indicated; name plate rubbing (code vessels); manufacturer's certificates and

warranties; specifications for required utilities and services; finish product identification. Whenever equipment or machinery assembly incorporates controls, motors or other products of other manufacturers, information of the other manufacturer or supplier shall be included.

(3) Form of Submittal: Contractor shall furnish four (4) copies of vendor information, neatly bound in rigid binders. Information shall be divided in each binder by tabs into such divisions as will make the information readily accessible. Owners project number, Short Title and date of submittal shall be on the spine and front cover of binders. Submittal of Vendor's Manuals for approval shall be in accordance with that for Shop Drawings per Article GC-15.

(4) Retainage Withheld: Final payment of retainage will not be approved until the Owner has received all Owners' Manuals, approved as complete and final.

K. Orientation by Contractor

(1) Requirement: Contractor and each Subcontractor, wherever applicable shall inform Owner's operating and maintenance personnel of proper operation and maintenance of facilities installed as required by the scope of work of the Contract.

(2) Orientation: Contractor shall conduct an inspection of all parts installed as required by the scope of work of the Contract. Contractor shall explain functions of switches and valves; methods of shutting off systems; method of draining systems; source of utilities and services; access to covered valves, etc.; lubrication points and access; for servicing of equipment. Contractor shall describe lubricants, filters, fuses, etc., which he has installed for initial operation and inform Owner's personnel of when such should be replaced in normal operation.

(3) Demonstration: Contractor shall demonstrate operation and function of control systems, hazard warning and suppression systems, mechanisms, etc. Actual discharge of sprinkler or other emergency systems is not required for orientation.

(4) Substantial Completion: Orientation by Contractor is required before Owner will accept Substantial Completion.

GC-19 EQUAL EMPLOYMENT OPPORTUNITY

A. Hiring, Continuation of Employment and Promotion:

(1) Hiring, continuation of employment and promotion practices of Contractor shall comply with the nondiscrimination clause contained in section 202, Executive Order 11246, as amended by Executive Order 11375, relative to Equal Employment Opportunity for all persons without regard to race, color, religion, sex or national origin, and the implementing rules and regulations, prescribed by the Secretary of Labor and the provisions of section 504 of the Rehabilitation Act of 1973, prohibiting discrimination solely by reason of handicap.

(2) All Contractors, Subcontractors and suppliers for University construction projects are required to have an employee profile on file with the Department of Facilities. These profiles shall be updated annually and/or after a significant change in the composition of the Contractor/Suppliers work force.

B. Use of Minorities on Project

(1) Policy: In an effort to expand economic opportunities for all, Owner requests that the Contractor make an affirmative effort to secure participation of minorities and other underrepresented groups when bidding on construction products for the University. This request for minority participation consists of all aspects of the construction process including, but not limited to, contractors, subcontractors, material suppliers and the make-up of the on-site work force.

(2) Action Required: The Contractors bid shall include a statement about the degree of participation of minorities in the on-site work force, the dollar amount of subcontracting work let to minority-owned firms and the dollar amount of materials, which the Contractor will be ordering from minority-owned

businesses. The Contractor shall complete Section BF-10 of the Form of Bidder's Proposal, which calls for the identification of minority-owned firms participating in the Contractor's bid, the extent of that participation and the projected level of minority participation in the make-up of the on-site work force. The Contractor shall meet or exceed all levels of minority participation stated in section BF-10 of the Bidders Form of Proposal.

(3) Criteria: Owner will consider the extent of participation of minorities and under-represented groups as one of the criteria of awarding the contract.

(4) (a) Report Required for Long Form Contracts: The Contractor shall maintain a daily log of the on-site work force composition by hours worked in total and identifying hours worked per ethnic group and gender for each firm represented. The work force composition shall be summarized on a monthly basis. A monthly summary of cost of the project, which has been furnished or performed by a firm that is minority or woman owned, shall be maintained. A copy of the monthly summaries and daily log sheets shall be bound and delivered to the Owner with the monthly progress billing. This information is required of all contractors, even if their firm or project has no minority or woman participation.

(b) Report Required for Short Form Contracts: The Contractor shall submit to the Owner a summary of the project's on-site work force composition by hours worked in total and per ethnic group and gender. In addition, a summary shall be submitted of the cost of the project, if any, which can be designated as done by a firm that is minority or woman owned. This information is required of all contractors, even if their firm or project has no minority or woman participation, and must be submitted with the billing for work completed.

(5) Qualification Requirements: To be qualified for work at Washington University, all contractors and subcontractors shall have a completed Contractor Employee File on file with the Department of Facilities. These profile forms shall be updated on an annual basis. All contractors and subcontractors shall submit a written statement, describing the measures that they will take to ensure maximum minority and women participation on the project, with the Bidders Form of Proposal.

(6) Limitation: This section does not nullify Section IB-19 of the Instructions For Bidders concerning recommended subcontractors.

GC-20 JOBSITE SAFETY AND SECURITY

A. Contractor shall initiate, maintain and supervise all safety precautions and programs in connection with the work. This includes compliance with all applicable laws, ordinances, rules, regulations and lawful orders of any public authority for the safety of persons or property. Contractor shall designate a responsible member of his organization at the site whose duty shall be the prevention of accidents.

B. Contractor shall abate any real or potential hazard to Owner's students, personnel, campus visitors and property due to Contractor's activity or any site condition. Contractor shall abate such hazard immediately and before proceeding with any work and without notice of Owner's Representative.

C. Contractor shall provide, install and maintain adequate temporary safety devices to abate such hazards including temporary barricades, signs, warning lights, walkways, safety nets, fences, shields and any other devices appropriate to the situation.

D. Contractor shall provide personal protective wearing apparel and devices for authorized visitors to the jobsite as may be required by Contractor, applicable laws and regulations.

E. Contractor shall maintain an adequate first-aid chest on site for treatment of minor injuries.

F. Contractor is entirely responsible for security and safety of the site until it is turned over to Owner. Contractor shall take all necessary precautions, including, without limitation, the furnishing of guards, fences, warning signs, flags and the like, for the safety of, and the prevention of injury, loss and damage to, persons, and property (including without

limitation, members of the public, students attending the University, Owner's employees and agents, Architect, Engineer and his employees, Contractor's employees, his subcontractors and their respective employees, other contractors, their subcontractors and respective employees) on, about or adjacent to the site where the work is being performed.

G. OSHA Compliance: Contractor shall comply with all applicable Occupational Safety and Health Administration (OSHA) rules and regulations for safety and health in construction projects in accordance with 29 CFR Part 1926.

H. Washington University has adopted the St. Louis Council of Construction Consumers "Model Substance Abuse Testing Specification". All contractors, subcontractors and material suppliers are required to meet the requirements of this policy. For additional information on this policy, contact Dennis Lavallee at (636) 394-6200.

I. Smoking shall only be permitted in designated smoking areas, which have been coordinated with the Owner. Smoking is not permitted within the footprint of Washington University buildings.

GC-21 HAZARD COMMUNICATION

A. Owner and Contractor shall comply with 29 CFR 1910.1200 and 1926.59.

B. Contractor shall provide a Material Safety Data Sheet (MSDS) to the Owner's Safety Office for each chemical and compressed gas brought onto the Campus of Washington University. Hazardous materials may not be used without prior coordination with the Safety Office. Contractor must make provision for adequate ventilation when using volatile materials such that University students, employees and visitors are not exposed to any chemical hazards. Adequate protection for the employees using the hazardous materials shall be provide by the Contractor.

B. Contractors working in areas containing University chemicals or hazardous materials or in ducts that exhaust hazardous chemicals shall contact the Owner's Safety Office to obtain information regarding the hazards of the chemicals and recommendations for personal protective equipment.

D. No chemical materials shall be disposed of in University trash containers. Contractors shall dispose of materials brought into the University in accordance with all federal, state, and local laws and regulations and University Disposal Policy.

E. Hazardous materials such as asbestos, asbestos products, polychlorinated biphenyl (PCB) or other toxic substances shall not be allowed on the site nor be used in the Work. The Contractor shall notify the Owner if any of the products or materials specified in the Contract Documents or proposed by the Contractor or its Subcontractors or material suppliers or encountered on the job site contain or are reasonably believed to contain hazardous materials in any form, so that a qualified consultant retained by the Owner can determine whether such materials may be used in the work or need to be removed from the site or rendered harmless in a manner which will not adversely affect the health of any persons and which will comply with applicable governmental laws and regulations.

F. Asbestos-Containing-Material: Replacement of Thermal Insulation

(1) Applicability: This section is applicable to all projects which have as their scope abatement of Asbestos-Containing-Material by removal of thermal insulation from pipes, vessels, ductwork, and the like. It is also applicable to all projects that have asbestos abatement as part of the project's scope of work.
(2) Requirement: The Contractor who removes asbestos-containing thermal insulation shall replace the insulation removed with non-asbestos-containing material. Replacement of thermal insulation is part of the scope of work of all asbestos abatement projects (and abatement portions of all other projects) whether or not replacement is specifically stated at any other place in the Contract Documents.
(3) Exceptions: Any exception to the requirement that the Contractor shall

replace thermal insulation removed on the project must be specifically stated in the Contract Documents.

G. Submittal: Contractor shall submit proposed replacement insulation material information, including the manufacturer's technical information and recommended method of installation, along with the Contractor's calculation of heat loss and proposed thickness. Submittal shall be in accordance with that for Shop Drawings per Section SC-2 of the Project of the Contract Documents.

H. Asbestos-Containing-Material: Sampling

(1) Applicability: This section is applicable to all projects that have as their scope abatement of Asbestos-Containing-Material. It is also applicable to all projects that have asbestos abatement as part of the project's scope of work.
(2) Requirement: The Contractor who removes Asbestos-Containing-Material shall deliver a two-ounce (volume measure) sample of the Asbestos-Containing-Material completely saturated and or covered with water, properly labeled and with identifying Project Summary to the Asbestos Abatement Administrative Assistant in the Department of Facilities Planning & Management. The Contractor shall deliver a sample from each different type of Asbestos-Containing-Material abated from the project area.
(3) Format of Samples: The Contractor shall obtain the University's required sample containers, container labels and Project Summary forms at the beginning of abatement work from the Asbestos Abatement Administrative Assistant in the Department of Facilities Planning & Management, as well as instructions for sealing, labeling and reporting.
(4) Retainage Withheld: Final payment or final payment of retainage will not be approved until the Contractor has submitted samples, all necessary close-out documentation and Project Summary to Owner and until Owner has accepted and approved the Contractor's submittals.

H. If asbestos or some other hazardous substance is suspected or encountered but not created on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately report the condition to the Owner and Architect in writing. The Contractor shall stop work only in areas where work cannot progress safely while utilizing reasonable precautions. The Owner shall be responsible to verify the presence or absence of the material or substance reported by the Contractor and, if present, to verify when the material or substance has been rendered harmless.

GC-22 BUILDERS RISK INSURANCE

A. Contractor shall maintain Builder's Risk Insurance on 100 percent completed value basis on the project to cover the Work in progress and materials stored on-site preparatory to being incorporated in the Work. The Contractor's Builder's Risk policy shall also cover loss or damage to materials while in transit, or stored off-site. Owner shall be named as an Additional Insured on the Contractor's Builder's Risk policy.

B. A copy of the Contractor's Builder's Risk policy shall be filed with Owner not less than five (5) days prior to commencement of the Work. If the project will be added as an endorsement or certificate to a Master Builder's Risk policy, a copy of the master policy shall be submitted to Owner as part of the project bid documents. The policy shall state:

(1) Washington University is Additional Insured.
(2) Insurer waives any right of recovery against Owner and/or Architect.
(3) Contractor's insurance is primary as to insurance, if any, maintained by Owner.

Insurer shall give Owner and Architect at least thirty (30) days notice in writing in advance of any cancellation, termination or lapse of the Builder's Risk policy, or the effective date of any reduction in the policy limits or coverage.

C. The deductible shall not exceed $25,000 unless approved in advance by Owner in its sole discretion. Contractor in all events is

solely responsible for payment of claims within the deductible or above the policy limits.

D. Owner in its sole discretion, at its sole expense and for its sole benefit may maintain its own Builder's Risk Insurance. In such event Contractor's insurance shall be primary. Contractor will not be named as an additional insured on Owner's policy.

GC-23 INSURANCE/INDEMNIFICATION

A. Contractor shall secure, pay for and maintain until all Work, including Work required by any guarantee or warranty required by the Contract Documents, is completed, such insurance that will protect the Contractor, the Owner, and the Architect and the Architect's consultants and agents and employees of any of them from claims directly and indirectly arising or alleged to arise out of the performance of or failure to perform the Work, or the condition of the Work or the job site, from claims by workmen, suppliers or subcontractors, from claims under any scaffolding, structural work or safe place law, or any law with respect to protection of adjacent landowners, and from any other claims to damages of property to bodily injury, including death, which may arise in whole or in part from operations by the Contractor or any subcontractor or anyone directly or indirectly employed by either of them. Such insurance shall also cover all contractual obligations that the Contractor has assumed including the indemnification provisions under this Article. Such insurance shall cover all contractual obligations that Contractor has assumed including the "Hold Harmless Agreement".

B. To the fullest extent permitted by law, the Contractor indemnify and hold harmless the Owner and the Architect, and their respective consultants, and the directors, officers, partners, employees and agents of any of them from and against claims, damages, losses and expenses, including but not limited to attorney's fees, arising out of or resulting from performance of the Work, provided that such claim, damage loss or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) including the loss of use resulting therefrom, but only to the extent caused in whole or in part by negligent acts or omissions of the Contractor, a subcontractor, anyone directly or indirectly employed by them or anyone for acts any of them may be liable, regardless of whether or not such claim, damage, loss or expense is jointly caused in part by the negligent act or omission of a party indemnified here under. Such obligation shall not be construed to negate, abridge, or reduce any other rights or obligations of indemnity which would otherwise exist as to a party or person described in this clause.

C. In claims against any person or entity indemnified under this clause by any employee of the Contractor, a subcontractor, anyone directly or indirectly employed by them or anyone for whose acts any of them may be liable, the indemnification obligation under this clause shall not be limited by a limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or a subcontractor under workers' or workmen's compensation acts, disability benefit acts or other employee benefit acts.

D. The obligations of the Contractor under this clause shall not extend the liability of Architect and its consultants and agents, and employees of any of them arising out of the preparation of maps, drawings, opinions, reports, surveys, Change Orders, designs or specifications, or the giving of or the failure to give directions and instructions by Architect and its consultants, and agents or employees of any of them, provided such giving or failure to give is the primary cause of the injury or damage.

HOLD HARMLESS

In consideration of the use of certain Washington University facilities, _____ understands that it is assuming the risk of using these facilities. Any personal belongings (equipment, books, jewelry, etc.) that _____ brings with them to Washington University is at their own risk and is not the responsibility of Washington University. Further, these items are not covered by Washington University insurance coverages. _____ agrees to protect, defend and hold free and harmless Washington University, its trustees, officers, and employees from any and all claims, suits, actions and liability of any character, arising, or alleged to arise, out of injuries or damages sustained by any person, persons, or property on account of, or in consequence of, any act or omission, neglect or misconduct, or in violation of any law, ordinance or regulation, by the undersigned, which was caused to occur during their use of Washington University facilities.

_____
Signature Date

_____
Title

_____
Company

_____
Dates of Use

GC-24 INSURANCE REQUIREMENTS

A. Contractor shall purchase and maintain such insurance as will protect him from claims set forth below which may arise out of result from Contractor's operations under the Contract, whether such operations be by himself or by any subcontractor or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

(1) Claims under Worker's or Workmen's compensation, disability benefit and other similar employee benefit acts;
(2) Claims for damages because of bodily injury, occupational sickness or disease, or death of his employees;
(3) Claims for damages because of bodily injury, occupational sickness or disease, or death of any person other than his employees;
(4) Claims for damages insured by usual personal injury liability coverage, which are sustained (1) by any person as a result of an offense directly or indirectly related to the employment of such person by Contractor, or (2) by any other person;
(5) Claims for damages because of injury to or destruction of tangible property, including loss of use resulting therefrom;
(6) Claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle; and
(7) Liability insurance shall include all major divisions of coverage and be on a comprehensive basis, including, but not limited to:

(a) Premises-Operations
(b) Independent Contractors
(c) Contractual Liability
(d) Products-Completed Operations.
(e) Personal Injury (Libel, Slander, Defamation of Character, Discrimination)
(f) Owned, Non-owned, and Hired Motor Vehicles
(g) Broad Form Property Damage Coverage
(h) Excavation, Collapse and Underground, Explosion

B. The insurance required shall be written for not less than the following limits:

(1) Workmen's Compensation: as required by the law of the State of Missouri and Employer's Liability Insurance, with limits of $1,000,000 (these coverages must include: Occupational Disease; Broad Form All States Endorsement; and U.S. Longshoreman Harbor Workers Endorsement).
(2) Comprehensive General Liability and Contractual Liability:

(a) Bodily injury and property damages:
$1,000,000 each occurrence
$1,000,000 aggregate

(b) Personal injury:
$1,000,000 each person
$1,000,000 aggregate

(3) Comprehensive Automobile Liability:

(a) Bodily injury:
$1,000,000 each occurrence
(b) Property Damage:
$500,000 each occurrence

(4) Umbrella Liability
$1,000,000

C. Certificate of Insurance acceptable to Owner shall be filed with Owner five (5) calendar days prior to the commencement of the Work. The Certificates shall have typewritten upon them (on the back, if space is insufficient on the front) the following provisions:

(1) Insurer will give to Owner and Architect and/or Engineer at least thirty (30) days notice in writing in advance of any cancellation, termination or lapse, or the effective date of any reduction in the amounts of the insurance.
(2) Washington University is an additional insured.
(3) Contractor's insurance shall be primary.

D. Contractor shall require each of his subcontractors to procure and maintain during the life of his subcontract, Subcontractor's General Liability and Property Damage Insurance of the type specified herein.

E. The Architect shall be named as an additional insured on the Contractor's Comprehensive General Liability policy, Excess Liability policy, Owner's Protective Liability policy and Builder's Risk policy.

F. The Contractor shall secure, pay for and maintain whatever Fire or Extended Coverage Insurance the Contractor may deem necessary to protect himself against loss of owned or rented capital equipment and tools, including any tools owned by mechanics, and any tools, equipment, scaffolding, staging, towers and forms owned or rented by the Contractor. The requirements to secure and maintain such insurance is solely for the benefit of the Contractor. Failure of the Contractor to secure such insurance or to maintain adequate levels of coverage shall not obligate the Owner, the Architect or the Architect's consultants or their agents and employees for any losses of owned or rented equipment. If the Contractor secures such insurance the Insurance policy shall include a waiver of subrogation clause as follows:

"It is agreed that in no event shall this insurance company have any right of recovery against the Owner or the Architect."

GC-25 SUBCONTRACTS

A. Contractor shall be responsible for the performance of all work required for the complete furnishing and installation of the Work as described in the Contract Documents.

B. Where required by local codes, jurisdictions, etc., Contractor shall arrange for the proper installation of such components or items of the work included which are not part of the work normally done by his personnel, by securing the services of personnel properly qualified for such work or by subcontracting such portions of the work to qualified firms.

C. Contractor shall obtain Owner's Representative's approval of subcontractors prior to the beginning of the Work. Owner has the right of approval of subcontractors throughout the course of the work. Should Owner rescind approval of subcontractor, Contractor shall replace disapproved subcontractor with another subcontractor approved by the Owner, at no additional cost to the Owner.

GC-26 SCHEDULE OF VALUES

A. Contractor shall submit to Owner for approval a breakdown showing portions of the Contract Sum as the value of each item of the work.

B. Contractor's schedule of values shall be subdivided for each item of work identified in the Contract Documents and additional value subdivisions for each subcontractor.

GC-27 PROJECT SCHEDULE

A. Contractor shall confer with Owner's Representative to determine a mutually acceptable schedule.

B. Contractor shall submit written copies of schedule for approval. Schedule shall be related to calendar periods and indicate starting and completion dates of major and critical items of the work and the various stages of construction. Should changes become necessary, Contractor shall follow approved Project Schedule unless Owner subsequently approves rescheduling individual items of the work. Should changes become necessary, Contractor shall revise the schedule and re-submit for approval.

C. Almost all of the Work must be scheduled in advance to permit Owner to make necessary adjustments in Owner's operations, which will allow Contractor to perform his work. Contractor shall follow approved Construction Project Schedule unless Owner subsequently approves rescheduling individual items of the Work.

D. Items scheduled shall be sufficiently small in scope and detailed to permit ready evaluation of the progress of completion of the item. Division of the Work into scheduled items may be specific items, class or type of work or by area as may best serve for monitoring progress of the item.

E. The dollar value of each scheduled item from the Schedule of Values shall be listed on the Project Schedule.

F. Items of Subcontractor work shall be scheduled in similar detail.

G. The Project Schedule shall be plainly related to calendar dates to permit identification of scheduled starting and completion dates for phases of each item of work and events.

H. If the value to be claimed on Project Schedules is not linear and continuous with completion schedule, percentages shall be indicated at appropriate points on the item schedule line.

I. Progress Schedules shall be submitted with each application for partial payment. The schedule for each scheduled item shall be distinctively marked to show completion claimed for payment and the total value claimed shall be written on the schedule.

J. Contractor shall revise the Project schedule whenever Owner requests. Contractor may revise the Project Schedule at any time. Revised Project Schedules are subject to Owner's approval. The Project Schedule shall be revised and resubmitted when the project is 15 percent, 40 percent, 75 percent and 90 percent complete.

K. The project schedule shall include an allowance of 63 bad weather days per year. This allowance is divided into the following monthly breakdown:

January	8 days
February	8 days
March	8 days
April	6 days
May	5 days
June	3 days
July	3 days
August	3 days
September	3 days
October	4 days
November	5 days
December	7 days

In the event that weather-related conditions preclude performance of 60% of critical path activities scheduled for a particular day, the day may be claimed by the contractor as a weather day and charged against the allowance included for that project. If good weather conditions prevail throughout the contract period and the allowed number of weather days are not encountered, the Contractor will not be required to complete the contract correspondingly ahead of the contract completion date. If poor weather conditions prevail such that all of the allowed bad weather days are exceeded, a no cost change order extending the date of scheduled completion will be executed.

GC-28 PERFORMANCE OF WORK

A. Should Owner's Representative find that Contractor or any subcontractor is failing to prosecute the work so as to assure completion in a timely manner or by Contract Substantial Completion Date, Owner's

Representative shall require Contractor by written notice, to provide additional material, manpower equipment sufficient to insure timely completion. Failure by Contractor to provide additional material, manpower and equipment immediately upon Owner's Representative's notice shall be a violation of the Contract.

B. If Contractor fails to prosecute the work so as to insure completion in a timely manner, or if any of the provisions of this contract are violated by contractor or by any of his subcontractors, Owner, by written notice, may cancel this contract. Thereafter, Owner may have the work completed and hold Contractor liable for all costs to owner for the completion of said Contract.

C. Contractor shall be liable for all costs incurred by Owner as a result of the contractor failing to meet scheduled completion dates. These costs shall be deducted from the Contract amount by Change Order.

GC-29 EXTENSION OF SCHEDULED TIME OF SUBSTANTIAL COMPLETION

A. Contractor shall not be entitled to any claim for damages and the Contract Sum shall not be revised on account of hindrances or delays from any cause whatsoever. If occasioned by any cause over which the Contractor has no control, or by any act or omission on the part of the Owner, such act, hindrance or delay may entitle the Contractor to an extension of time in which to complete the Work. Whether or not the Contractor shall be entitled to an extension of time shall be determined by Owner's Representative, provided that the Owner's Representative receives Contractor's written notice of the cause of such act, hindrance or delay within ten consecutive calendar days of its occurrence.

B. If the claim for a schedule extension is based on adverse weather conditions, the claim shall include documentation substantiating that weather conditions were abnormal for the period and could not have been reasonably anticipated. The claim shall also define how the weather conditions had an adverse effect on the critical path of the construction schedule.

End: General Conditions: Facilities Contracts

Appendix E.2: Rochester Institute of Technology

GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION

TABLE OF ARTICLES

ARTICLE 1

CONTRACT DOCUMENTS

1.1 DEFINITIONS

1.1.1 THE CONTRACT DOCUMENTS

The Contract documents consist of: the Advertisement/Request For Proposal, Form of Proposal, Owner-Contractor Construction Agreement, General Conditions of Contract for Construction, Supplementary General Conditions of the Contract for Construction (and all Enclosures, Appendices and Exhibits thereto), Specifications, Drawings, and any Addenda issued prior to the execution of the Owner-Contractor Agreement and all Modifications thereto. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a written interpretation issued by the Architect pursuant to Subparagraph 2.2.5, or (4) a written order for a minor change in the Work issued by the Architect pursuant to Paragraph 12.4

1.1.2 THE CONTRACT OR AGREEMENT

The Contract Documents form the Contract for Construction. This Contract represents the entire and integrated agreement between the parties hereto and supersedes all prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification as defined in Subparagraph 1.1.1. The Contract Documents shall not be construed to create any contractual relationship of any kind between the Architect and the Contractor, but the Architect shall be entitled to performance of obligations intended for his benefit, and to enforcement thereof. Nothing contained in the Contract Documents shall create any contractual relationship between the Owner or the Architect and any Subcontractor or Sub-subcontractor.

1.1.3 THE WORK

The Work comprises the completed construction required by the Contract Documents and includes all labor and supervision necessary to produce such construction, and all materials and equipment incorporated or to be incorporated in such construction or required for the construction.

1.1.4 THE PROJECT

The Project is the total construction of which the work performed under the Contract Documents may be the whole or a part.

1.1.5 MISCELLANEOUS DEFINITIONS

.1 The *"Drawings"* shall mean the graphic and pictorial portions of the Contract Documents, wherever located and whenever issued, showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules and diagrams.

.2 *"Final completion"* shall mean the date the Contract has been fully performed, all the Work has been completed and a final Certificate for Payment approved by the Owner has been issued by the Architect.

.3 *"Governmental authority (authorities)"* shall mean the United States of America, the State of New York, the County of Monroe ("County"), the City of Rochester ("City"), the Town of Henrietta ("Town") any political subdivision thereof and any agency, department, commission, board, bureau or instrumentality of any of the foregoing, now existing or hereafter created, having jurisdiction over the Project or any portion thereof or site thereof.

.4 *"Hazardous materials"* shall mean:

a. pollutants, contaminants, toxic or hazardous wastes, or any other substances the removal of which is required, or the manufacture, use, maintenance, storage, ownership or handling of which is restricted, prohibited, regulated or penalized by any Requirement now or at any time hereafter in effect, including any waste, substance or material that is listed in or exhibits any of the characteristics enumerated in 40 Code of Federal Regulations §§ 261.20-261.24 inclusive or in 6 New York Code, Rules and Regulations Parts 370 through 373 inclusive, or any hazardous substances as defined in the Comprehensive Environmental Response, Compensation and Liability Act or the Superfund Amendment and Reauthorization Act of 1986 ("SARA") that are present in threshold planning or reportable quantities as defined under SARA, or any toxic or hazardous chemical substances that are present in quantities that exceed exposure standards as those terms are defined under §§ 6 and 8 of the Occupational Safety and Health Act and 29 Code of Federal Regulations Part 1910 subpart Z, and:

b. any asbestos or polychlorinated biphenyls.

All references to statutes in this definition shall be deemed to refer to such statutes as the same may be amended from time to time, and to include any statute superseding or supplementing any such statute.

.5 The term "Product" as used herein includes materials, systems and equipment.

.6 The term "Project Manual" as used herein includes the Bidding Requirements, Conditions of the Contract, Drawings and the Specifications.

.7 *"Requirements"* shall mean, in addition to the other obligations, responsibilities and limitations set out in the Contract Documents, the obligations, responsibilities and limitations imposed by all present and future laws, rules, orders, ordinances, regulations, statutes, requirements, codes and executive orders, extraordinary as well as ordinary (including, without limitation, any of same relating to the environment and hazardous materials), of all governmental authorities, and of any applicable fire rating bureau, or other body exercising similar functions, affecting the real property or the maintenance, use or occupation thereof, or any street, avenue or sidewalk comprising a part of or in front thereof or any vault in or under the same, or requiring removal of any encroachment.

.8 The *"Specifications"* shall mean that portion of the Contract Documents consisting of the written requirements for materials, equipment, construction system, standards and workmanship for the Work, and

performance of related services.

.9 The terms "install" or "furnish all labor" are used herein as term contractions and unless specifically noted otherwise are to mean "perform all operations connected with installation of work including unloading materials to be installed, supplying all necessary equipment and rigs to do the work, test, place in operation and service."

.10 The terms "furnish" and "furnish all material" are used here in as term contractions and unless specifically noted otherwise are to mean "supply and deliver to the job site all materials and/or equipment so specified".

.11 The word "provide" is used herein as a term contraction and unless otherwise specifically noted is to mean "furnish, install, connect up complete, test, place in operation and service".

.12 The terms "approved", "equal", "proper" and words of similar meaning are understood to mean "in the opinion of the Architect".

1.1.6 DOCUMENTS:

The following documents are incorporated by reference into the General Conditions:

.1 The latest edition of all applicable Local, State and Federal Codes, including but not limited to the State of New York Uniform Fire Protection and Building Codes, the Occupational Safety and Health Act, and the Americans with Disabilities Act.

.2 The standards of the NFPA, including the National Electrical Code and the Life Safety Code.

.3 Where the standards of the Underwriter's Laboratories or the Factory Mutual Research Corp apply, all equipment and materials furnished shall comply with these standards and be so listed and labeled for the specific application.

.4 The standards of NEMA, BOCA, ASTM, ANSI, ASME and SMACNA.

1.2 EXECUTION, CORRELATION AND INTENT

1.2.1 The Contract documents shall be effective when signed by the Owner and Contractor.

1.2.2 Execution of the Contract by the Contractor is a representation that said Contract Documents are full and complete, are sufficient to have enabled the Contractor to determine the cost of the Work therein and to enter into the Contract and that the Contract Documents are sufficient to enable it to construct the Work outlined therein, and otherwise to fulfill all its obligations hereunder, including, but not limited to, Contractor's obligation to construct the
Work for an amount not in excess of the Contract Sum on or before the date(s) of Substantial Completion established in the Agreement. The Contractor further acknowledges and declares that it has visited and examined the site, examined all physical, legal, and other conditions affecting the Work and is fully familiar with all thereon and thereunder affecting the same. In connection therewith, Contractor specifically represents and warrants to Owner that it has, by careful examination, satisfied itself as to: (1) the nature, location, and character of the Project and the site, including, without limitation, the surface and subsurface conditions of the site and all structures and obstructions, difficulties and restrictions thereon and thereunder, both natural and man-made, and all surface and subsurface water conditions of the site and the surrounding area affecting the execution of the Work at the site; (2) the nature, location, and character of the general area in which the Project is located, including with limitation, its climatic conditions, available labor supply and labor costs, and available equipment supply and equipment costs; (3) the quality and quantity of all materials, supplies, tools, equipment, labor, and professional services necessary to complete the Work in the manner and within the cost and time frame required by the Contract Documents; and (4) the accommodation of the Work to and/or by work that may be performed by or for the Owner under other contracts, all required connections of any sort to such work under other contracts, and scheduling of Work as required in coordination with such work under other contracts; and any other consideration which may affect the Work in any manner. No allowance will be made in this connection to the Contractor unless an agreement therefor shall have been made in writing by the Owner at the time of the signing of the Contract Documents.

1.2.3 The intent of the Contract documents is to include all items necessary for the proper execution and completion of the work. The Contract Documents are complementary, and what is required by any one shall be as binding as if required by all. Work not covered in the Contract Documents will not be required unless it is consistent therewith and is reasonably inferable therefrom as being necessary to produce the intended results. Words and abbreviations which have well-known technical or trade meanings are used in the Contract Documents in accordance with such recognized meanings.

.1 If any such differences or conflicts between provisions or requirements in the Contract Documents were not called to the Owner's and Architect's attention prior to submission of bids, the Architect shall decide which of the conflicting Drawings, Specifications, requirements or other provisions of the Contract Documents will govern based upon the most stringent of the Drawings, Specifications, requirements or other provisions of the Contract Documents, and, subject to the approval of the Owner, the Contractor shall perform the Work at no additional cost and/or time to the Owner in accordance with the Architect's decision. Work not covered in the Contract Documents will not be required unless it is consistent therewith and is reasonably inferable therefrom as being necessary to produce the intended results.

.2 In the event of conflicts or discrepancies among the Contract Documents, interpretations will be based on the following priorities, provided, however, that the most stringent condition shall control:

a. The Agreement;
b. Addenda, with those of later date having precedence over those of earlier date;
c. The Supplementary Conditions;
d. The General Conditions of the Contract for Construction
e. Drawings and Specifications; and
f. The Bidding Documents.

.3 If there is any inconsistency in the Drawings or between

the Drawings and the Specifications or between or within any of the Contract Documents, unless otherwise ordered in writing by the Owner, the Contractor shall provide or abide by the better quality of, or the greater quantity of, Work, materials or services for the benefit of the Owner.

1.2.4 The organization of the Specifications into divisions, sections and articles, and the arrangement of Drawings shall not control the Contractor in dividing the work among subcontractors or in establishing the extent of Work to be performed by any trade.

1.2.5 Certain portions of the Specifications are written in condensed outline form and omitted words are to be supplied by inference. Naming of an article or operation shall have the effect of stating "Contractor shall furnish, install and complete" said operation or article unless it is further qualified in the context in which it appears.

1.2.6 When reference is made to specifications of a manufacturer, trade association, governmental agency, reference standard or similar source (such as ASTM, ASA, AISC, ACI, Gas, Etc.) such is made part of these specifications, having the force and effect as though reproduced herein, and upon entering into the Contract the Contractor acknowledges his familiarity with those pertaining to his work.

ARTICLE 2

ARCHITECT

2.1 DEFINITION

2.1.1 The Architect is the person lawfully licensed to practice architecture, or an entity lawfully practicing architecture identified as such in the Owner-Contractor Agreement, and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Architect means the Architect or his authorized representative.

2.2 ADMINISTRATION OF THE CONTRACT

2.2.1 The Architect will be the Owner's representative during construction and until final payment is due. The Architect will advise and consult with the Owner. The Owner's instructions to the Contractor shall be forwarded through the Architect. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

2.2.2 The Architect shall at all times have access to the Work wherever it is in preparation and progress. The Contractor shall provide facilities for such access so the Architect may perform his functions under the Contract Documents.

2.2.3 Based on the Architect's observations and an evaluation of the Contractor's Applications for Payment, the Architect will determine the amounts owing to the Contractor and will issue Certificates for Payment in such amounts, as provided in Paragraph 9.4.

2.2.4 The Architect will be the initial interpreter of the requirements of the Contract Documents and the judge of the performance thereunder by both the Owner and Contractor.

2.2.5 The Architect will render interpretations necessary for the proper execution or progress of the Work, with reasonable promptness and in accordance with any time limit agreed upon. Either party to the Contract may make written request to the Architect for such interpretations.

2.2.6 Claims, disputes and other matters in question between the Contractor and the Owner relating to the execution or progress of the Work or the interpretation of the Contract Documents shall be referred initially to the Architect for decision which he will render in writing within a reasonable time.

2.2.7 All interpretations and decisions of the Architect shall be consistent with the intent of and reasonably inferable from the Contract Documents and will be in writing or in the form of drawings. In his capacity as interpreter and judge, he will endeavor to secure faithful performance by the Contractor.

2.2.8 The Architect's decisions in matters relating to aesthetic effect will be final if consistent with the intent of the Contract Documents.

2.2.9 Any claim, dispute or other matter in question between the Contractor and the Owner, except those relating to aesthetic effect as provided in Subparagraph 2.2.8 and except those which have been waived by the making or acceptance of final payment as provided in Paragraph 9.8, shall be subject to resolution pursuant to Paragraph 7.9.

2.2.10 The Architect will have authority to reject Work which does not conform to the Contract Documents. Whenever, in his opinion, he considers it necessary or advisable for the implementation of the intent of the Contract Documents, after written approval by the Owner, he will have authority to require special inspection or testing of the work in accordance with Subparagraph 7.7.2 whether or not such Work be then fabricated, installed or completed. However, neither the Architect's authority to act under this Subparagraph 2.2.10, nor any decision made by him in good faith either to exercise or not to exercise such authority, shall give rise to any duty or responsibility of the Architect to the Contractor, any Subcontractor, any of their agents or employees, or any other person performing any of the work.

2.2.11 The Architect will review and approve or take other appropriate action upon Contractor's submittals such as Shop Drawings, Product Data and Samples, but only for conformance with the design concept of the Work and with the information given in the Contract Documents. Such action shall be taken with reasonable promptness so as to cause no delay.

2.2.12 The Architect will prepare Change Orders in accordance with Article 12, and will have authority to order minor changes in the work as provided in Subparagraph 12.4.1.

2.2.13 The Architect will conduct inspections to determine the dates of Substantial Completion and Final Completion, will receive and forward to the Owner for the Owner's review written warranties and related documents required by the Contract and assembled by the Contractor, and will issue a final Certificate for Payment upon compliance with the requirements of Paragraph 9.8.

2.2.14 In case of the termination of the employment of the Architect, the Owner shall appoint an architect against whom the Contractor makes no reasonable objection whose status under the Contract documents shall be that of the former architect.

2.3 JOB MEETINGS

2.3.1 Job meetings shall be coordinated and scheduled by the

Architect at least weekly. The Architect shall record and distribute minutes of each meeting.

2.3.2 Contractor's Project Manager, Superintendent, Owner's Construction Representative, the Architect and other interested parties shall attend the meetings.

.1 The Owner and/or Architect may impose fines, which may be deducted by Change order from the amount due the Contractor for missed meetings.

2.3.3 The Contractor shall require the appropriate subcontractors to attend such job meetings.

2.3.4 The purpose of the job meeting is to assure proper coordination; determine construction progress; monitor and update progress schedules; review requisitions and change orders; expedite completion of the Project in accordance with the Contract Documents and review other relevant items.

ARTICLE 3

OWNER

3.1 DEFINITION

3.1.1 The Owner is the person or entity identified as such in the Owner-Contractor Agreement and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Owner means the Owner or its authorized representative.

3.2 INFORMATION AND SERVICES REQUIRED OF THE OWNER

3.2.1 The Owner shall furnish all surveys describing the physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The furnishing of these surveys and the legal description of the site or any portion thereof shall not relieve the Contractor from its duties under the Contract Documents in general and Subparagraphs 1.2.2 and 1.2.3 of the General Conditions in particular. Neither the Owner nor the Architect shall be required to furnish Contractor with any information concerning subsurface characteristics or conditions of the areas where the Work is to be performed. When the Owner or Architect has made investigations of subsurface characteristics or conditions of the areas where the Work is to be performed, such investigations, if any, were made solely for the purposes of Owner's study and Architect's design. Neither such investigations nor the records thereof are a part of the Contract between Owner and Contractor. To the extent such investigations or the records thereof are made available to Contractor by the Owner or the Architect, such information is furnished solely for the convenience of Contractor. Neither Owner nor Architect assumes any responsibility whatsoever in respect of the sufficiency or accuracy of the investigations thus made, the records thereof, or of the interpretations set forth therein or made by the Owner or Architect in its use thereof, and there is no warranty or guaranty, either express or implied, that the conditions indicated by such investigations or records thereof are representative of those existing throughout the areas where the Work is to be performed, or any part thereof, or that unforeseen developments may not occur, or that materials other than or in proportions different from those indicated may not be encountered. The Contractor shall undertake such further investigations and studies as may be necessary or useful to determine subsurface characteristics and conditions. In connection with the foregoing, Contractor shall be solely responsible for locating (and shall locate prior to performing any Work) all utility lines, telephone company lines and cables and shall perform the Work in such a manner so as to avoid damaging any such lines, cables, pipes and pipelines.

3.2.2 Except as provided in Subparagraph 4.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for the construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

3.2.3 Information or services required to be furnished by Owner and reasonably requested by Contractor pursuant to the Contract Documents shall be furnished by the Owner with reasonable promptness to avoid unreasonable delay in the orderly progress of the Work.

3.2.4 Owner will furnish Contractor, free of charge, ten (10) composite copies of Drawings and Project Manual. Additional copies of Drawings and Specifications will be furnished to Contractor at the cost of reproduction, or free of charge if they are available from the bidding process.

3.2.5 The foregoing are in addition to other duties and responsibilities of the Owner enumerated herein and especially those in respect to Work by Owner or by Separate Contractors, Payments and Completion, and Insurance in Articles 6, 9 and 11 respectively.

3.3 OWNER'S RIGHT TO STOP THE WORK

3.3.1 If the Contractor fails to correct defective Work as required by Paragraph 13.2, fails to carry out the Work in accordance with the Contract Documents, or fails or refuses to provide a sufficient amount of properly supervised and coordinated labor or materials so as to be able to complete the Work within the Contract Time or fails to remove and discharge (within ten days) any lien filed upon Owner's property by anyone claiming by, through or under Contractor, or disregards the instructions of Architect or Owner when based on the requirements of the Contract Documents, or otherwise fails to comply with or carry out the Work in accordance with Contract Documents, the Owner, by a written order signed personally or by an agent specifically so empowered by the Owner in writing, may order the Contractor to stop the work, or any portion thereof, until the cause for such order has been eliminated; however, this right of the Owner to stop the Work shall not give rise to any duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Subparagraph 6.1.3.

3.4 OWNER'S RIGHT TO CARRY OUT THE WORK

3.4.1 If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within three days after receipt of written notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, or fails within such three-day period to eliminate (or diligently commence to eliminate) the cause of any stop work order issued under Subparagraph 3.3.1 hereof, the Owner may, after three days following receipt by the Contractor of an additional written notice and without prejudice to any other remedy he may have, make good such deficiencies. In such case an appropriate Change Order shall be issued, deducting from the payments then or thereafter due the Contractor the cost of correcting such deficiencies, including compensation for the Architect's additional services made necessary

by such default, neglect or failure. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the Owner. If there is an immediate need to correct deficiencies, the Owner may do so without notice to the Contractor and shall be entitled to reimbursement as set forth herein.

3.5 OWNER'S RIGHT TO AUDIT CONTRACTOR'S RECORDS

3.5.1 The Contractor's records, which shall include but not be limited to accounting records, written policies and procedures, subcontract files (including proposals of successful and unsuccessful bidders), original estimates, estimating worksheets, correspondence, change order files (including documentation covering negotiated settlements), and any other supporting evidence deemed necessary by the Owner or an auditor to substantiate charges related to the Contract (all the foregoing hereinafter referred to as "records") shall be open to inspection and subject to audit and/or reproduction, during normal working hours, by Owner's agent or its authorized representative to the extent necessary to adequately permit evaluation and verification of any invoices, payments or claims submitted by the Contractor or any of his payees pursuant to the execution of the Contract. Such records subject to examination shall also include, but not be limited to, those records necessary to evaluate and verify direct and indirect costs (including overhead and allocations) as they
may apply to costs associated with the Contract.

ARTICLE 4

CONTRACTOR

4.1 DEFINITION

4.1.1 The Contractor is the person or entity identified as such in the Owner-Contractor Agreement and is referred to throughout the Contract Documents as if singular in number and masculine in gender. The term Contractor means the Contractor or his authorized representative. In the case of a project with multiple prime Contractors, the term Contractor means the prime Contractor of each trade or his authorized representative.

4.2 REVIEW OF CONTRACT DOCUMENTS

4.2.1 In addition to and not in derogation of Contractor's duties under Subparagraphs 1.2.2 and 1.2.3 hereof, the Contractor shall carefully study and compare the Contract Documents and shall at once report to the Owner and the Architect any error, inconsistency or omission he may discover. The Contractor shall not be liable to the Owner or the Architect for any damage resulting from any such errors, inconsistencies or omissions in the Contract Documents that could not have been discovered by a prudent and experienced contractor in advance and that are not of the nature of items described in and intended to be covered in Subparagraphs 1.2.2 and 1.2.3 hereof. The Contractor shall perform no portion of the Work at any time without Contract Documents or, where required, approved Shop Drawings, Product Data or Samples for such portion of the work. The Contractor shall make no claim for, and hereby expressly waives, any increase in the Contract Sum on the basis of any of the following: (a) any inconsistency within or between the Drawings, the Specifications or any other portion of the Contract Documents of which the Contractor knew or should have known prior to execution of the Agreement; (b) inability or failure of the Contractor to complete any portion of the Work in accordance with constructions procedures, means, methods, techniques, or schedules anticipated by the Contractor; or (c) any interpretation of the Drawings, Specifications or any other portion of the Contract Documents which differs from a reasonable interpretation held by the Owner or Architect which the Contractor knew or could have determined prior to execution of the Agreement.

4.2.2 The Contractor shall verify all dimensions locating the Work and its relation to existing Work, all existing conditions and their relation to the Work and all man-made obstructions and conditions, etc., necessary for the proper execution of the work as indicated in the Contract Documents.

4.2.3 If the Contractor, during the progress of the Work, discovers any discrepancies between the Drawings and the Specifications, errors and/or omissions on the Drawings, or any discrepancies between physical conditions of the Work and the Drawings, he shall immediately notify the Architect in writing who shall promptly adjust same. Whether or not an error is believed to exist, deviations from the Drawings and dimensions given thereon shall be made only after approval in writing is obtained from the Architect. Any work performed after such discovery without the approval of the Architect shall be at the Contractor's risk and expense.

4.2.4 Whenever the Drawings show existing or other construction not required as part of the Contract Work, it is understood that it is so shown as a matter of information and that the Owner, while believing such information to be substantially correct, assumes no responsibility thereof. The Contractor shall make himself familiar with all conditions affecting the nature and manner of conducting the work.

4.2.5 Should the Specifications and Drawings fail to describe particularly the materials or kind of goods to be used in any place, then it shall be the duty of the Contractor to make inquiry of the Owner and Architect as to what is best-suited. The material that would normally be used in this place to produce first quality finished Work shall be considered a part of the Contract. A finished and complete installation is intended, and all hangers, fasteners, offsets, elevation changes, etc., required shall be provided by the Contractor whether specifically detailed or not.

4.2.6 Before ordering any materials or doing any other Work, the Contractor shall verify all measurements and be responsible for their correctness. No extra charge or compensation will be allowed for duplicate Work or materials required because of an unverified difference between an actual dimension and the measurements indicated in the Drawings. Any discrepancy found shall be submitted in writing to the Architect for consideration before proceeding with the Work.

4.2.7 Responsibility for insuring that new materials be fabricated accurately to field measurements to fit the new construction properly shall be solely that of the Contractor, who shall pay all costs involved in replacing or correcting any such improperly fitting materials.

4.3 SUPERVISION AND CONSTRUCTION
PROCEDURES

4.3.1 The Contractor shall supervise and direct the Work, using his best skill and attention. He shall be solely responsible for all construction means, methods, techniques, sequences and procedures and for coordinating all portions of the Work under the Contract and for safety, as well as conformity and timeliness of all portions of the

Work.

4.3.2 The Contractor shall be responsible to the Owner for the acts and omissions of his employees, Subcontractors and their agents and employees, and other persons performing any of the Work under a Contract with the Contractor. It is understood and agreed that the relationship of Contractor to Owner shall be that of an independent contractor. Nothing contained herein or inferable therefrom shall be deemed or construed to (1) make Contractor the agent, servant, or employee of the Owner, or (2) create any partnership, joint venture, or other association between Owner and Contractor. Any direction or instruction by Owner in respect of the Work shall relate to the results the Owner desires to obtain from the Work, and shall in no way affect Contractor's independent contractor status as described herein.

4.3.3 The Contractor shall not be relieved from his obligations to perform the Work in accordance with the Contract Documents either by the activities or duties of the Architect in his administration of the Contract, or by inspections, tests or approvals required or performed under Paragraph 7.7 by persons other than the Contractor.

4.3.4 Where equipment lines, piping, and/or conduit are shown diagrammatically, the Contractor shall be responsible for the coordination and orderly arrangement of the various lines of piping and conduit included in the Work of his Contract. He shall coordinate the work of his Subcontractors and prevent all interferences between equipment, lines or piping, architectural features, and avoid any unsightly arrangements in the exposed Work.

4.3.5 The Contractor, his employees and subcontractors, shall be subject to such rules and regulations for the conduct of work as the Owner may establish. The Contractor shall be responsible for the enforcement among his employees of the Owner's instructions.

4.3.6 The Contractor has the responsibility to ensure that all material suppliers and Subcontractors, their agents, and employees adhere to the Contract Documents, and that they order materials on time, taking into account the current market and delivery conditions and that they provide materials on time. The Contractor shall coordinate its Work with that of all others involved in the Project including deliveries, storage, installations and construction utilities. The Contractor shall make every effort to minimize disruption and expedite the Work through close coordination and cooperation. The Contractor shall be responsible for the space requirements, locations and routing of its equipment. In areas and locations where the proper and most effective space requirements, locations and routing cannot be made as indicated, the Contractor shall meet with all others involved, before installation, to plan the most effective and efficient method of overall installation.

4.3.7 Neither alternate methods of construction nor substitution of materials for those specified will be allowed unless approved by the Architect in advance and in writing. Proposals for such changes shall take the form of a Change Proposal and shall detail the benefits to the Owner, such as reduced cost. Delays due to the failure to order materials in a timely manner will not be accepted as a reason for substitution, but the Contractor shall be responsible for all special charges for shipping, overtime, expedited manufacture and the like as required to obtain the specified materials.

4.3.8 The Contractor shall establish and maintain bench marks and all other grades, lines, and levels necessary for the Work, report errors or inconsistencies to the Owner and Architect before commencing Work, and review the placement of the building(s) and permanent facilities on the construction site with the Owner and Architect after all lines are staked out and before foundation Work is started. Contractor shall provide access to the Work for the Owner, the Architect, other persons designated by Owner, and other governmental inspectors. Any encroachments made by Contractor or its Subcontractors (of any tier) on adjacent properties due to construction as revealed by an improvement survey, except for encroachments arising from errors or omissions not reasonably discoverable by Contractor in the Contract Documents, shall be the sole responsibility of the Contractor, and Contractor shall correct such encroachments within thirty (30) days of the improvement survey (or as soon thereafter as reasonably possible), at Contractor's sole cost and expense, either by the removal of the encroachment (and subsequent reconstruction on the Project site) or agreement with the adjacent property owner(s) (in form and substance satisfactory to Owner in its sole discretion) allowing the encroachments to remain.

4.4 LABOR AND MATERIALS

4.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and timely pay for all labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, insurance premiums and other facilities and services necessary for the proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work. Contractor shall also be responsible for labor peace on the Project and shall at all times make its best efforts and judgment as an experienced contractor to adopt and implement policies and practices designed to avoid work stoppages, slowdowns, disputes or strikes where reasonably possible and practical under the circumstances and shall at all times maintain Project-wide labor harmony. Except as specifically provided in Subparagraph 8.3.1 hereof, Contractor shall be liable to Owner for all damages suffered by Owner occurring as a result of work stoppages, slowdowns, disputes or strikes.

4.4.2 The Contractor shall at all times enforce strict discipline and good order among his employees and shall not employ on the Work any unfit person or anyone not skilled in the task assigned to him.

4.4.3 On receipt of signed Contract, Contractor will be expected to place firm orders with vendors for needed materials. With the approval of Owner, Contractor may include the cost of such materials in a monthly application for payment, provided such materials have actually been delivered to Contractor and properly stored by him with approval or under direction of Owner either at job site or in an approved storage shed or warehouse.

.1 If stored off site, Contractor shall furnish proof of title by Owner and provide adequate insurance coverage.

.2 Contractor shall warrant that he has good title to all materials used by him as part of the work of this Contract. No materials or supplies shall be purchased by Contractor or any of his Subcontractors that are subject to any chattel mortgage, conditional sale or other agreement by which an interest is retained by Seller.

4.4.4 Contractor shall deliver all materials at such times as will ensure speedy and uninterrupted progress of Work.

4.4.5 All products, materials and equipment shall be applied, installed, connected, used, cleaned and conditioned in accord with directions of manufacturer unless otherwise specified herein.

4.4.6 Contractor shall verify the identity and employment eligibility of all its employees and those of any of its Subcontractors engaged in activities in connection with the Project, whether on or off-site, on or after the effective date of this Contract. Contractor shall complete a "Daily WorkForce Log". (Exhibit 1)

4.4.7 The verification must comply with the documentation standards set forth in the Immigration Reform and Control Act of 1986 ("IRCA"), and any implementing regulations. Contractor further agrees to complete Immigration and Naturalization Service Form I-9, and to otherwise comply with the requirements of IRCA and its implementing regulations. Contractor will make the original Form I-9 available to the Owner within 2 business days of an oral or written request. Contractor agrees to indemnify the Owner against any liability or expense incurred by the Owner resulting from any alleged violation of IRCA relating to any individual employed by Contractor or any of its Subcontractors in connection with the Project. If requested by the Owner, Contractor shall maintain a Daily Work Force Log, in the form supplied by Owner, on the Project Site and make same, or copies of same, available to the Owner at any time upon its request.

4.4.8 The Contractor shall not permit the installation of any materials containing asbestos in any portion of the Work.

4.5 WARRANTY

4.5.1 The Contractor warrants to the Owner and the Architect that all materials and equipment furnished under this Contract will be fit for their intended purpose, new unless otherwise specified, and that all Work will be of good quality, free from faults and defects and in conformance with the Contract Documents. All Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. The warranty is not limited by the provision of Paragraph 13.2. This warranty shall include all parts and labor both on and off the site, together with all necessary transportation and shipping charges.

.1 ALL WARRANTIES SHALL INCLUDE LABOR AND MATERIALS AND SHALL BE SIGNED BY THE MANUFACTURER OR SUBCONTRACTOR AS THE CASE MAY BE AND COUNTERSIGNED BY THE CONTRACTOR. ALL WARRANTIES SHALL BE ADDRESSED TO THE OWNER AND DELIVERED TO THE ARCHITECT UPON COMPLETION OF THE WORK AND BEFORE OR WITH THE SUBMISSION OR REQUEST FOR ALL FINAL PAYMENT.

.2 The Contractor shall issue in writing to the Owner, as a condition precedent to final payment, a "General Warranty" reflecting the terms and conditions of this Paragraph 3.5 for all Work under the Contract.

.3 Except when a longer warranty time is specifically called for in the Specifications or is otherwise provided by law, the General Warranty shall be for twelve (12) months and shall be in form and content otherwise satisfactory to the Owner.

.4 Warranties shall become effective on a date established by the Owner and Architect in accordance with the Contract Documents. This date shall be the Date of Substantial Completion of the entire Work, unless otherwise provided in any Certificate of Partial Substantial Completion approved by the parties.

.5 The Contractor shall warrant for a period of twelve (12) months that the buildings(s) shall be watertight and leakproof at every point and in every area, except where leaks can be attributed to damage to the building(s) by external forces beyond Contractor's control. The Contractor shall, immediately upon notification by the Owner of water penetration, determine the source of water penetration and at its own expense, do any work necessary to make the building(s) watertight. Contractor shall also, at its own expense, repair or replace any other damaged materials, finishes, and furnishings damaged as a result of this water penetration, to return the building(s) to its (their) original condition.

.6 In addition to the foregoing stipulations, the Contractor shall comply with all other warranties referred to in any portions of the Contract Documents or otherwise provided by law or in equity, and where warranties overlap, the more stringent requirement shall govern.

.7 If for any reason the Contractor cannot warrant any part of the Work using materials or construction methods which have been specified, or shown, it shall notify the Owner and Architect in writing before the Contract is signed, giving reasons, together with a description of the particular materials and data on a substitution it can so warrant.

.8 All required maintenance shall be the Contractor's responsibility until the Owner has accepted the Project as complete, all required maintenance and user's manuals have been turned over to the Owner and the Owner's designated personnel have been instructed in the maintenance and operation of all applicable materials. This maintenance shall include a complete turnover procedure at the time of completion, including complete cleaning, testing and adjustment. The Contractor shall keep records of all maintenance performed as required by this Subparagraph, including work performed and times and dates on which it was performed. These records shall be turned over to the Owner at closeout.

4.5.2 The Contractor warrants that all manufacturer's or other warranties on all products, materials or equipment furnished by the Contractor shall run directly or be specifically assigned to Owner.

4.5.3 The Contractor warrants that the installation of any and all products, materials or equipment shall be in strict accordance with the manufacturer's requirements. In the event that the Owner seeks to enforce a claim based on a manufacturer's warranty and should such manufacturer then fail to honor its warranty based in whole or in part on a claim of defective installation, Owner shall be entitled to enforce said warranty against Contractor in accordance with the terms of said warranty, except that a claim of defective installation shall not be a defense to any warranty claim by Owner against Contractor.

4.5.4 The Contractor shall in all respects guarantee the Work to Owner and be responsible for all material, equipment and workmanship of the Work. The Contractor shall forthwith repair, replace or remedy in a manner approved by Owner, any said material, equipment, workmanship, or other part of the Work found by Owner to be defective or otherwise faulty and not acceptable to Owner which defect or fault appears during the period of one (1) year, or shorter or longer period as may be prescribed by the Contract, from the date of Final Inspection as evidenced by the Certificate of Substantial Work Completion issued by Owner. The Contractor shall also pay for any damage to the Work resulting from said defect or fault. The Contractor will also deliver all subcontractor guarantees

4.4.6 Contractor shall verify the identity and employment eligibility of all its employees and those of any of its Subcontractors engaged in activities in connection with the Project, whether on or off-site, on or after the effective date of this Contract. Contractor shall complete a "Daily WorkForce Log". (Exhibit 1)

4.4.7 The verification must comply with the documentation standards set forth in the Immigration Reform and Control Act of 1986 ("IRCA"), and any implementing regulations. Contractor further agrees to complete Immigration and Naturalization Service Form I-9, and to otherwise comply with the requirements of IRCA and its implementing regulations. Contractor will make the original Form I-9 available to the Owner within 2 business days of an oral or written request. Contractor agrees to indemnify the Owner against any liability or expense incurred by the Owner resulting from any alleged violation of IRCA relating to any individual employed by Contractor or any of its Subcontractors in connection with the Project. If requested by the Owner, Contractor shall maintain a Daily Work Force Log, in the form supplied by Owner, on the Project Site and make same, or copies of same, available to the Owner at any time upon its request.

4.4.8 The Contractor shall not permit the installation of any materials containing asbestos in any portion of the Work.

4.5 WARRANTY

4.5.1 The Contractor warrants to the Owner and the Architect that all materials and equipment furnished under this Contract will be fit for their intended purpose, new unless otherwise specified, and that all Work will be of good quality, free from faults and defects and in conformance with the Contract Documents. All Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment. The warranty is not limited by the provision of Paragraph 13.2. This warranty shall include all parts and labor both on and off the site, together with all necessary transportation and shipping charges.

.1 ALL WARRANTIES SHALL INCLUDE LABOR AND MATERIALS AND SHALL BE SIGNED BY THE MANUFACTURER OR SUBCONTRACTOR AS THE CASE MAY BE AND COUNTERSIGNED BY THE CONTRACTOR. ALL WARRANTIES SHALL BE ADDRESSED TO THE OWNER AND DELIVERED TO THE ARCHITECT UPON COMPLETION OF THE WORK AND BEFORE OR WITH THE SUBMISSION OR REQUEST FOR ALL FINAL PAYMENT.

.2 The Contractor shall issue in writing to the Owner, as a condition precedent to final payment, a "General Warranty" reflecting the terms and conditions of this Paragraph 3.5 for all Work under the Contract.

.3 Except when a longer warranty time is specifically called for in the Specifications or is otherwise provided by law, the General Warranty shall be for twelve (12) months and shall be in form and content otherwise satisfactory to the Owner.

.4 Warranties shall become effective on a date established by the Owner and Architect in accordance with the Contract Documents. This date shall be the Date of Substantial Completion of the entire Work, unless otherwise provided in any Certificate of Partial Substantial Completion approved by the parties.

.5 The Contractor shall warrant for a period of twelve (12) months that the buildings(s) shall be watertight and leakproof at every point and in every area, except where leaks can be attributed to damage to the building(s) by external forces beyond Contractor's control. The Contractor shall, immediately upon notification by the Owner of water penetration, determine the source of water penetration and at its own expense, do any work necessary to make the building(s) watertight. Contractor shall also, at its own expense, repair or replace any other damaged materials, finishes, and furnishings damaged as a result of this water penetration, to return the building(s) to its (their) original condition.

.6 In addition to the foregoing stipulations, the Contractor shall comply with all other warranties referred to in any portions of the Contract Documents or otherwise provided by law or in equity, and where warranties overlap, the more stringent requirement shall govern.

.7 If for any reason the Contractor cannot warrant any part of the Work using materials or construction methods which have been specified, or shown, it shall notify the Owner and Architect in writing before the Contract is signed, giving reasons, together with a description of the particular materials and data on a substitution it can so warrant.

.8 All required maintenance shall be the Contractor's responsibility until the Owner has accepted the Project as complete, all required maintenance and user's manuals have been turned over to the Owner and the Owner's designated personnel have been instructed in the maintenance and operation of all applicable materials. This maintenance shall include a complete turnover procedure at the time of completion, including complete cleaning, testing and adjustment. The Contractor shall keep records of all maintenance performed as required by this Subparagraph, including work performed and times and dates on which it was performed. These records shall be turned over to the Owner at closeout.

4.5.2 The Contractor warrants that all manufacturer's or other warranties on all products, materials or equipment furnished by the Contractor shall run directly or be specifically assigned to Owner.

4.5.3 The Contractor warrants that the installation of any and all products, materials or equipment shall be in strict accordance with the manufacturer's requirements. In the event that the Owner seeks to enforce a claim based on a manufacturer's warranty and should such manufacturer then fail to honor its warranty based in whole or in part on a claim of defective installation, Owner shall be entitled to enforce said warranty against Contractor in accordance with the terms of said warranty, except that a claim of defective installation shall not be a defense to any warranty claim by Owner against Contractor.

4.5.4 The Contractor shall in all respects guarantee the Work to Owner and be responsible for all material, equipment and workmanship of the Work. The Contractor shall forthwith repair, replace or remedy in a manner approved by Owner, any said material, equipment, workmanship, or other part of the Work found by Owner to be defective or otherwise faulty and not acceptable to Owner which defect or fault appears during the period of one (1) year, or shorter or longer period as may be prescribed by the Contract, from the date of Final Inspection as evidenced by the Certificate of Substantial Work Completion issued by Owner. The Contractor shall also pay for any damage to the Work resulting from said defect or fault. The Contractor will also deliver all subcontractor guarantees

required by the Contractor.

4.6 TAXES

4.6.1 The Owner has informed the Bidders that all materials supplied in connection with performance of the work which will become an integral component of the Project are not subject to the application of New York State and Monroe County sales taxes. Should such sales taxes be imposed, the Owner agrees that the contract Sum shall be increased by the full amount of all such sales taxes. The Owner hereby appoints the Contractor as its agent solely for purposes of the purchase of materials or services with respect to this project, provided, however, that this appointment shall not extend to the purchase or rental of tools, equipment, scaffolding, ladders, temporary elevators, hoists, safety barricades, safety fencing, protective enclosures or other materials or equipment required by the Contractor for the prosecution of its work or the fulfillment of its safety or site protection responsibilities set forth in this Agreement. This agency appointment includes the power to delegate such agency appointment, in whole or in part, to agents, subagents, contractors, subcontractors, materialmen, suppliers and vendors of the Contractor and to such other parties as the Contractor chooses so long as they are engaged, directly or indirectly, with respect to this project.

.1 Any sale to the Owner of materials or services with respect to the Project will be exempt from the New York State Sales and Compensating Use Taxes ("Sales Taxes") if an Exempt Organization Certificate (Form ST 119.1) is provided to the vendor at the time of the sale. In addition, any sale to the Contractor, a Subcontractor or a repairman of materials that become part of the real property of the Owner will be exempt from Sales Taxes if a Contractor's Exemption Certificate (Form ST 120.1) is provided to the vendor at the time of the sale.

.2 It shall be the responsibility of the purchasing Contractor, Subcontractor or repairman to provide the appropriate exemption certificate to the vendor at the time of the sale. It shall also be its responsibility to arrange for the negotiation of a sales contract with the Owner covering the "resale" to the Owner of materials that will not become a part of the real property of the Owner. Copies of the Owner's Exempt Organization Certificate may be obtained from the Project Manager's office.

4.6.2 With the exception of 4.6.1 the Contractor shall pay all sales, consumer, use and other similar taxes for the Work or portions thereof provided by the Contractor which are legally enacted at the time bids are received, whether or not yet effective. Contractor shall be solely responsible for, and pay, all contributions, assessments or taxes for unemployment or old age insurance or annuities now or hereafter imposed by any government or governmental entity, as well as all union fees or payments which are measured by wages, salaries or other remuneration paid to persons employed by Contractor or any subcontractor, or by Work performed under this Contract.

4.7 PERMITS, FEES AND NOTICES

4.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit and for all other permits, utility stakeouts and governmental fees, licenses and inspections necessary for the proper execution and completion of the Work which are customarily secured after execution of the Contract and which are legally required at the time the bids are received.

4.7.2 The Contractor shall give all notices and shall comply, and shall ensure that each Subcontractor complies, with all laws, statutes, ordinances, rules, regulations, permits and lawful orders of any Governmental authority or court (collectively "Laws") bearing on the performance of the Work, including but not limited to those Laws relating to the protection of health, safety and the environment and/or governing the handling, use, generation, treatment, storage, recycling, transportation or disposal of Hazardous Materials, waste materials regulated under 6 New York Code, Rules and Regulations Part 360, including without limitation, excavated soil, brush, trees, construction and demolition debris, and stormwater run-off during construction . Without limiting the foregoing, Contractor shall comply, and shall ensure that each Subcontractor complies, with all Laws regarding the protection of wetlands, including buffer zones related thereto. Unless otherwise in strict accordance with all applicable federal, state and local Laws, including those requiring notice to governmental authorities and/or permits, Contractor shall not, and shall ensure that each Subcontractor does not, i) place fill materials of any kind in, or dredge or otherwise unlawfully impact, a wetland or wetland buffer zone on Owner's property; or ii) place any material (including but not limited to excavated soil, trees, brush and construction and demolition debris) generated in the course of the Project in any wetland or wetland buffer zone located anywhere off of the Owner's property. Contractor agrees to provide a written statement specifying the locations of all such materials placed off of the Owner's property.

4.7.3 The Contractor shall review the Contract Documents for compliance with applicable laws, statutes, building codes and regulations. If the Contractor observes that any of the Contract Documents are at variance therewith in any respect, he shall promptly notify the Architect and Owner in writing, and any necessary changes shall be accomplished by appropriate Modification and no portion of the Work shall be commenced until the changes are accomplished, unless the Owner otherwise directs.

4.7.4 If the Contractor performs any Work (including, without limitation, the installation of any materials or equipment) that it knows or reasonably should have known would be contrary to such laws, ordinances, rules and regulations, and without direction from the Owner to proceed, the Contractor shall assume full responsibility therefor and shall bear all costs attributable to the correction thereof or related thereto and fines and penalties, if any.

4.8 ALLOWANCES

4.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by these allowances shall be supplied for such amounts and by such persons as the Owner may direct, but the Contractor will not be required to employ persons against whom he makes a reasonable objection.

4.8.2 Unless otherwise provided in the Contract Document:

.1 these allowances shall cover the cost to the Contractor, less any applicable trade discount, of the materials and equipment required by the allowance delivered at the site, and all applicable taxes;

.2 the Contractor's costs for unloading and handling on the site, labor, installation costs, overhead, profit and other expenses contemplated for the original allowance shall be included in the Contract Sum and not in the allowance;

.3 whenever the cost is more than or less than the allowance, the Contract Sum shall be adjusted accordingly by

Change Order, the amount of which will recognize changes, if any, in handling costs on the site, labor, installation costs, overhead, profit and other expenses.

4.9 SUPERINTENDENT

4.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site at all times during the progress of the Work. The superintendent shall represent the Contractor and all communications given to the superintendent shall be as binding as if given to the Contractor. Important communications shall be confirmed in writing. Other communications shall be so confirmed on written request in each case.

4.9.2 The Contractor shall not change the superintendent during the course of construction without prior notification of the Architect and Owner in writing.

4.9.3 If at anytime the Superintendent is not satisfactory to the Owner, Contractor shall, if requested by Owner, replace the Superintendent with another satisfactory to Owner.

4.10 PROGRESS SCHEDULE

4.10.1 The Contractor, immediately after being awarded the Contract, shall prepare and submit for the Owner's and Architect's review and approval an estimated progress schedule for the Work. The progress schedule shall be related to the entire Project to the extent required by the Contract Documents, and shall provide for expeditious and practicable execution of the Work. The schedule shall state the proposed starting and completion dates for the various subdivisions of the Work as well as the totality of the Work and identify the Project's critical path.

4.10.2 With the Progress Schedule, the Contractor shall provide Owner, and Architect, with copies of a table showing the projected monthly drawdown for value of work completed throughout the contract period.

4.10.3 The Progress Schedule shall be monitored and updated at the job meetings and copies supplied to Owner and Architect as updated. Each schedule shall contain a comparison of actual progress with the estimated progress for such point in time stated in the original schedule.

4.10.4 If, in the opinion of Owner, Contractor falls behind the latest Progress Schedule, the Contractor shall take whatever steps may be necessary to improve its progress and shall, if requested by Owner, submit operational plans demonstrating how the lost time may be regained. The Contractor is responsible to maintain its schedule so as not to delay the progress of the Project or the schedules of other contractors. If Contractor delays the progress of its work or the work of other Contractors, it shall be the responsibility of Contractor to increase the number of men, the number of shifts, the days of work and/or, to the extent permitted by law, to institute or increase overtime operations, all without additional cost to Owner in order to retain any time lost and maintain the Progress Schedule then in effect as established by Owner.

4.11 DOCUMENTS AND SAMPLES AT THE SITE

4.11.1 The Contractor shall maintain and make available at the site for the Owner and Architect one record copy of all Drawings, Specifications, Addenda, Change Orders and other Modifications, in good order and marked currently to record all changes made during construction, and approved Shop Drawings, Product Data and Samples. These shall be delivered to the Owner upon completion of the Work. In addition, Contractor shall be responsible for providing the Architect with record drawings on a CAD disk.

4.12 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

4.12.1 Shop Drawings are drawings, diagrams, schedules and other data specially prepared for the Work by the Contractor or any Subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Work.

4.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the Contractor to illustrate a material, product or system for some portion of the Work.

4.12.3 Samples are physical examples which illustrate materials, equipment or workmanship.

4.12.4 The Contractor shall prepare and submit to the Architect and the Owner a schedule of shop drawings indicating the subject matter, the general date of proposed submission to the Architect and identifying those shop drawings which are "critical path submittals." As the project schedule becomes refined, the Contractor shall promptly update his schedule of shop drawings delivering such revisions to the Architect and Owner. The Contractor shall further give the Architect 3 business days' notice of the actual date of submission of each particular shop drawing. The Architect shall review and approve or take other action with respect thereto within ten working days. When the Contractor agrees that a review and response is not capable of being completed within those time frames, such as, but not limited to, submittal of incomplete shop drawings, the Architect shall have the additional time required to make the necessary review and response. The Contractor shall review, approve and submit, with reasonable promptness and in such sequence as to cause no delay in the Work or in the work of the Owner or any separate Contractor, all Shop Drawings, Product Data and Samples required by the Contract Documents.

4.12.5 By approving and submitting Shop Drawings, Product Data and Samples, the Contractor represents that he has determined and verified all materials, field measurements, and field construction criteria related thereto, or will do so, and that he has checked and coordinated the information contained within such submittal with the requirements of the Work and of the Contract Documents.

4.12.6 The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data or Samples under Subparagraph 2.2.11 unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submission and the Architect has given written approval to the specific deviation. The Contractor shall not be relieved from responsibility for errors or omissions in the Shop Drawings, Product Data or Samples by the Architect's approval thereof.

4.12.7 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data or Samples, to revisions other than those requested by the Architect on previous submittal.

4.12.8 No portion of the Work requiring submission of a Shop

Drawing, Product Data or Sample shall be commenced until the submittal has been approved by the Architect as provided in Subparagraph 2.2.11. All such portions of the Work shall be in accordance with approved submittal.

4.13 USE OF SITE

4.13.1 The Contractor shall confine operations at the site to areas permitted by law, ordinances, permits and the Contract Documents and shall not unreasonably encumber the site with any materials or equipment or interfere with Owner's activities on properties adjacent to the site. The Contractor shall notify the Architect and Owner at least seven (7) days in advance of a proposed time for shutting down or interrupting any utilities, services or facilities which may affect the operation of other portions of the building or of other buildings, services or facilities of the Owner. In no case may any shutdown or interruption of any utilities, services or facilities be made without the approval and authorization of the Architect. Every reasonable means shall be employed by the Contractor to minimize vibration and noise which may result from Work and to minimize the length of any utility outage. Where required by the Architect, the Contractor shall provide temporary services for maintaining existing utilities, services or facilities. The Contractor shall coordinate through the Architect any Work in connection with adjacent areas, roadways, walks, or other facilities which would tend to prevent access thereto or interrupt, restrict, or otherwise infringe upon the Owner's use thereof.

4.14 CUTTING AND PATCHING OF WORK

4.14.1 The Contractor shall be responsible for all cutting, fitting or patching that may be required to complete the Work or to make its several parts fit together properly.

4.14.2 The Contractor shall not damage or endanger any portion of the work or the work of the Owner or any separate Contractors by cutting, patching or otherwise altering any work, or by excavation. The Contractor shall not cut or otherwise alter the work of the Owner or any separate Contractor except with the written consent of the Owner and of such separate Contractor. The Contractor shall not unreasonably withhold from the Owner or any separate Contractor his consent to cutting or otherwise altering the Work.

4.15 CLEANING UP

4.15.1 The Contractor at all times shall keep the premises free from accumulation of waste materials or rubbish caused by his operations. At the completion of the work he shall leave the Project in a clean and orderly condition, including removing all his waste materials and rubbish from and about the Project as well as all his tools, construction equipment, machinery and surplus materials.

4.15.2 If the Contractor fails to clean up at the completion of the Work, the Owner may do so as provided in Paragraph 3.4 and the cost thereof shall be charged to the Contractor.

4.16 COMMUNICATIONS

4.16.1 The Contractor shall forward all communications to the Owner through the Architect.

4.17 ROYALTIES AND PATENTS

4.17.1 The Contractor shall pay all royalties and license fees. He shall defend all suits or claims for infringement of any patent or other proprietary rights and shall save the Owner harmless from loss on account thereof, except that the Owner shall be responsible for all such loss when a particular design, process or the product of a particular manufacturer or manufacturers is specified, but if the Contractor has reason to believe that the design, process or product specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to the Architect and Owner.

4.18 INDEMNIFICATION

4.18.1 To the fullest extent permitted by law, Contractor shall indemnify, defend and hold harmless the Owner, and the Architect and their directors, trustees, officers, employees, representatives and agents (the "Indemnified Parties") from and against any and all loss, cost, damage, injury, liability, claim, cause of action, demand, penalty or expense (including attorneys' fees, whether incurred as a result of a third party claim or allegation or arising out of enforcing this Contract), directly or indirectly arising out of, resulting from or related to (in whole or in part) (1) the Work performed hereunder, (2) the Contract, (3) the act or omission, including but not limited to the violation of any Law (as defined in Section 4.7.2 above) of Contractor, a Subcontractor or any individual, partnership, joint venture or corporation (a) directly or indirectly employed by Contractor or a Subcontractor thereof or (b) for whose acts or omissions Contractor or a Subcontractor thereof may be liable, (4) personal injury, (including "grave injury" as defined in the Workers' Compensation Law), sickness, disease or death, including, without limitation, to any employees of the Contractor or others identified in Phrase (3) above, or (5) injury to or destruction of tangible property, including the loss of use resulting therefrom (excluding property damage to the Work itself to the extent that compensation is provided by the Owner's all-risk builder's risk insurance, subject to Contractor's liability for any deductible amounts thereunder), irrespective of whether there is a breach of a statutory obligation or rule of apportioned liability. The obligations of Contractor under this indemnification shall apply to all matters except to the extent indemnification of such person is precluded by statute and except those obligations arising solely from the wanton and willful negligence or the malicious acts or omissions of the Owner. The obligations contained in this Subparagraph shall not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity which would otherwise exist as to any party or person described in this Paragraph 4.18.

4.18.2 In any and all claims against the Indemnified Parties by any employee of the Contractor, any Subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts or omissions any of them may be liable, the indemnification obligation under this Paragraph 4.18 shall not be limited in any way by any limitation on the amount or type of damages, compensation or benefits payable by or for the Contractor or any Subcontractor under workers' or workmen's compensation acts, disability benefit acts or other employee benefit acts.

4.18.3 The obligations of the Contractor under this Paragraph shall not extend to the liability of the Architect, his agents or employees, arising out of (1) the preparation or approval of maps, drawings, opinions, reports, surveys, change orders, designs or specifications, or (2) the giving of or the failure to give directions or instructions by the Architect, his agents or employees.

4.18.4 Contractor shall promptly advise Owner in writing of any action, administrative or legal proceeding or investigation as to which

this indemnification may apply, and Contractor, at Contractor's expense, shall assume on behalf of Owner and conduct with due diligence and in good faith the defense thereof with counsel satisfactory to Owner; provided, that Owner shall have the right to be represented therein by advisory counsel of its own selection and at its own expense; and provided further, that if the defendants in any such action include both Contractor and Owner and Owner shall have reasonably concluded that there may be legal defenses available to it which are different from or additional to, or inconsistent with, those available to Contractor, Owner shall have the right to select separate counsel to participate in the defense of such action on its own behalf at Contractor's expense. In the event of failure by Contractor to fully perform in accordance with this indemnification paragraph, Owner, at its option, and without relieving Contractor of its obligations hereunder, may so perform, but all costs and expenses so incurred by Owner in that event shall be reimbursed by Contractor to Owner, together with interest on the same from the date any such expense was paid by Owner until reimbursed by Contractor, at the rate of interest provided to be paid on judgments, by the law of the jurisdiction to which the interpretation of the Contract is subject.

4.18.5 The obligations of the Contractor under this Paragraph 4.18 shall survive the expiration or termination of the Contract.

4.19 REPRESENTATIONS AND WARRANTIES

The Contractor represents and warrants:

1. That it is financially solvent and is experienced in and competent to perform the Work, and has the staff, manpower, equipment, subcontractors, and suppliers available to complete the Work within the time specified for the contract price.

2. That it is familiar with all Federal, State or other laws, ordinances, orders, rules and regulations, which may in any way affect the Work;

3. That any temporary and permanent Work required by the Contract can be satisfactorily constructed, and that said construction will not injure any person or damage any property;

4. That it has carefully examined the Contract and the Site of the Work and that, from the Contractor's own investigations is satisfied as to the nature and materials likely to be encountered, the character of equipment and other facilities needed for the performance of the Work, the general and local conditions, and all other materials or items which may affect the Work; and

5. That it is satisfied that the Work can be performed and completed as required in the Contract, and warrants that it has not been influenced by any oral statement or promise of the Owner or the Architect.

ARTICLE 5

SUBCONTRACTORS

5.1 DEFINITION

5.1.1 A Subcontractor is a person or entity who has a direct Contract with the Contractor to perform any of the Work including supply of equipment or materials. The term Subcontractor is referred to throughout the Contract documents as if singular in number and masculine in gender and means a Subcontractor or his authorized representative. The term Subcontractor does not include any separate Contractor or his subcontractors.

5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect Contract with a Subcontractor to perform any of the work. The term Sub-subcontractor is referred to throughout the Contract Documents as if singular in number and masculine in gender and means a Sub-subcontractor or an authorized representative thereof.

5.2 AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK

5.2.1 Unless otherwise required by the Contract Documents or the Bidding Documents, the Contractor, as soon as practicable after the award of the Contract, shall furnish to the Owner and the Architect in writing the names of the persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for each of the portions of the work. The Owner will, within 20 days from the receipt of such names from Contractor, reply to the Contractor in writing, stating whether or not the Owner or the Architect, objects to any such proposed person or entity. Failure of the Owner or Architect to reply within the time set forth above shall constitute notice of no reasonable objection. The list of names of proposed Subcontractors shall also include the amount of the respective bids.

5.2.2 The Contractor shall not Contract with any such proposed person or entity to whom the Owner or the Architect has made timely objection under the provisions of Subparagraph 5.2.1. The Contractor shall not be required to Contract with anyone to whom he has a reasonable objection. The Contractor shall not Contract with any person or entity declared ineligible under Federal laws or regulations from participating in Federally assisted construction projects or to whom the Owner or Architect has objected under the provisions of Article 5.2.1. The Contractor agrees to use its best efforts to give small business and minority-owned business enterprises, as well as locally-owned businesses, the maximum practicable opportunity to participate in the Subcontracts it awards and to make positive efforts to utilize small business and minority owned business sources of supplies and services for the Work.

5.2.3 If the Owner or the Architect objects to any such proposed person or entity, the Contractor shall submit a substitute to whom the Owner or the Architect has no objection.

5.2.4 The Contractor shall make no substitution for any Subcontractor, person or entity previously selected except for cause. The Contractor may select a replacement for such person upon written notice to the Owner and Architect unless the Owner or Architect objects within 20 days or receipt of such notice from the Contractor.

5.2.5 Upon request of Owner, contractor shall submit to Owner promptly following execution, three copies of every subcontract or purchase order and a copy of every revision, amendment, modification or cancellation executed or issued by Contractor with respect thereto. Should Owner so request, Owner is not obligated to make payment on account of Work performed or Materials furnished by a Subcontractor or a Materialman under a subcontract or purchase order unless there shall have been filed with Owner prior to the submission of a Requisition for each payment, three copies of such subcontract or purchase order containing the provisions required by the Construction Documents to be contained therein, except as may otherwise be specified by Owner with respect to purchase orders for

minor purchases.

5.3 SUBCONTRACTUAL RELATIONS

5.3.1 By an appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by the terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities which the Contractor, by these Documents, assumes toward the Owner and the Architect. Said agreement shall preserve and protect the rights of the Owner and the Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that the subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the Contractor-Subcontractor agreement, the benefit of all rights, remedies and redress against the Contractor that the Contractor, by these Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with his Sub-subcontractors. Each subcontract shall contain provision for execution of lien waivers in form and substance acceptable to Owner as a condition of payment by the Contractor. Contractor shall require each Subcontractor to (1) inspect the Project site, including all relevant surfaces and job conditions, before beginning Work and (2) accept or cite necessary corrections in the Project site, including surfaces or job conditions, before beginning Work.

5.3.2 Contractor shall include a provision in all subcontracts and purchase orders, except as may otherwise be specified by Owner with respect to purchase orders for minor purchases, that, in order to permit verification of contractor's costs, Owner shall have the right to have its representatives in addition to governmental auditors inspect and audit the books of account and records of the Subcontractors and Materialmen, including the right to make excerpts from such books and records. Contractor shall include a provision in all subcontracts and purchase orders that will enable representatives of the Owner to obtain access during working hours to the appropriate books of account and records of the Subcontractors and Materialmen relating to the work to determine if there is compliance with the requirements of law or the Construction Documents.

5.3.3 In the event the Contractor fails to discharge or bond any lien placed upon the Work, within ten (10) business days after the giving notice of same by Owner to Contractor, the Owner may (but is not obligated to) pay such Subcontractor directly, less the amount to be retained under its Subcontract. Any amount so paid by the Owner shall be credited against amounts due Contractor or repaid by the Contractor in the manner set forth in Paragraph 2.4 if insufficient credit exists.

5.3.4 The Owner shall have no obligation to pay, or to see to the payment of, any monies to any Subcontractor. Nothing contained in Paragraph 5.3 shall be deemed to create any contractual relationship between the Owner and any Subcontractor or to create any rights of any Subcontractor against the Owner.

5.3.5 All subcontract agreements shall conform to the requirements of the Contract Documents, and Contractor hereby assigns to Owner (and Owner's permitted assigns) all its interest in any subcontract agreements and purchase orders now existing or hereinafter entered into by Contractor for performance of any part of the Work, which assignment will be effective upon acceptance by Owner in writing and only as to those subcontract agreements and purchase orders that Owner designates, in its sole discretion, in said writing. It is agreed and understood that Owner may accept said assignment at any time during the course of construction prior to Final Completion. Upon such acceptance by Owner, (1) contractor shall promptly furnish to Owner true and correct copies of the designated subcontract agreements, and purchase orders, and (2) Owner shall only be required to compensate the designated Subcontractor(s) or supplier(s) for compensation accruing to such party(ies) for Work done or materials delivered from and after the date on which Owner determines to accept the subcontract agreement(s) or purchase order(s). All sums due and owing by Contractor to the designated Subcontractor(s) or supplier(s) for work performed or materials supplied prior to Owner's determination to accept the subcontract agreement(s) or purchase order(s) shall constitute a debt between such parties and Contractor. It is further agreed that all subcontract agreements and purchase orders shall provide that they are freely assignable by Contractor to Owner and assigns under the terms and conditions stated hereinabove. It is further agreed and understood that such assignment is part of the consideration to Owner for entering into the Contract with Contractor and may not be withdrawn prior to Final Completion. Contractor shall deliver or cause to be delivered to Owner a written acknowledgment in form and substance satisfactory to Owner from each of its Subcontractors and suppliers of the contingent assignment described herein no later than ten (10) days after the date of execution of each subcontract agreement and purchase order with such parties.

ARTICLE 6

WORK BY OWNER OR BY SEPARATE CONTRACTORS

6.1 OWNER'S RIGHT TO PERFORM WORK AND TO AWARD SEPARATE CONTRACTS

6.1.1 The Owner reserves the right to perform work related to the Project with his own forces, and to award separate Contracts in connection with other portions of the Project or other work on the site under these or similar Conditions of the Contract. Contractor will not claim that delay is involved because of such action by Owner unless the action by Owner or Owner's Contractors is negligent in timeliness of performance.

6.1.2 When separate Contracts are awarded for different portions of the Project or other work on the site, the term Contractor in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

6.1.3 The Owner will provide for the coordination of the work of his own forces and of each separate Contractor with the Work of the Contractor, who shall cooperate therewith as provided in Paragraph 6.2.

6.2 MUTUAL RESPONSIBILITY

6.2.1 The Contractor shall afford the Owner and separate Contractors reasonable opportunity for the introduction and storage of their materials and equipment and the execution of their work, and shall connect and coordinate his Work with theirs as required by the Contract Documents. Contractor will not claim that delay or additional cost is involved because of such action by the Owner unless action is negligent in timeliness of performance.

6.2.2 If any part of the Contractor's Work depends for proper

execution or results upon the work of the Owner or any separate Contractor, the Contractor shall, prior to proceeding with the work, promptly report to the Owner and the Architect any apparent discrepancies or defects in such other work that render it unsuitable for such proper execution and results. Failure of the Contractor to so report shall constitute an acceptance of the Owner's or separate Contractors' work as fit and proper to receive his Work, except as to defects which may subsequently become apparent in such work by others.

6.2.3 Any costs caused by defective or ill-timed work shall be borne by the party responsible therefore.

6.2.4 Without limiting any other obligations or liability of the Contractor to Owner, should the Contractor or any Subcontractor or Sub-subcontractor cause damage to the work or property of the Owner, or to other work on the site, the Contractor shall promptly remedy such damage as provided in Article 10.2.5.

6.2.5 Should the Contractor cause damage to the work or property of any separate Contractor, the Contractor shall upon due notice promptly attempt to settle with such other Contractor by agreement, or otherwise to resolve the dispute. If such separate Contractor sues or initiates an arbitration proceeding against the Owner on account of any damage alleged to have been caused by the Contractor, the Owner shall notify the Contractor who shall defend such proceedings at the Contractor's expense, pursuant to the indemnity provisions set forth in Paragraph 4.18 and if any judgment or award against the Owner arises therefrom the Contractor shall pay or satisfy it and shall reimburse the Owner for all attorney's fees and court or arbitration costs which the Owner has incurred.

6.3 OWNER'S RIGHT TO CLEAN UP

6.3.1 If a dispute arises between the Contractor and separate Contractors as to their responsibility for cleaning up as required by Paragraph 4.15, the Owner may clean up and charge the cost thereof to the Contractors responsible.

ARTICLE 7
MISCELLANEOUS PROVISIONS

7.1 GOVERNING LAW

7.1.1 Contractor and each Subcontractor shall comply fully with all applicable requirements of all governmental authorities.

7.1.2 This Agreement shall be governed by the laws of the State of New York without regard to conflicts of law principles.

7.2 SUCCESSORS AND ASSIGNS

7.2.1 The Owner and the Contractor each binds himself, his partners, successors, assigns and legal representatives to the other party hereto and to the partners, successors, assigns and legal representatives of such other party with respect to all covenants, agreements and obligations contained in the Contract documents. Neither party to the Contract shall assign the Contract or sublet it as a whole without the written consent of the other, nor shall the Contractor assign any moneys due or to become due to him hereunder, without the previous written consent of the Owner. Any assignment without such prior written consent shall be void. Owner may, however, assign the Contract without Contractor's consent to any other party or entity without thereby releasing Owner from its responsibilities under the Contract unless the Contractor shall consent in writing to the Owner being so released from responsibility (Contractor's consent shall not be unreasonably withheld, delayed or conditioned).

7.3 WRITTEN NOTICE

7.3.1 Written notice shall be deemed to have been duly served if delivered in person to the individual or member of the firm or entity or to an officer of the corporation for whom it was intended, or if delivered at or sent by registered or certified mail to the last business address known to him who gives the notice.

7.4 CLAIMS FOR DAMAGES

7.4.1 Should either party to the Contract suffer injury or damage to person or property because of any act or omission of the other party or of any of his employees, agents or others for whose acts he is legally liable, claim shall be made in writing to such other party within a reasonable time after the first observance of such injury or damage. All written claims for damages or extra work shall include time of occurrence, location and other identifying factors and shall be supported if so required by Architect by letters, and journals or diaries, instructions, vouchers or other pertinent and applicable records.

7.4.2 For any action by Contractor that causes an avoidable fire alarm activation, Contractor shall pay to Owner, or Owner may offset against amount otherwise payable to Contractor the amount of $500 per avoidable fire alarm activation.

7.4.3 Should Contractor fail to return any Owner provided keys, Contractor shall pay to Owner, or Owner may offset against amount otherwise payable to Contractor the amount of $500 per key ring lost.

7.5 PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND

7.5.1 The Owner shall have the right to require the Contractor to furnish bonds covering the faithful performance of the Contract and the payment of all obligations arising thereunder if and as required in the Bidding documents or in the Contract Documents.

7.5.2 If at any time Owner shall be or shall become dissatisfied with any surety or sureties then upon the Performance Bond or the Payment Bond, or if for any other reason such bonds shall cease to be adequate security to Owner, Contractor shall within ten (10) days after notice from Owner to do so, substitute an acceptable bond or bonds in such form and sum and signed by such other surety or sureties as may be satisfactory to Owner, except that the penal sum of said bond shall not exceed the Contract Price as adjusted by Change Orders. The premiums on such bond or bonds shall be paid by Contractor. No further payments shall be deemed due nor shall be made until the new surety or sureties shall have furnished such an acceptable bond or bonds to Owner.

7.6 RIGHTS AND REMEDIES

7.6.1 The duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law.

7.6.2 No action or failure to act by the Owner, Architect or Contractor shall constitute a waiver of any right or duty afforded any of them

under the Contract, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach thereunder, except as may be specifically agreed in writing.

7.7 TESTS

7.7.1 If the Contract Documents, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any portion of the Work to be inspected, tested or approved, the Contractor shall give the Architect timely notice of its readiness so the Architect may observe such inspection, testing or approval. The Contractor shall bear all costs of such inspections, tests or approvals conducted by public authorities. Unless otherwise provided, the Owner shall bear all costs of other inspections, tests or approvals.

7.7.2 If the Architect determines that any Work requires special inspection, testing, or approval which Subparagraph 7.7.1 does not include, he will, upon written authorization from the Owner, instruct the Contractor to order such special inspection, testing or approval, and the Contractor shall give notice as provided in Subparagraph

7.7.3. If such special inspection or testing reveals a failure of the Work to comply with the requirements of the Contract Documents, the Contractor shall bear all costs thereof, including compensation for the Architect's additional services made necessary by such failure; otherwise the Owner shall bear such costs, and an appropriate Change Order shall be issued.

7.7.3 Required certificates of inspection, testing or approval shall be secured by the Contractor and promptly delivered by him to the Architect. Tests on inspections shall be made promptly to avoid unreasonable delay in the Work.

7.7.4 If the Architect is to observe the inspections, tests or approvals required by the Contract Documents, he will do so promptly and, where practicable, at the source of supply.

7.7.5 Any material to be furnished shall be subject to inspections and tests in the shop and field by the Architect. Shop inspection shall not relieve the Contractor of the responsibility to furnish satisfactory materials, and the right is reserved to reject any material at any time before final acceptance of the work, when in the opinion of the Architect the materials and workmanship do not conform to the Specification requirements.

7.7.6 Test specimens will be submitted to an independent laboratory designated by the Architect. Test data will be furnished to the Contractor by the Architect.

7.7.7 The Owner reserves the right to perform material sampling and testing to ensure that all materials used in the Work are asbestos free.

7.8 INTEREST

7.8.1 Payments due and unpaid under the Contract documents shall bear interest from the date payment is due and any amount of interest included in or on an award made pursuant to Article 7.9 shall be at such rate as the parties may agree upon in writing or, in the absence thereof, at the "prime rate," as reported by The Wall Street Journal in its column "Money Rates," or, if no longer reported therein, as reported in a comparably reliable source using a substantially similar basis for calculation; provided, however, that amounts controverted in good faith shall not bear interest until and unless determined in the first instance to be due by the Architect (if the matter is referred to the Architect for initial decision) as provided under Article 4 hereof. In no event shall any interest be due and payable by Owner to Contractor, any Subcontractor or any other party on any of the sums properly retained by Owner pursuant to any of the terms or provisions of any of the Contract Documents.

7.9 DISPUTE RESOLUTION

7.9.1 All claims, disputes and other matters in question between the Contractor and the Owner arising out of, or relating to, the Contract Documents or the breach thereof, except as provided in Article 2.2.8 with respect to the Architect's decisions on matters relating to aesthetic effect, and except for claims which have been waived by the making or acceptance of final payment as provided by Article 9.8.4 and 9.8.5 shall be decided by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association then pertaining if the total amount of any monetary damage claimed by each party to said arbitration by claim or counterclaim is less than $100,000. Each party making such a claim in arbitration agrees that it includes all damages which have or ever will arise out of the facts on which said claim is based and that the damages it may recover as a result of said claim are limited to a maximum of $100,000. The limit on claims to be pursued in arbitration shall not be avoided by alleging damages not reasonably related to the claim or by commencing multiple arbitration proceedings arising out of a single dispute; it being the intent of the parties to resolve all disputes described above that involve no more than $100,000 by arbitration and that all other disputes be resolved in the courts of the State of New York pursuant to Article 7.9.5.

7.9.2 The foregoing agreement to arbitrate and any other agreement to arbitrate with an additional person or persons in connection with the Project shall be specifically enforceable under the prevailing arbitration laws of the State of New York. The award rendered by the arbitrators shall be final and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

7.9.3 The venue of any arbitration occurring pursuant to this Article or any court proceeding to interpret or enforce said Article shall be in Monroe County, State of New York.

7.9.4 Notice of the demand for arbitration shall be filed in writing with the other party or parties to said arbitration and with the American Arbitration Association. The demand for arbitration shall be made within the time limits specified as provided elsewhere in these General Conditions, and in all other cases within a reasonable time after the claim, dispute of other matter in question has arisen, and in no event shall it be made after the date when institution of legal or equitable proceedings based on such claim, dispute or other matter in question would be barred by the applicable statute of limitations.

7.9.5 Except as provided in Article 7.9.1, all other claims, disputes and other matters in question between the Contractor and the Owner arising out of, or relating to, the Contract Documents or the breach thereof, except as provided in Article 2.2.8 with respect to the Architect's decisions on matters relating to aesthetic effect, and except for claims which have been waived by the making or acceptance of final payment as provided in Articles 9.9.4 and 9.9.5 shall be decided by the courts of the State of New York and venue for any such action shall be in Monroe County.

7.9.6 Unless otherwise agreed in writing, the Contractor shall carry

on the Work and maintain its progress during any arbitration or court proceedings, and the Owner shall continue to make payments to the Contractor in accordance with the Contract Documents.

7.9.7 It is agreed that such other parties as are necessary to resolve any dispute submitted to arbitration or court may be joined as parties and the claims against them consolidated with arbitration or court action arising out of or relating to the Contract Documents or breach thereof.

7.9.8 The parties agree that any arbitration hearings demanded under this Contract will be heard by a maximum of 3 arbitrators whose qualifications shall be mutually agreed upon.

7.9.9 The parties agree that in the event that a claimant recovers less than 50 percent of the total amount identified in its demand for arbitration, that party shall pay all of the arbitration fees, the arbitrators fees and the attorneys' fees of the opposing party.

7.10 WAIVER OF REMEDIES

Contractor acknowledges that it can be compensated adequately by money damages for any breach of this Agreement which may be committed by Owner or Architect. Contractor agrees that no default, act or omission of Owner or Architect shall constitute a material breach of contract entitling contractor to cancel or rescind this Agreement or to suspend or abandon performance thereof, other than the failure of Owner to make a payment of the Contract Price in accordance with the terms hereof solely because sufficient funds to pay the Contract Price have not been appropriated or will otherwise not be made available to Owner. Except as provided in this paragraph, Contractor hereby waives all rights and remedies to which Contractor might otherwise be or become entitled to become of any wrongful act or omission of Owner or Architect saving only Contractor's rights to money damages.

ARTICLE 8

TIME

8.1 DEFINITIONS

8.1.1 Unless otherwise provided, the Contract Time is the period of time allotted in the Contract Documents for Substantial Completion of the Work as defined in Subparagraph 8.1.3, including authorized adjustments thereto.

8.1.2 The date of commencement of the Work is the date established in a notice to proceed. If there is no notice to proceed, it shall be the date of the Owner-Contractor Agreement or such other date as may be established therein.

8.1.3 The Date of Substantial Completion of the Work or designated portion thereof is the Date certified by the Architect when construction is sufficiently complete, in accordance with the Contract Documents, and a certificate of occupancy has been issued, so the Owner can occupy or utilize the Work or designated portion thereof for the use for which it is intended without interference from Contractor or Contractor's activities in completing the remaining Work. Owner may, but is not obligated to, occupy and utilize the Work after Substantial Completion. Certain portions of the Work, particularly those affecting other areas, may be placed into beneficial service before other parts. For the purposes of the Agreement, the date of Substantial Completion for each such portion shall be defined as that date upon which that portion is placed into beneficial service by the Owner or upon which the Work is accepted by the Owner, whichever comes first. Substantial Completion shall not relieve the Contractor of its obligation to complete the Work in accordance with the Contract Documents.

8.1.4 The term 'day' as used in the Contract Documents shall mean calendar day unless otherwise specifically designated.

8.1.5 Work remaining to be completed after Substantial Completion shall be limited to items which can ordinarily be completed within the thirty (30) day period (one month) before final payment is made.

8.2 PROGRESS AND COMPLETION

8.2.1 All time limits stated in the Contract Documents are of the essence of the Contract. In any instance in which additional time is allowed for the completion of any Work, the new time of completion established by said extension shall be of the essence.

8.2.2 The Contractor shall begin the work on the date of commencement as defined in Subparagraph 8.1.2. He shall carry the Work forward expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time. It is expressly understood and agreed, by and between the Contractor and the Owner, that the time for completion of the Work described herein is a reasonable time for completion of the same.

8.2.3 In no case shall the Contractor delay the progress of the Work, or any part thereof, on account of changes in the Work or disputes caused by proposed or ordered changes in the work, or any disputes or disagreements as to the equitable value of the changes.

8.3 DELAYS AND EXTENSIONS OF TIME

8.3.1 If the Contractor is delayed at any time in the progress of the Work by any act or neglect of the Owner or the Architect, or by any employee of either, or by any separate Contractor employed by the Owner, or by changes ordered in the Work, or by occurrences beyond the control and without the fault or negligence of the Contractor and which by the exercise of reasonable diligence the Contractor is unable to prevent or provide against, including labor disputes (other than disputes limited to the work force of, or provided by, the Contractor or its Subcontractors), fire, unusual delay in deliveries not reasonably anticipatable, unavoidable casualties, or by other occurrences which the Architect, subject to the Owner's approval, determines may justify delay, then, provided that the Contractor is in compliance with Subparagraph 4.3.3 hereof, the Contract Time shall be extended by Change Order for the length of the delay actually and directly caused by such occurrence as determined by the Architect and approved by the Contractor and Owner (such approval not to be unreasonably withheld, delayed, or conditioned); provided, however, that such extension of Contract Time shall be net of any delays caused by or due to the fault or negligence of the Contractor or which are otherwise the responsibility of the Contractor and shall also be net of any contingency or "float" time allowance included in the Contractor's construction schedule. The Contractor shall, in the event of any occurrence likely to cause a delay, cooperate in good faith with the Architect and Owner to minimize and mitigate the impact of any such occurrence and do all things reasonable under the circumstances to achieve this goal.

8.3.2 The Owner shall give the Contractor reasonable notice of his intent to occupy the Premises, describing the extent, purpose, and

condition of the Occupancy. The Contractor may, upon receipt of the notification, request an extension of time if such occupancy, in his opinion, will result in delay or hindrance of normal pursuance of the Work or additional work on his part.

8.3.3 Any claim for extension of time shall be made in writing to the Architect not more than ten days after the commencement of the delay; otherwise it shall be waived. In the case of a continuing delay only one claim is necessary. The Contractor shall provide an estimate of the probable effect of such delay on the progress of the Work.

8.3.4 If no agreement is made stating the dates upon which interpretations as provided in Subparagraph 2.2.5 shall be furnished, then no claim for delay shall be allowed on account of failure to furnish such interpretations until fifteen days after written request is made for them, and not then unless such claim is reasonable.

8.3.5 Extension of time provided for the completion of the Work shall be the Contractor's sole remedy for delay (except for the Contractor's right to terminate the Contract pursuant to the provisions of Article 14 hereof), unless the same shall have been caused by acts constituting intentional interference by Owner with Contractor's performance of the Work where, and to the extent that, such acts of the Owner continue after Contractor's written notice to Owner of such interference. The Owner's exercise of any of its rights under the Contract, including, without limitation, its rights under Article 12, Changes in the Work, regardless of the extent or number of such Changes, or the Owner's exercise of any of its remedies of suspension of the Work, or requirement of correction or re-execution of any defective Work, shall not under any circumstances be construed as intentional interference with Contractor's performance of the Work.

8.3.6 The Owner may seek recovery for actual damages suffered due to delays of the Contractor; such actual damages will be considered to commence five (5) days after each or all of the following: (1) scheduled Substantial Completion date for any portion of the Work, (2) scheduled occupancy date for any portion of the Work, (3) scheduled Substantial Completion date for the entire Work, and (4) scheduled occupancy date for the entire Work. The dates referenced herein shall be subject to adjustment as provided in the Contract Documents.

ARTICLE 9

PAYMENTS AND COMPLETION

9.1 CONTRACT SUM

9.1.1 The Contract Sum is stated in the Owner-Contractor Agreement and, including authorized adjustments thereto, is the total amount payable by the Owner to the Contractor for the performance of the Work under the Contract Documents.

9.2 SCHEDULE OF VALUES

9.2.1 At least 30 days before the first Application for Payment, the Contractor shall submit to the Owner and the Architect for approval a schedule of values which in the aggregate equals the total Contract Sum, divided so as to facilitate payments to Subcontractors, supported by such data or evidence of correctness as the Architect may direct or as required by the Owner. This schedule, when approved by the Architect and Owner, shall be used to monitor the progress of the Work and to compute the amounts of the various payments requisitioned on the Certificates For Payment. All items with entered values will be transferred by the Contractor to the "Application and Certificate For Payment," and shall include the latest approved Change Orders. Change Order values shall be broken down to show the various subcontracts. The Application For Payment shall be on a form as provided by the Architect and approved by Owner. Each item shall show its total scheduled value, value of previous applications, value of the application, percentage completed, value completed and value yet to be completed. All blanks and columns must be filled in, including every percentage complete figure. No Application for Payment shall be required to be approved until after the Schedule of Values has been approved by the Owner and Architect.

9.2.2 The Schedule of Values and Applications for Payment shall be prepared by the Contractor using a modified version of A.I.A. Forms G-702 and G-703, "Application & Certification for Payment". The Schedule of Values shall be submitted to the Owner and the Architect for approval a minimum of thirty (30) days before the first Application for Payment. A milestone payment schedule may be required by the Owner, and shall be made a part of the Schedule of Values when agreed upon by the parties. Profit and general office overhead shall be included in each item. All Applications for Payment, Change Orders, and other documents involving monetary statements shall have totals rounded off to the whole dollar amount for 0 cents through 50 cents. All items above 50 cents through 99 cents to the next dollar.

9.3 APPLICATIONS FOR PAYMENT

9.3.1 At least twenty-five (25) days before the date for each progress payment established in the Owner-Contractor Agreement, the Contractor shall submit to the Architect an itemized Application for Payment, notarized if required, and reflecting retainage, if any, as provided elsewhere in the Contract Documents. Applications for payment must include (add and/or deduct) adjustments to the Lump Sum of the Contract resulting from work performed under approved Change Orders (specified under Article 12) and shall be shown separately on the application for previous and current periods. Each Application and Certificate for Payment shall be accompanied by two (2) up-to-date copies of the Progress Schedule, revised to the end of the application period. The Application for Payment shall be accompanied by (1) a certification by an officer of Contractor to the effect that: "There are no known mechanics', materialmen's or laborers' liens or claims or any other liens or claims, legal or equitable, contractual, statutory, or constitutional, outstanding or known to exist at the date of this Application; all due and payable bills with respect to the Work have been paid to date or are included in the amount requested in the current Application and there is no known basis for the filing of any mechanics', materialmen's or laborers' lien or claim or any other lien or claim, legal or equitable, contractual, statutory, or constitutional, on the Work."; (2) waivers and releases from Contractor and all Subcontractors, laborers, and materialmen for Work done and materials furnished in such form as to constitute an effective waiver and release of all such liens and claims under the laws of New York; and (3) Contractor's warranty as to the Work and materials for which payment is sought.

9.3.2 Unless otherwise provided in the Contract Documents, payments will be made on account of materials or equipment not incorporated in the Work but delivered and suitably stored at the site and, if approved in advance by the Owner, payments may similarly be made for materials or equipment suitably stored at some other location agreed upon in writing. Payments for materials or equipment stored on or off the site shall be conditioned upon submission by the

Contractor of bills of sale or such other procedures satisfactory to the Owner to establish the Owner's title to such materials or equipment or otherwise protect the Owner's interest, including applicable insurance and transportation to the site for those materials and equipment stored off the site.

9.3.3 The Contractor warrants and agrees that title to all Work will pass to the Owner either by incorporation in the Work or upon the receipt of payment therefore by the Contractor, whichever occurs first, free and clear of all liens, claims, security interests, or encumbrances whatsoever, that the vesting of such title shall not impose any obligations on Owner or relieve Contractor of any of its obligations under the Contract, that the Contractor shall remain responsible for damage to or loss of the Work, whether completed or under construction, until responsibility for the Work has been accepted by Owner in the manner set forth in the Contract Documents, and that no Work covered by an Application for Payment will have been acquired by the Contractor, or by any other person performing Work at the site or furnishing materials for the Project, subject to an agreement under which an interest therein or an encumbrance thereon is retained by the seller or otherwise imposed by the Contractor or such other person."

.1 Each Application for Payment shall be accompanied by duly executed waivers of liens for any amounts included in the previous month's Application for Payment establishing payment or satisfaction of all the obligations of the Contractor to its Subcontractors, all in form and substance reasonably satisfactory to the Owner, plus such other sworn statements as may be required by Owner.

9.3.4 Duplicate originals of the periodic Subcontractor and material-men's lien waivers and releases shall remain on file at the Contractor's office for inspection by the Owner or Owner's lenders. Duplicate originals of final lien waivers and releases supplied by each Subcontractor and material-man shall remain on file at the Contractor's office for a period of one (1) year from the date of final payment and shall be available for inspection by the Owner or Owner's lenders (if any).

9.3.5 When Application for Payment includes materials stored off the project site or stored on the Project site but not incorporated in the Work, for which no previous payment has been requested, a complete description of such materials shall be attached to the application. Suitable storage which is off the Project site shall be a bonded warehouse or appropriate storage approved by Owner and Owner's lenders (if any) with the stored materials properly tagged and identifiable for this Project and properly segregated from other materials. The Owner's written approval shall be obtained before the use of an off-site storage is made. Such approval may be withheld in Owner's sole discretion.

9.4 CERTIFICATES FOR PAYMENT

9.4.1 The Architect will, within seven days, after the receipt of the Contractor's Application for Payment, either issue a Certificate for Payment to the Owner, with a copy to the Contractor, for such amount as the Architect determines is properly due, or notify the Contractor in writing his reasons for withholding a Certificate as provided in Subparagraph 9.6.1.

9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on his observations at the site as provided in Subparagraph 2.2.3 and the data comprising the Application for Payment, that the Work has progressed to the point indicated; that, to the best of his knowledge, information and belief, the quality of the Work is in accordance with the Contract Documents (subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to the results of any subsequent tests required by or performed under the Contract Documents, to minor deviations from the Contract Documents correctable prior to completion, and to any specific qualifications stated in his Certificate) and that all lien waivers and certificates required under the Contract Documents have been furnished to the Architect in proper form and that the Contractor is entitled to payment in the amount certified less retainage as provided in the Contract Documents. However, by issuing a Certificate for Payment, the Architect shall not thereby be deemed to represent that he has made exhaustive or continuous on-site inspections to check the quality or quantity of the Work or that he has reviewed the construction means, methods, techniques sequences or procedures, or that he has made any examination to ascertain how or for what purpose the Contractor has used the moneys previously paid on account of the Contract sum, except where the Architect knows that the Contractor has not paid its subcontractors or suppliers, the Architect shall advise the Owner in writing before recommending or issuing a Certificate for Payment.

9.5 PROGRESS PAYMENTS

9.5.1 After the architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents. The Owner shall make payments on account of the Contract provided therein, as follows: (a) On or about the twenty-eight (28th) day of each month 90% of the value of each line item based on the Contractors Prices of labor and materials incorporated in the Work up to the first day of that month, as estimated by the Architect, less the aggregate of the previous payments; (b) thirty (30) days after final completion of the Work, provided the Work then is fully completed and accepted by the Owner and the contract fully performed, a final payment of the entire balance due the Contractor. The basis for payment shall be certificates of payments as described in Article 9; A.I.A. Form G-702, Application & Certificate for Payment, with the exception of the first, shall be notarized by a duly authorized notary public so licensed in the State of New York. Final Certificates will not be issued until: (1) Labor and materials required under the Contract have been furnished and completed and all accounts for extra work, materials and allowances for omissions have been rendered, audited, and agreed to and incorporated in such Certificate, and (2) A.I.A. Document G-706, Contractors Affidavit of Payments of Debts & Claims, and G-706A, Contractors Affidavit of Release of Liens, have been completed and approved by Architect and Owner, and (3) all other requirements of 9.8.2 have been satisfied.

9.5.2 The Contractor shall promptly pay each Subcontractor, upon receipt of payment from the Owner, out of the amount paid to the Contractor on account of such Subcontractor's Work, the amount to which said Subcontractor is entitled, reflecting the percentage actually retained, if any, from payments to the Contractor on account of such Subcontractor's Work. The Contractor shall, by an appropriate agreement with each Subcontractor, require each Subcontractor to make payments to his sub-subcontractors in similar manner.

9.5.3 Neither the Owner nor the Architect shall have any obligation to

pay or to see to the payment of any moneys to any subcontractor except as may otherwise be required by law.

9.5.4 No Certificate for a progress payment, nor any progress payment, nor any partial or entire use or occupancy of the Project by the Owner, shall constitute an acceptance of any work not in accordance with the Contract documents.

9.6 PAYMENTS WITHHELD

9.6.1 The Architect may decline to certify payment and may withhold his Certificate in whole or in part, to the extent necessary reasonably to protect the Owner, if in his opinion he is unable to make representations to the Owner as provided in Subparagraph 9.4.2. If the Architect is unable to make representations to the Owner as provided in Subparagraph 9.4.2 and to certify payment in the amount of the Application, he will notify the Contractor as provided in Subparagraph 9.4.1. If the Contractor and the Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which he is able to make such representations to the Owner. The Architect may also decline to certify payment or, because of subsequently discovered evidence or subsequent observations, he may nullify the whole or any part of any Certificate for Payment previously issued, to such extent as may be necessary in his opinion to protect the Owner from loss because of:

.1 defective Work not remedied,

.2 third party claims filed or reasonable evidence indicating probable filing of such claims,

.3 failure of the Contractor to make payments properly to Subcontractors or for labor, materials or equipment,

.4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract sum,

.5 damage to the Owner or another Contractor,

.6 reasonable evidence that the Work will not be completed within the Contract Time, or

.7 failure to carry out the Work in accordance with the Contract Documents.

9.6.2 The Owner may refuse to make payment on any Certificate for Payment for any default of the Contractor, including, but not limited to those defaults set forth in Clauses 9.6.1.1 through

9.6.3. The Owner shall not be deemed in default by reason of withholding payment while any of such defaults remain uncured.

9.6.4. When the above grounds in Subparagraph 9.6.1 are removed, payment shall be made for amounts withheld because of them.

9.7 SUBSTANTIAL COMPLETION

9.7.1 When the Contractor considers that the Work, or a designated portion thereof which is acceptable to the Owner, is substantially complete as defined in Subparagraph 8.13, the Contractor shall so notify the Architect and prepare for submission to the Architect a list of items to be completed or corrected. The failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents. When the Architect on the basis of an inspection determines that the Work or designated portion thereof is substantially complete, he will then prepare a final Punch List and a Certificate of Substantial Completion which shall establish the Date of Substantial Completion, and in the event the Owner occupies or utilizes the Work, shall state the responsibilities of the Owner and the Contractor for security, maintenance, heat, utilities, damage to the Work, and insurance, and shall fix the time within which the Contractor shall complete the items listed therein. Until Owner occupies the Work, Contractor shall not be relieved of any of its obligations under the Contract Documents respecting safety, security, maintenance, heat, utilities, insurance or damage to the Work. Warranties required by the Contract Documents with respect to a portion of the Work shall commence on either the date of the entire work or the date the Owner uses or occupies such portion of the Work unless otherwise provided in the Certificate of Substantial Completion. The Certificate of Substantial Completion shall be submitted to the Owner and the Contractor for their written acceptance. If the Owner does not occupy or use the Work prior to Final Acceptance, warranties shall commence as of the date of Final Acceptance. The date of commencement of warranties shall be called herein the "Warranty Date. The Work will not be considered suitable for Substantial Completion review until all Project systems included in the Work are operational as designed and scheduled, all designated or required governmental inspections and certifications have been made and posted, a Certificate of Occupancy (having terms acceptable to the Owner) has been issued by the proper authority, designated instruction of Owner's personnel in the operation of system has been completed, and all final finishes within the Contract are in place. In general, the only remaining Work shall be minor in nature, so that the Owner could occupy the building on that date and the completion of the Work by the Contractor would not materially interfere or hamper the Owner's or Owner's tenants' (or those claiming by, through or under Owner) normal business operations. As a further condition of Substantial Completion acceptance, the Contractor shall certify that all remaining Work will be completed within thirty (30) consecutive calendar days or as agreed upon following the Date of Substantial Completion.

9.7.2 Upon Substantial Completion of the work or designated portion thereof and upon application by the Contractor and certification by the Architect, the Owner shall make payment, reflecting adjustment in retainage, if any, for such Work or portion thereof, as provided in the Contract Documents. The Owner, when all the Work is substantially complete, shall pay to the Contractor the balance due the Contractor pursuant to the Contract, less:

1. two (2) times the value of any remaining items of Work to be completed or corrected; and

2. an amount necessary to satisfy any and all claims, liens or judgments against the Contractor.

As the remaining items of Work are completed and accepted by the Owner, the Owner shall pay the appropriate amount pursuant to the duly completed and submitted monthly requisitions.

9.7.3 In the event of Partial Occupancy before Substantial Completion as provided above, the Contractor shall cooperate with the Owner in making available for the Owner's use and benefit such building services as heating, ventilating, cooling, water, lighting, telephone, elevators and security for the portion or portions to be occupied, and if the Work required to furnish such services is not

entirely completed at the time the Owner desires to occupy the aforesaid portion or portions, the Contractor shall make every reasonable effort to complete such Work or make temporary provisions for such Work as soon as possible so that the aforementioned building services may be put into operation and use.

9.7.4 In the event of Partial Occupancy prior to Substantial Completion, mutually acceptable arrangements shall be made between the Owner and Contractor in respect of the operation and cost of necessary security, maintenance and utilities, including heating, ventilating, cooling, water, lighting and telephone services and elevators. The Owner shall assume proportionate and reasonable responsibility for the cost of the above services reduced by any savings to Contractor for such services realized by reason of Partial Occupancy. Further, mutually acceptable arrangement shall be made between the Owner and Contractor in respect of insurance and damage to the Work. Contractor's acceptance of arrangements proposed by Owner in respect of such matters shall not be unreasonably withheld, delayed, or conditioned.

9.7.5 In each instance, when the Owner elects to exercise its right of Partial Occupancy as described herein, Owner will give Contractor, Construction Manager and Architect advance written notice of its election to take the portion or portions involved, and immediately prior to Partial Occupancy, the Owner, Contractor and Architect shall jointly inspect the area to be occupied or portion of the Work to be used to determine and record the conditions of the same.

9.7.6 It shall be understood, however, that Partial Occupancy shall not: (1) constitute final acceptance of any Work; (2) relieve the Contractor for responsibility for loss or damage because of or arising out of defects in, or malfunctioning of, any Work, materials, nor from any other unfulfilled obligations or responsibilities under the Contract Documents; or (3) commence any warranty period under the Contract Documents; provided that Contractor shall not be liable for ordinary wear and tear resulting from such Partial Occupancy.

9.8 FINAL COMPLETION AND FINAL PAYMENT

9.8.1 Upon receipt and approval of written notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection and, when he finds the Work acceptable under the Contract Documents and the Contract fully performed, he will promptly issue a final Certificate for Payment stating that to the best of his knowledge, information and belief, and on the basis of his observations and inspections, the Work has been completed in accordance with the terms and conditions of the Contract Documents and that the entire balance found to be due the Contractor, and noted in said final Certificate, is due and payable. The Architect's final Certificate for Payment will constitute a further representation that the conditions precedent to the Contractor's being entitled to final payment as set forth in Subparagraph 9.8.2 have been fulfilled.

9.8.2 Neither the final payment nor the remaining retained percentage shall become due until the Contractor delivers to the Owner and the Architect (1) A.I.A. Documents G706, Contractor's Affidavit of Payment of Debts and Claims, and G706A, Contractor's Affidavit of Release of Liens, or other forms satisfactory to Owner, which have been completed and approved by the Architect and the Owner, covering all Work including that of all Subcontractors, vendors, labor, materials and services, executed by an authorized officer and duly notarized; (2) Consent of Surety for Final Payment and Release of Lien, A.I.A. Forms G707 and G707A, and the warranty described in Paragraph 9.3.3 which have been submitted and approved by the Architect and the Owner; (3) all applicable-as-built drawings and documents showing significant changes in the Work made during construction, job records, certificates and other Project Record Documents; (4) all punchlist items have been satisfactorily completed (unless the Owner agrees in writing that certain items may be completed subsequently and the Contractor delivers to the Owner a certified check in an amount equal to twice the value of the uncompleted work); (5) a permanent Certificate of Occupancy has been issued by the proper authority (which Contractor shall obtain); and (6) all applicable certificates of insurance required to remain in force after completion of the Work shall have been delivered to Owner. If any Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify him against any such lien. If any such lien remains unsatisfied after all payments are made, the Contractor shall refund to the Owner all moneys that the latter may be compelled to pay in discharging such lien, including all costs, interest and reasonable attorneys' fees. Upon demand by the Owner, Contractor shall provide and file bond for discharge of any lien, as required by the New York State Lien Law.

9.8.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by the issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance for Work not fully completed or corrected is less than the retainage stipulated in the Contract Documents, and if bonds have been furnished as provided in Paragraph 7.5, the written consent of the surety to the payment of the balance due for that portion of the work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

9.8.4 The making of final payment shall constitute a waiver of all claims by the Owner except those arising from:

.1 unsettled liens,

.2 faulty or defective Work appearing after Substantial Completion,

.3 failure of the Work to comply with the requirements of the Contract Documents, or

.4 terms of any special warranties required by the Contract Documents.

9.8.5 The acceptance of final payment shall constitute a waiver of all claims by the Contractor except those previously made in writing and identified by the Contractor as unsettled at the time of the final Application for Payment.

9.9 AS BUILT DRAWINGS

9.9.1 The Contractor shall red mark blue line prints of the project indicating all changes to the drawings and submit them to the A/E prior to submitting final request for payment.

9.9.2 Where coordination drawings have been prepared in CAD

format, the Contractor shall also submit these CAD files.

9.10 Operating and Maintenance Manuals – Prior to invoicing for final payment, the Contractor shall submit to the Owner Operating & Maintenance manuals and copies of all approved submittals in the following formats: three hard-copy sets of O&Ms and submittals in binders and electronic copies of all O&Ms in a format acceptable to the Owner, to be conveyed to the Owner on a CD.

ARTICLE 10

PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

10.1.1 The Contractor shall be responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work.

10.1.2 The Contractor shall, if requested by Owner, furnish written copies of said programs.

10.1.3 The Contractor shall immediately notify RIT's Campus Safety Office of any accident occurring in the performance of work for RIT (whether on or off RIT property) and shall promptly provide RIT's Facilities Management Services with copies of any accident reports.

10.2 SAFETY OF PERSONS AND PROPERTY

10.2.1 The Contractor shall take all necessary precautions for the safety of, and shall provide all necessary protection to prevent damage, injury or loss to:

.1 all employees on the Work and all other persons who may be affected thereby;

.2 all the Work and all materials and equipment to be incorporated therein, whether in storage on or off the site, under the care, custody or control of the Contractor or any of his Subcontractors or Sub-subcontractors; and

.3 other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures and utilities not designated for removal, relocation or replacement in the course of construction.

10.2.2 The Contractor shall give all notices and comply with all applicable laws, ordinances, rules, regulations and lawful orders of any public authority bearing on the safety of persons or property or their protection from damage, injury or loss. Contractor shall provide all facilities and shall follow all procedures required by the Occupational Safety and Health Act (OSHA) including, but not limited to, providing and posting all required posters and notices and shall otherwise be responsible for compliance with all other mandatory safety laws.

10.2.3 The Contractor shall erect and maintain, as required by existing conditions and progress of the work, all necessary safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent utilities and erecting fences and gates to isolate work sites and prevent entry by unauthorized persons.

10.2.4 When the use or storage of explosives or other hazardous materials or equipment is necessary for the execution of the Work, the Contractor shall exercise the utmost care and shall carry on such activities under the supervision of properly qualified personnel.

10.2.5 The Contractor shall promptly remedy at its sole cost and expense all damage or loss to any property referred to in Clauses 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, any Subcontractor, any Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable and for which the Contractor is responsible under Clauses 10.2.1.2 and 10.2.1.3 . The obligations of the Contractor under this indemnification shall not extend to the liability of the Architect, its agents, or employees, arising out of (1) the preparation or approval of maps, Drawings, opinions, reports, surveys, Change Orders, designs or Specifications, or (2) the giving of or the failure to give directions or instructions by the Architect, its agents or employees provided such giving or failure to give is the primary cause of the injury or damage. The Contractor shall be held responsible for any and all breakage, loss or damage to any Work until acceptance by the Owner. If the Contractor fails to take immediate corrective action following notice from the Owner or the Architect of any unsafe condition or deficiency in the Work of Subparagraphs 10.1.1 through 10.2.7, the Owner shall have the right, but not the obligation, to take all necessary corrective action at the Contractor's expense. The charge-back shall also include a charge for the time of any employees of the Owner involved in taking such corrective action.

10.2.6 The Contractor shall designate a responsible member of his organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and the Architect.

10.2.7 The Contractor shall not load or permit any part of the Work to be loaded so as to endanger its safety.

10.3 EMERGENCIES

10.3.1 In any emergency affecting the safety of persons or property, the Contractor shall act, at his discretion, to prevent threatened damage, injury or loss. Any additional compensation or extension of time claimed by the Contractor on account of emergency work shall be determined as provided in Article 12 for Changes in the Work. The Contractor shall immediately notify RIT's Campus Safety Office of any accident occurring on RIT's premises and shall promptly provide RIT's Facilities Management Services with copies of any accident reports.

10.4 HAZARDOUS MATERIALS

10.4.1 In the event Contractor encounters on the site material reasonably believed to be "Hazardous Materials" as defined herein, Contractor shall immediately stop work in the area affected and report the condition to Owner and Architect in writing. The work in the affected area shall not be resumed until a determination has been made by Owner as to how to proceed.

ARTICLE 11

INSURANCE

11.1 CONTRACTOR'S LIABILITY INSURANCE

11.1.1 Before starting and until Final Payment (except that products and contractual liability coverage shall continue in force until three years after the date of final Payment with Owner to receive annual evidence of such continuance), Contractor and its Subcontractors shall purchase and maintain such insurance as will protect them from claims set forth which may arise out of, or result from, the Contractor's operations under the Contract, whether such operations be by themselves, or by any Subcontractor, or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable.

The Contractor shall, at its own expense, maintain insurance as outlined below with minimum limits as referenced.

.1 BROAD FORM COMMERCIAL GENERAL LIABILITY: With limits of $1,000,000 ($2,000,000 general aggregate) written on an occurrence basis including coverage for bodily injury and property damage, XCU, product liability, products/completed operations, contractual liability, contingent liability, and personal injury liability and advertising liability (Refer to 11.2).

.2 AUTO LIABILITY: Including owned, hired and non-owned autos, trucks, tractors, trailers, motorcycles or other automotive equipment. $1,000,000 combined single limit (each accident). Coverage must apply to non-ownership protection for all employees of contractor engaged in performance of this contract. Coverage shall include contractual liability.

.3 EXCESS LIABILITY: $3,000,000 minimum in excess of underlying limits. The umbrella shall be no more restrictive than the underlying coverage.

.4 WORKERS' COMPENSATION & EMPLOYER'S LIABILITY: Statutory New York State limits.

.5 ASBESTOS LIABILITY (If Work Includes Asbestos Removal): With limits of $1,000,000 written on an occurrence basis.

11.1.2 These coverages and limits are to be considered minimum requirements under this Contract and in no way limit the liability of the Contractor.

11.1.3 This insurance shall be written by a company licensed to do business in New York State with a minimum acceptable rating of A-7 and reasonably satisfactory to Owner. Each policy shall provide for notification to Owner thirty (30) days prior to termination or restrictive amendments. The insurance companies issuing the policies shall have no recourse against Owner for the payment of premiums or for any assessments under any form or policy. Owner reserves the right to request copies of insurance policies prior to commencement of Work.

11.1.4 If at any time any of the above required insurance policies should be canceled, terminated or modified so that the required insurance is not in effect, Owner may require Contractor to suspend performance of the Work. No extension of time shall be allowed to Contractor in the event of any such suspension. Whether or not the Work is suspended, Owner may, at its option, obtain replacement coverage in whole or in part, the cost of which shall be payable by Contractor to Owner.

11.1.5 Owner shall be named as an additional insured (CG 2010, Form B) on all policies purchased by the Contractor as described herein with the exception of Workers' Compensation and Employer's Liability.

11.2 COMMERCIAL GENERAL LIABILITY POLICY

11.2.1 The Commercial General Liability Policy shall provide insurance for Contractor and Owner for Bodily Injury and Property Damage to third persons arising out of:

.1 Work performed by Contractor himself with his own employees, called "premises - operations."

.2 Work performed by his Subcontractors, called "sublet work" or "Independent Contractor" (this is referred to as Contractors' Protective Liability).

.3 Contractor's liability assumed under "hold harmless" clauses or indemnity provisions of this Contract. (This is referred to as Contractual Liability Insurance.)

.4 Products Liability coverage covering the completed building or installation or products furnished. (This is called Products Liability Insurance for the Manufacturer and Completed Operations Liability Insurance for Contractor.).

11.2.2 In the event of claims being made by reason of personal injuries suffered by any employee or employees of one insured hereunder for which another insured hereunder is or may be liable, then this policy shall cover such insured against whom a claim is made or may be made in the same manner as if separate policies had been issued to each insured hereunder.

11.2.3 In the event of claims made by reason of damage to property belonging to any insured hereunder for which another insured is, or may be liable, then this policy shall cover such insured against whom a claim is made or may be made in the same manner as if separate policies had been issued to each insured hereunder.

11.3 CERTIFICATES OF INSURANCE

11.3.1 Certificates from the insurance carrier stating the limits of liability, any self-insured retention deductible applicable to each liability, and expiration date shall be filed in triplicate with Owner before operations are begun. Such certificates not only shall name the types of policy provided, but also shall refer specifically to this Contract and the articles and the above paragraphs in accordance with which insurance is being furnished, and shall state that such insurance is being required by such articles/paragraphs of this Contract, and shall be sufficiently comprehensive as to insure Owner (named as an additional insured) as well as Contractor and certify that the coverage extends to acts or omissions of Subcontractors, as to permit Owner to determine that the required insurance coverage has been provided without the responsibility of examining the individual insurance policies. For contracts being initiated regarding the RIT Inn and Conference Center, add to (Certificate Holder (Owner) The 5257 West Henrietta Road LLC, (Owner of Bldg. & Entity of RIT) 5257 W. Henrietta Road, Rochester, NY 14623 as Additional Insured.

11.3.2 If the initial insurance expires prior to completion of the Work,

renewal certificates shall be furnished by the date of expiration.

11.4 SUBCONTRACTOR INSURANCE

11.4.1 Contractor shall require each of Contractor's Subcontractors to procure and maintain, until the completion of that Subcontractor's Work, insurance of the types specified in Paragraph 11.1.1 above, unless Contractor has provided the required insurance naming Owner as an additional insured and extending to the acts or omissions of the Subcontractors. It shall be the responsibility of Contractor to ensure that all his Subcontractors comply with all of the insurance requirements contained herein relating to such subcontractors.

11.5 BUILDERS RISK INSURANCE

11.5.1 Owner and not Contractor shall self insure or carry all-risk Builders Risk Insurance including extended coverage, vandalism, malicious mischief to the full replacement value of all the Work and all materials, equipment and supplies on or near the site of the Work. Such insurance shall be payable to Owner, Contractor, Subcontractors and Sub-subcontractors as their interests may appear but all such policies shall contain appropriate waivers of subrogation as against all parties in form satisfactory to Owner. However, the Contractor, Subcontractors and Sub-subcontractors shall be responsible for insuring their own tools, equipment and appliances.

11.5.2 The Owner shall have the option of requesting the Contractor to carry Builders Risk Insurance as described in Subparagraph 11.5.1 provided the Owner compensates the Contractor for providing this coverage.

11.6 MISCELLANEOUS PROVISIONS

11.6.1 Neither the procurement nor the maintenance of any insurance by Owner or Contractor shall in any way be construed or deemed to limit, discharge, waive or release Contractor from any obligation under the Contract, nor to limit the liability of Contractor for any act or omission.

11.6.2 Owner and Contractor waive all rights against each other for damages caused by fire or other perils to the extent covered by insurance provided under this Article, except such rights as they may have to the proceeds of such insurance held by Owner as trustee. Contractor shall require similar waivers by its Subcontractors.

11.6.3 If required in writing by any party of interest, and if a Performance Bond does not already exist, Owner as trustee shall, upon occurrence of an insured loss, request a bond from the Contractor for the proper performance of its duties. Owner shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties of interest may reach, or in accordance with an award by arbitration, in which case the procedure shall be as provided herein. If after such loss no other special agreement is made, replacement of damaged work shall be covered by an appropriate Change Order.

11.6.4 Owner as trustee shall have power to adjust and settle any loss with the Insurers unless one of the parties of interest shall object in writing within five days after the occurrence of loss to Owner's exercise of this power, and if such objection be made, arbitrators shall be chosen as provided herein. Owner as trustee shall, in that case, make settlement with the Insurers in accordance with the directions of such arbitrators. If distribution of the insurance proceeds by arbitration is required, the arbitrators will direct such distribution.

ARTICLE 12

CHANGES IN THE WORK/SUBSTITUTIONS

12.1 CHANGE ORDERS

12.1.1 A Change Order is a written order to the Contractor signed by the Owner and the Architect, issued after execution of the Contract, authorizing a change in the Work or an adjustment in the Contract Sum or the Contract time. The Contract Sum and the Contract Time may be changed only by Change Order. A Change Order signed by the Contractor indicates his agreement therewith, including the adjustment in the Contract Sum or the Contract Time.

.1 A field directive or field order shall not be recognized as having any impact upon the Contract Sum or the Contract Time and the Contractor shall have no claim therefore unless it shall, prior to complying with same and in no event no later than 10 working days from the date such direction or order was given, submit to the Owner for the Owner's approval its change proposal.

.2 When submitting its change proposal, the Contractor shall include and set forth in clear and precise detail breakdowns of labor and materials for all trades involved and the estimated impact on the construction schedule. The Contractor shall furnish spread sheets (on computer disk if requested) from which the breakdowns were prepared and, if requested, spread sheets of any Subcontractors.

.3 All change proposals shall be in duplicate and numbered consecutively. A change proposal number shall not be duplicated, whether or not the proposal is accepted. Where applicable, a change proposal shall clearly reference the associated Request for Proposal.

.4 A change proposal shall not be revised by reason of a change in the substance of the described work but rather a new change proposal shall be issued under a new number.

.5 In general, each change proposal shall include:

a. The Project name and Work number as designated in the Contract Documents;

b. Work to be executed by a Subcontractor shall be shown separately in the same form as prescribed for the Contractor, and the Subcontractor shall be identified by trade and firm name; and

c. A brief description of the Work to be added to or deleted from the Contract.

.6 Change proposals do not become part of the Contract until and unless returned by the Project Manager in the form of a Change Order which has been executed by the Owner, the Architect and the Contractor.

12.1.2 The Owner, without invalidating the Contract, may order changes in the Work within the general scope of the Contract consisting of additions, deletions or other revisions, the Contract Sum

and the Contract Time being adjusted accordingly. All such changes in the Work shall be authorized by Change Order, and shall be performed under the applicable conditions of the Contract Documents.

.1 Unit prices agreed upon as the basis of a Change Order shall be attached to these General Conditions as Exhibit "A" upon the award of bid and/or shall be as designated in Contractor's Proposal.
If the quantities originally contemplated are so changed in a proposed Change Order that application of the agreed unit prices to the quantities of Work proposed will cause substantial inequity to the Owner or the Contractor, the applicable unit prices shall be equitably adjusted.

.2 If any materials previously required are omitted by written order of the Owner after they have been delivered to or partially worked on by the Contractor and consequently will not retain their full value for other uses, the Contractor shall be allowed its actual cost of such omitted materials, less the fair market value of such materials, as determined by the Architect.

.3 Changes in the Contract Sum for changes in the Work shall exclude charges involving penalties, alleged damages, cancellation charges unless bona fide and unavoidable, and other charges which do not relate to the cost of labor, materials, use of equipment, overhead and profit. When the Contract Time cannot be extended, due to commitments by the Owner, authorized Changes in the Work shall not affect the completion date. Where the Contract Time can be extended, such extension shall not be the basis for an extra claim in addition to the amount of the Change Order.

12.1.3 Pricing of Construction Contract Change Orders and Calculation of Reimbursable Personnel Costs.

Contractor agrees that it will incorporate the provisions of these articles into all agreements with lower tier Contractors, Subcontractors, etc. It is further understood that these change order pricing provisions will apply to all types of contracts and or subcontracts including but not limited to lump sum contracts, unit price contracts, and cost plus contracts. Whenever change order proposals to adjust the contract price become necessary, the Owner will have the right to select the method of pricing to be used by the Contractor. The options will be 1) lump sum change order proposal, 2) unit price change order proposal, or 3) cost plus change order proposal as defined in the following provisions.

.1 Lump sum change order proposals - The Contractor shall submit a properly itemized Lump Sum Change Order Proposal covering the additional work and/or the work to be deleted. This proposal will be itemized for the various components of the work and segregated by labor, material, and equipment in a detailed format satisfactory to the Owner. The Owner will require itemized detail on all change order proposals from the Contractor, subcontractors and sub-subcontractors regardless of tier. Details to be submitted will include line item estimates showing material and labor quantity take-offs, material prices by item and related labor hour pricing information and extensions (by line item and by drawing as applicable).

.a Labor - Estimated labor costs to be included for self performed work shall be based on the actual cost per hour paid by the contractor for those workers or crews of workers who the contractor reasonably anticipates will perform the change order work. Estimated labor hours shall include hours only for those workmen and working foremen directly involved in performing the change order work. Supervision above the level of working foremen (such as general foremen, superintendent, project manager, etc.) is considered to be included in the agreed upon Markup Percentages as outlined in article 12.1.15.

.b Labor Burden - Labor burden allowable in change orders and in calculating reimbursable personnel costs shall be defined as employers net actual cost of payroll taxes (FICA, Medicare, SUTA, FUTA), net actual cost for employer's cost of union benefits (or other usual and customary fringe benefits if the employees are not union employees), and net actual cost to the employer for worker's compensation insurance taking into consideration adjustments for experience modifiers, premium discounts, dividends, rebates, expense constants, assigned risk pool costs, net cost reductions due to policies with deductibles for self insured losses, assigned risk rebates etc. Contractors shall reduce their standard payroll tax percentages to properly reflect the effective cost reduction due to the estimated impact of the annual maximum wage limitations payroll taxes are subject to. The hourly rate for a particular employee shall be calculated by dividing the employee's fully loaded annual salary (with labor burden calculated as set forth above) by an amount of annual work hours net of standard paid time off, to yield an effective hourly rate for the employee. (Example 2,080 hours less 2 weeks vacation, 7 holidays and 2 sick days = 1,928 hours). The purpose of this is to acknowledge that the contractor incurs these costs in their payroll. The understanding is that no hours for paid time off will be charged for the change order work, only actual hours on the job will be billed. This method also applies to Cost Plus change orders referenced in 12.1.3.3.

.c Material - Estimated material change order costs shall reflect the Contractor's reasonably anticipated net actual cost for the purchase of the material needed for the change order work. Estimated material costs shall reflect cost reductions available to the Contractor due to trade discounts, free material credits, and/or volume rebates. Cash discounts on material purchased for change order work shall be credited to Owner if the Contractor is

provided Owner funds in time for Contractor to take advantage of any such cash discounts. Price quotations from material suppliers must be itemized by each specific item to be purchased. "Lot pricing" quotations will not be considered sufficient substantiating detail.

.d Equipment - Allowable change order estimated costs may include appropriate amounts for rental of major equipment specifically needed to perform the change order work (defined as tools and equipment with an individual purchase cost of more than $750). Further, for Contractor owned equipment, the aggregate equipment rent charges for any single piece of equipment used in any change order work shall be limited to 50% of the fair market value of the piece of equipment when the first change order is priced involving usage of the piece of equipment. Fuel necessary to operate the equipment will be considered as a separate direct cost associated with the change order work.

.e Indirect Costs (Overhead) - As a further clarification, the agreed upon Markup Percentage Fee as stated in 12.1.6 is intended to cover the contractor's profit and all indirect costs (overhead) associated with the change order work. Items intended to be covered by the Markup Percentage Fee include, but are not limited to: home office expenses, branch office and field office overhead expense of any kind; project management; superintendents; general foremen; estimating; engineering; coordination; expediting; purchasing; detailing; legal; accounting; data processing or other administrative expenses; shop drawings; permits; auto and umbrella insurance; pickup truck costs. The cost for the use of small tools is also considered to be covered by the Markup Percentage Fee. Small tools shall be defined as tools and equipment (power or non-power) with an individual purchase cost of less than $750.

.2 Unit Price Change Order Proposals - As an alternative to Lump Sum Change Order Proposals, the Owner may choose the option to use Contract Unit Prices. The Contractor will submit within seven (7) days after the receipt of the Owner's written request for the a Unit Price Proposal, a written Unit Price Proposal itemizing the quantities of each item of work for which there is an applicable Contract Unit Price. The quantities must be itemized in relation to each specific contract drawing.

.a Unit Prices - Contract Unit Prices will be applied to net differences of quantities of the same item. Such Contract Unit Prices will be considered to cover all direct and indirect costs of furnishing and installing the item including the subcontractor's Markup Percentage Fee.

.b Unit prices subsequently agreed upon shall be attached to the Agreement as Exhibit "A" upon the award of bids. If the quantities originally contemplated are so changed in a proposed Change Order that application of the agreed unit prices to the quantities of Work proposed will cause substantial inequity to the Owner or the Contractor, the applicable unit prices shall be equitably adjusted.

.3 Cost Plus Change Order Proposals - As an alternative to either Lump Sum Change Order Proposals or Unit Price Change Order Proposals, the Owner may elect to have any extra work performed on a cost plus markup percentage fee basis. Upon written notice to proceed, the Contractor shall perform such authorized extra work at actual cost for direct labor, actual cost of labor burden, actual cost of material used to perform the extra work, and the actual cost of rental of major equipment (without any charge for administration, clerical expense, general supervision or superintendent of any nature whatsoever, including general foremen, or the cost of rental of small tools, minor equipment or plant) plus the approved mark up percentage fee. The intent of this clause is to define allowable cost plus chargeable costs to be the same as those allowable when pricing Lump Sum Change Proposals as outlined in articles 12.1.3.1 above. Owner and Contractor may agree in advance in writing on a maximum price for this work and Owner shall not be liable for any charges in excess of the maximum. Daily time sheets with names of all Contractor's employees working on the project will be required to be submitted to the owner for both labor and equipment used by the Contractor for time periods during which extra work is performed on a cost plus fee basis. Daily time sheets will break down the paid hours worked by the Contractor's employees showing both base contract work as well as extra work performed by the each employee.

.4 by the method provided in Subparagraph 12.1.4.

12.1.4 If none of the methods set forth in Clauses 12.1.3.1, 12.1.3.2 or 12.1.3.3 is agreed upon, the Contractor, provided he receives a written order signed by the Owner, shall promptly proceed with the Work involved. The cost of such Work shall then be determined by the Architect on the basis of the reasonable expenditures and savings of those performing the Work attributable to the change, including in the case of an increase in the Contract Sum, a reasonable allowance for overhead and profit. In such case, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data for inclusion in a Change Order. Unless otherwise provided in the Contract Documents, cost shall be limited to the following: cost of materials, including sales tax and cost of delivery; cost of labor, including social security, old age and unemployment insurance, and fringe benefits required by agreement or custom; workers' or workmen's compensation insurance; bond premiums; rental value of equipment and machinery; and the additional costs of supervision and field office personnel directly attributable to the change. Pending final determination of cost to the Owner, payments on account shall be made on the Architect's Certificate for Payment. The amount of credit to be allowed by the Contractor to the Owner for any deletion or change which results in a net decrease in the Contract Sum will be

the amount of the actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in any one change, the allowance for overhead and profit shall be figured on the basis of the net increase, if any, with respect to the change.

12.1.5 Accurate Change Order Pricing Information - The Contractor, Subcontractors and lower tier Sub-Subcontractors agree that they are responsible for submitting accurate cost and pricing data to support its Lump Sum Change and/or Cost Plus Change Order Proposals or other contract price adjustments under the contract. Contractor and all other Contractors further agree to certify that the change order cost and pricing data submitted is accurate, complete, current and in accordance with the terms of the contract with respect to pricing of change orders.

12.1.6 Right to Verify Change Order Pricing Information - Contractor, Subcontractors, and lower tier Sub-Subcontractors agree that any designated Owner's representative will have the right to examine the contractor's records to verify the accuracy and the appropriateness of the pricing data used to price Change Order Proposals. Even after the change order Proposal has been approved, the Contractor and all lower tier subcontractors agree that an appropriate contract price adjustment will be made, if it is later determined that the change order cost and pricing data submitted was inaccurate, incomplete, not current or not in compliance with these provisions.

12.1.7 Requirements for Detailed Change Order Pricing Information - Contractor agrees to provide and require all Subcontractors and lower tier Sub-Subcontractors to provide a breakdown of allowable labor and labor burden cost information. This information will be used to evaluate the potential cost of labor and labor burden related to change order work. It is intended that this information represent an accurate estimate of the Contractor's actual labor and labor burden cost components and will be subject to verification of the underlying cost components. The Owner may elect to negotiate such labor rates, based upon the information submitted, with the understanding that such rates will become fixed and agreed upon for the purpose of pricing change order work. This information is not intended to establish fixed billing or change order pricing labor rates. However, at the time change orders are priced, the submitted cost data for labor rates may be used to price change order work. The accuracy of any such agreed upon labor cost components used to price change orders will be subject to later audit. Approved change order amounts may be adjusted later to correct the impact of inaccurate labor cost components if the agreed upon labor cost components are determined to be inaccurate.

12.1.8 Overhead and profit shall not be calculated on credits. The amount of credit to be allowed for a deletion or change which results in a net decrease in the Contract Sum shall be the actual net cost. When both additions and credits covering related work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of the net increase, if any.

12.1.9 If any product previously required is omitted by written order of the Owner after it has been delivered to or partially worked on by the Contractor and consequently will not retain its full value for other uses, the Contractor shall be allowed its actual cost of such omitted product, less the fair market value of such product, as determined by the Consultant.

12.1.10 If any product previously required is omitted by written order of the Owner prior to it being ordered, the Owner shall receive full credit. If omitted after it has been delivered, the Contractor shall attempt to return it for full credit and give the Owner full credit. If it can not be returned for full value due to re-stocking charges or because it has been partially worked on by the Contractor and consequently will not retain its full value for other uses, the Owner may require the Contractor to turn it over to the Owner as is or agree that the Contractor shall be allowed its actual cost of such omitted product, less the fair market value of such product, as determined by the Consultant.

12.1.11 Cost shall not be allowed in excess of usual rental charges in the Rochester area for similar equipment of like size and condition, including costs of necessary supplies and repairs for operating equipment on site in connection with other Work unless its use directly causes actual and additional costs to the Contractor. If equipment not on site is required for a change in Work only, the cost of transporting equipment to and from the site will be allowed.

12.1.12 Maximum Markup Percentage Allowable on Self Performed Work - With respect to pricing change orders involving work performed by a contractor with their own forces, a single maximum Markup Percentage Fee shall be allowed to all contractors regardless of tier to compensate them for all overhead (indirect costs) and profit. Such Markup Percentage Fee shall be as follows: 10% of the net change order direct cost for self performed work
In the event that changes require deletions of work, no markup percentage fees shall be added to the credit and such credit shall be based on the net change order cost.

12.1.13 Maximum Markup Percentage Allowable on Work Performed by Lower Tier Contractors - With respect to pricing change orders involving work performed by lower tier contractors, the maximum Markup Percentage Fee allowable to the contractor supervising the lower tier contractors work shall be as follows: 5% of the work performed by the lower tier subcontractor. No markups shall be permitted beyond two tiers of subcontractors.

12.1.14 The allowance for overhead and profit stated in 12.1.12 and 12.1.13 shall be inclusive of all supervisory and field office personnel costs unless it can be demonstrated (e.g. through an extension of Contract Time) that Contractor actually incurred additional costs of supervision and field office personnel directly attributable to the Change.

12.1.15 Maximum Markup Percentage Allowable on Work Performed by a Subcontractor's Supplier - With respect to materials supplied to a subcontractor whose vendor is installing the material, the maximum Markup Percentage Fee allowable to the contractor shall be that of a lower tier contractor - 5% of the work performed by the supplying vendor. No markups shall be permitted beyond two tiers of suppliers.

12.2 CONCEALED CONDITIONS

12.2.1 If conditions are encountered at the site which are (1) subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, then notice by the observing party shall be given to the other party promptly before conditions are disturbed and in no event later than 10 days after first observance of

the conditions. The Architect will promptly investigate such conditions and, if they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend an equitable adjustment in the Contract Sum or Contract Time, or both. The Contractor acknowledges that the Contract amount set forth in its bid includes such provisions which the Contractor deems proper for all subsurface or site conditions the Contractor could reasonably anticipate encountering as indicated in the Contract, or borings, reports, rock cores, foundation investigation reports, topographical maps or other information available to the Contractor or from the Contractor's inspection and examination of the Site prior to the submission of bids.

12.3 CLAIMS FOR ADDITIONAL COST

12.3.1 If the Contractor wishes to make a claim for an increase in the Contract Sum, he shall give the Architect written notice thereof within twenty days after the occurrence of the event giving rise to such claim. This notice shall be given by the Contractor before proceeding to execute the Work, except in an emergency endangering life or property in which case the Contractor shall proceed in accordance with Paragraph 10.3. No such claim shall be valid unless so made. Any change in the Contract Sum resulting from such claim shall be authorized by Change Order.

.1 If the Owner and the Contractor cannot agree on the amount of the adjustment in the Contract Sum, it shall be determined in the first instance by the Consultant in accordance with the provisions of Paragraph 12.1.3. Any change in the Contract Sum resulting from such claim shall be authorized by Change Order.

12.3.2 If the Contractor claims that additional cost is involved because of, but not limited to, (1) any written interpretation pursuant to Subparagraph 2.2.8, (2) any order by the Owner to stop the work pursuant to Paragraph 3.3 where the Contractor was not at fault, (3) any written order for a minor change in the Work issued pursuant to Paragraph 12.4, or (4) failure of payment by the Owner pursuant to Paragraph 9.7, the Contractor shall make such claim as provided in Subparagraph 12.3.1.

12.3.3 All written claims for damages or extra work shall include time of occurrence, location and other identifying factors and shall be supported if so required by Architect, by letters, journals, or diaries, instructions, vouchers, or other pertinent or applicable records.

12.3.4 Owner shall not be liable to any Contractor or Subcontractor for damages caused by any breach of contract, delay in performance or other act of neglect by any other Contractors or Subcontractors having Contracts for performance of any portion of the Work or by bad weather, or any causes designated Acts of God or force majeure by any court of law or any cause outside Owner's reasonable control.

12.4 MINOR CHANGES IN THE WORK

12.4.1 The Architect following consultation with and approval by the Project Manager, will have authority to order minor changes in the Work not involving an adjustment in the Contract Sum or an extension of the Contract Time and not inconsistent with the intent of the Contract Documents. Such changes shall be effected by written order, and shall be binding on the Owner and the Contractor. The Contractor shall carry out such written orders promptly.

12.5 SUBSTITUTIONS

12.5.1 Using the name of a proprietary item or the name of a particular supplier in the naming of an item is intended to establish the type, function, and quality required, unless the name is followed by the words indicating that no substitution is permitted. Materials or equipment of other suppliers or manufacturers may be accepted by the Architect or Engineer (A/E) if sufficient information is submitted by the contractor to allow the A/E to determine that the proposed materials or equipment is equivalent or equal to that named.

12.5.2 The procedure for review by the A/E will include the following:

.1 Requests for review of substitute items of material or equipment will not be accepted by the A/E from anyone other than the Contractor.

.2 The Contractor shall make written application for acceptance thereof, certifying that the proposed substitute will:

.a Perform adequately the functions and achieve the results called for by the general design.

.b Be similar and of equal substance to that specified and be suited to the same use as that specified.

.3 The application will state that the evaluation and acceptance of the proposed substitute will not prejudice the Contractor's achievement of substantial completion on time whether or not the acceptance of the substitute will require a change in the contract documents to adapt the design to the proposed substitute.

.4 All variations of the proposed substitute from that specified will be identified in the application.

.5 Available maintenance, repair and replacement service will be indicated.

6 THE APPLICATION SHALL CONTAIN AN ITEMIZED ESTIMATE OF ALL COSTS OR CREDITS that will result directly or indirectly from the acceptance of such substitute.

12.5.3 COSTS OF REDESIGN BY THE A/E, AS WELL AS CLAIMS OF OTHER CONTRACTORS AFFECTED BY THE RESULTING CHANGE SHALL BE PAID FOR BY THE CONTRACTOR PROPOSING THE SUBSTITUTE.

12.5.4 A substitute proposal will be reviewed once at no charge to the Contractor. If the proper procedure is not followed or if the substitute is not accepted as an equal, no future substitute submissions will be reviewed unless the A/E is paid in advance by the Contractor for the time required to review the additional substitutions.

12.5.5 The A/E is the person who has the final determination of the acceptability of the proposed substitutes without recourse from the Contractor.

ARTICLE 13

UNCOVERING AND CORRECTION OF WORK

13.1 UNCOVERING OF WORK

13.1.1 If any portion of the Work should be covered contrary to the request of the Owner or Architect or to requirements specifically expressed in the Contract Documents, it must, if required in writing by the Owner or Architect, be uncovered for his observation and shall be replaced at the Contractor's expense.

13.1.2 If any other portion of the Work has been covered which the Architect has not specifically requested to observe prior to being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such work be found in accordance with the Contract Documents, the cost of uncovering and replacement shall, by appropriate Change Order, be charged to the Owner. If such Work be found not in accordance with the Contract Documents, the Contractor shall pay such costs unless it be found that this condition was caused by the Owner or a separate Contractor as provided in Article 6, in which event the Owner shall be responsible for the payment of such costs unless otherwise provided in the Contract Documents.

13.2 CORRECTION OF WORK

13.2.1 The Contractor shall promptly correct all Work rejected by the Architect as incomplete, defective or as failing to conform to the Contract Documents whether observed before or after Substantial Completion and whether or not fabricated, installed or completed. The Contractor shall bear all costs of correcting such rejected Work, including compensation for the Architect's additional services made necessary thereby.

13.2. If, within one year after the Warranty Date or within such longer period of time as may be prescribed by law or by the terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be defective or not in accordance with the Contract Documents, the Contractor shall correct it promptly after receipt of a written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. This obligation shall survive termination of the Contract. The Owner shall give such notice promptly after discovery of the condition.

13.2.3 The Contractor shall remove, at Contractor's cost, from the site all portions of the Work which are defective or non-conforming and which have not been corrected under Subparagraphs 4.5.1, 13.2.1 and 13.2.2 unless removal is waived by the Owner.

13.2.4 If the Contractor fails to correct defective or non-conforming Work as provided in Subparagraphs 4.5.1, 13.2.1 and 13.2.2, the Owner may correct it in accordance with Paragraph 3.4.

13.2.5 If the Contractor does not proceed with the correction of such defective or non-conforming Work within a reasonable time fixed by written notice from the Architect, the Owner may remove it and may store the materials or equipment at the expense of the Contractor. If the Contractor does not pay the cost of such removal and storage within ten days thereafter, the Owner may upon ten additional days' written notice sell such Work at auction or at private sale and shall account for the net proceeds thereof, after deducting all the costs that should have been borne by the Contractor, including compensation for the Architect's additional services made necessary thereby. If such proceeds of sale do not cover all costs which the Contractor should have borne, the difference shall be charged to the Contractor and an appropriate Change Order shall be issued. If the payments then or thereafter due the Contractor are not sufficient to cover such amount, the Contractor shall pay the difference to the Owner.

13.2.6 The contractor shall bear the cost of making good all work of the Owner or separate Contractors destroyed or damaged by such correction or removal.

13.2.7 Nothing contained in this Paragraph 13.2 shall be construed to establish a period of limitation with respect to any other obligation which the Contractor might have under the Contract documents, including Paragraph 4.5 hereof. The establishment of the time period of one year after the Date of Substantial Completion or such longer period of time as may be prescribed by law or by the terms of any warranty required by the Contract Documents relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which his obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to his obligations other than specifically to correct the Work.

13.3 ACCEPTANCE OF DEFECTIVE OR NON-CONFORMING WORK

13.3.1 If the Owner prefers to accept defective or non-conforming Work, the Owner may do so instead of requiring its removal and correction, in which case a Change Order will be issued to reflect a reduction in the Contract Sum where appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 14

TERMINATION OF THE CONTRACT

14.1 TERMINATION BY THE CONTRACTOR

14.1.1 If the Work is stopped for a period of sixty days under an order of any court or other public authority having jurisdiction, or as a result of an act of government, such as a declaration of a national emergency making materials unavailable, through no act or fault of the Contractor or a Subcontractor or their agents or employees or any other persons performing any of the Work under a contract with the Contractor, or if the Work should be stopped for a period of thirty days by the Contractor because the Architect has not issued a Certificate for Payment as provided in Paragraph 9.7 or because the Owner has not made payment thereon as provided in Paragraph 9.7, then the Contractor may, upon seven additional days' written notice to the Owner and the Architect, terminate the Contract and recover from the Owner payment for all Work executed and for any proven loss sustained upon any materials, equipment, tools, construction equipment and machinery, a pro-rated share of his fee thereon but, in no event shall the Owner be liable to Contractor for any prospective loss including but not limited to lost profits or unabsorbed overhead. However, such payment to Contractor shall be less any set offs to which Owner may be entitled.

14.2 TERMINATION BY THE OWNER

14.2.1 If Contractor is adjudged a bankrupt, or makes a general assignment for the benefit of creditors, or if a receiver is appointed on account of Contractor's insolvency, or if Contractor is placed in reorganization or if he refuses or fails, except in cases for which

extension of time is provided, to supply enough properly skilled workmen or proper product, or if he fails to make prompt payment to Subcontractors for product or labor, or disregards laws, ordinances, rules, regulations or orders of any public authority having jurisdiction, or otherwise is guilty of a violation of a provision of the Contract Documents, or if Contractor fails to substantially complete the Work by the date set forth herein respectively accordingly to the schedule, then Owner may, without prejudice to any right or remedy and after giving Contractor and his surety, if any, ten days written notice and opportunity to cure, terminate the employment of Contractor and take possession of the site and of all product, tools and machinery thereon owned by Contractor and may finish the work by whatever method Owner may deem expedient. In such case, Contractor shall not be entitled to receive any further payment until the Work is finished.

14.2.2 If the unpaid balance of the Contract Sum exceeds the costs of finishing the Work, including compensation for the Architect's additional services made necessary thereby, such excess shall be paid to the Contractor. If such costs exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or to the Owner, as the case may be, shall be certified by the Architect, upon application, in the manner provided in Paragraph 9.4, and this obligation for payment shall survive the termination of the Contract.

14.3 TERMINATION BY THE OWNER FOR CONVENIENCE

14.3.1 In addition to the Owner's right to remove the Contractor from any part of the Work pursuant to the Contract Documents, the Owner may, at any time, at will and without cause, terminate any part of the Work or any subcontract or all remaining Work for any reason whatsoever by giving seven (7) days' prior written notice to the Contractor specifying the part of the Work or subcontract to be terminated and the effective date of termination. The Contractor shall continue to prosecute the part of Work not terminated. If any part of the Work or subcontract is so terminated, the Contractor shall be entitled to payment, less any setoffs to which the Owner may be entitled, for Work properly executed in accordance with the Contract Documents (the basis for such payment shall be as provided in the Contract) and for costs directly related to the Work thereafter performed by the Contractor in terminating such Work or subcontract including reasonable demobilization and cancellation charges provided said Work is authorized in advance by the Architect and the Owner. No payment shall be made by the Owner, however, to the extent that such Work or subcontract is, was, or could have been terminated under the Contract Documents or an equitable adjustment is made or denied under another provision of the Contract. In case of such termination, the Owner will issue a Construction Change Directive or authorize a Change Order making any required adjustment to the Date of Substantial Completion and/or the Contract Sum. For the remainder of the Work, the Contract Documents shall remain in full force and effect.

14.3.2 In no event, however, shall the Owner be liable to the Contractor in an amount greater than the Contract Sum or for any prospective loss of profits or unabsorbed overhead nor shall the cost of termination exceed that portion of the Contract Sum which the completed portion of the Work (plus additional obligations approved by the Architect) bears to the contemplated total value of the Work. Nothing in Paragraph 14.3.1 shall in any way affect the Owner's right to terminate because of the Contractor's default.

14.3.3 Upon a determination by a court of competent jurisdiction that termination of Contractor pursuant to Subparagraph 14.2.1 was wrongful, such termination will be deemed converted to a termination for convenience pursuant to Subparagraph 14.3.1 and Contractor's remedy for wrongful termination shall be limited to the recovery of the payment permitted for termination for convenience as set forth in Subparagraph 14.2.5.

14.3.4 In addition to Owner's right to suspend, delay, or interrupt Contractor from any part of Work pursuant to other provisions of the Contract Documents, Owner may, at any time, at will and without cause, suspend, delay, or interrupt any part of Work or any subcontract or all Work for any reason whatsoever for such period of time as the Owner may determine by giving seven (7) days' prior written notice to Contractor specifying the part of the Work or subcontract to be suspended, delayed, or interrupted and the effective date of such suspension, delay, or interruption, as the case may be. Contractor shall continue to prosecute the part of the Work not suspended, delayed, or interrupted and shall properly protect and secure the part of the Work so suspended, delayed or interrupted, so far as is necessary in Owner's reasonable opinion. Notwithstanding Subparagraph 8.3.3. hereof, if any part of the Work or subcontract is so suspended, delayed, or interrupted, the Contractor shall be entitled to payment of reasonable standby fees (or at Owner's option, payment for demobilization and subsequent remobilization) and of costs directly associated with protecting and securing the affected Work, provided said costs are authorized in advance by Architect and Owner. No payment shall be made by Owner, however, to the extent that such Work or subcontract is, was, or could have been suspended, delayed, or interrupted under other provisions of the Contract Documents or an equitable adjustment is made or denied under another provision of the Contract. In case of such suspension, delay, or interruption, the Owner will authorize a Change Order making any required adjustment to the Date of Substantial Completion and/or the Contract Sum. For the remainder of the Work, the Contract Documents shall remain in full force and effect.

14.3.5 Upon any termination pursuant to Article 14.3.1, Contractor agrees to waive any claims for damages on account of such termination and agrees that the sole remedy of Contractor is to receive payment for the full value for all Work properly done by Contractor to the date of termination, plus the cost of settling materialmen, Subcontractor and vendor claims, and an equitable amount for demobilization and winding up Contractor's activities on the site. In no case shall any payment be made for anticipatory profit, underutilization of personnel or equipment, or items of consequential loss or damage. The Owner shall not pay, or cause to be paid, any amounts due hereunder except upon receipt of documentation reasonably satisfactory to the Owner and the Architect with respect to amounts claimed by Contractor.

OWNER

ROCHESTER INSTITUTE OF TECHNOLOGY

By: _____

Signature

Gary A. Prokop
Director, Operations and Procurement

Date:

CONTRACTOR/ARCHITECT/ENGINEER

By: _____

Signature

Print Name and Title

Date:

EXHIBIT 1

DAILY WORKFORCE LOG FOR RIT CONSTRUCTION PROJECTS

Date: Week Beginning - _____

Project

Contractor/Sub-Contractor Name

Listed workers:

M	T	W	TH	F	S	SU	Name (print)

I certify that these are all of our employees who worked on this job site this week. All of them are legally authorized to work in the United States.

Printed Name: _____

Signature: _____

Appendix F

UFES Survey Responses

Question: *Do you think that the mandatory use of a truly standardized Uniform Front End Specifications (that is, endorsed by owners, designers, contractor and subcontractors alike) would reduce claims and disputes on projects? The UFES would not necessarily be identical for public and private works. Why or why not?*

1: I absolutely agree that mandatory use of a true set of GC's and GR's would assist in reducing claims and disputes on projects over the long run. For the same reason that mandatory use of the FAR clauses helps prevent many issues (because everyone involved knows clearly the intent of each provision, we are left arguing only over facts) use of a similar set of GC's and GR's would help outside the Federal sector. The real challenges is twofold -- one, getting someone to draft the provisions in simple, understandable language and, two, getting agreement of a large number of organizations representing every party's interests -- owners, designers, CM's, constructors, subcontractors, suppliers, etc. Whether this can be done, I doubt it sincerely. Look at the recent experience with the new version of the AIA's documents where the AGC and several subcontractor organizations refused to endorse the new documents despite having spent some considerable amount of time on the task force to draft these documents.

Do we need separate public vs private versions of these uniform documents? Absolutely. Why? Because private and public organizations allocate risk quite differently and will continue to do so for the foreseeable future. And, even in the public sector, different versions for differing jurisdictions may be required. For example, California has a very well developed Public Contract Code with many California-specific requirements which differ radically from Arizona. Without statutory changes, no public works owner in California can agree to anything but what the Public Contract Code calls for.

2: In the longer term, once the UFES would be established sufficiently that all parties and their people would know the provisions, and there would be sufficient experience with resolution of disputes under their provisions to establish how the UFES should be interpreted, there should be a reduction in claims and disputes. This would eventually occur, I believe, since improved communication between parties to a contract usually tends to reduce misunderstandings and disputes. This presumes that UFES would truly become the standard in the industry and not just another set of "standard" contract documents from which to choose. The benefits of the true standardization could derive from more comprehensive use of any of the construction contract document sets

currently available. (Ideally the requirement to use the UFES would be phased in over a number of years, giving ample time for practitioners and students to learn the UFES well.) UFES would likely offer no drastic reduction in claims and disputes, however, since the site-specific, project-specific nature of construction would preclude identical application and interpretation of the documents from job to job.

Anyway, that's my two cents, Sid. I'd like to see a little more standardization of procedures and documents in the industry--not mandated, but by concurrence. Higher construction education can help in that regard. Good luck.

3: My single-word answer to your question is "no."

First, by definition, each project is unique. Logic is contradicted by thoughts that a standardized specification would be equally applicable to all projects without much modification. Please know that I assume that even a "unified" spec would allow for a certain (limited) amount of modification. Nevertheless, even if a quarter of the clauses in a typical specification were project-specific, that would require an awful lot of modification, and would thus challenge the "unified" concept.

Second, and more to your question, specs do not cause claims to occur. The specifications may define the outer boundaries of the battleground, but the disputes are brought onto the battlefield, and only affected in certain ways by the terms of the contract. The primary catalyst for all project disputes is human attitude. Why is it that some projects have few if any claims, while others are riddled with them? It is all about how willing (and how skilled) people are at working through their initially different perspectives. If they are open and understanding, and if they communicate in an even-keeled and respectful manner, resolutions will follow. If they are not, no amount of contract language will reduce the friction.

3: The answer is an unqualified "maybe." Not trying to be funny, but the real issues to consider include:

(a) A contract clause / specification is applied by humans with all their frailties. Even the most clearly written and understandable clause can come into dispute when people are pushed against a wall on a project that has issues. Either they really didn't consider all the ramifications the first few times they read it in context of the current issue, or they have chosen to use it as their weapon of choice. Either way the results can be ugly.

(b) If you are dealing with the same parties (contractors, owners, subcontractors, etc.) doing the same type of work then unified specifications like you describe is a positive for continuity. Consider this the "measured mile" approach to contracting behavior. However, when you are dealing with super large / complex design-build, often one-off efforts, then the contract and specifications need more tailoring to fit its unique circumstances and the parties involved.

(c) When dealing with international projects you have the added complexity of local customs, local laws and regulations, and international parties, all of which can create significant execution issues. The contract may not fully address local laws and regulations and rely upon international or home country specifications that ultimately create barriers to smooth and timely execution. This first domino to tip then results in never ending chaos and disputes for the balance of the project.

On balance the idea is commendable and has merit, but should not be mandated except in those types of projects and situations where the above identified problems do not exist.

5 : First of all, I don't think you will get everyone to "agree" on a front-end spec. One has to keep in mind that specs is that they are written by owners. Owners have a completely different mindset than contractors. What is considered "fair" in the mind of an owner is considered grievous in the mind of a contractor.

Putting that aside, a consistent spec would create less confusion and possibly result in claims being addressed better during the project. However, most contractual provisions have apposing positions that each sides can legally raise. Even when the spec is being constantly changed to keep up with resent court rulings, as is done with the DAS spec in Ohio, the language is constantly being challenged.

Often claims are pursued due to a disputes on the factual issues. If the specs could successfully get the sides to agree on the factual issues as the project progresses, it would greatly reduce litigation.

6 : Based on your assumptions, yes, the types of general conditions claims and disputes as we see them today would be reduced because the process of everyone endorsing the general conditions would force it to be fair and comprehensive. However, the assumption that you COULD get everyone to endorse it is another question! And the scenario you have spelled out necessitates a variety of versions, leading to conflicts over WHICH ONE to use, etc. The final caveat is WHO is doing the enforcing? It would have to be a government agency to have any teeth, with consequences if the directive were not followed... Although General Conditions claims would be less confusing if everyone had to use the same document, conflict would only be shifted from that to other areas, one of them being the legality of forcing entities to use the general conditions in the first place...

In short, when two entities do not agree on an issue, they will find a way to dispute it.

7 : I think it will increase disputes. It may reduce claims in the area that you thought of ahead of time and stuck your finger in the hole in the dike; but there's always something you didn't think of (like whack-a-mole). That being reality, meanwhile the added detail and the great volume of the front-end spec gives the illusion that you were able to think of everything (exhaustiveness) and therefore just provide more fodder for creative language interpretation to support claims.

One of the wonders that I've seen is the General Conditions that Toyota uses in Japan and Korea to build major plants: 3 pages of fine print, very few claims. Granted, there are major cultural (non-Western) factors at play here, but in their opinion, "the more general the clauses, the more subject matter it will cover, and hence greater the risk coverage".

Sounds cynical? Maybe I've been in this business too long.

8 : CCDC documents have widespread use in the commercial sector on projects with an architect. There is some limited use in the public sector. Typically these projects will use front end CCDC documents in conjunction with Masterformat developed jointly by CSI and CSC.

In the industrial world most people have not heard of CCDC and/or Masterformat and typically each Owner has their own form of Contract sometimes reinvented for each major project. On occasion they will use forms recommended by their engineering firm which always requires, in the mind of the Owner, "tweaking".

With that background assuming, the above does not fall within your 2 paragraph limit, I have the following response to your question.

Based on the use of the CCDC documents it would seem that there are less disputes "escalated" because there is more certainty as to the meaning of the term(s) in question and perhaps more importantly more certainty as to how it would be interpreted by the courts. I agree with Donald people are people and there will always be disputes. With however widespread use of standard form documents, over time a body of knowledge and precedence is developed that reduces creative and/or unnecessary arguments.

As both the private and public sector have used the same document in Canada I see no reason why it can't be used by both sectors. The reluctance by the public sector, here in Canada, has been as a consequence of their difficulty in moving away from their traditional draconian type Contracts.

9 : In theory, I believe the use of a UFES standard would preclude or reduce claims as long as all owners adhere to what the specs say. In application, however, a UFES standard may not be practicable.

The one advantage I see with a UFES standard is that it would help create consistency with the relationship in which owners, designers and contractors work; however, I can see this working only on small projects. Having this consistency also benefits those owners and designers that are not very sophisticated with construction contract requirements typically found with projects that are small and/or those with challenged budgets, where the services of professional construction managers and oftentimes construction attorneys are unable to be used.

On the other hand, most owners (especially private owners) who do (or think they do) understand construction, by their nature, like the flexibility to specify the "front ends" that best suit them; i.e. the golden rule approach. Even given commercial specs developed by groups such as AIA, CSI or Masterspec, owners often perform a cut and paste exercise incorporating their own modifications to these documents. Claims, unfortunately, often are the result of modified front end specs.

10 : I think the use of a standardized UFES would be highly effective in reducing disputes and claims on a project because it would contain a good prospective specification, and the construction industry, mainly Contractors, would ultimately learn to produce a good prospective analysis of delay impacts. The enforced usage of this prospective TIA allows for negotiation of the risk, in time and money, of the ramifications of potential delays, as well as allowing Owners to participation in the mitigation of their own delays. I would also hope that it would reference forensic methodology that must be used when the window of opportunity for predicting delay impacts and the risk has already been assumed by the Owner.

11 : The use of a UFES certainly could avoid some claims and disputes merely because the people in the project may know what is contained in them. Too many small contractors (and subcontractors) never receive or never read the front end. They rely on what they think it says from the last project (or some project in the past). Even the larger more sophisticated contractors have issues sometimes with their people not reading the contract and relying on what they think it says.

On the negative, are there any legal problems with drafting a UFES that is applicable in 50 states? I think some owners would resist because they want to tailor their specs to their advantage. I suspect that if adopted, uniform General Conditions would be subject to project and/or owner specific modifications through Special Provisions/Conditions specification sections to some degree negating the benefit of the UFES

12 : If the UFES are prescriptive to the degree that only predetermined equipment/systems and prequalified manufacturers and vendors are permitted, then there should (emphasize "should") be a reduction in claims. My experience, however, shows that regardless of the specifications, if a contractor loses money past the pain threshold on a job they will seek a way to recover the loss regardless of fault (thus the "should" part above). Also, depending upon the type of construction project, technology changes. In a process plant, for example, by the time the contract is let vs. the time the project is constructed may be several years. Advances in technology may render the prior spec out of date, or not in compliance with new environmental reg's, etc. To bring up to current technology would require a change, which opens the door for a claim.

Side note: "Mandatory" makes me immediately want to rebel against the system. I think contractors similarly hate being told what to do, especially by owners who hire them because they really don't know what to do, or think they do but really don't.

13 : The use of mandatory, truly standard UFES would indeed reduce claims and disputes on projects. Why change the rules of the game every time we play? If the playing fields (General Conditions) were level on all projects think what advances we could make in project management and project execution without reinterpretation of the rules of the game and rogue expectations and restraints. It would indeed prevent claims and after using the standard UFES, case history and precedents set that would prevent many of the abuses that occur due to wordsmithing an advantage to the owner, designer, contractor or subcontractor. Ideally it should be the same for both public and private work so that all may have the same rules to play the game.

The industry has attempted to have UFES. The standard AIA format was the best attempt but over enthusiastic consultants and parties, trying to protect their client's interests and the fact that buy in from owners, designers, contractors and subcontractors is not an easy objective, it has been water down. Buy in is only one of the problems. What group would author the UFES and then what about the enforcement of the standard? Then you would have to deal with state and federal laws that would differ in regions (i.e. pay when paid laws).

14 : Here is the thing about standardization – we standardize things so that we can reduced errors (by the contractor and the owner) and to reduce costs. Mathematically, you can show that the owner offering a job up for bid, actually pays the total cost of all parties to bid the job. When N = number of bidders, and C = the cost to bid, the probability of winning the contest is 1/N, therefore in order to recover the cost of the bid, C, each bidder must include N*C in their individual bids. Therefore, the owner pays the cost of everyone that bids the job, including all of the subcontractors that bid the work – based on the same analysis. As a consequence, the owner wants to reduce C (or N, though that is not typically a fruitful strategy – because contractors use an average "N" when determining their mark-up) and the best way to do this is to make the job easier and less costly to bid. In addition, standardizing GC's – like using the AIA 201, reduces both the time it takes to review the specs, (generally because the estimators know where the killer terms are located and look for them in the Special Conditions) it also reduces uncertainty and hedging against uncertainty in the bidding process.

15 : Philosophically, one would think uniform contract requirements should be the Holy Grail. However, each player organization has their own perceptions, philosophies, and practices [and never the twain shall meet ….-Kipling] that are time tested and proven for them. Hence, because each knows with undoubted certainty that THEIRS is/are the correct ones, they will never condescend to a 'uniform' set of conditions.

I don't agree that any standard, uniform, or other 'General Conditions' or Specifications should need modification from contract to contract. These documents evolved through many trials under fire and have been distilled into what they are, a proven best statement of what is required and/or the rules of conduct / engagement.

Modern, contemporary construction work scheduling has matured drastically. Now, today, we don't need 20. 30, 40,+ page manifestos. We only need a requirements statement that solely specifies what is required. Unfortunately we have wide spread misuse and at times outright abuses either unintentionally or otherwise so that for the time being our specification must, or should, contain certain prohibitions of that behavior.

16 : I don't think using a mandatory UFES would reduce claims and disputes on projects for the following reasons:

I think the formation of the general conditions of a contract is affected by a variety of factors, such as the law of the location in which it is used and the prevailing norms and culture. In this respect, there may be potential difficulties arising if a standard form of general conditions was used in different States (if in the USA) or in different regions of the world. As for the law, for example, in the USA you may have varying case law in different States about a particular term (say, for example, no-damages-for-delay clause). This would, in turn, affect how a the delay damages clause would be drafted in these terms and conditions. As for the culture, the Middle East, for example, employs a different set of construction management principles than in the USA. For example, a standard form of UFES may advocate the partnership or win-win approach, which may be a very new concept in the Middle East (or even in some locations in North America or some countries in Europe) . Also, from my experience and interaction with lawyers here in Egypt on construction arbitration cases, a lot of Egyptian lawyers would place equal (if not more) emphasis on the Civil Code when presenting or rebutting cases than they do on the contract itself. This takes us back to the effect of the governing law in the location in which the UEFS is intended to be used.

The other factor to consider is the varying risks associated with the roles of the contracting parties (such as owner-contractor, owner-designer, owner-vendor, contractor-subcontractor). I would imagine that it is more appropriate to have a set of general conditions for each type of contract, since the risk involved is different in each case. The only way to circumvent this problem is if the UEFS was too general, but this may give rise to ambiguity in the contract which would lead to an increase in, rather than an avoidance of, claims and disputes. This same factor, I believe, could also be the reason that public and private projects should not have the same general conditions. For example, public contracts may tend to give concepts such as public policy much more weight than private contracts, and may therefore contain stringent obligations on the contractor which private contracts may not.

17 : I'm doubtful that the use of a UFES system would result in any meaningful reduction in claims. Consider that most claims involve disputed extra work, delays and acceleration, differing site conditions, failure to make payment, etc. UFES would help identify a uniform approach to resolving the claims but wouldn't prevent the claims from arising in the first place. In most cases, a better job by the design team in preparing the information behind the front end specs would prevent or reduce the amount of claims.

In addition, many states and municipalities have a de facto UFES in that they have fairly standard general conditions that might be tweaked for the specifics of a project. Yet, they never seem to lack claims, probably due to deficiencies in the design.

Lastly, we have 50 state court systems, many federal court districts as well as countless local court systems. Each would interpret the UFES differently, particularly as it pertains to public and private work. For evidence of this, we need look no further than notice and no damage for delay provisions in contracts to see that courts typically protect the public fiscally by enforcing these provisions on public contracts and ignoring them on private contracts.

Appendix G

Glossary and Acronyms

Glossary

This abbreviated glossary is being provided to assist the reader with terminology unique to the topic. More comprehensive glossaries and dictionaries are available at the websites of the Construction Management Association of America (http://cmaanet.org/glossary.php) and Constructionplace.com (http://www.constructionplace.com/glossary.asp) for construction management specific terms and at Max Wideman's excellent project management site, http://www.maxwideman.com/pmglossary/.

Model Clauses:	Contract or specification language provided as a guideline for drafting provisions specific to a project or endeavor. Their use is not mandatory but often provides a "safe harbor" solution to the draftsperson. See, for example, **Business Proposes Alternative Model Contract Clauses for Data Transfers from the EU**, available at http://www.mofo.com/news/news/article580.html and **Progress Report on Code Clauses for "Limit Design"**, ACI-ASCE Committee 428, most recently accessed on 3/19/08.
Order of Precedence	A provision intended to establish ranking (superiority) in the event of a conflict or inconsistency between various contract documents as, for example, between the drawings and written technical specifications.
Project Delivery Method:	The means by which work is contracted such as Lump Sum (also known as Firm Fixed Price), Guaranteed Maximum Price (GMP) and Design/Build, among other methods.

Standardized:	Something established by authority, custom, or general consent as a model or example; regularly and widely used, available, or supplied. (www.m-w.com) Pre-printed forms are often referred to as "standardized" forms.
Third-Party Beneficiary	A non-signatory to an agreement or an unnamed person or entity for whose benefit a contract may exist.

Acronyms

AACEI	Association for the Advancement of Cost Engineering International
ABC	Associated Builders and Contractors
AGC	Associated General Contractors of America
AIA	American Institute of Architects
AOD	Associated Owners and Developers
ASA	American Subcontractors'Association
ASCE	American Society of Civil Engineers
CII	Construction Industry Institute
CMAA	Construction Management Association of America
COAA	Construction Owners Association of America
EJCDC	Engineers Joint Contract Documents Committee
FARS	Federal Acquisition Regulations
FES	Front End Specifications
GC	General Contractor
NAWIC	National Association of Women in Construction

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